GROWTH OPPORTUNITIES FOR THE DOMESTIC NEW LIGHT VEHICLE MARKET IN SOUTH AFRICA

By

FAIZAL KHAN

Submitted in accordance with the requirements for the degree of

DOCTOR OF PHILOSOPHY

in the subject

MANAGEMENT STUDIES

at the

UNIVERSITY OF SOUTH AFRICA

PROMOTER: PROF J W STRYDOM

CO-PROMOTER: DR N LAMPRECHT

JUNE 2023

Declaration

Name: Faizal Khan ____

Student number: 41025636 ____

Degree: PhD in Management Studies _________________________________

Topic:

GROWTH OPPORTUNITIES FOR THE DOMESTIC NEW LIGHT VEHICLE MARKET IN SOUTH AFRICA

I declare that this thesis entitled: **“Growth opportunities for the domestic new light vehicle market in South Africa”** is my own work and that all the sources that I have used, or quoted, have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

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Acknowledgements

Firstly, I want to thank God Almighty for giving me the patience, strength, willpower, and perseverance to complete this study. It was a long, bumpy, excruciating road but I received the willpower and courage to overcome all the hurdles and to continue when the going got tough. It is only through God's grace and mercy upon me that I was able to complete this research, for which I am forever grateful.

I feel a profound sense of appreciation towards several remarkable people who made it possible for me to complete this study. I would like to extend a heartfelt thank you for all their contributions, time, and advice.

I thank my supervisors, Prof JW Strydom and Dr Norman Lamprecht, for their patience, guidance, expertise, and invaluable advice, for supporting me when the process became difficult and encouraging me to get it done. These two supervisors are a perfect team for anyone who wishes to pursue and attain a degree in the automotive industry. Their extensive knowledge, coupled with your own dedicated, hard work will ensure you succeed in achieving your goals as I have done with my master's degree and now a doctorate. On a personal note, their academic excellence, inspiration, and continuous encouragement are highly appreciated, and I could not have asked for better mentors.

I thank all the participants who assisted me with this study, who gave their valuable time and imparted their knowledge. Without their participation, this study would not be complete.

I thank Dr Marthi Pohl for all the statistics, without her excellent statistical skills, guidance, and patience, I would have been lost. She has truly been a pillar of strength, especially when I became overwhelmed with the statistics. I thank her dearly for her significant contribution to the completion of the research.

I thank Linda van den Berg for her excellent language editing. She has proven herself to be an excellent proof-reader and language editor for which I am extremely appreciative.

I thank UNISA's centre for Business Management, for its financial assistance with most aspects of this study.

I thank my loving parents, Ayob and Rahilla Khan, for all their love and support, for always believing in me and being proud of me. I am extremely fortunate to have them in my life, without them, I would not have come this far. Thank you for your precious prayers and for making me believe in myself.

I thank my brothers Imtiaz, Feroz, Iqbal and Nasar Khan, who has kept me on my toes by always pushing me. I thank my aunt, Nassreem Bux, and my mother-in-law, Razia Khan, who has kept me in their precious prayers. To my immediate family, cousins, and friends who have supported me throughout this journey: Samir, Aadil, Haroon, Ismail, Nadia, Shazia, Ayesha, Raqeeba, Nabeelah, Faranaz, Sadia, and my lovely nephews and nieces, I thank you all as there are too many names to mention.

To the love of my life, Nasreen Khan, thank you for your patience, sacrifice, support, and encouragement throughout my studies. I would have been lost without you by my side always encouraging and motivating me to achieve new heights. I will forever be indebted to you. To my beloved children, Mohammed Farhan, Sofiah, and Aaminah Khan, thank you for being tolerant, understanding, caring and patient with me while I pursued my studies. I will always remember Aaminah sitting on my lap, playing with my phone whilst I do my research; these moments will be cherished. I know that so much of our time together has been sacrificed while I focused on completing this study, however, from now on, my time is yours and we will enjoy the fruits of the sacrifices we made. Thank you for encouraging me to go beyond my limits, now this chapter in my life is completed. You are my pillars of strength and together we will transcend further.

Abstract

The export-oriented South African automotive industry is in a typical position seeing that it needs to pursue growth strategies in an ever-evolving global marketplace. The industry must supply its main automotive export markets with the latest vehicle technology without losing sight of the domestic and African markets which currently trail behind international fuel and emissions standards. The study researched and identified growth opportunities for the domestic new light vehicle market in South Africa. The South African automotive industry has undergone significant changes in the past decades because of evolving automotive policies, pressure for a greener environment, the advancement of alternative energy sources, and other exogenous factors, such as the impact of the Coronavirus Disease 2019 (COVID-19) pandemic. Technological evolution brought the advent of the fourth industrial revolution, the decline of the internal combustion engine, the quest for cleaner fuels, technological leaps in the development of electric vehicles, changing consumer buying patterns, and the use of the digital economy to disrupt the status quo of the automotive industry. The importance of a vigorous South African automotive industry cannot be overemphasised because it is the country's largest manufacturing industry, therefore a vital contributor to the economy and a major job creator.

The research attempts to identify the different growth opportunities available to the South African automotive industry to ensure its long-term sustainability. The study used an embedded mixed methods approach as both quantitative and qualitative research methods were used. The research paradigms used is a combination of exploratory and descriptive research as well as pragmatism. The conclusions of the study established that growth opportunities for the South African automotive industry do exist in the form of enhancing automotive research and development, encouraging new vehicle manufacturing opportunities, increasing the localisation of automotive components, and improving infrastructure to attain the targeted growth objectives. The recommendations made are that government, in conjunction with the relevant stakeholders, must take joint responsibility to find innovative solutions to pursue the stated growth opportunities, while still managing rising costs which are negatively impacting the growth of the domestic market.

Keywords: MIDP, APDP, SAAM, NAAMSA, AIEC, AAAM, SADC, SACU, AGOA, manufacturing sector, ASCCI, LCVs, EV, OEM.

Opsomming

Die uitvoergeoriënteerde Suid-Afrikaanse motorbedryf bevind hom in ’n moeilike posisie aangesien die industrie groeistrategieë ’n voortdurend wisselende wêreldmark moet nastreef. Die bedryf moet sy vernaamste motoruitvoermarkte van die nuutste voertuigtegnologie voorsien sonder om die plaaslike mark en die Afrika-mark, wat tans sleg by internasionale brandstof- en emissiestandaarde afsteek, uit die oog te verloor. Die studie het groeigeleenthede vir die plaaslike mark vir nuwe ligte voertuie in Suid-Afrika nagevors en geïdentifiseer. Die Suid-Afrikaanse motorbedryf het in die afgelope dekades aansienlike aanpassing vanweë veranderende motorbeleide, druk vir ’n groener omgewing, die vooruitgang van alternatiewe energiebronne en ander eksogene faktore, soos die impak van die koronavirussiekte-2019-pandemie (COVID-19-pandemie), ondergaan. Tegnologiese verandering het die koms van die Vierde Nywerheidsrevolusie, die uitfasserinf van die binnebrandenjin, die soeke na skoner brandstof, tegnologiese innovasies in die ontwikkeling van elektriese motors, veranderende kooppatrone van verbruikers en die gebruik van die digitale ekonomie wat die status quo van die motorbedryf ontwrig, teweeggebring. Die belangrikheid van ’n lewenskragtige Suid-Afrikaanse motorbedryf kan nie oorbeklemtoon word nie, aangesien dit die land se grootste vervaardigingsbedryf is en ’n onmisbare bydrae tot die ekonomie lewer en ’n groot bron van werkskepping is.

Die doel van die navorsing was om die verskillende groeigeleenthede wat tot die Suid-Afrikaanse motorbedryf se beskikking is, te identifiseer om die bedryf se langtermyn-volhoubaarheid te verseker. ’n Ingebedde gemengdemetode-benadering is vir die studie gebruik, waar beide kwantitatiewe en kwalitatiewe navorsingsmetodes gebruik is. ’n Kombinasie van verkenningsnavorsing en beskrywende navorsing, sowel as pragmatisme, is as navorsingsparadigmas gebruik. Die gevolgtrekkings van die studie was dat die Suid-Afrikaanse motorbedryf wel groeigeleenthede tot sy beskikking het indien motorbedryfnavorsing en -ontwikkeling bevorder word, nuwe voertuigvervaardigingsgeleenthede aangemoedig word, die lokalisasie van motoronderdele verhoog word en infrastruktuur verbeter word ten einde die gestelde groeidoelwitte te behaal. Die aanbevelings wat op grond van die studie gemaak is, is dat die regering, in samewerking met die tersaaklike belanghebbendes, gesamentlik

verantwoordelikheid moet neem om innoverende oplossings te vind ten einde die gestelde groeidoelwitte te bereik, en terselfdertyd stygende koste wat die groei van die plaaslike mark negatief beïnvloed, te bestuur.

Sleutelwoorde: Motorbedryfontwikkelingsprogram ("MIDP"), Motorproduksie en ontwikkelingsprogram ("APDP"), Suid-Afrikaanse Motormeesterplan ("SAAM"), Nasionale Vereniging van Motorvervaardigers van Suid-Afrika ("NAAMSA"), Motorbedryfuitvoerraad ("AIEC"), Afrika-vereniging van Motorvervaardigers ("AAAM"), Suider-Afrikaanse Ontwikkelingsgemeenskap ("SADC"), SuiderAfrikaanse Doeane-unie ("SACU"), Wet op Groei en Geleenthede in Afrika ("AGOA"), vervaardigingsektor, Inisiatief vir Motorbedryfaanbodkettingmededingendheid ("ASCCI"), ligte kommersiële voertuig ("LCV"), elektriese motor ("EV"), vervaardiger van oorspronklike toerusting ("OEM").

Kgutsufatso

Indasteri ya dikoloi e rekisetsang dinaheng tse kantle ho naha ya Aforika Borwa e boemong bo tlwaelehileng ka ha e hloka mawa a ho e hodisa mmarakeng o dulang o fetoha lefatsheng kaofela. Indasteri e tlameha ho fepela mebaraka ya yona e meholo ya dikoloi tseo e di rekisetsang kantle ho naha, theknoloji ya moraorao ya dikoloi e sa lebale mebaraka ya lehae le ya Aforika, eo ha jwale katleho ya yona e latelang dipehelo tsa matjhabeng tsa dibeso le ho ntshetswa ha kgase ya tsona moyeng. Phuputso e batlisisitse le ho hlwaela mmaraka wa lehae wa dikoloi tse ntjha tse rwalang thepa le batho ba banyane, menyetla ya kgolo Aforika Borwa. Indasteri ya dikoloi ya Aforika Borwa e bile le diphetoho tse kgolo mengwahashomeng e fetileng ka lebaka la maano a ntshetswang pele a amang dikoloi, kgatello ya ho ntlafatsa mokgwa oo disebediswa di sebediswang ka oona ho fokotsa kameho ya tsona maphelong a batho le tikolohong, ntshetsopele ya mehlodi e meng ya eneji, le dintho tse ding tse tswang kantle tse jwalo ka kameho ya sewa sa Lefu la vaerase ya Corona sa 2019 (COVID-19). Ntshetsopele ya theknoloji e fihlisitse phetoho e kgolo ya tshebediso ya theknoloji, ho fokotseha ha metjhini e fetolelang eneji e ka hara ntho e itseng ho ba eneji e e tsamaisang ka ho tjhesa dibeso tsa fosile, ho batla dibeso tse hlwekileng, dintshetsopele tse kgolo tsa bohlokwa tsa theknoloji tsa ho hlahiswa ha dikoloi tse tsamayang ka motlakase, ho fetoha ha ditlwaelo tsa bareki tsa ho reka le tshebediso ya theknoloji e kopanyang batho, dikgwebo, disebediswa le metjhini ya dijithale le ditselatshebetso tsa yona, ho sitisa boemo bo renang ba ditaba tse amanang le indasteri ya dikoloi. Bohlokwa ba indasteri e matlafetseng ya dikoloi Aforika Borwa bo ke ke ba toboketswa le ho feta hobane ke indasteri e kgolo ka ho fetisisa ya tlhahiso naheng, kahoo e na le seabo sa bohlokwa moruong le tlhahisong e kgolo ya mesebetsi.

Patlisiso e leka ho hlwaya menyetla e fapaneng ya kgolo e fumanehang indastering ya dikoloi Aforika Borwa ho netefatsa tshehetso ya yona ya nako e telele. Phuputso e sebedisitse mekgwa e kopantsweng ka ha ho sebedisitswe mekgwa ya patlisiso e bokellang le ho hlopholla datha eo e seng ya dipalo le patlisiso e lekanyang maikutlo a bankakarolo ka ho sebedisa dipalo le dinomoro, ka bobedi. Mekgwa e sebedisitsweng ya ho etsa dipatlisiso ke e kopantseng patlisiso ya sehlooho se sa

hlaloswang hantle kapa se sa batlisisweng haholo le patlisiso ya mokgwa o hlalosang dintho tse ikgethang tsa sehlooho se batlisiswang mmoho le ho rarolla bothata ka tsela e loketseng maemo a renang ho na le ho latela mehopolo le melao e sa fetoheng. Qetelo ya phuputso e fumane hore indasteri ya dikoloi ya Aforika Borwa e na le menyetla ya kgolo ka ho matlafatsa dipatlisiso le ntshetsopele ya dikoloi, ho kgothalletsa menyetla ya ho etswa ha dikoloi tse ntjha, ho etsa hore dikarolo tsa dikoloi di hlahiswe dikhamphaning tsa lehae ka bongata, le ho ntlafatsa infrastraktjha ho fihlela dipheo tse batlwang tsa kgolo. Ditshisinyo tse entsweng ke tsa hore mmuso le bathahaselli ba amehang ba tlameha ho jara boikarabelo mmoho ho fumana ditharollo tse hlahisang mehopolo e metjha tsa ho phehella ho hlahisa menyetla ya kgolo e boletsweng, ha ho ntse ho laolwa ditheko tse phahameng tse amang kgolo ya mmaraka wa lehae hampe.

Mantswe a bohlokwa: MIDP, APDP, SAAM, NAAMSA, AIEC, AAAM, SADC, SACU, AGOA, lekala la tlhahiso, ASCCI, LCVs, EV, OEM.

Abbreviations

AI – Artificial Intelligence

AV – Autonomous Vehicle

ACS – Australian Customs Service

AIS – Automotive Investment Scheme

ATS – Automotive Transformation Scheme

AAAM – Association for African Automotive Manufacturers

ACIS – Automotive Competitiveness and Incentive Scheme

AFTA – ASEAN Free Trade Area

AGOA – African Growth and Opportunity Act

AIEC – Automotive Industry Export Council

AITF – Automotive Industry Transformation Fund

APDP – Automotive Production Development Programme

AfCFTA – African Continental Free Trade Area

ANOVA – One-way Analysis of Variance

ASCCI – Automotive Supply Chain Competitiveness Initiative

B2B – Business-to-business

B2C – Business-to-consumer

BEVs – Battery Electric Vehicles

BOI – Board of Investment

BNEF – Bloomberg New Energy Finance

C2C – Consumer-to-consumer

CAN – Competitive Advantage of Nations

CPI – Consumer Price Index

CEMS – College of Economics and Management Sciences

CO – Carbon Monoxide

CO_2 – Carbon Dioxide

COVID-19 – Coronavirus Disease 2019

CBU – Completely Built-up-Unit

CKD – Completely Knocked-Down

CRM – Customer Relationship Management

DTIC – The Department of Trade, Industry and Competition

EEC – European Economic Community

EC – Electronic Commerce

EFA – Exploratory Factor Analysis

EU – European Union

EVs – Electric Vehicles

E-SCM – Electronic-Supply Chain Management

ESKOM – Electricity Supply Commission

FDI – Foreign Direct investment

FTAs – Free Trade Agreements

GATT – General Agreement on Tariffs and Trade

GDP – Gross Domestic Product

GSP – General Systems of Preferences

HC – Hydrogen Carbons

ICE – Internal Combustion Engine

IT – Information Technology

IoT – Internet of Things

ICCT – International Council on Clean Transportation

IP – Internet Protocol

ITAC – International Trade Administration Commission

JIT – Just-in-Time

LOR – Live Online Retail

LCVs – Light Commercial Vehicles

MIDP – Motor Industry Development Programme

MNCs – Multinational Corporations

NAACAM – National Association of Automotive Component and Allied Manufacturers

NAAMSA – National Association of Automobile Manufacturers of South Africa

NADA – National Automobile Dealers' Association

NAFTA – North American Free Trade Area

NEVs – New Energy Vehicles

NOx – Nitrogen Oxides

NRF – National Research Foundation

OEM – Original Equipment Manufacturer (vehicle manufacturer)

OICA – International Organisation of Motor Vehicle Manufacturers

PI – Production Incentive

PM – Particulate Matter

PCA – Principal Component Analysis

PMI – Absa Purchasing Managers Index

PWC – PricewaterhouseCoopers

PHEVs – Plug-in Hybrid-Electric Vehicles

R – South African Rand

SA – South Africa

SCA – Sustainable Competitive Advantage

SCI – Supply Chain Integration

SCM – Supply Chain Management

SUVs – Sports Utility Vehicles

SAAM – South African Automotive Masterplan

SACU – Southern African Customs Union

SADC – Southern African Development Community

SARS – South African Revenue Service

SKD – Semi Knocked-Down

SPSS – Statistical Package for Social Sciences

SWOT – Strengths Weaknesses Opportunities and Threats

TIPS – Trade and Industrial Policy Strategies

TMC – Toyota Motor Company

TFTA – Tripartite Free Trade Area

TRIM – Trade Related and Investment Measure

UK – United Kingdom

UNISA – University of South Africa

US – United States

USD – United States Dollar

VAA – Vehicle Assembly Allowance

VAT – Value Added Tax

VOC – Volatile Organic Compounds

VW – Volkswagen

WEF – World Economic Forum

WFC – Worldwide Fuel Charter

WTO – World Trade Organisation

WWW – World Wide Web

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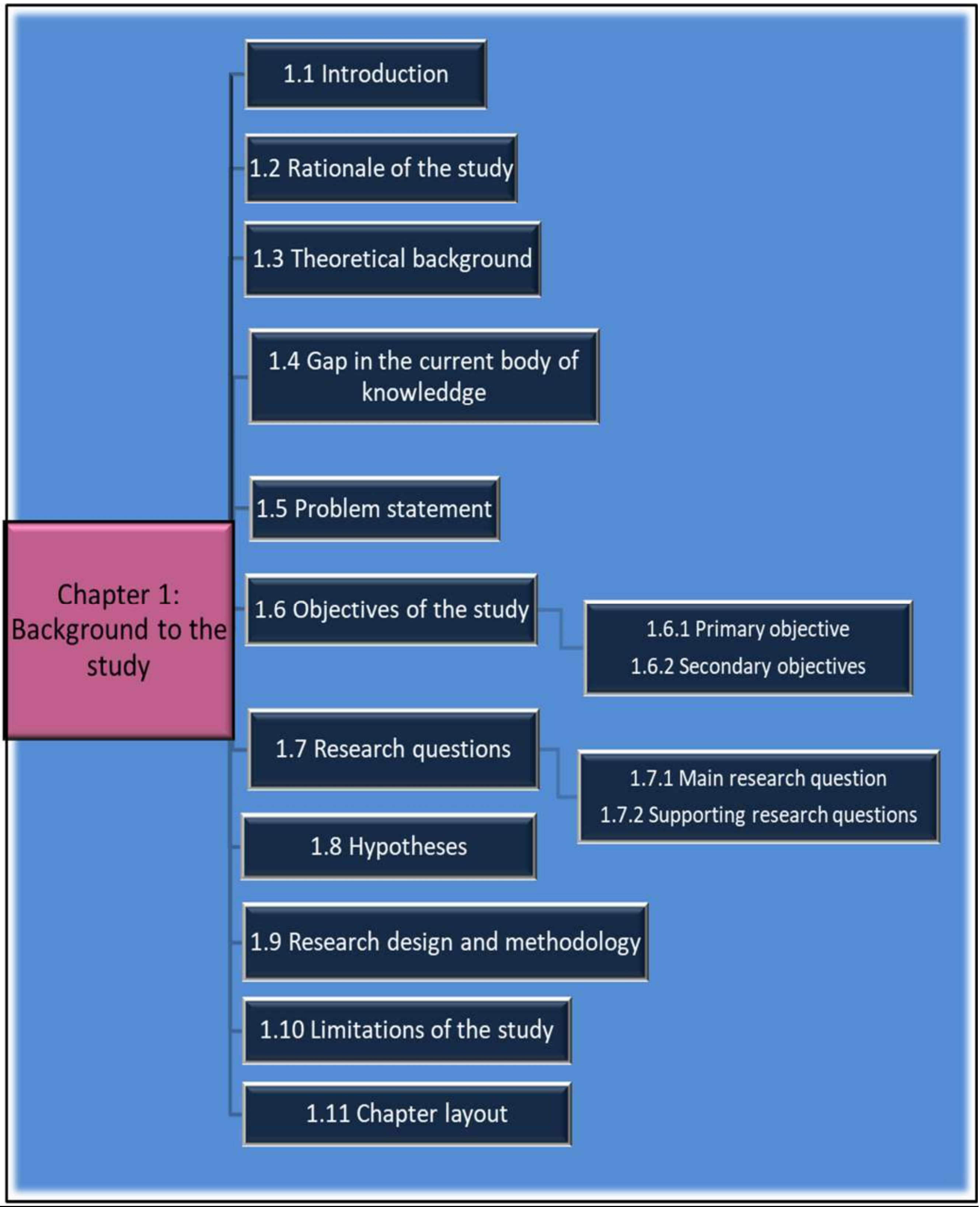
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Chapter 1

Background to the study

1.1 Introduction

The South African new light vehicle market comprises of passenger car and light commercial vehicle models and supply consists of a diverse variety of domestically manufactured and imported vehicles. According to the Automotive Industry Export Council (AIEC) (2022:16), the trading environment in South Africa is extremely competitive compared to global standards and in 2021 there were no less than 43 passenger car brands and 3 077 model derivatives, the vastest selection of market-size ratio found globally. Similarly, in the light commercial vehicle segment, during the same period, there were no less than 23 brands with 746 model derivatives to select from (AIEC, 2022:16). The vehicle ownership ratio is 178 vehicles per 1 000 persons which indicates that a significant growth potential still exists in South Africa (AIEC, 2022:6).

The domestic new vehicle market and new vehicle sales are closely linked to the South African economy's performance. In 2020, the domestic new vehicle market was depressed because of the global Coronavirus Disease 2019 (COVID-19) pandemic which had a devastating impact on consumers' spending levels and the affordability of new vehicles. The pandemic had a crippling effect on the new vehicle sales market which experienced a hefty decline of 156 041 units (29.2%) compared to 2019 sales figures; 536 612 units were sold in 2019 compared to 380 206 units in 2020 (AIEC, 2021:16). The pandemic not only exacerbated the economic recession in the country, but the devastating impact resulted in the 2020 domestic new vehicle market to experience the same sales levels as 18 years ago (AIEC, 2021:16). In the South African vehicle market, passenger car sales contributed 65.5% and increased by 23.4%, whilst Light Commercial Vehicles (LCVs) contributed 28.7% and increased by 20% from 2020 to 2021 to the total market (AIEC, 2022:15). Passenger car sales, which were sold through the national dealers and are a representation of consumer activity in the market, constituted 84.5% of total sales in 2021, followed by the vehicle rental industry with 10.1%, industry corporate fleet sales with 2.8% and government with 2.6% (AIEC, 2022:15). Imports dominate the domestic market where passenger car imports constituted 78.3% and LCVs 18.1% of total light vehicles sold in South Africa in 2021 (AIEC, 2022:25). Consumers are still battling with affordability in the new vehicle market owing to the current market conditions and a depreciating rand value. Over the past few years, even the premium segments showed a sharp decline in imported premium models' sales because of sharp price increases.

The abovementioned figures highlight the dynamic new South African vehicle marketplace. Disruptions are occurring in this industry. One such example is the changing consumer behaviour of buyers. Until now, consumers were habitual in their buying pattern using traditional methods of information. However, brands now have a window of opportunity to influence their purchase early in the buying process owing to new technological marketing practices. A targeted marketing campaign which employs the right advertisement, aimed at the right audience, and on the right communications channel, can be highly effective in directing buyers to not only a new car, but also to a specific brand (Automotive Refinishers, 2017:20). Customers are clearly smarter and more astute in their buying practices.

The online environment has become increasingly important to consumers because they spend a significant amount of time perusing and searching for the product they want to buy before stepping into a dealership; thus, a dealer's website should be easy to access and navigate, it must be intuitive and as attractive as possible. According to Autolive June issue (2020:11), South African internet users spend more time online than most other countries' users. On a daily average, they spend eight hours and twenty-three minutes online, this is three times more than the Americans and twice the amount of time that Germans spend online. The virtual showroom is an exemplary way to exhibit motor vehicles, provide detailed specifications about a vehicle to clients, and to allow the client to change certain specifications to suit their specific needs. They are able to customize their specific vehicle choice by adding extras, and once they have completed the selection online, they could step into the dealership to complete the transaction. A survey done in 2017 indicated that 75% of millennials do not wish to go into a car dealership to buy a vehicle and preferred to complete the entire transaction online (Autolive September issue, 2017:16). It is a critical marketing tool for role-players who want to embed their footprint in the cyberspace community to have an online presence in the South African automotive industry (Autolive June issue, 2020:11).

Another form of disruption is centered around the nature of competition. Car companies' competition is no longer other car companies, it is online companies e.g., Google, Apple and Amazon which provide ride sharing and transport services to consumers (Naude & Badenhorst-Weiss, 2011:200; Autolive June issue, 2017:13). Software applications and alternative communication and distribution channels are disrupting most traditional industries as well as the automotive industry. Taxi services software application tools have caused great disruption, for example, Uber has become the world's largest taxi company without owning a single vehicle (Bala & Verma, 2018:328). Technology development and more demanding clients are also disrupting the auto industry (Tolmay & Venter, 2017:1). In 2018, the first self-driving cars appeared in public. This will, inter alia, impact car ownership with speculation that it will decline in future (Autolive June issue, 2017:13). Another technological disruption is the emergence of the Electric Vehicle (EV). The major automotive OEMs recently announced that they will move away from fuel to electrical power sources as political pressure is intensifying in this regard (Autolive January issue, 2019:1). Europe, being South Africa's main export market, transcended China as the hot spot for EV growth and for the first time since 2015, EV sales in Europe outpaced EV sales in China (AIEC, 2021:44). Global EV sales more than doubled to 6.6 million units in 2021 compared to 3.24 million units in 2020 owing to soaring demand from the Chinese market, Tesla, and the Volkswagen Group (AIEC, 2022:38).

The latest disruption to impact the global automotive landscape is the COVID-19 pandemic. The pandemic has globally caused disruptions in every industry and is an immense challenge which the South African automotive industry is contending with (Autolive June issue, 2020:2). As part of a fully integrated value chain in the global automotive environment, decisions by head offices and the South African automotive industry's major trading partners will have an impact on future developments in the automotive industry in South Africa and on domestic consumers' purchasing patterns.

Growing the domestic new vehicle market while acknowledging these disruptions, is one of the imperative building blocks to realise the domestic automotive industry's ambition to widen vehicle manufacturing in future.

1.2 Rationale of the study

The South African automotive industry is one of the anchors of the national industrial base because it contributed 4.3% to the national Gross Domestic Product (GDP), 17.3% to manufacturing output, and 12.5% to all South African exports in 2021 (AIEC, 2022:6). The South African government is committed to the automotive industry. Government's incentives, which manifested in the form of the Motor Industry Development Programme (MIDP) and the Automotive Production and Development Programme (APDP), have been the backbone to promote the domestic automotive industry. The expansion of South Africa's automotive industry was directly linked to these strategic programmes which helped domestic manufacturers to innovate (AIEC, 2016:18). One of the MIDP's major achievements was to incorporate the miniscule South African automotive industry into the global automotive environment (AIEC, 2013:11; Komorasamy & Hoque, 2015:976). The APDP's vision, implemented in January 2013, was to obtain economies of scale by manufacturing approximately one million vehicles per annum by 2020, with a growth opportunity for the first and second tier suppliers to broaden and deepen the domestic supplier base in the country (AIEC, 2017:25).

The South African automotive industry, which is relatively small, needs to grow in global terms. In 2020, because of the global COVID-19 pandemic, South Africa's vehicle production declined from a record high of 631 921 units in 2019 to 447 218 units in 2020 (AIEC, 2021:42) moving farther away from the one-million-unit vehicle production figure. According to the International Organisation of Motor Vehicle Manufacturers (OICA) (2022:1), South Africa had a global market share of 0.62% in 2021, and globally ranked 21st regarding vehicle manufacturing. Toyota celebrated 42 years of market leadership in South Africa and is the leading automotive brand with a market share of 25.3%, followed by the Volkswagen (VW) Group of South Africa with a 15.4% market share, in third place is Hyundai automotive South Africa with a 7.2%

market share, and in fourth place is Ford Motor Company with a 6.7% market share in 2021 (AIEC, 2022:17). In 2021, the domestic OEMs accounted for approximately 61.5% of the overall new vehicle market in South Africa (AIEC, 2022:17). Hyundai automotive South Africa, being the largest independent vehicle importer in the country, accounted for 7.2% of the overall new vehicle market share in 2021 (AIEC, 2022:17). The important question is: How to grow the manufacturing and consumption of new vehicles domestically, and in exports, to achieve international competitiveness and the one million manufacturing target? Table 1.1 reveals the number of passenger cars and light commercial vehicles manufactured in South Africa with the domestic and export value from 2012 to 2021.

Table 1.1: Passenger cars and light commercial vehicles manufactured in South Africa with their domestic and export value from 2012 to 2021

Year	Passenger Cars				Light Commercial Vehicles			
	Market units			Exports as a % of total	Market units			Exports as a % of total
	Domestic	Exports	Total		Domestic	Exports	Total	
2012	120 518	151 660	272 178	55,7	121 638	123 443	245 081	50,4
2013	113 357	151 892	265 249	57,2	127 051	121 345	248 396	48,9
2014	123 101	154 920	278 021	55,7	137 044	118 585	255 629	46,4
2015	111 890	228 459	340 349	66,2	140 870	102 664	243 534	42,1
2016	98 743	237 715	336 458	70,6	130 346	104 987	235 333	44,6
2017	100 528	230 047	330 575	69,6	136 438	105 862	242 300	43,7
2018	99 494	220 889	320 383	68,9	133 081	128 005	261 086	49,0
2019	87 822	260 843	348 665	74,8	128 995	125 455	254 450	49,3
2020	59 428	178 788	238 216	75,1	93 749	91 942	185 691	49,5
2021	65 493	173 774	239 267	72,3	108 885	123 281	232 166	53.1
Average	98 038	198 899	296 937	66,6	125 810	114 557	240 367	47,7

Sources: (AIEC, 2017:18; AIEC, 2018:17; AIEC, 2019:19; AIEC, 2020:20; AIEC, 2021:20; AIEC, 2022:20)

Table 1.1 reveals that in 2021, the domestic market share was relatively small, and exports contributed substantially to the production volume of vehicle manufacturers to the extent of 72.3% in the case of passenger cars, and 53.1% in the case of light commercial vehicles. Although the overall production of OEMs increased, the domestic market share declined. A high volume of South African manufactured vehicles is not necessarily destined for local sales but rather meant for the export market (Naude & Badenhorst-Weiss 2012a:49; Ambe & Badenhorst-Weiss, 2013:1; AIEC, 2020:24). In doing this, import credits are generated so that imported vehicles can be offered at the best prices by rebating the relevant import duties, thereby enabling a wider choice range demanded by a consumer-driven domestic market.

The APDP vision of sales beyond one million vehicles did not come to fruition when the policy terminated on 30 June 2021. A crucial aspect of the APDP, amongst others, was to achieve higher growth consumption in the domestic new vehicle market to offset the higher vehicle production volume (AIEC, 2016:23). Government plays a critical role in the development and growth of the automotive industry by providing long-term assurances that policy support will continue beyond 2020. The South African Automotive Masterplan (SAAM) 2021-2035 aims to transcend the APDP and will create a framework wherein even larger sums of investments and production may be obtained to broaden and deepen the automotive industry, and it will provide assurances to multinational vehicle and automotive component companies when investing in South Africa (AIEC, 2020:7).

The SAAM 2021-2035's objectives include the following: grow South African vehicle manufacturing to 1% of global manufacturing; double automotive employment in the supply chain; increase local content in South African manufactured vehicles to 60%; transform the automotive value chain; and deepen value addition within South African automotive value chains (AIEC, 2022:32). The SAAM 2021-2035 aims to achieve 1% of global vehicle manufacturing which equates to approximately 1.4 million vehicles per annum. The domestic market and exports need to grow relative to this level of manufacturing to offset the higher production achieving market optimisation. There will be several "pillars" to support the objectives of the SAAM, these include domestic market optimisation, regional market development, localisation, industry transformation, and infrastructure and skills development (AIEC, 2022:32). These pillars endeavour to develop the domestic industry and to increase new vehicle manufacturing and consumption to that of international levels. Figure 1.1 indicates the new vehicle sales in South Africa from 1999 to 2021 and shows its close correlation to GDP.

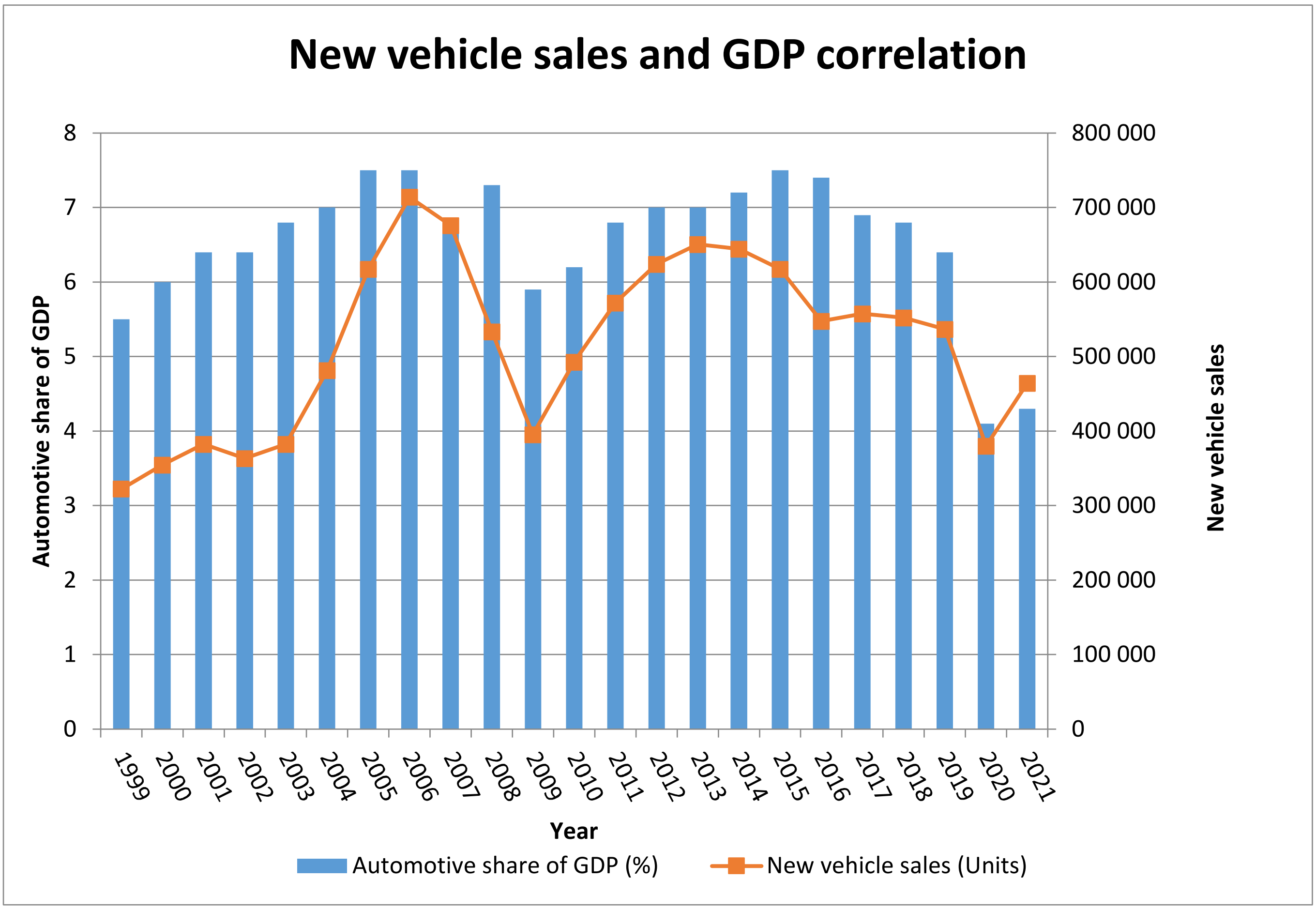


Figure 1.1: New vehicle sales from 1999 to 2021 and its correlation to GDP

Sources: (National Association of Automobile Manufacturers of South Africa, 2016:5; OICA, 2022:1)

South Africa's higher GDP growth rates from 2003 to 2006 resulted in nearly doubling new vehicle sales to reach a record high of 714 315 units in 2006 (National Association of Automobile Manufacturers of South Africa, 2017b). The global financial crisis of 2008 affected the financial markets and severely impacted the automotive industry which has not yet recovered to the record levels set in 2006 (Paddey & Rousseau, 2011:349). According to the National Association of Automobile Manufacturers of South Africa (NAAMSA) (2016:8), GDP growth of more than 4.5% would result in an annual domestic new vehicle sales growth of more than 20%, whilst GDP growth of

2.5% to 4.5% would result in a volume growth of 10% to 20% per annum. GDP growth of 1.5% to 2.5% is required to ensure a modest growth in new vehicle sales. If the ambitious targets of one million units per annum by 2020 is achieved, the automotive industry's contribution to the South African GDP would rise to approximately 10% (NAAMSA, 2016:4). The total number of new vehicle sales in South Africa during 2021 amounted to 464 493 units and constituted both locally manufactured and imported vehicles (AIEC, 2022:6). In 2021, the 262 281 new light vehicles imported to South Africa came from twenty-four countries. These imported light vehicles constituted 60% of the total light vehicle sales, slightly higher than the 57% of 2020 because of the rebound in domestic new vehicle market (AIEC, 2022:25). In 2021, 78.3% of passenger vehicles and 18.1% of LCVs sold in South Africa were imported (AIEC, 2022:25). This highlights that imports and domestic production are influenced and governed by the fluctuations in the GDP and the automotive policy regime in South Africa. The South African model mix consists of fulfilling the demands of a consumer-driven market by offering the best and most suitable selection of domestically manufactured and imported models to consumers (AIEC, 2022:25).

However, even with the diverse range of models and a competitive pricing environment, consumers are battling with affordability and the South African economic environment is depressed. As stated previously, there are economic factors inhibiting growth in the domestic new vehicle market. Factors affecting vehicle affordability include:

- Inflation. High inflation rates exert pressure on households' disposable income and result in low growth which impact new vehicles' sales. The average inflation rate from 1999 to 2021 was 5.8% (Tradingeconomics, 2022).
- Interest rates. This directly affects the new vehicle market because there is a strong inverse relationship between new vehicle sales and increased interest rates. The average interest rate from 1999 to 2021 was 7.9% (Tradingeconomics, 2022).
- The rand exchange rate. Rand depreciation increases manufacturing costs seeing that a significant part of new vehicle components is imported, adding pressure on new vehicle prices. The average value of the rand from 1999 to 2021 was R9.90/United States dollar (Tradingeconomics, 2022).

- Vehicle taxation. The tax burden on consumers is a major factor discouraging people who want to purchase a vehicle. These costs include ad valorem tax, import duties, emissions tax, and the standard percentage of Value Added Tax (VAT). Motor vehicle buyers are confronted with other taxes which are not based on the purchase price of a vehicle, such as the fuel price, tolls, tyre levies, insurance, and fringe benefit taxes. Up to 42% of a premium vehicle's price constitutes a form of tax whilst on an entry level vehicle's price, it constitutes 18% (Autotrader, 2017:1; Autolive February issue, 2019:1).
- Consumer and business confidence. Affordability is a major factor affecting consumers. Low consumer confidence could result in consumers being forced to downgrade and buy more affordable models in the new vehicle segment, or to buy a used vehicle. Business confidence levels have an impact on commercial vehicle sales and vice versa. The average business confidence levels from 1999 to 2021 were forty-four index points out of one hundred (Tradingeconomics, 2022).

Another aspect that is affecting the economic environment and the domestic automotive market is the consumer's choice pattern which is changing from petrol to diesel vehicle types. The popularity of diesel-engine models has increased significantly and, in 2021, new diesel passenger car and light commercial vehicle sales in South Africa constituted 33.7% of total light vehicle sales, down from 35.5% in 2020 (AIEC, 2022:17). As the market continues to grow, consumers are seeking more fuel-efficient vehicles. Domestic hybrid petrol and diesel vehicle sales which is seen as the interim measure towards moving to the full use of EV's amounted to 678 units in 2021, up from 232 units in 2020 whilst EV sales increased from 92 units in 2020 to 218 units in 2021 (AIEC, 2022:17).

The global automotive industry is dynamic, highly competitive and adopting the latest technologies (Ambe & Badenhorst-Weiss, 2011:4; Naude & Chiweshe, 2017:3). Latest trends, which are part of the fourth industrial revolution, are the impact of EVs, rapidly changing technologies, the use of Euro 6 fuels, virtual dealership showrooms, and consumption patterns of the millennials. The European Union (EU) is South Africa's main export destination and the latest trends there, for example, the move away from petrol and diesel engines, will impact future sales in the new vehicle market. All these aspects are going to have an impact on South Africa's position in the global automotive industry and the domestic new vehicle market.

Against this background, the APDP's one million production volume target was not met in 2020, however, it remains imperative that South Africa progresses to the next production level under the SAAM 2021-2035. The difficulties include: economies of scale; the general competitiveness gap with competing global manufacturing locations; the geographical disadvantage to the main export markets of the world; the disparity of wage increases not matching productivity; the lack of manufacturing competitiveness of South African automotive manufacturers; the impact of the COVID-19 pandemic; as well as the rapid change in technology and fuel standards in South Africa's main export destinations (NAAMSA, 2016:29; Zondo, 2018:2; AIEC, 2021:7). These difficulties need to be assessed and analysed to enable South Africa to keep up and compete more effectively in the global arena. The rationale of this study will be to identify growth opportunities for the domestic new light vehicle market in South Africa so that the objectives set out by the SAAM 2021-2035 could be reached by producing 1.4 million vehicles per annum by 2035.

1.3 Theoretical background

Based on the work of leading authors, there are different theoretical areas in business and management which underpin the research, such as strategic marketing and management, and international business inter alia. Other aspects, which are also based on the work of leading authors, that underpin the research include the theory on competitive advantage, comparative advantage and absolute advantage, growth strategies, international marketing strategies, strategic marketing decisions, market driven strategies, marketing communication decisions, internet and digital marketing, the globalisation of markets and strategies, and international business strategies. The literature review conducted in the following chapters is a process of mapping the research gap to establish the contribution which the research aims to achieve (Beech, 2015:67).

The automotive industry is one of the most successful industries in South Africa (Piderit, Flowerday & Von Solms, 2011:1; Naude, 2013:407; Tolmay & Badenhorst-Weiss, 2015:1). The South African automotive industry is in a peculiar position as stated above, and it is imperative that OEMs attract new automotive investments to ensure the industry's success in the long run. Government policies, such as the MIDP, aimed to integrate South Africa's small domestic automotive industry into the global supply chain to achieve international competitiveness, and to attract large sums of investments (Kaggwa, 2010:29; Lamprecht, Rudansky-Kloppers & Strydom, 2011:56). The SAAM 2021-2035 policy will tread a similar developmental path by aiming to achieve 1% of global vehicle manufacturing (AIEC, 2021:36).

The study's aim is to analyse and determine how the growth theory, and the practice thereof, could be established in the South African automotive industry's context. In this thesis, a detailed analysis of the theory can be found in chapters 2, 3, and 4. A thorough keyword search was done in the National Research Foundation's (NRF) (2022) database to verify whether any prior research was conducted in this area. To date, no research dissertations or theses were undertaken with specific reference to this study's topic and title.

1.4 Gap in the current body of knowledge

The study researched and analysed growth opportunities for the South African domestic new light vehicle market in an increasingly changing business environment. The following gaps in the body of knowledge have been identified. These gaps were either covered partially, or not at all by other authors who did research on the South African automotive industry.

Table 1.2: Gap in the current body of knowledge

Gap in the current literature	Description of relevant research
The research gap under investigation was the state of the South African automobile market and focused on the impact that the COVID-19 pandemic had on the potential growth opportunities for the domestic new light vehicle market in South Africa. The COVID-19 pandemic commenced in December 2019 and represented uncharted territory for the global and South African automotive industries as this was the first pandemic of this kind that impacted these industries. How the pandemic impacted South Africa's automotive industry, added a different dimension to viewing the existing environmental scanning models.	International business and strategy authors such as: Porter (1990), Hill (2014), Cavusgil, Knight, and Riesenberger (2014), Barney and Hesterly (2015), Wild and Wild (2016) and Ehlers and Lazenby (2019) did not explicitly factor global pandemics and their impact on national competitive advantage into their discussions. The COVID-19 pandemic added a different dimension to the traditional theories, and this was applied to the South African automotive industry using Porter's diamond model on competitive advantage. The element of chance impacted all four elements in Porter's diamond model and the national competitive advantage. The COVID-19 pandemic caused a revolution in the way businesses had to operate and had to adapt to the new ways of conducting business. This study surveyed domestic automotive high-profile role-players and stakeholders to determine the impact of the element of chance on their businesses because of the pandemic.
The research gap under investigation focused on the importance of Africa as a market to the South African automotive industry under the African Continental Free Trade Area (AfCFTA) which was implemented in January 2021. There is an existing body of literature, written by various authors, which emphasises the African continent to be of high importance to the South African automotive industry.	Authors such as: Kaggwa (2010), Black and McLennan (2015), Black, Makundi and Mclennan (2017), Lamprecht and Tolmay (2017), Awuah (2019) and Deloitte (2020) did not discuss Africa as a potential market under the AfCFTA. The responses obtained represent a knowledgeable opinion of Africa as a prospective market for the South African automotive industry under the AfCFTA. The responses provide a broad insight into

However, there are opposing views which state that Africa is not as important for the South African automotive industry. These authors, who are either for, or against Africa, did not discuss Africa as a potential market under the AfCFTA. This study surveyed 62 high-profile role-players and automotive stakeholders to establish whether Africa could be a prospective market under the AfCFTA.	the prospects of Africa, and they highlight the marketing, strategic, and supply chain strategies of the new vehicle manufacturers regarding the markets they intend to pursue.
The research gap under investigation was the South African Automotive Masterplan (SAAM) (2021-2035) and its implications on the domestic market. The study surveyed 62 high-profile role-players and automotive stakeholders to establish whether the SAAM (2021-2035) would be beneficial to the role-players and stakeholders or whether it is a good policy only in theory.	The previous policy dispensation, namely the APDP (2013-2020), had a good set of objectives, pillars, and vision in theory, but it did not achieve all its stated outcomes (AIEC, 2020:32; AIEC, 2021:37). The SAAM (2021-2035), implemented in 2021, also has an ambitious set of pillars, objectives, and vision (AIEC, 2021:96; AIEC, 2022:32). The researcher consulted the Trade and Industrial Policy Strategies (TIPS) research document published by Barnes, Montmasson-Clair, Moshikaro, and Ndlovu (2022) to find how the SAAM (2021-2035) will impact the domestic market and stakeholders. This publication focuses primarily on the New Energy Vehicle (NEV) market in South Africa and corroborates the findings of the study about the SAAM (2021-2035). This provides evidence that this study contributed to the body of knowledge.
The research gap under investigation was the use of basic content and thematic analysis to further develop the current themes and published research. The similarity of responses was quantified to determine the most important metrics impacting the South	The existing literature such as: Ambe and Badenhorst-Weiss (2013), NAAMSA (2017), Autolive (2018), Autolive (2019), Barnes, Black, Comrie and Hartogh (2018), Barnes, Grant and Ndlovu (2020), AIEC (2021) and AIEC (2022) did not list a hierarchy of importance regarding the

African automotive industry. Although the existing literature (see column to the immediate right) discussed these metrics, no hierarchy of importance was ever established. Furthermore, higher order statistical techniques and complex relationships in the industry were investigated. These include Principal Component Analysis (PCA), Exploratory Factor Analysis (EFA), the Kaiser-Meyer-Olkin test and the Bartlett's Test of Sphericity. These techniques were used to measure the correlation of different variables identified in the study.	factors impinging the South African automotive industry. The open-ended responses of the automotive role-players and stakeholders were quantified to establish a hierarchy of importance and can be used as starting points to stimulate growth in the South African automotive industry. The intent of the Principal Component Analysis (PCA) was to determine if linear combinations of the items asked under each subsection could be found, and if it represents a meaningful set of items which can be labelled with an appropriate composite name. Exploratory Factor Analysis (EFA) and PCA are related but conceptually distinct techniques (Basto & Pereira, 2012). PCA reduces the number of variables by extracting the essence of the dataset and creating principal components, whereas EFA uncovers the constructs underlying the data and identifies latent factors to explain the data. EFA includes extraction methods, such as maximum likelihood, and principal axis factoring. Streiner (2003) highlights the difference between scales defined by effect indicators against indices which do not need to display a high level of internal consistency and argues that it should not even be applied in most indices' case. However, the researcher's intent was only to establish the extent of correlation between the items and not to deem the factor reliable, or not, as in scale development.
The research gap under investigation was the use of moderator analysis. The analyses were considered exploratory as a first research	The researcher, after studying the results from the descriptive and inferential statistics and based on these results, explored the potential moderation effect of the moderator on the relationships between

attempt to uncover moderation effects in the South African automotive industry.	the independent variable and the dependent variable. Potential independent variables, moderator, and dependent variables were identified for testing. Hayes process macro, the analysis used to test for moderation effects, requires the OLS assumptions of linearity, normality and homoscedasticity of residuals and independence to be met. Because a single independent variable was used, multi-collinearity testing was not applicable. The correlation matrix (see table 6.25) implies linear relationships between the independent and dependent variables. Heterogeneity was explored using the scatterplot of standardized predicted values against standardized residual values as recommended by many authors, notably e.g., Hair, Black, Babin and Anderson (2009). Potential heteroskedasticity was addressed by applying the heteroskedasticity-consistent inference option. In total, 54 moderating effect tests were done, using the process macro tool in SPSS V26 (Hayes & Rockwood, 2016:1), of which only eight tests were observed to have moderating effects. The 54 moderation tests considered all potential combinations of independent variables, moderator, and dependent variables. Each regression contains a different combination of independent variable, moderator, and dependent variable and the moderation decision is based on a confidence interval obtained through bootstrapping and relates to the statistical significance of the interaction term. The bootstrapping method relates to the process of resampling and estimating the statistics of a

	population by sampling a dataset with replacements. Bootstrapping provides an efficient way to ensure that the models are stable and reliable, therefore, the confidence interval was used to determine the existence of a moderation effect. This represents the first time that moderator analysis was conducted on the South African automotive industry and contributes to the body of knowledge. The moderating effect is discussed after each illustrated figure from figures 6.13 to 6.20 in chapter 6, section 6.59.
The research gap under investigation was to survey 62 domestic high-profile automotive role-players and stakeholders regarding the potential growth opportunities for the domestic new light vehicle market in South Africa. The existing research literature did not survey the higher industry echelons to establish the potential growth opportunities for the domestic new light vehicle market in South Africa and to infer real world relationships by these responses.	The existing literature such as: Lamprecht (2006), Lamprecht (2009), Ambe (2012), Naude and Badenhorst-Weiss (2012), Khan (2015), Kilbourn (2015), Barnes and Black (2017), Barnes, Black, Comrie and Hartogh (2018) and Barnes, Grant and Ndlovu (2020) did not survey high-profile automotive stakeholders with the aim of establishing potential growth opportunities for the domestic new light vehicle market in South Africa. The responses and findings represent the knowledgeable opinion of the South African automotive industry's role players. The information and techniques used provide insight into the current status quo at a refined level. It indicates a contribution to knowledge, specifically in terms of the moderator analysis and the qualitative analyses, which provide information to the industry that can be used as departure points in terms of strategies and priorities. The responses to the items in the questionnaire are the opinion of a purposive sample that represent the automotive industry in South Africa. It is not merely the opinion

	of a random sample of respondents asked about, e.g., their attitude towards savings. The data was considered meaningful, and it represents the automotive industry's views on a particular subject. Therefore, the factors and other analyses were deemed valid and valuable. Therefore, inferring real world relationships within the context of the automotive industry in South Africa were considered valid.

1.5 Problem statement

One of the key issues in the abovementioned discussion is that international competitiveness and sustainability in the long run continues to be an immense challenge for the South African automotive industry. Achieving economies of scale is a huge test for South Africa's automotive manufacturers. Domestically, the price of vehicles, the heavy tax burden on new vehicles, the weak rand exchange rate, and the depressed performance of the South African economy have put vehicle affordability under strain, therefore, the South African new vehicle market is under pressure (AIEC, 2021:16; AIEC, 2022:16). The two main challenges and consequences facing South Africa's automotive manufacturers in the international market are the low volumes of vehicles being sold, and its poor geographic location to the primary automotive markets of the world (Tolmay, 2017:2). It is important to grow the domestic market as a cornerstone for achieving future production outputs while exports continue to be the primary focus to achieve international competitiveness via higher volumes and economies of scale benefits. Moreover, globally the automotive industry was facing a global pandemic. The COVID-19 pandemic had a devastating effect on one of the world's largest industries and can be considered the worst crisis ever to impact the automotive industry (OICA, 2020:1). The change in consumers' purchasing patterns is accentuated by the pandemic, the rapid technological changes, and problems with brand loyalty will have an impact on the South African motor industry.

In addition to the growth and consumption of vehicles and the abovementioned disruptions, South Africa is still struggling with issues such as substandard fuel quality. South Africa is approximately 15 years behind the rest of the world in terms of fuel standards and quality (Nel & Du Plooy, 2013:552; NAAMSA, 2017a:1). The rapid production and implementation of Euro 6 fuels in South Africa are important from an economic and environmental point of view because automotive vehicles are the main producers of Carbon Dioxide (CO_2) (Thauer, 2013:129; Habidin, Zubir Fuzi, Latip & Azman, 2015:5). If the domestic vehicle manufacturers cannot supply the domestic and export markets with similar high technology, i.e., high fuel-efficient and low emission new motor vehicles, the motoring public will not have access to the latest low emission vehicle technology. Moreover, South Africa will continue to fall behind the rest of the world because, to manufacture export vehicles for high technology markets while simultaneously manufacturing standard vehicles for low technology markets, promote inefficiencies and weighs down the industry's global competitiveness. This will negatively impact the South African motor industry's sustainability in the long run. All these issues bring the main question into focus: How can the South African motor industry attain the stated objective of producing 1.4 million vehicles per year by 2035, while selling more cars in the domestic and regional South African market?

1.6 Objectives of the study

The following objectives were identified:

1.6.1 Primary objective

The main premise of this study is to determine:

- The growth opportunities for the domestic new light vehicle market in South Africa.

To achieve the above-mentioned primary objective, the following secondary objectives will need to be attained.

1.6.2 Secondary objectives

- To determine the driving factors which promote new vehicle sales in South Africa.
- To determine the constraint factors impacting new vehicle sales in South Africa.
- To investigate the global disruption in vehicle technology and fuel standards' impact on the consumption patterns of the new vehicle market in South Africa.
- To investigate the different options how South Africa's vehicle manufacturers can grow their new vehicle market share within the African region and in international markets.
- To investigate the impact of the COVID-19 pandemic on South Africa's new vehicle sales and future growth strategies.
- To determine the differences between foreign and locally owned companies; high and low growth expectancy groups; positive and negative growth outlook groups; and relative affordability groups regarding (see Appendix C for questionnaire):
  (i) the importance of growth drivers (question 6 of the questionnaire).
  (ii) the business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire).
  (iii) the business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire).
  (iv) the business impact of the different criteria impacting on new vehicle sales' growth (see these criteria in question 10 of the questionnaire).
  (v) the business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire).
  (vi) the importance of the digital future criteria impacting new vehicle sales' growth (see these criteria in question 13 of the questionnaire).
  (vii) the importance of the different criteria for South Africa's vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire).
- To determine the relationship between the expectation of growth of new vehicle sales in South Africa and:
  (i) company type.
  (ii) each of the challenges to new vehicle sales' growth.

1.7 Research questions

The following research questions were developed:

1.7.1 Main research question

The main research question stemming from the primary objective of the study would be:

- What are the growth opportunities for the domestic new light vehicle market in South Africa?

1.7.2 Supporting research questions

The supporting research questions stemming from the secondary objectives of the study would be:

- What are the driving factors which promote new vehicle sales in South Africa?
- What are the constraint factors dampening new vehicle sales in South Africa?
- What are the global disruptions in vehicle technology and fuel standards' impact on the consumption patterns of new vehicles in South Africa?
- What different options can be used to grow the new vehicle market share within the African region and in international markets?
- How big an impact has the COVID-19 pandemic had on new vehicle sales and future growth strategies in South Africa?
- Do differences exist between foreign and locally owned companies; high and low growth expectancy groups; positive and negative growth outlook groups; and relative affordability groups regarding (see Appendix C for questionnaire):
  (i) the importance of growth drivers (question 6 of the questionnaire)?
  (ii) the business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire)?
  (iii) the business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire)?

(iv) the business impact of the different criteria impacting new vehicle sales' growth (see these criteria in question 10 of the questionnaire)?
(v) the business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire)?
(vi) the importance of the digital future criteria impacting new vehicle sales' growth (see these criteria in question 13 of the questionnaire)?
(vii) the importance of the different criteria for South Africa's vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire)?

- What is the relationship between the expectation of new vehicle sales' growth in South Africa and:
  (i) company type?
  (ii) the challenges of new vehicle sales' growth?

1.8 Hypotheses

A total of 6 hypotheses have been set and they will be tested based on responses to the questions in the empirical survey of this study. These hypotheses are aligned with secondary objectives six and seven of the study. The hypotheses, as outlined below, will be discussed in chapter 6 to further substantiate the objectives achieved, the conclusions reached, and the recommendations made. The following were identified and used in the hypotheses' testing:

(i) The importance of growth drivers (question 6 of the questionnaire).
(ii) The business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire).
(iii) The business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire).
(iv) The business impact of the different criteria impacting new vehicle sales' growth (see these criteria in question 10 of the questionnaire).
(v) The business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire).
(vi) The importance of the digital future criteria impacting new vehicle sales' growth (see these criteria in question 13 of the questionnaire).

(vii) The importance of the different criteria for South Africa’s vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire).

(viii) Company type.

(ix) The challenges of new vehicle sales’ growth.

These were subjected to Principal Component Analysis (PCA) and 14 factors (see chapter 6, section 6.5 for these 14 factors) were identified which were subsequently used in the testing of the hypotheses.

- H1: There is a difference between the domestic companies and the foreign companies regarding their perceptions of each of the identified 14 factors.
- H2: There is a difference between the high growth expectation group and the low growth expectation group regarding their perceptions of each of the identified 14 factors.
- H3: There is a difference between the positive and negative growth outlook groups regarding their perceptions of each of the identified 14 factors.
- H4: There is a difference between the affordability comparison groupings regarding their perceptions of each of the identified 14 factors.
- H5: There is a relationship between company type and growth expectation.
- H6: There is a relationship between each of the challenges experienced and the perceived expectation of growth in new sales volume.

1.9 Research design and methodology

The research design can be described as the framework for the collection and analysis of data (Bryman & Bell, 2015:28; Wiid & Diggines, 2015:62; Sekaran & Bougie, 2016:95). The research design, as defined by Saunders, Lewis & Thornhill (2019:173), delineate how information will be gathered, measured, and analysed so that the research question(s) may be answered. The research will follow a sequential process of investigating and analysing the available literature sources and cases to develop the theoretical discussion. Qualitative research methods will be used to investigate the philosophy of the OEMs, importers or groups, and other groups in South Africa for the population of the study. Following this, another round of quantitative investigations will be held with all the role-players. This process can be described as a sequential exploratory design (Creswell, 2015:40).

Qualitative and quantitative research methods will be used to support each other. Saunders et al. (2019:181) state that the research design begins by using a deductive or inductive approach to develop a broader theoretical perspective thereby providing guidance towards the research. The study focuses on identifying growth opportunities for the South African new light vehicle market and exploratory research is a valuable means of discovering new information by asking open-ended questions. The methods that can be used to conduct exploratory research are:

- A thorough research of the literature available on the domestic and global automotive industry.
- Interviews with experts within the domestic automotive industry, such as the automotive OEMs, the vehicle importers or groups, the independent vehicle dealer groups, and various role-players. This was an important part of the study but due to the COVID-19 pandemic, interviews and surveys were done using electronic methods of communication.

Zikmund, Babin, Carr and Griffin (2013:53) delineate descriptive research studies as characteristics of people, objects, groups, organisations, or environments. Descriptive research entails that management is already aware of, or understand, the problem area and its underlying relationships. Descriptive research is used to provide a precise analysis of the market environment (Aaker, Kumar, Leone & Day, 2013:66; Saunders et al., 2019:187). The research methods used in the research design are structured and quantitative and include:

- Online surveys.

It is important to have a sound understanding of the phenomenon so that only relevant data is collected. This research study will have a positivistic philosophy with a deductive approach. The research design will consist of mixed methods, using an embedded mixed methods approach. Embedded mixed methods research is when one methodology supports the other. Exploratory research and descriptive research will be combined to support one another.

1.10 Limitations of the study

The first limitation of the study is that it will primarily focus on growth opportunities for the domestic new light vehicle market in South Africa. The study will not focus on medium and heavy commercial vehicles and buses. In addition, disruptions related to the rapid advances in technology; the volatility of the South African Rand and growth opportunities for the country; the possible impact of the Biden administration's foreign trade policy; Brexit trade implications; and the full extent of the COVID-19 pandemic and its impact on the South African automotive industry, could not be factored into the research as these must be seen as exogenous, uncontrollable factors beyond the scope of the study.

1.11 Chapter layout

Chapter 1 covers the background of the study, highlights the theoretical background underpinning the study, articulates the research problem and objectives, and discusses the research design and limitations of the study.

Chapter 2 delineates the critical analysis of the relevant academic literature available on the competitiveness theory, international marketing strategies, international business and sustainable competitive advantage, strategic management strategies, and supply chain management as it relates to growth of the South African automotive industry. The following two chapters are linked to this chapter because they provide the background theory needed to understand the relationship between theory and practice.

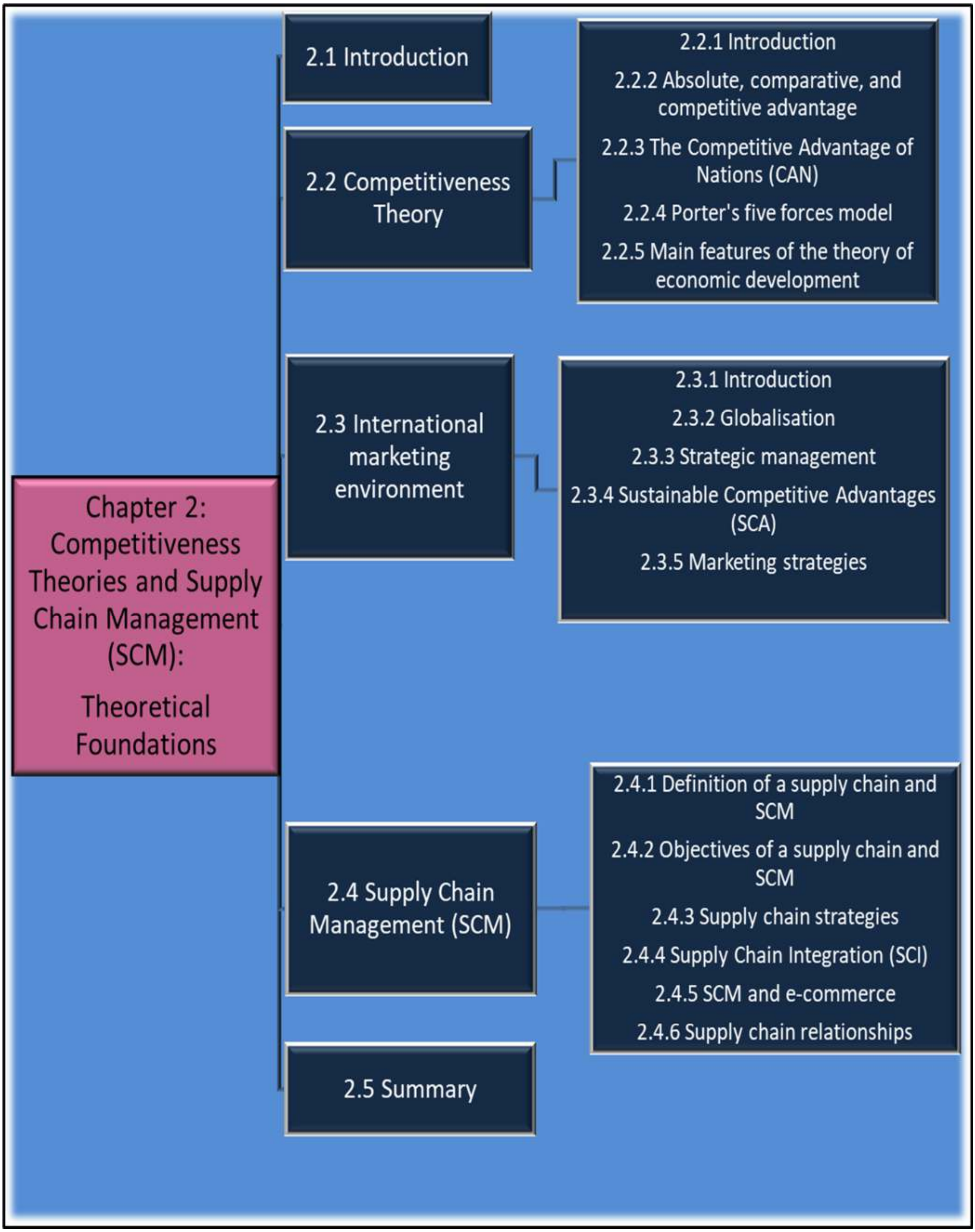
Chapter 3 deals with the analysis and critical review of the literature available on the global automotive environment. It focuses on the dynamics, trends, and rapid technological changes in international markets and on the African continent.

Chapter 4 describes the South African automotive industry and highlights the country's position in the global automotive environment. It discusses the various automotive policy regimes from the MIDP, the APDP, to the SAAM 2021-2035. Chapter 4 relates to the practical aspects of policy decisions in the South African automotive industry and their impact on the domestic new vehicle market.

Chapter 5 focuses on the research process, philosophy and approach, principles, design, and methodology.

Chapter 6 covers the data analyses, inferential analysis and hypotheses testing, and interpretation of data of the empirical research undertaken. The chapter also deals with the hypotheses testing after the data set has been evaluated.

Chapter 7 lays out the findings and recommendations of the study regarding the analysis of growth opportunities for the domestic new light vehicle market in South Africa.


Chapter 2: Competitiveness Theories and Supply Chain Management (SCM):
Theoretical Foundations
2.1 Introduction
2.2 Competitiveness Theory
2.2.1 Introduction
2.2.2 Absolute, comparative, and competitive advantage
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Chapter 2

Competitiveness Theories and Supply Chain Management: Theoretical Foundations

2.1 Introduction

The South African automobile industry is indelibly part of the global motor industry and supply chain, therefore, the global linkages wherein the industry operates will be reviewed. In chapter 2, the focus will be on the theoretical framework required for the study. To achieve this in a provide a broad context, the focus will be on the applicable competitiveness theories, the international marketing environment, the impact of globalisation, strategic management strategies, sustainable competitive advantages, marketing strategies, and supply chain management as it applies to growth.

2.2 Competitiveness Theory

2.2.1 Introduction

Competitiveness, for the purposes of this study, can be described as the measure of a country's advantages over its disadvantages in selling its products on the international markets (Alleyne & Francis, 2014:69). The classical trade theories explain the economic conditions of a country that determines its advantages and disadvantages on which international trade is based. The theory of absolute advantage was postulated by the theories of Adam Smith, and it states that countries should specialise in the production of goods wherein they are more efficient, in producing, than any other country (Aregbeshola, Luiz, Ojah, Oosthuizen, Palmer & Venter, 2011:19; Cavusgil, Knight & Riesenberger, 2014:172; Wild & Wild, 2016:169). David Ricardo took Adam Smith's theory a step further and stated that even if another country can produce a certain product more efficiently than the one which has an absolute advantage, it can still be beneficial in trading (Cavusgil et al., 2014:174; Hill, 2014:166; Wild & Wild, 2016:169). Comparative advantage focuses on the efficiency of production rather than the cost thereof. According to the comparative advantage theory, even if a country has an absolute advantage in producing various goods more efficiently than another country, it can still be beneficial to trade to maximise the output of a certain good (Aregbeshola et al., 2011:19; Hill, 2014:166; Wild & Wild, 2016:169). The limitation with this theory is that it assumes a simple world with only two countries trading; however, the current global business environment has evolved (Wild & Wild, 2016:172). It does not consider that the business environment has changed into a global village with many countries trading goods daily. It does not factor in countries' varying exchange rates or the logistical costs of transporting traded goods (Hill, 2014:168). It furthermore does not factor in the difficulties and costs regarding transferring natural resources to another country (Hill, 2014:168; Wild & Wild, 2016:172).

The leading vehicle manufacturers have extended their global footprint by producing and selling vehicles on an increasing number of markets. South Africa is home to a significant automotive manufacturing sector which is increasingly integrated within the global automotive industry supply chain and, as such, is heavily impacted by changes happening on a global level (Gastrow, 2012:5895). The way South African automotive manufacturers globalise their production and distribution, will depend on their absolute, comparative, and competitive advantage which will be discussed next.

2.2.2 Absolute, comparative, and competitive advantage

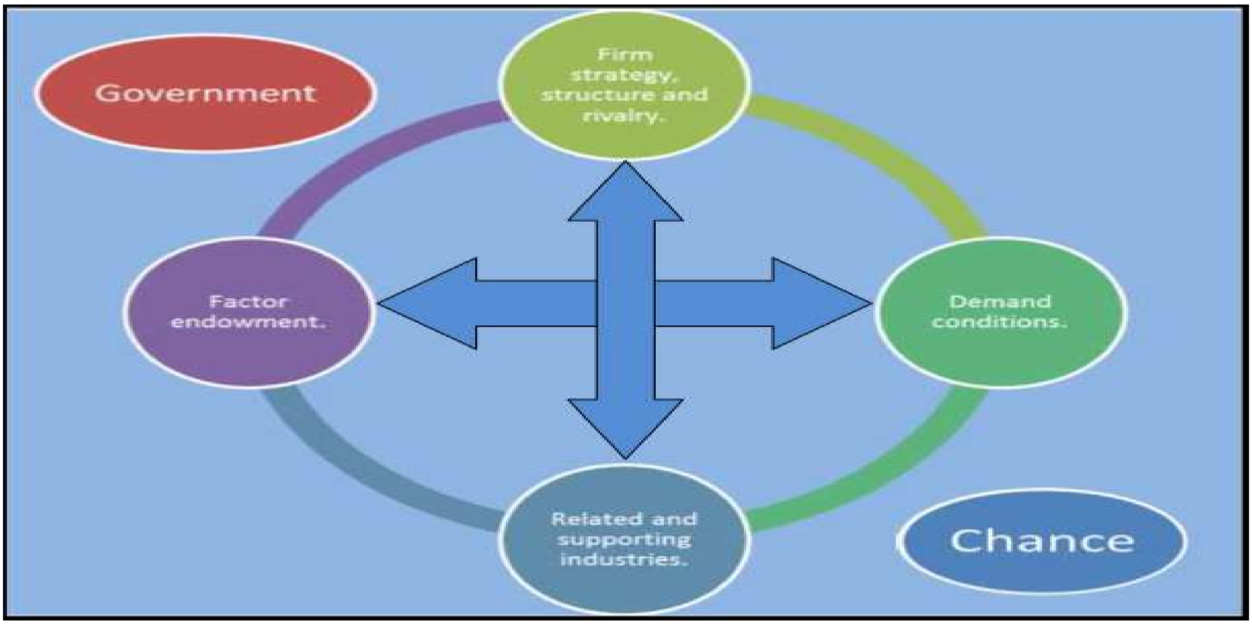
International trade was based on the classical economic theories, but it has evolved owing to the impact of the various industrial revolutions (currently the 4th industrial revolution) where several of important developments have emerged to analyse international trade in the light of non-conventional economics (Alleyne & Francis, 2014:68). International trade has further evolved in what is now known as globalisation, which refers to a more integrated world economy leading to more economic, political, and technological interdependence among national institutions and economies (Hill, 2014:5; Nieman & Bennett, 2014:339; Wild & Wild, 2016:35). Globalisation has made absolute advantages (countries that specialise in the production of goods wherein they are more efficient, in producing, than any other country), as well as comparative advantages (which focuses on the efficiency of production rather than the cost thereof) not feasible, because goods and services can be obtained from almost anywhere in the world seeing that trade barriers have fallen (Aregbeshola, et al., 2011:19; Cavusgil et al., 2014:172; Wild & Wild, 2016:169). Governments have been globalising their markets for international trade to boost their economies by creating more jobs so that the standard of living may increase. Although globalisation creates a wide range of opportunities, it also creates various challenges for industries like the automotive industry (Lamprecht & Tolmay, 2017:131). Whilst cross border trade may have significant benefits for households because it can drive goods' prices lower and increase the availability of products for consumers, for other households it has the opposite effect. A disparity in wealth distribution and job losses are the negative effects of cross border trade (Ospina, 2018:2; Rawlinson, 2018:2). For the unemployed, lower consumer goods prices do not compensate for the loss of earnings.

Why certain nations are the market leaders in the production of certain products are explained by Michael Porter's theory on national competitive advantage. The national competitive advantage theory can be defined as the capacity of an industry to innovate and upgrade to determine the country's competitiveness in that industry (Porter, 1990:74; Hill, 2014:181; Wild & Wild, 2016:177). A competitive advantage is having core competencies or technology that competitors struggle to imitate. These competencies can range from superior strategies or knowledge, innovativeness, and close relationships with suppliers which are used to enter and grow new markets. Porter (1990:74) states that to determine whether a nation has a competitive advantage, would depend on the collective competitive advantages of the nation's firms. An intense competitive environment results in the production of higher quality products, developing stronger relationships, and meeting the demands of domestic customers promptly so that a competitive advantage of local firms can be developed, maintained, or even sustained.

Porter's Competitive Advantage of Nation's (CAN) theory is discussed in more detail in the following section.

2.2.3 The Competitive Advantage of Nations (CAN)

Porter's (1990:78) theory argued, by virtue of his diamond model, that competitive advantage at both local and global level stems from four major elements and it determines the country's competitive position in an industry. The four major elements are revealed and discussed in figure 2.1.



<u>Figure 2.1: Competitive advantage: Porter's diamond model</u>
<u>Sources: (Porter, 1990:78; Hill, 2014:181; Wild & Wild, 2016:177-179)</u>

Firms' strategies and their leaders' actions have long-term effects on future competitiveness (Wild & Wild, 2016:179). Firms' strategy, structure, and rivalry reflect the nature of a nation's domestic rivalry and conditions (Hill, 2014:181; Kharub & Sharma, 2016:475). It determines how firms are created, organised, and managed. The more intense the struggle to survive is, the greater a nation's competitiveness will be which aids in creating and maintaining a national competitive advantage (Cavusgil et al., 2014:182; Wild & Wild, 2016:179).

Demand conditions refer to the nature of the home market demand for specific products and services (Hill, 2014:181; Kharub & Sharma, 2016:475). The conditions in the home base affect an industry's ability to compete internationally through three main mechanisms (Davies & Ellis, 2000: 3-4; Cavusgil et al., 2014:182):

- An industry will have an advantage in market segments which are more important at home than elsewhere.
- The power and sophistication of buyer demand facilitates the development of competitive advantages in particular industries.
- A nation’s industries gain if the needs of the buyers at home anticipate the needs of buyers in foreign countries, resulting in the proactive learning in how to meet those needs.

In each of these circumstances, the critical point is not the size of the home market, but rather the extent to which it promotes innovation amongst local companies. A large home market which satisfies all three conditions will support international competitiveness.

Related and supporting industries refer to the presence of clusters of suppliers which provide input to the company that is competing internationally (Cavusgil et al., 2014:183; Wild & Wild, 2016:178). The nation’s competitive industry would compete more effectively if home based industries were linked to one another. Linkages include vertical or horizontal relationships between supplying and buying sectors or common customers, distribution channels, or technologies (Davies & Ellis, 2000:4).

Factor conditions describe a nation’s position on factors of production, such as labour, natural resources, capital, location, and technology necessary to compete effectively (Hill, 2014:181; Kharub & Sharma, 2016:474). These factors play a role in their home base if they are to be successful.

The four elements which constitute the diamond are most likely to bring success in industries or industry segments where the diamond is most favourable (Hill, 2014:181). Although the diamond is the core focus, Porter argues that there are two added variables (see figure 2.1) which can also affect the national competitive advantage. The first variable is chance events which include rapid changes in financial markets, unpredictable technological discontinuities, new inventions and wars, political decisions by foreign governments, and exchange rates (Hill, 2014:181; Wild & Wild, 2016:179). The COVID-19 pandemic represented a territory of total uncertainty that plagued the entire automotive landscape. This element is discussed in detail in chapter 4 and its impact on the diamond model. The unpredictable changes arising from policy renegotiations or cancellations which are emanating from the United States of America (USA) and the United Kingdom (UK), will impact the South African automotive industry. This will be discussed in chapter 4.

The second variable is government's effect (Hill, 2014:181; Wild & Wild, 2016:179). Government, through policy choices, can either promote or detract from the national competitive advantage. Government's regulation can change home demand conditions which can influence the intensity of rivalry within an industry. In South Africa, this can be further understood by the various policy regimes that the automotive industry has undergone. The Automotive Production and Development Programme (APDP) terminated in 2020 and the South African Automotive Masterplan (SAAM) 2021-2035 is the current policy dispensation. Although these two variables are not part of the diamond, they are necessary to complete the model. Government's role in Porter's diamond model is very important because it directly impacts all four main elements (Hill, 2014:184; Wild & Wild, 2016:179). According to Porter (1990:87), government's role is important as a catalyst and challenger. The purpose is to encourage firms to increase their competitive performance to achieve higher levels of growth. Government policies that are successful are those that promote an environment in which firms can realise a competitive advantage.

There have been reservations about Porter's diamond model theory. Whilst supporters of the theory saw CAN as an integrating measure amongst different methods, detractors saw shortfalls in the diamond theory. Hill (2014:183) states that this theory has not been subjected to detailed empirical testing and that the diamond model is a general theory that tries to explain all forms of trade. This is considered a weakness in the methodology because it may, or may not, help specific firms succeed in international competition. South Africa is geographically disadvantaged to the main automotive markets in the world and cannot compete because of higher logistical costs that make South African manufacturers more expensive than their rivals. The Blue Ocean strategy by Kim and Mauborgne (2004:3) provides a contrasting view on the competitive advantage of nations strategy. Kim and Mauborgne (2004:3) advocate pursuing new markets that are uncontested by competitors using a hybrid approach that simultaneously uses a low cost and differentiation strategy. This strategy opposes the fundamental tenet of competitive advantage where a trade-off exists between value and cost (Kim and Mauborgne, 2004:3). This was the strategy followed by Japanese car manufacturers after World War 2.

The researcher concludes that the arguments for and against Porter's theory on CAN imply that a single growth strategy may not be the best methodology in the current fast-evolving business environment. Globalisation has impacted the way business is conducted and each country needs to consider strategies within the trend's context in the global market.

Porter's five forces model theory is discussed in the following section.

2.2.4 Porter's five forces model

Porter's five forces model of competitive advantage proposes how a firm can achieve a competitive advantage in a particular industry by leveraging five imperative forces of the industry. The five forces are factors which could affect the positioning of a firm in a particular industry and includes (Blythe & Martin, 2019:28):

- The bargaining power of buyers.
- The bargaining power of suppliers.
- The threat of substitutes.
- The threat of new entrants.
- The threat of existing competition.

By using Porter's diamond and five forces model, some of these theories could be applied to the South African automotive industry and some to organisations that form part of the industry to establish the attractiveness of the industry.

Table 2.1: Industry and organisation specific competitiveness

Industry competitiveness	Organisation specific competitiveness
• Government support in the form of financial incentives and long-term industry policy. • Established OEM presence with substantial capital already invested. • World-class automotive manufacturing value chain. • South Africa assisted in locating the supporting industries which supply inputs to the domestic automotive industry. • Raw material available in abundance. • Competition is intense seeing that most major global car brands are found in South Africa. • Preferential international market access and South Africa's participation in BRICS. • Geographically advantaged to pursue regional vehicle and automotive component demand opportunities in Africa. • South Africa has regional integration opportunities under the African Continental Free Trade Area (AfCFTA).	• Increased foreign direct investment by OEMs to upgrade and upscale manufacturing. • The seven major OEMs operate in South Africa with world-class technology and manufacturing plants. • Domestic manufacturers could manufacture high quality new vehicles for the domestic and international markets. • Organisational competitiveness of certain OEMs. For example, the Hilux manufactured by Toyota has been the top selling one-ton LCV for the 49th time in its 52 years on the domestic market. • The Toyota OEM celebrated 42 years of consecutive market leadership in 2021. • The Toyota OEM dominated customer satisfaction levels on new vehicle purchases in the vehicle quality survey in 2021.

Sources: (AIEC, 2021:20; AIEC, 2022:18)

2.2.5 Main features of the theory of economic development

The theory of economic development as described by Schumpeter has four main features (Langroodi, 2021:67-72):

- Circular flow. The same products are produced and sold in the same way every year.
- The role of the entrepreneur. This is to break away from the circular flow by innovating and producing new products.
- Cyclical process or business cycle. The analysis of the economic process under capitalism is cyclical as have being witnessed during the past decades in the global economy.
- End of Capitalism. Capitalism is the recipe for self-destruction. Capitalism gave rise to greed and self-enrichment and empowered a minority group of people. In South Africa, capitalism has been a disaster for the black working class who are among the poorest people in the world. This traditional capitalism is becoming redundant because of information technology and abundance of information and in South Africa, new labour laws are promoting equality to the less privileged.

Schumpeter advocated the continuous improvement in products through innovation for which growth can be achieved. The South African automotive industry is on the cusp of technological evolution. The digital revolution will cause major disruptions to the global automotive business environment. It is anticipated that software will alter most traditional industries in the next five to ten years and the OEMs will realise that their competitors are no longer other automotive companies, but Google, Amazon, and Apple amongst others (Naude & Badenhorst-Weiss, 2011:200; Autolive June issue, 2017:13; AIEC, 2018:14). The digital future impacts the diamond model of national competitive advantage which was discussed in section 2.2.3 because South African automotive OEMs will need to market the latest technology vehicles such as electric vehicles to the domestic market and export markets to remain competitive and achieve growth.

The functioning of the international marketing environment will be discussed next.

2.3 International marketing environment

2.3.1 Introduction

The business environment is in constant change and people, or companies, need to scan the environment on a regular basis to identify current marketing behaviours, opportunities, or challenges. The traditional marketing environmental model distinguishes between the micro-market and macro-marketing sub-environments. Besides the economic environment, part of the macro-environment includes social, political, technological, natural, as well as the international marketing environment. International marketing can be defined as the process of identifying and satisfying the human and social needs domestically and globally (Mullins & Walker, 2013:5; Cravens & Piercy, 2013:5; Kotler & Keller, 2016:27). Thus, the core focus of the international automobile manufacturers is to operate in the international marketing sphere to satisfy the global customer's needs in a manner that is superior to the global competitors. The alternatives, also called competitive strategies, are to be more innovative, more efficient, to manufacture at a lower cost or through differentiation. Marketing is about creating value for the customer to achieve higher satisfaction levels (Cravens & Piercy, 2013:9; Mullins & Walker, 2013:11). Intense global competition and the challenge of changing customer demands make the creation of customer value even more critical. The globalisation of the industry and its impact on the research area will be discussed next.

2.3.2 Globalisation

Globalisation can be described as the move towards greater economic cultural, political, and technological interdependence among national institutions and economies (Mullins & Walker, 2013:24; Hill, 2014:5; Wild & Wild, 2016:35). Globalisation has impacted Porter's diamond model and the identification of the national competitive advantage because it has changed the way firms are conducting their business. The world economy is becoming more interdependent and integrated as the shift towards free trade continues. The globalisation of markets refers to the merging of national markets into one large global marketplace (Cravens & Piercy, 2013:21; Wild & Wild 2016:35). Developing countries have been liberalising their trade regimes to sell internationally, however, this is proving to become more difficult because there are obstacles hindering free trade (Masipa, 2018:2).

Over the past few years, Brexit, and the previous USA administration's nationalistic economic stance aimed to slow down, or fragment, all forms of cross border trade in the core markets (Ghemawat & Altman, 2019:1). However, these obstacles did not stop the world from becoming more globalised. The opportunities and forces unleashed by technology and globalisation have ushered in the fourth industrial revolution (Rawlinson, 2018:1). Globalisation and the way in which cross border trade has been conducted, is now being altered rather than paused, delayed, or even stopped. According to Canuto (2018:2), the process of globalisation entails promoting free trade among nations which increases Foreign Direct Investment (FDI) and heightens international competition. The increased international competition associated with globalisation contributes to growth as it forces business to adopt and embrace recent technologies to succeed in the business arena (Canuto, 2018:1).

2.3.2.1 Drivers of globalisation

The two main factors driving globalisation are the fall of trade barriers and constant evolution in technological change (Hill, 2014:10; Wild & Wild, 2016:38). The global business environment is complex and dynamic and can be described as a constantly changing and turbulent environment (Cravens & Piercy, 2013:21). The common phrase being echoed is the need to globalise or die. The increasingly global nature of competition is forcing industries in all economies to spread their products to new markets, to adapt to environmental changes, to create new global alliances, to be socially responsible, and to ensure that the product's cost is competitive. Firms go global because they want to enter new markets and share in the specific advantages of expanding abroad, such as government's policies, tax incentives or tax breaks, resources, or labour (Hill, 2014:5; Wild & Wild, 2016:36). The driving forces behind globalisation are directly related to certain political, technological, social, and economic factors which will be discussed next.

- Political. The way politics shape laws, and laws shape the opportunities for, and threats to, an organisation (Kinicki & Williams, 2013:76; Hill, 2014:10; Wild & Wild, 2016:38). A cornerstone political focus has been to develop and grow free trade amongst countries. The two primary organisations who have had a major impact on the liberalisation of trade are the General Agreement on Tariffs and Trade (GATT), which was replaced by the World Trade Organisation (WTO) in 1995, and the European Union (EU). In 1957, the European Economic Community (EEC) was established with an objective to provide simpler integration of economic and political activities where people, products, and financial flow could be accessed throughout the world. However, during the previous presidency, the United States of America's foreign trade policy environment has impacted the political environments. Free trading relations which have underpinned the globalisation process are being challenged for the first time in years (AIEC, 2018:14). Developments in the UK, such as Brexit, will fundamentally alter trade implications between the UK and other countries. South Africa, who is fully integrated with the global automotive industry, will need to determine what the impact of these global developments will be on the country and its automotive industry.

- Technological. Technological developments result in new methods and processes which transform resources into goods and services (Kinicki & Williams, 2013:76; Hill, 2014:12; Wild & Wild, 2016:42). Advances in the technological environment have a direct impact on the changes in the overall environment. These advances in technological innovation manifest because of new research and development. Technological innovation has accentuated the process of globalisation with new products, methods, processes, and services being widely available and accessible to all. Technology is the major factor that accentuates the fourth industrial revolution. People, markets, and countries are too well connected with technology and the fourth industrial revolution is going to accelerate this even more (Rawlinson, 2018). The global technological landscape has been revolutionised and the process of innovation is at its peak. The global diffusion of knowledge and technology has favourable network effects through cross-pollination, as this enables technology receiving countries to advance their own research and development in innovation (Canuto, 2018:1). The pace at which global automotive technology is advancing means that today's innovation is tomorrow's norm (AIEC, 2019:36). The four automotive megatrends, namely mobility, self-driving, digitisation, and electrification will continue to shape the future of the global automotive industry (AIEC, 2019:36).

- Social. Social aspects refer to latest trends and influences manifesting in a country or a society, or a culture of human relationships and values which may affect an organisation (Kinicki & Williams, 2013:77; Wild & Wild, 2016:42). According to Chandy & Dervis (2016:1), one of the social ills of globalisation is that it has led to greater inequality between a country's citizens and even between countries. The COVID-19 pandemic increased this inequality in the world. The inequality of wealth distribution and job losses are both social problems created by globalisation (Ospina, 2018; Rawlinson, 2018:2). Globalisation and advancements in technology have been catalysts to lower market barriers and information costs. The effects of these on inequality are neither inevitable nor entirely predictable (Chandy & Dervis, 2016:8).

- Economic. Economic refers to the general state of the economy in a country and focuses on aspects, such as inflation, unemployment, interest rates, and economic growth that may affect an organisation's performance (Aregbeshola et al., 2011:94; Kinicki & Williams, 2013:77). The economic environment is very important because foreign investors are keener on investing in a country that has a healthy economic environment. The world economy is expected to grow at a rate of 5.4% in 2021 (United Nations, 2021). Whilst this might be a modest global growth rate, it conceals an uneven pace of economic progress across the world (United Nations, 2021). Global growth is not being reached at the places it is needed most and, therefore, contributes to the elevated levels of economic inequality across the world. Africa's economic prospects are expected to be stagnant or to grow very marginally compared to Asia, the United States of America, or Europe. Southern Africa's growth is largely determined by developments in South Africa's economy because it contributes to approximately 60% of the economic output of the region (United Nations, 2019:125).

The impact of these forces of globalisation and the effect on South Africa and its domestic automotive industry will be discussed in chapters 3 and 4.

2.3.2.2 Foreign Direct Investment (FDI)

FDI is primarily a capital market transaction that allows a foreign competitor or government to acquire a substantial interest in a domestic firm's ownership (Aregbeshola et al., 2011:200; Hill, 2014:224). FDI forms an inherent part of the internationalisation strategy to establish a physical presence in a foreign country of choice through direct ownership of productive assets, such as technology, capital, land, labour, plant, and equipment (Cavusgil et al., 2014:418; Bezuidenhout, Grater & Kleynhans, 2018:2). Governments around the world want their industries to be internationally competitive to attract larger numbers of FDI to boost their economies (Coetzee, Bezuidenhout, Claasen & Kleynhans, 2015:155). Developing countries have been attracting many FDI inflow to increase their economic growth and development (Black, 2011:178; Coetzee et al., 2015:155). FDI is a major source of growth opportunities for the entire economy because of the ripple effects to other firms and industries who benefit through technology sharing and increased competition (Bezuidenhout et al., 2018:2). The following advantages of securing a higher level of FDI have been identified (Aregbeshola et al., 2011:200-201; Hill 2014:232-233):

- FDI uses capital markets in such a way that the domestic capital market is not destabilised.
- It favours firms with the controlling ownership stake in a domestic firm. It is a highly attractive method which goes beyond the operations of licensing and exporting.
- It sensitises foreign investors to be socially responsible to the needs of the domestic community.
- Foreign firms serve as important conduits for enhancing the productivity of domestic firms through the transfer of new production technologies which are not yet available.
- FDI is an important and viable economic growth strategy for governments seeking long-term relationships with foreign investors to increase economic stability in the country.

FDI is an advanced technique of foreign market entry strategies that firms use to start manufacturing plants, marketing subsidiaries, or other facilities in targeted countries. The overarching objective of FDI is to rapidly grow a firm's competitiveness in the global arena, however, there are other motives that trigger Multinational Corporations (MNCs) to pursue FDI (Herger, 2016:1). The market, resource or asset, or efficiency seeking motives aid MNCs in their FDI decision making (Cavusgil et al., 2014:420; Wild & Wild, 2016:215, 216). The first motive that MNCs may want to capitalise on is new market opportunities owing to lucrative benefits abroad. The three main market seeking motivations are (Cavusgil et al., 2014:420):

- Accessing new markets or opportunities. Firms want, for various reasons, to be near their customers to provide them with their products, services, and offerings.
- Tracking key customers. MNCs track their key customers because they do not want to lose them to competitors.
- Compete with key rivals in their own markets. The underlying goal hereof is to make competitors use their resources to defend their own market.

South Africa is home to many global automotive OEMs who could use their influence and infrastructure as a base to penetrate other parts of Africa, especially Sub-Saharan Africa. The second motive that MNCs may seek is resources or assets, which makes acquiring production facilities in a foreign market highly important. An MNC may pursue FDI ventures to acquire the following assets (Cavusgil et al., 2014:420-421; Wild & Wild, 2016:215):

- Raw materials needed in unique industries, for example agriculture.
- Knowledge or other assets. Firms entrench their position and understanding of their target markets by having a domestic presence through FDI.
- Technological and managerial knowledge.

The abundance of raw materials in South Africa has attracted automotive companies to the country. The catalytic convertor supply chain was established to capitalise on the platinum group metals in the country. The third motive that MNCs may seek is efficiency through international expansion, which is to increase their economies of scale. By expanding globally, firms can increase sales and employ company assets across a wider range of products and markets. Besides the primary goal of achieving economies of scale, international business can achieve four major efficiency seeking goals, namely (Cavusgil et al., 2014:421-422; Wild & Wild, 2016:216):

- Minimise sourcing and production costs by accessing inexpensive labour and other cheap input to the production process.
- Locate production near customers.
- To take advantage of government incentives. In addition to restricting imports, governments frequently offer subsidies and tax concessions to foreign firms to encourage them to invest domestically. FDI is encouraged by governments because it provides jobs domestically, capital, increases tax revenue, and transfers skills and technologies.
- Avoid trade barriers. MNCs often enter markets via FDI to circumvent tariffs and other trade barriers as they normally apply only to exporting. However, this motive is declining in importance because trade barriers have fallen in many countries.

FDI is motivated by a firm's pursuit of long-term wealth-creation. The benefits of FDI have a knock-on effect because it creates employment and other benefits in a country (Hill, 2014:250). According to Masipa (2018:2), FDI is directly linked to economic growth because promoting higher levels of FDI will increase GDP through higher production output and exports. Increasing FDI in South Africa, specifically in the domestic automotive industry, is crucial for job creation and a building block to improve exports (Masipa, 2018:3). However, FDI in South Africa has been declining with the country not even ranking among the top twenty-five investment destinations on the index in 2017 (Engineeringnews, 2018a). Crime and corruption are the two major factors impinging FDI inflow into South Africa (Masipa, 2018:7). High levels of crime dissuade the inflow of foreign investors as they question the state of security in South Africa (Masipa, 2018:7). According to Engineeringnews (2018a), investors are optimistic about the economic prospects of Asia Pacific, Europe, and the United States of America because the key factors they seek are regulatory transparency, lack of corruption, and political stability. Nowadays, investors are prioritising governance factors when deciding where to invest and South Africa as an emerging market is seen as a higher risk because of political instability. Strict policies need to be developed and implemented to fight corruption to encourage foreign investors to invest in South Africa (Masipa, 2018:7).

Globalisation has an impact on strategic management strategies. Strategic management will be discussed next.

2.3.3 Strategic management

Strategic management is the process of setting objectives, the development of policies and plans to achieve these objectives and allocating resources to implement these plans (Barney & Hesterly, 2015:26; Brui, 2018:531; Ogbechie, 2018:171). It guides the overall direction of the entire organisation and is an instrument to tackle competition, change, and conditions for survival. An organisation's strategy describes how competitive advantages will be achieved (Barney & Hesterly, 2015:26; Thomas & Housden, 2017:149; Ogbechie, 2018:168). Competitive advantage is the fundamental source for explaining organisations' superior performances; thus, represents the critical objective of strategic management (Gomes & Romao, 2018:14). A good strategy is one that will gain the abovementioned advantages and sustain it in the long run. Strategic management aids strategic decision making by using a systematic, logical, and rational approach to strategy.

2.3.3.1 The strategic management process

The strategic management process is a sequential set of analyses and choices that heightens the likelihood that a firm will select a good strategy, that is, a strategy that generates competitive advantages (Barney & Hesterly, 2015:26; Ogbechie, 2018:169). The strategic management process begins when an organisation defines its mission. This describes its long-term purpose and defines what the organisation aspires to be in the long run, and what it wants to avoid in the short-term. It adds purpose to the organisation because it promotes cooperative behaviour to achieve this visionary state. Once the mission and vision have been set, the organisation can progress to the next step which is setting the long-term objectives.

The objectives should be specific, measurable targets which the organisation can achieve to assess the extent to which the mission and vision are being reached (Barney & Hesterly, 2015:27; Wild & Wild, 2016:305). High quality objectives are closely connected to the elements of an organisation's mission, and it should be easily measurable over time. Low quality objectives are those that either do not exist or are not connected to the mission at all. The objectives must be quantitative, measurable, realistic, and achievable among organisational units (Wild & Wild, 2016:305). Strategic objectives could include building a reputation in the marketplace and gaining a competitive advantage, whereas financial objectives could include lowering costs per unit, higher production levels, and earning a higher profit. Once the objectives have been set and outlined, the analysis of the internal and external environments can start. Figure 2.2 exhibits the three stages of the strategic management process and is discussed immediately thereafter.

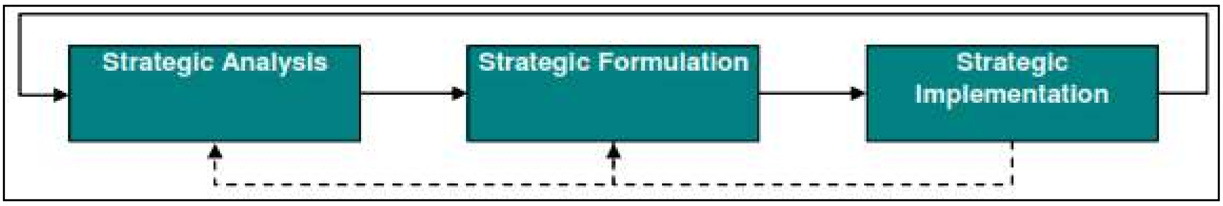


Figure 2.2: The strategic management process

Source: (Barney & Hesterly, 2015:27; Ogbechie, 2018:169)

2.3.3.1.1 Strategic analysis

Strategic analysis and marketing require the directing and coordination of the marketing efforts, by scanning the target markets based on an analysis of the best market growth opportunities (Cravens & Piercy, 2013:15; Kotler & Keller, 2016:59). Organisations will conduct a target markets analysis to strengthen their competitiveness in these markets. Strategic analysis and marketing, a market driven process of strategy development, factor in a turbulent business environment and the need to deliver best customer value (Cravens & Piercy, 2013:15). Strategy analysis and marketing's focus is on organisational performance rather than increasing sales.

Strategic analysis aims to transform an organisation's long-term objectives into specific performance targets to be achieved after analysing the organisations internal environment for strengths and weaknesses, and its external environment for opportunities and threats (Barney & Hesterly, 2015:27; Ogbechie, 2018:169). SWOT is the acronym for Strengths, Weaknesses, Opportunities and Threats (Kotler & Keller, 2016:71; Gurel & Tat, 2017:995). SWOT can be defined as (Pearce & Robinson, 2013:151; Kotler & Keller, 2016:71; Gurel & Tat, 2017:996; Blythe & Martin, 2019:24):

- Strengths. Strengths are an organisation's resources or capability to satisfy the customers' needs which gives it a superior advantage over its competitors.
- Weaknesses. A weakness is a deficiency in an organisation's resources or capability to satisfy the customers' needs which places it at a disadvantage relative to its competitors.
- Opportunities. An opportunity is a major favourable situation in the business environment. It could be one's own resources, technology, or expertise in specific capabilities which is required to compete more effectively in the business environment.
- Threats. Threats are a negative situation in the firm's environment and are impediments to the firm's current or desired position in the business environment.

SWOT analysis is a management tool used in the strategic analysis and marketing process to develop an effective organisational and competitive strategy (Gurel & Tat, 2017:995; Thomas & Housden, 2017:171; Blythe & Martin, 2019:24). Organisations will analyse their internal environment to maximise their strengths and minimise their weaknesses, whilst scanning their external environment for new opportunities and threats. Scanning these environments provides an effective strategy that will guide the strategic direction of the organisation to achieve its goals, and to gain a competitive advantage over its competitors (Gurel & Tat, 2017:994; Thomas & Housden, 2017:171; Blythe & Martin, 2019:27). Strategic analysis and marketing synchronise the entire organisation with the environment and is considered the art of finding, developing, and profiting from the SWOT analysis (Kotler & Keller, 2016:71). The SWOT analysis is very important because it guides the strategic decision-making process. When conducting a SWOT analysis, the following factors should be considered (Thomas & Housden, 2017:171):

- Be realistic about the outcomes.
- Be detailed enough to be understood.
- Be evidence based and specific to the organisation.
- Represent an accurate picture of the organisation and its environment.
- Be based on measurement where possible.
- Prioritise and suggest actions.

When formulating the strategy, it is important to consider the limitations associated with the SWOT analysis, such as overemphasising internal strengths and overlooking external threats, being static and ignoring changing circumstances, and certain strengths not necessarily being or leading to a competitive advantage (Gurel & Tat, 2017:1004-1005). The SWOT application to South Africa's automotive industry will be discussed in chapter 4. Once the SWOT analysis has been performed, the organisation can move onto the next step which is the strategy formulation phase.

2.3.1.1.2 Strategy formulation

Strategy formulation is the development of long-term plans for the effective management of environmental opportunities and threats, factoring in internal strengths and weaknesses (Barney & Hesterly, 2015:27; Ogbechie, 2018:169). The essence of formulating a strategy is to relate the organisation to its operating environment. This provides sufficient evidence that there is significant independence in the formulation of a strategy, the organisation, and the environment (Wild & Wild, 2016:305; Ogbechie, 2018:169). The strategy formulation process includes the following range of choices (Ogbechie, 2018:169):

- Deciding the purpose and the guiding aspiration of the organisation.
- Deciding where to compete, this can include geographical locations, product categories, consumer segments, and distribution channels.

- Reaching consensus on the customer value proposition and competitive advantage.
- Having the required skills and capabilities to succeed.
- Designing the support structures, systems and processes required to drive the business as per the choices.

The strategic choices which are available to the organisation fall into two large categories, business-level strategies, and corporate-level strategies. Business-level strategies are actions the organisation will take to achieve a competitive advantage in a single market or industry (Barney & Hesterly, 2015:29). The three generic business-level strategies are cost leadership, differentiation, and niche market focus which will be discussed in section 2.3.4. Corporate-level strategies are actions the organisation will take to achieve a competitive advantage by operating in multiple markets or industries (Barney & Hesterly, 2015:29). The objective of making a strategic choice should be based on the strategic management process. A strategy which is formulated based on the strategic management process is likely to be a sustainable source of competitive advantage. The last phase of the strategic management process can start once a strategy has been successfully formulated and the chosen strategy is being pursued.

2.3.1.1.3 Strategy implementation

A strategy that has been successfully analysed and formulated is worthless if it is not implemented. Strategy implementation is the execution of the organisations' policies and practices which are consistent with its strategy (Barney & Hesterly, 2015:29; Brui, 2018:537; Ogbechie, 2018:169). The three organisational policies and practices which are important in implementing a strategy are (Barney & Hesterly, 2015:29; Ogbechie, 2018:169):

- The organisational structure of the firm. This refers to the organisational structure used to implement all business-level strategies which are being pursued.

- The formal and informal management control systems. This involves the management of the organisation. There are tight control systems, and the various departments will report to the chief executive officer.
- Compensation policies. This involves rewarding employees who meet their targets and objectives. This is a critical aspect to implement the chosen strategies.

The main premise of executing the chosen strategies is to maximise and achieve a sustainable competitive advantage (Ogbechie, 2018:169). An organisation's strategic management practices are demanding because it carries a high degree of uncertainty, and strategic decisions cannot be reversed without huge costs implications.

2.3.1.1.4 Strategy evaluation

Organisations are forced to constantly evaluate their performance because of the fierce competitiveness of the global arena. It is critically important that an organisation's strategic management performance is regularly evaluated because of the dynamic and constantly changing business environment. Strategy evaluation is the continuous monitoring and assessment of the chosen strategy and the implementation thereof which is being synchronised with the objectives of the organisation (Brui, 2018:537). Formulating objectives for the organisation serves no purpose if the achievement thereof is not monitored. This requires that the organisation must do a comparison of their anticipated results to their actual results, evaluate individual performances, and examine the progress made towards the chosen objectives. Once the strategic evaluation has been completed, the organisation will be able to take corrective action, if necessary, based on the results that have been achieved. The main goal of the organisation will be to generate a sustainable competitive advantage. A highly volatile business environment reinforces the principle of continuous strategy evaluation in achieving a sustainable competitive advantage in the long run.

Sustainable competitive advantages will be discussed next.

2.3.4 Sustainable Competitive Advantage (SCA)

Intense competition in domestic and international markets, technological advancements, and assertive and demanding customers have fuelled the global arena whereby firms are constantly searching for new ways and methods to achieve a sustained competitive advantage. Sustainable Competitive Advantage (SCA) can be defined as the continuation of benefits and the application of value creation strategies which establish rewards over a long term (Mullins & Walker, 2013:439-440; Pearce & Robinson 2013:231; Hakkak & Ghodsi, 2015:300). Companies' strategic choices to obtain an SCA will depend on the market it is pursuing. These strategic choices can be categorised as business level strategies or corporate level strategies. Business level strategies entails firms acting in a single market or industry to attain a competitive advantage, whilst corporate level strategies entails acting in multiple markets or industries simultaneously to attain a competitive advantage (Barney & Hesterly, 2015:29). Three business strategies, namely cost leadership, product differentiation, and niche market focus will be discussed. They are also referred to as generic business strategies.

A competitive advantage exists when an organisation can produce or sell a product at a lower cost (cost advantage) or deliver benefits that exceed those of competitors (differentiation). Low-cost leadership and differentiation have been identified as the two most prominent sources of competitive advantage whilst developing a niche market is also a strategy option that could be adopted (Pearce & Robinson 2013:231; Badenhorst-Weiss & Cilliers, 2014:7; Fathali, 2016:137). Organisations who possess a competitive advantage because of low-cost or differentiation can create more value for customers than their competitors, and they can enjoy superior profits.

2.3.4.1 Low-cost leadership

A low-cost leadership strategy is when a firm aims to be the lowest cost producer in the industry. The success of the business is premised on producing a product, or service, at a lower cost than its competitors, and it must be an SCA (Mullins & Walker, 2013:445; Pearce & Robinson, 2013:232-233; Josiah & Nyagara, 2015:2; Kotler & Keller, 2016:74). For this strategy to succeed, a firm must focus on cost reduction throughout its operations to earn a suitable profit and a high return on investment. By offering products and services at the lowest cost to the industry, the challenge is to earn a suitable profit for the company. Mullins & Walker (2013:440) state that pursuing a low-cost strategy allows little room for investments to maintain the product, or to improve it with technological enhancements required to compete effectively. It has implications on profit margins and the ability to finance future growth strategies. This strategy also tends to focus more on the competitors than the customers (Atikia, Mukulu, Kihoro & Waiganjo, 2015:136). Customers usually perceive lower prices with a product of inferior quality. Badenhorst-Weiss & Cilliers (2014:7) state that focusing on lower costs is not a bad decision in and of itself, but it should not form the sole basis of a competitive strategy because growth is less likely to follow. Pearce and Robinson (2013:234-235) state that the key basis for a business' competitive strategy depends on whether the low-cost activities are sustainable and provide one, or more, of the following advantages relative to key industry forces:

- Low-cost advantages that minimise the chances of pricing pressure from buyers.
- The ability to sustain low-cost advantages for a lengthier period may push competitors into other areas, reducing the price competition.
- New entrants competing on price must face a well-established cost leader without the ability, or necessary skills, to copy every cost advantage.
- Low-cost advantages should detract from the popularity of substitute products.
- Higher margins enable cost producers to remain unaffected by supplier cost increases.

The important aspect of following a low-cost leadership strategy is that it must provide a cost advantage that will lead to a sustained competitive advantage. The ability of a valuable low-cost leadership competitive strategy to generate a sustained competitive advantage depends on that strategy being rare, or costly to imitate either through duplication or substitution (Barney & Hesterly, 2015:136). The sources of the cost advantage can differ and be dependent on the structure of the industry. Economies of scale, proprietary technology or easy access to raw materials could be the main sources of rare cost advantages (Atikia et al., 2015:136; Barney & Hesterly, 2015:125; Fathali, 2016:137). Cost advantages based on economies of scale are rare because many manufacturers cannot copy this. Some of the global automotive original equipment manufacturers (OEMs) could have proprietary technology software, which is unique to their manufacturing, giving them cost advantages in the market. Cost advantages based on access to raw materials are rare because it can be difficult and costly to transfer raw materials. When adopting a low-cost leadership strategy, the focus must be on organisational structure, management controls, and compensation policies, as well as on reducing costs, increasing efficiency, and customer value which reinforces this strategy as a sustainable competitive advantage (Barney & Hesterly, 2015:141). The application of these aspects on the South African automotive industry will be discussed in chapter 4.

2.3.4.2 Differentiation

A differentiation strategy aims to create a competitive advantage by the product or service being uniquely valuable to a buyer based on features, performance, technology, or other factors which is not related to the cost and price (Mullins & Walker, 2013:440; Pearce & Robinson, 2013:236; Fathali, 2016:138). This business strategy attempts to create a competitive advantage by maximising the perceived value of its own product or service relative to the perceived value of a competitor's product or service (Barney & Hesterly, 2015:162; Kotler & Keller, 2016:74). By increasing the perceived value of its products or services, an organisation can charge a premium price. This strategy aims to create an SCA by making the product difficult to create or imitate. An organisation that can successfully differentiate their products or services would be able to generate more revenue by charging higher prices and it can lead to an SCA (Barney & Hesterly, 2015:162). Thus, competition on non-price factors, such as product features and quality, innovation, service and delivery, or technological capabilities, is the core focus to grow the business (Badenhorst-Weiss & Cilliers, 2014:7). Fathali (2016:138) highlights a few pre-requisites that are needed for this strategy to be successful:

- Good research, development, and innovation.
- The ability to deliver superior quality products or services.

- Effective sales and marketing to make the customer market understand and aware of the differentiated product on offer.
- Organisations need to stay agile with their new product development processes.

Product differentiation strategies augment value to firms by enabling them to charge prices for their products or services which are higher than their average total cost (Barney & Hesterly, 2015:162). Organisations that implement this strategy successfully can reduce a myriad of environmental threats whilst exploiting a host of environmental opportunities. Product differentiation reduces the threat of rivalry because each firm in an industry attempts to carve out its own unique product. It also helps reduce the threat of substitutes by making an organisation's current product appear more attractive than substitute products. Product differentiation can reduce the threat of powerful buyers because buyers who are interested in this specific product must buy it from the organisation that is selling it. Furthermore, product differentiation can aid an organisation in taking advantage of environmental opportunities. It can consolidate a fragmented market, it can be an important strategic option in a declining market, and it can influence the way an organisation acts in a global industry (Barney & Hesterly, 2015:162). When adopting a differentiation strategy, the focus must be on organisational structure, management controls, and compensation policies, as well as on innovation, creativity, product performance, and product style which reinforces this strategy (Barney & Hesterly, 2015:169). The application of these aspects on the South African automotive industry will be discussed in chapter 4.

2.3.4.3 Niche market focus

Pearce and Robinson (2013:241) state that this strategy uses a differentiation strategy, or a low-cost strategy, or a combination of both to solely focus on the narrow market demand instead of the larger market. Organisations can use both these strategies simultaneously if they learn how to manage the inherent contradictions of these two strategies. The narrow focus approach usually uses some criteria, such as geographic location, product type or features, customer selection, or a combination thereof. A niche market focus strategy may be advantageous at the inception stages; however, it is unlikely to remain a niche because competitors will follow and copy the offered product or service (Badenhorst-Weiss & Cilliers, 2014:6). Thus, this strategy is likely inadequate to provide long-term sustainable growth. The global automotive manufacturers require economies of scale in the production of vehicles to lower costs and to ensure sustainability.

The marketing strategies will be discussed next.

2.3.5 Marketing strategies

A marketing strategy is the blueprint for directing and coordinating the marketing effort which is to reach the target markets and turn them into customers (Kotler & Keller, 2016:59; Armstrong, Kotler, Harker & Brennan, 2019:10; Cant, 2020:3). Ansoff (1957:114) highlighted four marketing strategies that an organisation could use as a path to future industry growth. The four growth alternatives are (Ansoff, 1957:114):

- Market penetration. This strategy seeks to improve business performance by increasing the sales volume to existing customers, or by searching for customers in new markets.
- Market development. This strategy aims to enhance an organisations income level by increasing sales in the existing market with its present product line, or with new explored products.
- Product development. This strategy aims to develop new products with different characteristics to improve performance.
- Diversification. This strategy involves departing from current products and markets.

The organisation will use one or more of these strategies to create a competitive advantage, to attain the stated objectives and goals, and to achieve significant sustainable growth. The goal is to understand what the customer wants, to provide the right products, and to satisfy the customer in an efficient manner. The marketing strategy is a continuous process of making decisions, implementing them, and measuring their effectiveness over time (Cravens & Piercy, 2013:16; Kotler & Keller, 2016:78; Armstrong et al., 2019:11). Strategic evaluation and control are concerned with tracking performance and, when necessary, amending plans to keep performance on track. Engaging in continuous evaluation, helps to discover new opportunities and potential threats that may arise. It is also the connecting link in the marketing strategy process as shown in figure 2.3.

2.3.5.1 The marketing strategy process

The marketing strategy process entails the analysis, planning, implementation, and management process, as seen in figure 2.3 and discussed immediately thereafter.

Figure 2.3: Marketing strategy process

Source: (Cravens & Piercy, 2013:16)

Markets, segments, and customer value consider market and competitor analysis, market segmentation, strategic customer relationship management, and the continuous learning about markets. This helps to guide the design of a new strategy or to change an existing strategy. Activities include (Cravens & Piercy, 2013:16; Mullins & Walker, 2013:180; Blythe & Martin, 2019:76-89):

- Markets and competitive space. Once markets have been identified, buyers and competition can be analysed. A product market calls for specific products which can satisfy a set of needs and wants for people willing and able to buy it. The main premise is to profile the buyers, to understand their product preferences, and to estimate the size and rate of market growth.
- Strategic market segmentation. This is a process by which a market is divided into distinct customer subsets, with similar needs and characteristics, which lead them to respond in similar ways to a specific product offering. The objective is to examine differences in needs and wants and to identify the segments within the product market offering.
- Strategic customer relationship management. This involves the delivery of superior customer value by personalising the interaction between the customer and the company. It aims to develop better relationships with customers and to retain their loyalty.

Designing market-driven strategies involve market targeting and positioning strategies, building marketing relationships, and developing new products. Activities include (Cravens & Piercy, 2013:16; Mullins & Walker, 2013:180; Blythe & Martin, 2019:89):

- Market targeting and strategic positioning. This requires deciding how, when, and where to compete in the market. The objective of a market targeting strategy is to select the people that management wishes to serve in the product market. This requires evaluation of various segments in terms of market potential, growth rate, and competitive intensity.
- Innovation and new product strategy. New products are needed to replace older ones when sales and growth decline. New product planning is critical to satisfy customer requirements and to produce high quality products at competitive prices.

Market-driven program development involves the implementation of the marketing mix of variables which will be discussed in the following section. These marketing variables are combined to form the positioning strategy selected for each market. Activities include (Cravens & Piercy, 2013:19; Mullins & Walker, 2013:180; Cant, 2020:153):

- Strategic product management. This refers to the product as the focal point of the positioning strategy. Product strategy includes developing plans for new products, managing programs for successful products, and what to do with problematic products.
- Pricing strategy. Price is a critical factor in positioning a product or service. Organisations must be aware of customers' reaction towards a product's cost, the cost of alternate products, and the competition's prices. Pricing strategy involves selecting the role of price in the positioning strategy.
- Promotion strategy. Advertising, sales promotion, direct marketing, and public relations aid the organisation to communicate with its customers and other stakeholders. These activities make up the promotion strategy which is an essential component in communicating the positioning strategy to buyers and to others who influence the purchasing process.
- Distribution strategy. This involves linking the producers with the end user household and business markets.

Implementing and managing market-driven strategies involve the selection of customers to target and move the marketing strategy on to the action stage. This stage considers designing the marketing organisation and implementing and managing the strategy. Activities include (Cravens & Piercy, 2013:20; Cant, 2020:175-177):

- Designing market-driven organisations. This involves the synchronisation of people with work responsibilities in such a manner that it best suits the marketing strategy.
- Marketing strategy implementation and control. This involves preparing the marketing plan and budget, implementing the plan, and using it to continuously manage and control the strategy. The marketing plan includes details, such as targeting, positioning, and the marketing mix activities.

The marketing strategy process focuses on the customer and on providing the right products to the target market. It is founded on the premise that to achieve the organisation's goals, the organisation must provide a more superior value to the target market than its competitors.

2.3.5.2 The marketing mix

The marketing mix is the combination of controllable marketing variables that an organisation will use to execute the marketing strategy to achieve the goals and objectives in each target market (Kotler & Keller, 2016:47-49; Blythe & Martin, 2019:9; Cant, 2020:199). The marketing variables are known as the four P's, namely product, price, promotion, and place that are used to analyse a business' market position and whether a competitive advantage can be realised (Kotler & Keller, 2016:47-49; Blythe & Martin, 2019:9; Cant, 2020:199). The traditional marketing mix has been expanded by factoring in the growing importance of service products and their characteristics in the marketing mix. Four factors have been added, namely people, processes, physical evidence, and community. These eight variables are discussed below (Mullins & Walker, 2013:17-18; Bothma & Gopaul, 2015:288-294; Kotler & Keller, 2016:47-49; Blythe & Martin, 2019:9;):

- Product policy is concerned with the characteristics, or set of benefits, which meet the needs of the organisation's customer. This includes tangible characteristics such as product quality and packaging, and intangible characteristics like branding, warranties, and service.
- Pricing policy is concerned with the cost of the product to the customer. Prices used to be negotiated between the buyer and seller before the advent of large-scale retailing and mass production where one price was set for all buyers. The digital era is taking the pricing policy back to an era of dynamic pricing for individual customers.
- Promotion is concerned with transmitting the message to the customers. It includes all the tools in the marketing toolbox, such as advertising, selling, sales promotions, and public relations. All these tools are used to persuade the customer to purchase the product.
- Place is part of the distribution channel. The purpose of the distribution channel is to make the right quantities of the right product or service available at the right time, at the right physical location, to enable the exchange of goods and services between a buyer and seller.

- People are considered fundamental aspects of the marketing mix. People reflect the internal marketing aspect, and those employees are important to the marketing success. Marketing will only be as good as the people working in the organisation and it highlights that those marketers must view consumers as people to better understand their lives, and not just as shoppers consuming their products.
- Processes are the internal and external procedures, transactions, and communications which are required to run an organisation. Processes reflect all the creativity, discipline, and structure brought to marketing management.
- Physical evidence is concerned with the internal and external layout of a building, or staff uniforms, which reassures the customer regarding the organisation.
- Community, a new marketing variable which is added to the marketing mix, is concerned with the digital environment. An online community is a social group of people interacting via the web. It incorporates intertwined relationships, built upon shared interests that satisfy members' needs that are not individually achievable.

The synchronisation of the various marketing variables is critical for achieving a successful marketing strategy. The last marketing variable, namely community, will now be discussed in greater detail because it has caused a revolution in the global marketing environment (Thomas & Housden, 2017:26).

2.3.5.3 Digital marketing

Digital marketing uses digital technologies and electronic media types to market products and services interactively online to reach consumers, promote brands, create awareness, and increase sales (Botha & Bothma, 2015:13; Chipp, Ismail & Meiring, 2017:220; Jacunski, 2018:11). Digital marketing is linked to the change in consumer purchasing trends and how this affects the global automotive industry is discussed in chapter 3. Digital marketing is also linked to the fourth industrial revolution and will be discussed in detail in chapter 3. The critical component underpinning the digital revolution is the immense growth in computing power (Schafer, 2018:6). Digital marketing methods have continuously been growing whilst traditional advertising methods, namely television, radio, magazines, and newspapers have been declining (Chipp et al., 2017:220).

The internet's rapid growth and the digitisation of information products and product information have altered the marketing landscape. It has fundamentally altered business strategies and their online and offline marketing strategies (Chipp et al., 2017:341). The increase in digital marketing is expected to continue because the internet offers many advantages over traditional methods and has become widely available amongst consumers (Thomas & Housden, 2017:12; Bala & Verma, 2018:334-335). The internet is one of the most powerful marketing tools at an organisation's disposal, and marketers who fail to incorporate it into their business marketing strategy will be at a disadvantage (Bala & Verma, 2018:325).

2.3.5.3.1 The internet

The internet can be described as a network of networks, a system of interrelated components that permits the sharing of information and communication amongst computers that are sharing the system (Botha & Bothma, 2015:3; Bothma & Gopaul, 2015:3; Chipp et al., 2017:6; Bala & Verma, 2018:327). These computers are located around the world and are connected to the internet which becomes a tangled web of connections referred to as the World Wide Web (WWW). The other important aspect of the internet is the term Internet Protocol (IP). The IP is a set of standards that enables computers with different operating systems and a wide range of applications to share data and communicate with each other. The internet represents the infrastructure, and the IP is the language that computers speak to transmit the data (Botha & Bothma, 2015:3; Chipp et al., 2017:6). Every computer on the internet has its own exclusive number known as the IP address. By having all these computers connected to this global system of networks, can provide a multitude of benefits, such as (Botha & Bothma, 2015:3; Bothma & Gopaul, 2015:12; Chipp et al., 2017:12):

- It can offer a simpler and easier marketing communications channel for millions of individual and business internet users to use.
- The information that is available on all these computers can be accessed by all internet users.

- The internet's infrastructure allows a vast range of business activities to be conducted, for example advertising and other marketing activities.
- Detailed consumer information can be cheaply gathered in the digital world, permitting greater customisation especially regarding information goods, such as automotive products.
- Electronic commerce (e-commerce) can potentially alter market structures, eliminate traditional players whilst creating opportunities for new types of intermediaries.

The internet is the most powerful tool in the emerging globalisation (Bala & Verma, 2018:328). South Africa's internet users were 4.5 million (9.1%) of the population in 2008, it increased to 28.5 million (52%) of the population by 2016, and by 2020, 36.5 million (57.3%) of the population were internet users (Statista, 2021). More than half the South African population currently use the internet and this trend will grow even more, so much so that it will play a critical role in the future of e-commerce. Some companies, such as Uber, do not own a single vehicle but they are the world's largest taxi company (Bala & Verma, 2018:328). Uber understood the power of the internet and adapted with the market. The internet's properties provide the basis for understanding e-commerce, as well as the key success factors in the e-commerce arena. This will now be discussed.

<u>2.3.5.3.2 E-commerce</u>

The emergence of e-commerce took the form of electronic fund transfers which were limited to business between large companies and financial institutions. This evolved to include manufacturers, retailers, services, and a multitude of other businesses which resulted in the initiation of electronic data interchange. E-commerce can be described as the use of the internet to conduct transactions where products and services are purchased and paid for online (Botha & Bothma, 2015:13; Bothma & Gopaul, 2015:14). There has been a remarkable growth in e-commerce over recent years which now has various classifications based on the nature of the transaction. The following classifications are commonly used (Botha & Bothma, 2015:3; Chipp et al., 2017:22):

- Business-to-consumer (B2C) – B2C refers to a company selling its products and services to consumers via an online interface (web or mobile), where companies set up an online site for consumers to visit and conduct their transactions.

- Business-to-business (B2B) – B2B refers to the commercial exchanges between companies. B2B e-commerce business models can take different forms, such as online marketplaces.

- Consumer-to-consumer (C2C) – C2C involves consumers that utilise the web as a platform to facilitate exchanges between each other.

Many companies follow a multiple approach and attempt to service businesses and consumers at the same time. A company creates a website that is aimed at the consumer to facilitate transactions, but it could also integrate its procurement and payments systems with those of its suppliers and partners to obtain goods and raw materials which it needs to conduct its business (Botha & Bothma, 2015:77). The following table highlights the benefits of e-commerce for businesses and consumers.

Table 2.2: Benefits of e-commerce for businesses and consumers

Benefits to businesses	Benefits to consumers
• Reduces costs for inventory management. Automation of inventory management by using web-based management systems. • Reaches global markets by overcoming geographical locations. A brick-and-mortar store is limited to the physical location, but e-commerce allows suppliers to reach global market segments. • Monitors consumers' buying behaviour patterns. Allows businesses to alter and modify their products as customers preferences and technologies change. • Reduces marketing and labour costs. Automation of selling processes and quicker to update advertisements using software technologies.	• It offers a wider range of choices from a variety of sellers. • Products can be purchased from remote and distant areas. Consumers can buy products and services from anywhere and travelling to these places are no longer necessary because it transcends geographical locations. • Consumers can make price comparisons. Users can surf multiple websites searching for the best prices. • It is convenient and saves time. Purchases can be made without leaving home. • Remains accessible all the time. E-commerce websites are open 24/7/365 which allows consumers to shop anytime.

Sources: (Botha & Bothma, 2015:25; Chipp et al., 2017:69, Thomas & Housden, 2017:12; Bala & Verma, 2018:336)

2.3.5.3.3 E-commerce and the impact on consumer behaviour

People live in a very different world than 20 years ago. The world is changing as technology reaches into many corners of their lives through many different platforms. Since the advent of the online world, the internet has become a seamless part of consumers' lives and can pervade many aspects of their decision-making processes, from need recognition to post-purchase evaluation (Chipp et al., 2017:111). Consumers not only use the internet for shopping activities but also to collect information, to communicate with each other, and to seek entertainment. The consumer decision-making process involves every step of the purchase process, from deciding on a product, which then becomes a need, to the use and disposal of that product (Chipp et al., 2017:125; Jacunski, 2018:15). A motor vehicle can be a product that becomes a need, and the consumer decision-making process will start. All the steps that follow, from the information search on vehicles to the actual purchase of the vehicle, will make up the decision-making process and most of these steps can now be done online. Because motor vehicles are higher priced products, consumers do extensive decision-making. The shoppers' smartphones are with them constantly, so many purchases get checked and compared with other online sites. This has an influence on the purchasing decision of the consumer. Figure 2.4 presents a model of the consumer's decision-making process and the various factors influencing the process.

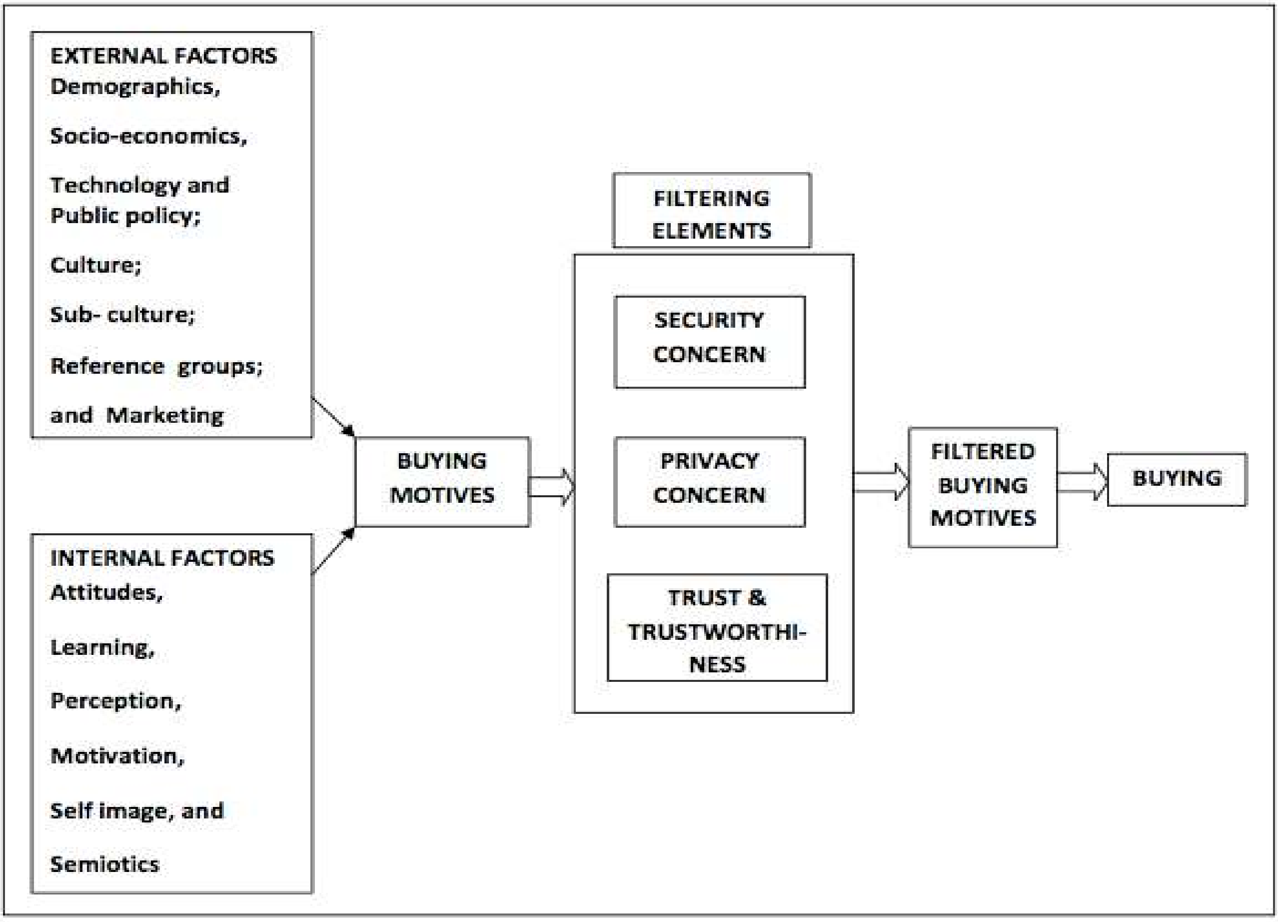


Figure 2.4: E-commerce consumer behaviour model

Source: (Botha & Bothma, 2015:67)

According to the e-commerce consumer behaviour model, in figure 2.4, the purchasing decision process is the consumer's reaction to different stimuli (Botha & Bothma, 2015:67; Jacunski, 2018:15). This process is influenced by the characteristics of the consumer, the environment, and the e-commerce being offered by the business. It is critically important that businesses provide reliable information about their products on offer. This makes it easy for the consumer to understand the offered product and it allows the consumer to compare the product against competitors in a simplified manner.

The internet has had a significant impact on consumers' decision-making, either by online searches, social media, mobile interactions, or deciding at the point of sale (Chipp et al., 2017:126). E-commerce business competes with many other competitors for consumers' money and loyalty, both on and off the web. All these businesses are trying to influence the decision-making process of the consumer and are trying to create consumer loyalty towards the product offered on the web. This means that when consumers access the web to search for the sought-after product, the business' website must successfully guide the consumer through the decision-making process.

Most corporate companies have a web presence, and it is important for the e-commerce site to attract customers. Online promotion plays a critical role in attracting customers to the website. A company's website must guide the prospective buyers because they may not know what they need. Once customers have visited the website, the next step is to convert these visitors into buying customers.

2.3.5.3.4 Evaluating e-commerce websites

A company's website must be valuable and contribute to the business (Kotler & Keller, 2016:639). For companies with an online presence, all forms of communication and business transactions between the company and the customer can take place on the website. The three management areas that are critical in managing the creation of a website are (Botha & Bothma, 2015:45; Bothma & Gopaul, 2015:49-62; Kotler & Keller, 2016:639-640):

- Planning. Planning the website is an important business activity and needs proper attention because it would determine whether a consumer makes a purchase, or not, or even determine the web traffic on the business' website. Consumers can take their online shopping activities to a myriad of other online competitors if the company's website is difficult to use because it portrays a negative image of the company. The main goal of the website is to satisfy the consumers' needs and the businesses' objectives which will ensure a long-term profitable relationship (Botha & Bothma, 2015:45; Bothma & Gopaul, 2015:53).

- Incorporating the planning into the website design. The website's design should include the look and feel of the business, consider the audience's characteristics, communicate the necessary information, and portray the website's purpose and specifications. The website must combine all these aspects to produce a user-friendly website.

- Evaluating and testing the website before and after the launch to garner feedback for improved actions and maintenance aspects. It is extremely important for a business to evaluate the website before and after implementing it. Pre-testing a website is an uncomplicated process whereby the website is screened for weaknesses and problems before launching. This helps to avoid releasing a negative image and/or publishing any inaccurate information.

According to Kotler & Keller (2016:639), to promote repeat visits to a company's website, marketers and website designers must be cognisant of the context and content factors whilst embracing constant change to a website. The website is the customer's virtual portal to the company's business doors. Customers are only a mouse-click away from going online which means that businesses must ensure that their customers' demands are met quickly, easily, and efficiently. The only way to build an efficient and successful online business is to provide the best service to the customer in a timely and swift manner.

<u>2.3.5.3.5 E-commerce and Customer Relationship Management (CRM)</u>

Online business transactions will occur daily, and the buyer and seller may never see or meet each other, but this does not mean that customer service is unimportant (Bothma & Gopaul, 2015:176). Customer Relationship Management (CRM) is a premium customer care approach (Botha & Bothma, 2015:147; Ziliani & Ieva, 2016:275; Thomas & Housden, 2017:210; Mathu & Phetla, 2018:4). CRM is a customer-oriented approach with the emphasis on long-term sustainable customer relationships which augment value for both the customer and the business (Botha & Bothma, 2015:148; Ziliani & Ieva, 2016:275; Tolmay & Venter, 2017:2). Customers are a valuable business asset that must be nurtured and cared for in the long run. This will lead to a long-term profitable relationship for the customer and the business. A long-term customer relationship develops into loyalty which leads to repeated product purchases from the organisation (Thomas & Housden, 2017:213). CRM shifts the focus from a sales approach to a customer driven one. The five activities that focus on the customer are (Botha & Bothma, 2015:148):

- Identification. This involves learning as much as possible about the customer to be able to interact with them.
- Individualisation. This refers to following a unique approach to each customer based on their needs.
- Interaction. The internet represents one of the most sophisticated means to communicate with the customer.
- Integration. Monitor and manage the relationship with the customer throughout all parts of the business.
- Integrity. Earn and nurture the trust of the customer.

CRM encompasses all aspects of communication or interaction between the business and the customer. Technology's advancements and the advent of e-commerce have revolutionised the way businesses are conducting CRM and the relationship is managed more electronically (Botha & Bothma, 2015:148). The traditional form of CRM has evolved to e-CRM since the advent of e-commerce. E-CRM involves using technology to assist customer interactions with little or no human intervention from the supplier (Botha & Bothma, 2015:149; Ziliani & Ieva, 2016:276). E-CRM consists of two elements (Botha & Bothma, 2015:149; Ziliani & Ieva, 2016:276):

- It uses direct to consumer channels, such as emails and the web. It also uses other channels, such as chats, web access points, automatic teller machines, and kiosks.
- It uses technology to market the specific content by displaying it before the customer.

Consumers using the internet expect a prompt response to enquiries. Businesses who want to excel at CRM must live up to consumers' expectations and speed up any actions relating to customer service, the internet, or other enquiries. There are many tools for building a successful online CRM of which the most important is, having accessible personnel who can respond to any queries (Botha & Bothma, 2015:151). The following are different methods which can be adopted (Botha & Bothma, 2015:151-157):

- Personalised web pages.
- Automated response to emails.
- Frequently asked questions.
- The search facility.
- Help desks and call centres.
- Response time.
- On-time order fulfilment.
- Returns policy.

The importance of CRM cannot be emphasized enough. The customer is a business's most valuable asset (Ziliani & Ieva, 2016:275). Customers are regarded as the blood of the business because they provide the income and profit. Long-term relationships with the customer are crucial because it will encourage loyalty and keep the customer satisfied (Ziliani & Ieva, 2016:275). It is more expensive to win a new customer than to keep an existing one. By implementing a successful CRM, the business gets to know and understand the customer better and build a strong database enabling it to efficiently serve the customer (Botha & Bothma, 2015:161).

2.3.5.3.6 The digital future and its impact on marketing and supply chain strategies

The boundaries between an online and offline environment are becoming less noticeable. The differences may completely diminish as people live in an augmented reality. Clothes, watches, cars, homes and even the internal body systems will be connected to the online world (Chipp et al., 2017:447). First, the internet connected computers, then mobile phones, and then people through social networking which brought the online environment into homes, cars, waiting rooms, and the retail environments. Devices have become active and intelligent from biometrics to an era of smart products. Smart products can be described as consumer products with intelligence generating technologies which have sensors to gather data from the world around them (Chipp et al., 2017:454). These smart products use data to alter the environment, they have computational power to analyse data, and have interfaces which consumers can interact with. The following are smart products (Chipp et al., 2017:454):

- Smart homes. The main premise behind a smart home is to increase comfort, convenience, and security.
- Smart cars. This does not only refer to driverless cars, but also cars wherein which the driver and passengers can access, consume, interact with, and disseminate information between each other.
- Smart cities. This involves the city being made up of intelligent technology agents that sense, monitor, and adjust the city environment to maximise its functions.

Interaction with these devices have been revolutionised from typing a command to voice activated commands. All these devices are part of the environment and technology is connecting it to the internet which gave rise to the Internet of Everything (IoE). Figure 2.5 shows the completeness of connectedness and the future of digital innovation.

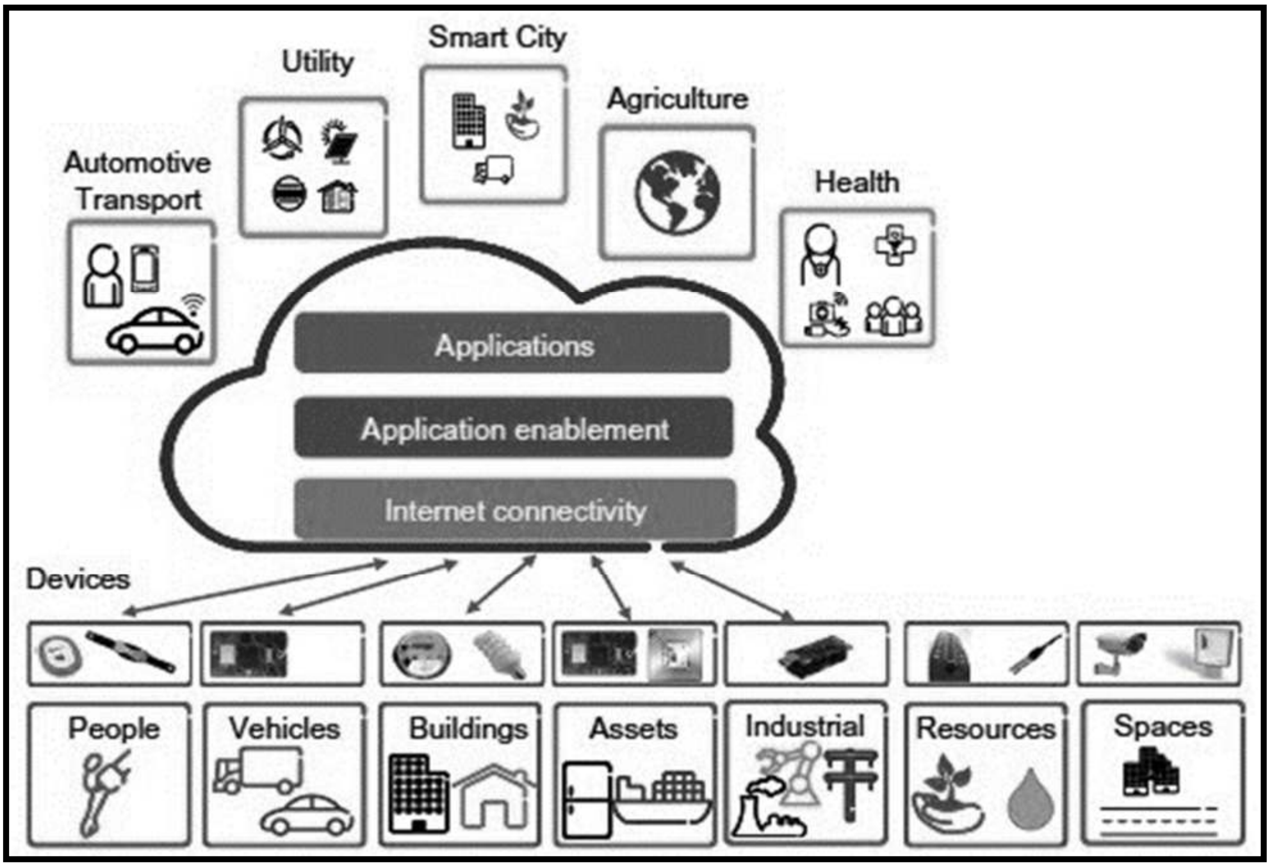


Figure 2.5: The completeness of connectedness
Source: (Chipp et al., 2017:457)

Marketing and strategies will be affected across a wide range of touch points. Advertising, retailing, service, product development, consumer and business collaboration, consumer behaviour, and supply chain strategies are some of the core functions to be affected. As technology develops, the ability to innovate and alter industries, for example Uber, make concepts like car ownership obsolete (Chipp et al., 2017:468). Connected devices are becoming intelligent, more pervasive, and revolutionising old business models. Virtual worlds bring a multitude of buyers and sellers together in a single online application. The virtual marketplace allows these buyers and sellers to interact, negotiate prices and quantities, and promote free market economies to rule the community trade (Botha & Bothma, 2015:66). E-commerce, virtual worlds, automation, and advanced computing will impact the future of business, strategic management, marketing, and supply chain management strategies.

The theoretical constructs of supply chain management and its impact on growth opportunities in the automobile industry will be discussed next.

2.4 Supply Chain Management (SCM)

In the global automotive industry, they not only compete with the end products, which is the vehicle, they also compete supply chains with supply chains. The global automotive industry benefits when the supplier base is strong and competitive, therefore the relevance of focusing on Supply Chain Management (SCM) (AIEC, 2016:87).

2.4.1 Definition of a supply chain and SCM

A supply chain can be defined as the activities which result in a final product being produced to the customers' satisfaction (Krajewski, Malhotra & Ritzman, 2016:23; Wisner, Tan & Leong, 2017:5; Hugos, 2018:3). This involves all the activities from inception, i.e., from the extraction of raw materials from the earth to the product. The Council of Supply Chain Management Professionals (CSCMP) (2013:187) define SCM as the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. It includes coordination and collaboration with channel partners which can be suppliers, intermediaries, third-party service providers, and customers. SCM integrates supply and demand management within and across companies (Naude, 2013:407). SCM is an integrating function with its primary responsibility of linking major business functions and business processes, within and across companies, into a cohesive and high-performing business model (Hugos, 2018:4). It includes all the logistics management activities noted above, as well as manufacturing operations. It drives the coordination of processes and activities with and across marketing, sales, product design, finance, and information technology. The South African automotive OEMs form part of the global supply chains and is fully integrated with the sourcing strategies of the parent companies (Tolmay, 2017:1).

The objectives of a supply chain and SCM will be discussed next.

2.4.2 Objectives of a supply chain and SCM

The objectives of the supply chain and SCM are to maximise the overall value generated (Chopra & Meindl, 2013:15; Fawcett, Ellram & Ogden, 2014:32; Badenhorst-Weiss, Cilliers, Dlamini & Ambe, 2018:7). Value does not only refer to financial or monetary terms, but in SCM it refers to the maximisation of value in time, place, or other utilities. Value is determined by the difference between the costs incurred in a supply chain to satisfy a customer's order and the final product's worth to the customer (Badenhorst-Weiss & Tolmay, 2016:1331; Badenhorst-Weiss et al., 2018:7). McKeller (2014:9) states that value adding activities in the supply chain are those that, at every link of the supply chain, aid with the transformation of raw materials into the final product which customers are willing to pay for. All activities in the supply chain that do not meet these criteria, and do not contribute to the final product, are considered non-value adding activities. All parties to a supply chain benefit when non-value adding activities are reduced or eliminated. Organisations who can maximise their value adding activities are better positioned to leverage valuable capabilities into suitable competitive advantages. The APDP benefits were based on adding value to the supply chain in South Africa and the focus were on the lower tier suppliers (AIEC, 2018:26). This will be discussed in greater detail in chapter 4.

The supply chain strategies will be discussed next.

2.4.3 Supply chain strategies

Turbulence and heightened competition have changed the conditions in the global marketplace which led to alternative strategies for growth being developed (Ambe, 2014a:637; Tolmay & Venter, 2017:2). A supply chain strategy is part of the total business strategy, designed in such a manner that it encapsulates the basis of competition, such as quality, cost, flexibility, delivery, and innovation (Ambe, 2014a:637; Fawcett et al., 2014:32; Badenhorst-Weiss et al., 2018:66). The supply chain strategy must be synchronised with the competitive strategy to achieve the goals and objectives of the supply chain (McKeller, 2014:97). Figure 2.6 highlights that a supply chain strategy may be determined by the product characteristics, manufacturing characteristics, and decision drivers of the supply chain.

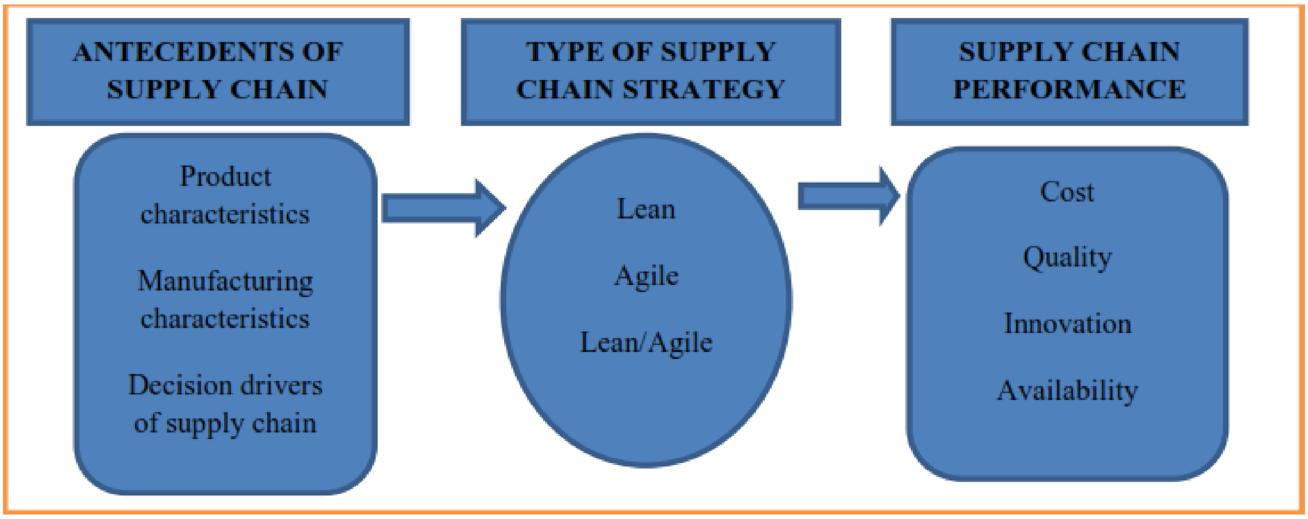


Figure 2.6: Theoretical model of supply chain strategies

Sources: (Ambe, 2014a:639; Fawcett et al., 2014:32)

An organisation's supply chain strategy must be matched with practice to avoid any impediments in the supply chain. This strategy must be integrated with the marketing strategy to fulfil and satisfy the customer's needs faster, more efficiently, and less costly. As shown in figure 2.6, there are two major generic strategies in supply chain management, namely lean and agile strategies. The choice of strategy depends on the circumstances to market the product. Lean and agile strategies may also be combined resulting in a hybrid strategy called the "leagile" supply chain strategy. These three strategies will now be discussed.

2.4.3.1 Lean strategy

A lean strategy is a form of continuous improvement which focuses on identifying and eliminating waste, as well as non-value-added operations (Myerson, 2012:2; Ambe, 2014a:638; Bandyopadhyay, 2016:38). "Waste" in supply chain terms can be defined as anything that does not add value to a process; thus, value-added activities against non-value-added or wasteful activities in a process (Myerson, 2012:19; Rathilall & Singh, 2018:2). Lean means manufacturing without waste. A lean supply chain is concerned with cost reduction by operating the basic processes with a minimum waste. The primary objective of a lean supply chain can be realised by using the principles of the Just-in-Time (JIT) framework (Bandyopadhyay, 2016:38-39; Krajewski et al., 2016:229). The following are characteristics of a lean supply chain strategy (Myerson, 2012:2; Bandyopadhyay, 2016:38-48; Rathilall & Singh, 2018:2):

- Customer focus and value. Continuous value adding activities for the end customer.
- A flow-based manufacturing system. Meet customer's needs more promptly by eliminating waste and non-value-added operations.
- Comprehend value stream activities. Meet customer's expectations by producing quality products at each stage of the value stream aiming for a zero-defect production.
- Pull system. Lean organisations can operate on its own and source, or manufacture, what the customer needs when the customer needs it. A method wherein customer demand prompts the manufacturing or servicing of an item.
- Overall perfection. Waste reduction and continuous improvement are the pillars for this strategy. Organisations will tend to become leaner and faster as they improve. Perfecting the processes will have a positive result at each step of the process.

Organisations following a lean supply chain strategy use the principles of the JIT philosophy (Myerson, 2012:77; Mathu & Phetla, 2018:3). Over the past 30 years, the global automotive industry has been on the forefront of the move towards a lean inventory and JIT distribution (Barnes & Morris, 2008:38; Naude, 2013:407; Manners-Bell, 2018:51). The JIT philosophy is a precarious manufacturing system used to eliminate waste and to achieve the effects of automation (Mathu & Phetla, 2018:3). It aims to provide a wide range of products with the shortest possible lead times and the lowest possible mistakes. The JIT manufacturing system provides simplicity to an uninterrupted flow of materials by including all activities, from the design of the product to the delivery to the customers, on a JIT basis. In the early 1960s, it was known as the Kanban system and Toyota Motor Company (TMC) pioneered and developed the JIT manufacturing system (Krajewski et al. 2016:243). Automotive OEMs continue to use the JIT manufacturing system to achieve the following strategic objectives (Bandyopadhyay, 2016:33; Manners-Bell, 2018:51):

- Gaining competitive advantages.
- Improving responsiveness to customers.
- Achieving perfect quality.
- Improving flexibility of the production system.
- Reducing total production cost.
- Using time-based management.

The goal of the lean approach strategy is to satisfy the customer in the most timely and efficient manner (Rathilall & Singh, 2018:2).

2.4.3.2 Agile strategy

Agile, also referred to as the agility strategy, is a meticulous approach to the business challenges to profit from the demanding, on-going fragmenting global markets by producing superior quality, superior performance, customer configured goods and services (Ambe, 2014a:638; Gurahoo & Salisbury, 2018:2). Current business trends, such as growing product varieties, shorter product life cycles, increased outsourcing, globalisation, and the advances in information technology, require an agile supply chain strategy (Badenhorst-Weiss, van Biljon & Ambe, 2017:46). This business approach’s core principle is flexibility, which allows the manufacturer to rapidly respond to new demands in the volume and variety of products required by the market (Gurahoo & Salisbury, 2018:2). Agile, in the SCM context, focuses on responsiveness and it is critical for achieving global competitiveness in the complex challenging supply chains. The organisation could copy and remain successful in the continuously changing market environment (Ngwenya & Naude, 2016:3). The following four key characteristics of an agile supply chain strategy have been identified (Myerson, 2012:177-179; Badenhorst-Weiss et al., 2017:47; Gurahoo & Salisbury, 2018:2):

- Customer sensitivity. Customer sensitivity refers to the product or service offering in the market and the level of customisation and responsiveness to demanding markets.
- Virtual integration. Virtual manufacturing is considered an important enabler in SCM. Virtual integration occurs in both upstream (suppliers) and downstream (customers) in terms of information integration.
- Process integration. Process integration refers to a high degree of interconnectivity between network members. It is measured by the ability to generate and use information and market signals to develop products and management systems.
- Network integration. Network integration refers to using different specialists to add more flexibility to the supply chain. It is achieved by shared investments and joint planning and strategy development in different areas, such as logistics, purchasing, and production.

The success of any integration must be linked to the primary goal of an agile supply chain strategy, which is to enrich and satisfy the customer (Ambe, 2012:122; Badenhorst-Weiss et al., 2017:47). Agile supply chains need a network of supply chain partners to make up the virtual firm. The use of information technology to share data among supply chain members is crucial. Seeing that the global automotive industry is in constant evolution with rapid technological innovations, the focus is on time compression, flexibility, and quick responses to satisfy the customers' needs.

2.4.3.3 Leagile strategy

Lean and agile supply chain strategies may be integrated to form a hybrid system called the "leagile" supply chain strategy (Bandyopadhyay, 2016:122; Gurahoo & Salisbury, 2018:3). The leagile strategy is a system that combines the advantages of leanness and agility (Ambe, 2014a:638, Badenhorst-Weiss et al., 2017:49). Leagile supply chains promote competitiveness in an organisation in a cost-effective manner. By combining lean and agile strategies within the total supply chain strategy, enable the position of the decoupling point, where the goal is to be lean up to the decoupling point and agile beyond it. Lean focuses on waste elimination and achieving low-cost delivery of the product, whilst agility focuses on the complexity of a volatile and unpredictable market. By employing a leagile supply chain strategy, the organisation will ensure that it is responsive to customer demand, it is flexible, and it delivers at the lowest cost, which will lead to a competitive advantage through innovation, cost, service, and quality (Ambe, 2012:124; Gurahoo & Salisbury, 2018:3-4; Badenhorst-Weiss et al., 2018:85). By following this strategy, automotive OEMs would achieve economies of scale by standardising the manufactured product, namely the vehicle models. They would postpone activities in the supply chain until the demand is known. Once the final customer has chosen their unique specifications, such as colour or any additional features which they would prefer their vehicle to be finished with, the OEMs would complete the final product according to each customer's specifications.

Supply Chain Integration (SCI) will be discussed next.

2.4.4 Supply Chain Integration (SCI)

A branch of SCM is the integration of key business processes across the supply chain to be more efficient (Ambe, 2014b:278; Krajewski et al., 2016:23). Horn, Badenhorst-Weiss, Cook, Heckroodt, Howell, Phume & Strydom (2014:184) define Supply Chain Integration (SCI) as the process of amalgamating various groups or functions, either formally or informally, physically or with information technology, to work together on a common business-related purpose. Bandyopadhyay (2016:229) states that an SCI involves the movement of goods from the manufacturer to the final customer along the distribution channel in an organised manner. SCI is important because it is a critical component of a successful supply chain (Badenhorst-Weiss et al., 2017:63; Mathu & Phetla, 2018:2). SCI is a competitive advantage used by companies to achieve a higher level of collaboration and coordination among supply chain partners. SCI involves both internal and external processes and are necessary to attain the common goal of satisfying the ultimate customer (Krajewski et al., 2016:565). There are two main types of SCI, namely internal integration and external integration which will be discussed next.

2.4.4.1 Internal SCI

Internal SCI involves the cooperation between various departments to achieve the strategic objectives of the organisation and the supply chain (Horn et al., 2014:184; Krajewski et al., 2016:565). The primary functions in the internal supply chain are production, purchasing, and marketing and these are linked to the customer's demand for products or services. No supply chain can be successful without the human decision and the business systems that it operates. For internal integration, cross functional teams are important to fulfil this role. Cross functional teams consist of personnel who conduct various functions to achieve supply chain related tasks, such as planning, product design, analysing market changes, reducing internal supply chain costs, and improving overall quality and service (Horn et al., 2014:185). Internal SCI requires the amalgamation of the different activities in the business, this is a prerequisite before progressing to external integration (Ambe, 2012:30; Badenhorst-Weiss et al., 2017:63).

2.4.4.2 External SCI

External SCI involves linking the internal supply chain to the chosen strategic suppliers and customers in supply chains (Horn et al., 2014:185; Badenhorst-Weiss et al., 2017:64). The external supply chain includes both suppliers and customers (Krajewski et al., 2016:565). On the demand side of the supply chain, through customer integration, firms will do thorough research to understand the product, market, and culture to quickly respond to the changing demands of the customer. On the supply side of the supply chain, the physical flow applies customer integration to enable a JIT delivery and postponement strategy. Figure 2.7 shows a framework for internal and external SCI and illustrates the supply chain approach most adopted, which is the focal organisation and its integration with the supply chain.

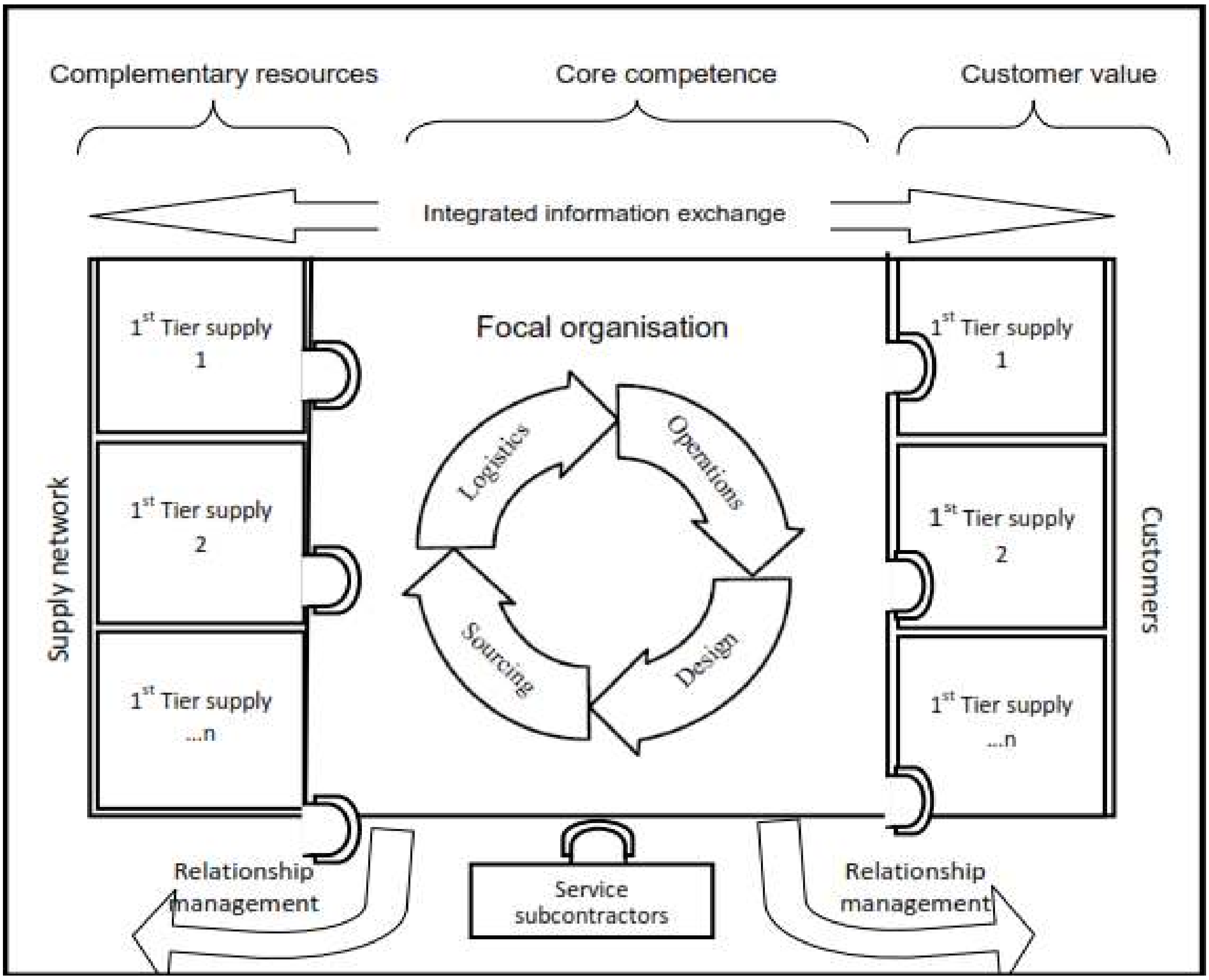


Figure 2.7: Internal and external SCI

Source: (Ambe, 2012:32)

Benefits of a successful SCI process are, it reduces the effects of supply chain disruptions and strengthens supplier relationships amongst each other to satisfy the customer at the lowest possible cost (Horn et al., 2014:187; Krajewski et al., 2016:565).

SCM and e-commerce will be discussed next.

2.4.5 SCM and e-commerce

The e-commerce era, as discussed to in section 2.4, has impacted supply chains and traditional SCM (Myerson, 2012:149; Badenhorst-Weiss et al., 2017:249). The fundamental changes in the global business environment have forced organisations to re-examine and re-construct their supply chains to meet the increasing sophistication and diffusion of new technologies (Myerson, 2012:149; Badenhorst-Weiss et al., 2017:249). E-commerce and SCM enable an organisation to focus on linking automation, integration, and synchronisation of four different aspects, namely physical, financial, information, and decision-making in a single or multiple organisations. If an organisation can integrate its back-end systems with that of the suppliers, then several important benefits can be achieved. The organisation can have an efficient JIT supply, reducing raw material stock which decreases warehousing costs and increases overall efficiency (Badenhorst-Weiss et al., 2017:249). As highlighted earlier, the global automotive industry has been on the forefront of the move towards a lean inventory and JIT distribution (Manners-Bell, 2018:51). E-commerce has added new dimensions to the way supply chain processes have been conducted, transforming SCM into electronic supply chain management (e-SCM).

2.4.5.1 e-SCM

E-SCM can be defined as the integration, synchronisation and automation of physical flow, funds flow, and information flow through the supply chain (Horn et al., 2014:187; Badenhorst-Weiss et al., 2017:257). The objective of e-SCM is to incorporate the various activities within the organisation to improve customer value (Badenhorst-Weiss et al., 2017:249). In an e-SCM system, traditional processes, such as procurement, sourcing, and shipment, are important in the supply chain. E-SCM aims to improve the integration of supply chain relationships through technological solutions which allow electronic connections between members, their applications, and systems (Badenhorst-Weiss et al., 2017:257). Thus, the internet enhances e-SCM by transmitting real time information among partners for stronger collaboration.

2.4.5.2 Supply chain visibility

Supply chain visibility is the ability to check and track the movement of the product from sourcing the raw materials, to delivering the finished product to the end customer (Horn et al., 2014:187; Badenhorst-Weiss et al., 2017:261; Mathu & Phetla, 2018:2).

Supply chain visibility allows an organisation to monitor the progress throughout the supply chain and act swiftly when an impediment occurs (Mathu & Phetla, 2018:2). Organisations who can check and track their supply chains' movement, can translate this ability into a competitive advantage (Badenhorst-Weiss et al., 2017:261). The idea is to increase visibility as a critical strategy to reduce costs and to increase operational efficiencies. Supply chain visibility is synchronised with the use of the internet as this is an ideal vehicle to provide supply chain information among members (Horn et al., 2014:187; Badenhorst-Weiss et al., 2017:262; Mathu & Phetla, 2018:2). Supply chain visibility is more important to organisations that are part of the global supply chain network. The South African automotive industry has become increasingly integrated with the global supply chains of the global automotive OEMs and is now recognised as an international production base (AIEC, 2018:14).

2.4.5.3 E-procurement as part of e-SCM

E-procurement can be seen as a subset of e-SCM and is commonly used when higher volumes of generic items, such as business consumables or standard raw materials, are purchased daily (Horn et al., 2014:188; Badenhorst-Weiss et al., 2017:263). The internet aids in the procurement process by making available electronic catalogues, electronic marketplaces, and online requests for quotes (Badenhorst-Weiss et al., 2018:244). Organisations will create an online environment which connects all the purchasing needs, and links these to its supply partners. Automating the daily purchasing tasks, by using e-commerce technologies, the following e-procurement advantages can be realised (Horn et al., 2014:188; Badenhorst-Weiss et al., 2017:267):

- Purchasing process cost reduction.
- Supplier consolidation.
- Seller self-service.
- Automating and consolidating purchases.
- Lower risk of misunderstanding and discrepancies.
- An e-procurement system will track all costs the company spent at each supplier.

The global automotive OEMs are procuring their parts and components electronically on a JIT basis. Once the stock reaches a minimum quantity level, the system automatically places the order for specific parts.

2.4.5.4 E-logistics

E-logistics is concerned with the use of information technology, such as the internet, to track the movement of goods from one organisation to another (Horn et al., 2014:189; Badenhorst-Weiss et al., 2017:270). Information systems in the supply chain are linked so that all parties can prepare for the delivery. An important aspect of e-logistics is to know when the goods will arrive, so that it can be co-ordinated and dispatched accordingly. A major benefit of e-logistics is that it factors in supplier constraints and transportation restrictions which may arise and disrupt goods' delivery dates, which then impacts the flow of goods in the entire supply chain (Badenhorst-Weiss et al., 2017:270). E-logistics is important because it can be synchronised with the JIT distribution, and it has become a demand in the global automotive OEMs to attain operational efficiencies.

The supply chain relationships will be discussed next.

2.4.6 Supply chain relationships

Fawcett et al. (2014:342) state that a core principle of SCM is that all relationships are not created equal. In general, supply chain role-players strive to build efficient relationships with suppliers to maintain the best quality and supply chain performance (Tolmay, 2017:1). Building strong relationships in the supply chain provide a distinct competitive advantage and is important for the business to succeed (Fawcett et al., 2014:342; Tolmay & Venter, 2017:1; Badenhorst-Weiss et al., 2018:94). Supply chain relationships can be fragile and easily melt down which will have catastrophic effects on any part of the supply chain. Therefore, strong relationships with effective communication among all businesses are necessary to compete successfully. The South African government supports the domestic automotive industry with long-term policy certainty and incentive schemes to encourage the production expansion of the domestic vehicle manufacturers, and to deepen and broaden the component basket. Automotive OEMs and component manufacturers must adhere to strict prescriptions by customers regarding product quality and logistics, so these manufacturers only have the actual relationship with customers whereby value can be added (Tolmay, 2017:1).

2.4.6.1 Types of buyer-supplier relationships

Relationships between buyers and suppliers are not always the same. They can vary from low value transaction-based interactions to partnerships that have important strategic and financial benefits for the business. Three principal classes of relationships have been identified, each with their own activities and attributes (Fawcett et al., 2014:343; Badenhorst-Weiss et al., 2017:120; Badenhorst-Weiss et al., 2018:95). This is exhibited in figure 2.8 and discussed immediately thereafter.

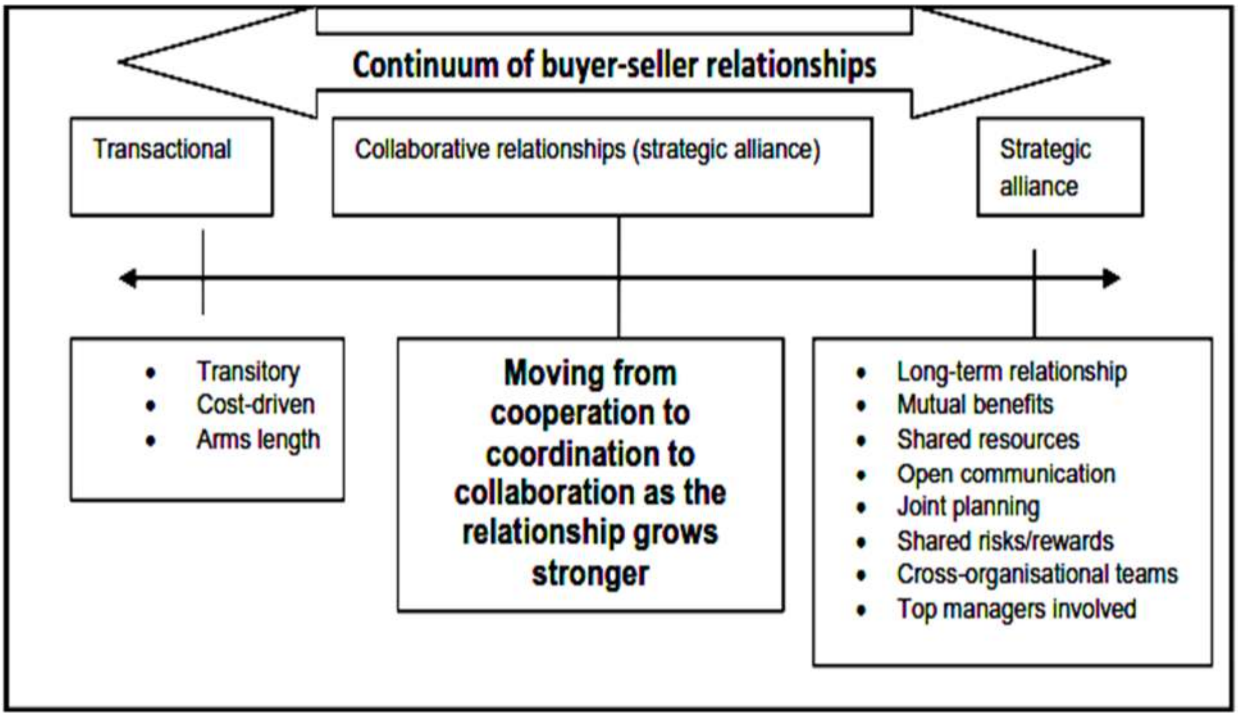


Figure 2.8: Relationship intensity spectrum

Source: (Fawcett et al., 2014:343)

2.4.6.1.1 Transactional relationships

Transactional relationships represent a straightforward relationship between a buyer and seller where they exchange goods or services for payment (Horn et al., 2014:51; Badenhorst-Weiss et al., 2018:95). It is also called the arm's length relationship and represents the bulk of a firm's supply chain relationships which is neither good nor bad (Naude & Badenhorst-Weiss, 2012b:96; Fawcett et al., 2014:345). Transaction relationships concentrate on efficiency and is often transitory; thus, it does not receive much managerial time. In this relationship, neither party is especially concerned with the well-being of the other and they move from one contract to another (Naude & Badenhorst-Weiss, 2012b:96; Badenhorst-Weiss et al., 2017:120). Transactional relationships exist in all buying firms. Burt, Petcavage & Pinkerton (2010:67) highlight several characteristics of transactional relationships:

- The concern for each other's well-being in the relationship is minimal or none.
- There is no sharing of costs, data, and forecasts.
- Price is the focal point of the relationship.
- There is continuity of independent deals, little or no basis exists for collaboration.

Burt et al. (2010:67) highlights some advantages of transactional relationships, such as minimal time and effort required on procurement to determine price, because the market forces of supply and demand determine the price, and a lower skills level of purchasing staff are required. The disadvantages, as highlighted by Burt et al. (2010:67), include delivery and supply disruptions, communication difficulties, and minimum services provided by suppliers.

2.4.6.1.2 Collaboration relationships

As supply chain members move further away from the transactional spectrum of the continuum towards stronger collaborative relationships, they become cognisant of the need for cooperation. Within SCM, collaborating relationships are strategically formed in the supply chain to improve activities done to the advantage of all members of the supply chain, and ultimately add value to the final customer (Badenhorst-Weiss & Tolmay, 2016:1329; Badenhorst-Weiss et al., 2018:95). Collaboration relationships are formed when the buyer and supplier work towards a common goal (Naude &

Badenhorst-Weiss, 2012b:96; Horn et al., 2014:51; Tolmay, 2017:3). McKeller (2014:24) states that supply chain collaboration consists of the collective interactions of supply chain members towards achieving a common goal. Collaboration between supply chain members is an approach which contributes to minimising costs and creating a competitive advantage. Collaboration relationships are important for the following reasons (Fawcett et al., 2014:343; McKeller 2014:24; Badenhorst-Weiss et al., 2018:95):

- Efficiency in supply chain operations is maximised which is important in the dynamic global economy.
- A competitive advantage can be created whilst also minimising costs.
- Supply chain objectives can be achieved quicker through this approach.
- Waste in the supply chain is reduced or eliminated.
- Customers benefit from the superior value that is added between the parties.
- Risk management is improved by a close working relationship.

Collaboration relationships are based on recognising their interdependency and the necessity to cooperate. Parties in collaborative relationships can advance their interests by working towards achieving a common goal. A setback of collaboration relationships is that it requires a serious commitment from both parties to build and manage these relationships (Horn et al., 2014:51; McKeller, 2014:23). Toyota and BMW announced their collaboration in 2013 but there was no activity until mid-2017. The way the Japanese and the Germans manufacture vehicles are very different in terms of their philosophies and ideas. It took both these OEMs approximately two years to hash out their differences so that they can reach a common goal. The Toyota Supra was launched in 2019 after many years of collaboration between Toyota and BMW. The global automotive OEMs tend to adopt a long-term view on supplier relationships and consider these relationships as collaborative.

<u>2.4.6.1.3 Strategic alliance relationships</u>

Strategic alliances are an important building block for achieving successful supply chain teams, if monitored closely and managed efficiently (Fawcett et al., 2014:347;

Badenhorst-Weiss et al., 2018:95). An alliance, or partnership, between two organisations who share the risks and rewards is typically multifaceted, long-term, and goal-oriented (Horn et al., 2014:51; Badenhorst-Weiss et al., 2017:121). A solution where everyone benefits should occur when two firms have compatible needs and form an alliance. Strategic alliance relationships are characterised by open communication and supported by linked information systems. Badenhorst-Weiss & Tolmay (2016:1332) state that by forming an alliance, they expect to create a productive and long-lasting relationship which is mutually more beneficial than working alone. The core purpose of forming an alliance is to strategically achieve a common goal which each organisation could not reach independently (Badenhorst-Weiss & Tolmay, 2016:1332; Badenhorst-Weiss et al., 2018:95). The focus will be on cost reduction, with value addition to the end customer, and striving to improve the competitive position of the entire supply chain. An important part of strategic alliances is that partners must continuously explore new ideas and opportunities to grow their businesses together (Badenhorst-Weiss et al., 2017:121).

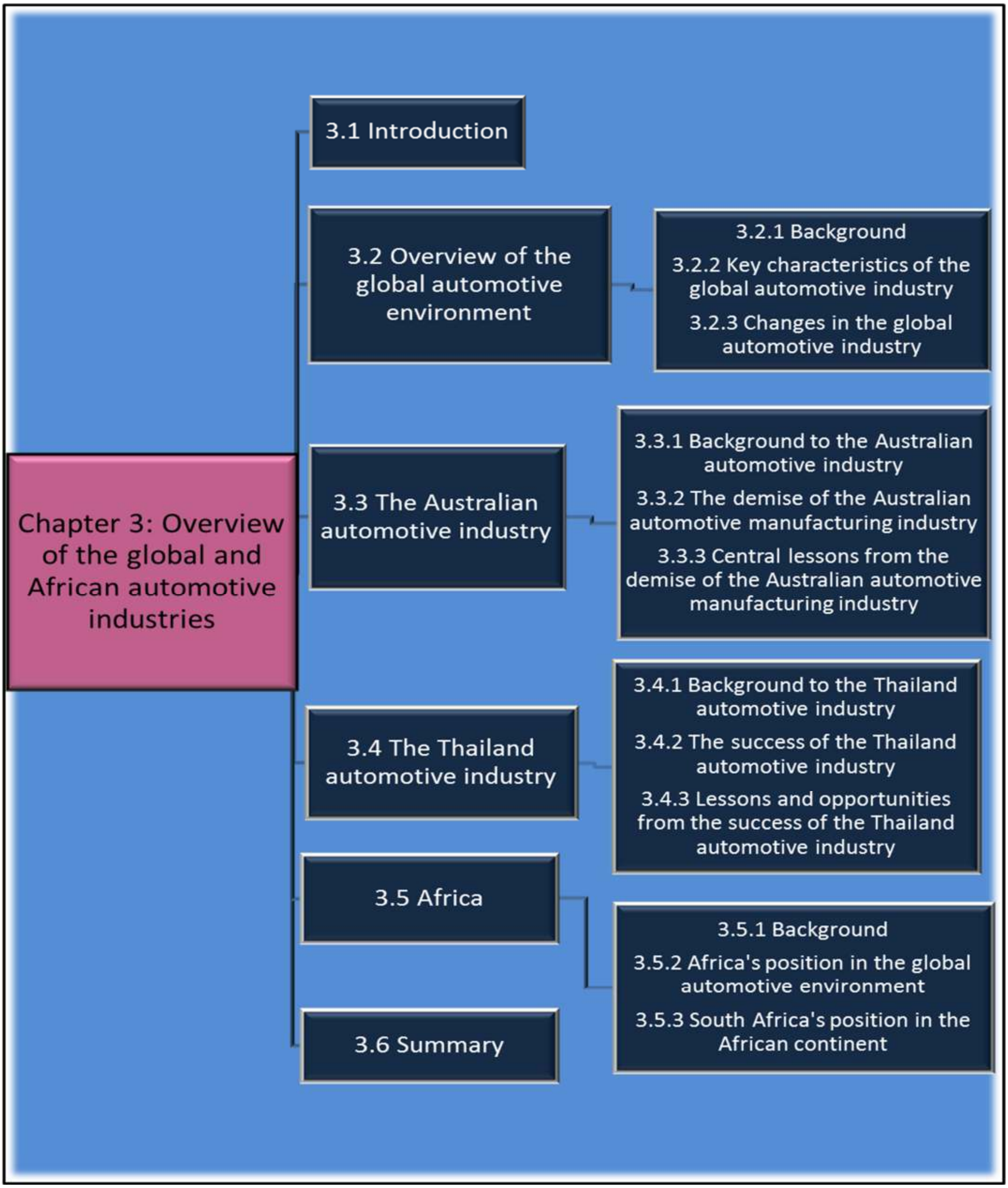
Toyota refers to their suppliers as business partners because they work with them in long-term relationships to achieve a common goal based on mutual trust. In 2018, the Volkswagen Group and Ford Motor Company announced that they had signed a memorandum of understanding, thereby confirming that they are exploring a strategic alliance to strengthen their competitiveness, and to better serve their customers (Carmag, 2018). Building a successful strategic alliance, requires arduous work and commitment by both parties. As partnerships will experience impediments at some point, it is important that partners tackle these obstacles together ensuring the longevity of the relationship.

2.4.6.2 The choice of relationship strategy

The global automotive industry is facing a tremendous number of challenges, such as technological changes, ever more demanding clients, and shorter life and logistical cycles which are accentuated by the phenomenon of globalisation (Tolmay & Venter, 2017:1). The South African automotive industry is fully integrated with the global automotive supply chains and is also subjected to these challenges. The importance of the domestic automotive industry cannot be emphasised enough and, as such, it is critical that the industry discover new innovative ways to differentiate and sustain automotive role-players in the competitive global environment. One way is through long-term relationships with suppliers. Long-term relationships are regarded as beneficial with the promise of customer retention (Tolmay & Venter, 2017:1). Suppliers have an important role to play in assuring competitiveness in the supply chain. Long-term supplier relationships are a fundamental principle of SCM, and the value of these relationships should not be underestimated (Badenhorst-Weiss & Tolmay, 2016:1). As highlighted in this section above, the choice of relationship strategy needs to nurture supply chains that are sustainable and optimised, and which is based on long-term trusting relationships between suppliers and customers in a supply chain.

2.5 Summary

Chapter 2 focused on the competitiveness theories, globalisation, strategic management strategies, sustainable competitive advantages, marketing strategies, and the theoretical principles underlying the supply chain. It elaborated on the classical economic theories of competitiveness and its relevance in the current business environment. Globalisation and its impact on industries and markets were discussed. The theoretical tenets underlying international marketing were discussed to provide a solid foundation for the study. The theoretical framework of SCM was developed in this chapter. It provided the definition of SCM, the objectives of SCM, it discussed SCM in detail and elaborated on supply chain relationships. SCM focuses on providing a competitive advantage, improving profitability for supply chain firms, and adding value for the customers. SCM deals with the entire process of transforming raw materials into finished products and supplying them to customers. Limited examples were cited to link theory with practice as far as the automotive industry is concerned. The following chapter will discuss the global automotive industry in detail.



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Chapter 3

Overview of the global and African automotive industries

3.1 Introduction

Chapter 2 provided the theoretical foundation required for the study. Important theoretical concepts were discussed and explained in detail, with the emphasis on their impact on the domestic automotive industry. Chapter 3 provides a background of the key characteristics of the global automotive industry. The major global trends and developments occurring in the global automotive environment will be discussed. The Australian and Thailand automotive industries which shows similarities with the South African automotive industry will be discussed to ascertain what potential problems South Africa can expect, and to learn how to grow the domestic new vehicle market. The African automotive industry will then be discussed to see where South Africa is positioned, and which opportunities can be exploited on the African continent. The focus of the chapter is, therefore, synchronised with the aim of the study, i.e., to analyse growth opportunities for the domestic new light vehicle market in South Africa.

3.2 Overview of the global automotive environment

3.2.1 Background

The automotive industry is often referred to as one of the most global industries because of the diversity of their products which spread around the world, and which are dominated by small companies enjoying global recognition (Barnes & Morris, 2008:32; Ambe & Badenhorst-Weiss, 2013:2; Tolmay & Badenhorst-Weiss, 2015:2; Badenhorst-Weiss & Tolmay, 2016:1329). The automotive industry is necessary for the well-being of the global community. The International Organisation of Motor Vehicle Manufacturers (OICA) (2019:1) states that in 2018, the global automotive industry invested substantially in innovation, investing approximately 85 billion euros in research, development, and production, and employed more than 8 million people.

Over the last century, the automotive industry has become a flagship of global industrial industries and is regarded as the largest manufacturing sector in the world (Barnes & Morris, 2008:32; Naude, 2013:407; Badenhorst-Weiss & Tolmay, 2016:1329).

The global automotive industry is technologically advanced, in terms of both its manufacturing processes and its products. According to the Automotive Industry Export Council (AIEC) (2022:8), automotive technology is accelerating at a rapid pace highlighting that today's innovation is tomorrow's norm, and OEMs are finding it increasingly difficult to be market leaders based purely on differentiating the latest technology trends. With the accentuation of connected cars and artificial intelligence, OEMs will need a range of solution providers and data aggregators who can provide useful data to all sectors' consumers, government departments, and smart city developers.

The key characteristics of the global automotive industry will be discussed next.

3.2.2 Key characteristics of the global automotive industry

The automotive industry is a prime example of globalisation. The major automotive Original Equipment Manufacturers (OEMs) are increasing their global footprint by manufacturing vehicles at an array of plants across the world (AIEC, 2018:11). The OEMs play a dominant role in, and determine, the direction of the global automotive industry. The global automotive industry is currently led by the main vehicle manufacturers, namely Toyota, Volkswagen, Hyundai-Kia, General Motors, Stellantis, Honda, Nissan, Ford, Renault, BMW, Changan, Mercedes, Maruti Suzuki, Geely and Mazda. These major OEMs have increased their global presence by establishing new production facilities around the world. Table 3.1 shows the world sales ranking of motor vehicle manufacturers in 2021.

Table 3.1: World sales ranking of motor vehicle manufacturers in 2021

Rank	Manufacturer	Total units (2021)
1	Toyota	9 562 483
2	Volkswagen	8 882 346
3	Hyundai-Kia	6 668 037
4	General Motors	6 294 385
5	Stellantis	6 142 200
6	Honda	4 456 728
7	Nissan	4 064 999
8	Ford	3 942 755
9	Renault	2 689 454
10	BMW	2 521 596

Source: (Factorywarrantylist, 2022:1)

Table 3.1 pointed out the world sales ranking of vehicle manufacturers in 2021. Toyota dethroned Volkswagen for the number one spot as the top sales manufacturer in the world in 2020 and remained the top sales manufacturer in 2021. All these vehicle manufacturers are represented in South Africa either as manufacturers or as importers. Table 3.2 shows the ranking and global vehicle production of the top twenty-one countries in 2021.

Table 3.2: Global ranking and vehicle production of the top twenty-one countries in 2021

Rank		**Country**	**Total (Units)**		**Passenger cars (2021)**	**Commercial vehicles (2021)**
2020	**2021**		**2020**	**2021**		
1	1	China	25 225 242	26 082 220	21 407 962	4 674 258
2	2	USA	8 822 399	9 167 214	1 563 060	7 604 154
3	3	Japan	8 067 557	7 846 955	6 619 242	1 227 713
6	4	India	3 742 454	4 399 112	3 631 095	768 017
5	5	South Korea	3 506 774	3 462 404	3 162 727	299 677
4	6	Germany	3 394 446	3 308 692	3 096 165	212 527
7	7	Mexico	3 176 600	3 145 653	708 242	2 437 411
9	8	Brazil	2 014 055	2 248 253	1 707 851	540 402
8	9	Spain	2 268 185	2 098 133	1 662 174	435 959
11	10	Thailand	1 427 074	1 685 705	594 690	1 091 015
10	11	Russia	1 435 551	1 566 317	1 352 740	213 577
13	12	France	1 316 371	1 351 308	917 907	433 401
14	13	Turkey	1 297 878	1 276 140	782 835	493 305
20	14	Indonesia	690 176	1 121 967	889 756	232 211
12	15	Canada	1 376 127	1 115 002	288 235	826 767
15	16	Czech Republic	1 159 151	1 111 432	1 105 223	6 209
17	17	Slovakia	990 598	1 000 000	1 000 000	-
16	18	United Kingdom	987 044	932 488	859 575	72 913
18	19	Iran	880 997	894 298	838 251	56 047
19	20	Italy	777 057	795 856	442 432	353 424
22	**21**	**South Africa**	**446 215**	**499 087**	**239 267**	**259 820**
Global			77 711 725	80 154 988	57 054 295	23 100 693

Sources (AIEC, 2022:37; OICA, 2022:1)

Table 3.2 displayed the global vehicle production of the top twenty-one countries in 2021. South Africa increased its global production ranking to 21 in 2021 as its global market share increased to 0.62% (AIEC, 2022:36). Globally, automotive manufacturing is spread across Asia Pacific, Europe, the North American Free Trade Area (NAFTA), South America, the Middle East, and Africa. The impact of the pandemic has been uncompromising on the global automotive industry with production and sales drastically declining in 2020 but there has been a recovery in 2021. Total global new vehicle sales increased by 3.9 million units (4.95%), i.e., from 78.8 million units in 2020 to 82.97 million units in 2021 indicating that the new vehicle market stabilised (AIEC, 2022:37). Total global production increased from 77.7 million units in 2020 to 80.2 million units in 2021 as the global economy started to recover from the effects of COVID-19 pandemic (AIEC, 2022:36). The international benchmark of producing more than one million vehicles were surpassed by seventeen countries in 2021, an increase from fifteen countries in 2020 (AIEC, 2022:36).

China continued to transcend the rest of the world with vehicle production of 26.1 million units in 2021 (AIEC, 2022:36). The United States of America (USA) was second with production of 9.2 million units and Japan third producing 7.8 million units in 2021 (AIEC, 2022:36). The Chinese new vehicle market remained the major market globally with sales increasing by 3.8% to 26.3 million units in 2021 primarily because of the popularity of EVs (AIEC, 2022:38). China produced and sold more vehicles than the succeeding three major markets combined. This is because of economic developments within China and an accumulated demand from a population that exceeds one billion people. This trend highlights the change from the traditional west to the emerging east in terms of vehicle production and consumption.

In the past decade, major developments and changes have occurred in the global automotive industry. This will be discussed next.

3.2.3 Changes in the global automotive industry

The past decade has given rise to major developments and changes in the global automotive industry. These changes stem from heightened globalisation, newer technologies, and the increased demand for fuel-efficient and eco-friendly vehicles dominating the marketplace. Globalisation and intense competition have exposed the automotive industry to boundless opportunities, as well as immense challenges (Badenhorst-Weiss & Tolmay, 2016:1329). Globalisation has impacted positively on developing economies because of OEMs pursuing new market opportunities, but this was dampened by the outbreak of the global COVID-19 pandemic. Production decreased in most of the world's largest vehicle producing economies, and the COVID-19 pandemic has proven to be the global automotive industry's largest growth impediment in recent times, with production and sales tumbling and supply chains heavily disrupted resulting in losses worth billions. Whilst the automotive industry is a critical activity in advanced industrialised nations, it is increasing in significance in the emerging economies of North and East Asia, South America, and Eastern Europe where growth is exponential. Thus, global liberalisation of the automotive industry has benefitted developing economies with their strong demand and cost competitive factors of production. Globalisation, however, has had a devastating impact on certain economies, for example the Australian automotive industry which resulted in the demise of the Australian automotive manufacturing industry in 2017. This will be briefly discussed later in the chapter.

The global automotive industry currently is at the cusp of an evolution with new production technologies and systems to reach higher standards and production rates (AIEC, 2018:11; AIEC, 2021:42). There are rapid changes in technological advancements which have altered the global manufacturing landscape and the traditional way wherein vehicle manufacturers operated (Autolive July issue, 2018:1; AIEC, 2021:42). The uncertainty in the political landscape of the main automotive markets, the effects of Brexit, the impact of environmentally friendly automotive fuels, the surge in electric vehicle usage in the main automotive markets, autonomous vehicles, alternate transport systems, changing consumer behaviour trends, and the fourth industrial revolution are some of the major developments occurring in the global automotive industry and will be discussed next.

3.2.3.1 The fourth industrial revolution

According to the Cambridge Dictionary (2021), the term “industrial revolution” is described as the period during which work started to be done by more machines at factories than by hand at home. With the advancement of science and technology, there have been continuous industrial developments around the world (Liao, Loures, Deschamps, Brezinski & Venancio, 2017:1). According to Schafer (2018:6), the fourth industrial revolution started 30 years after the third revolution from around the year 2000. Because of the increased attention on the internet and the cyber world, in recent years, governments, industries, and the public have noticed the increasing trend towards the fourth industrial revolution (Liao et al., 2018:2).

The fourth industrial revolution, also referred to as the digital revolution or industry 4.0, is an era wherein innovation and technological development are epitomised. The critical component underpinning the digital revolution is the heavy growth in computing power (Schafer, 2018:6). It is characterised by the emergence of ground-breaking technologies, such as advanced robotics, artificial intelligence, the internet of things, virtual and augmented reality, enterprise wearable, and additive manufacturing which is revolutionising business models and processes across various industries (World Economic Forum, 2017:3; World Economic Forum, 2021:4). Countries and governments can no longer focus on developments and trends within their own industries and sectors but need to understand the different developments and disruptions occurring in the entire world regarding suppliers, customers, and adjacent markets. The products demanded by consumers, factory processes and footprints, and the management of global supply chains are being reshaped to an unprecedented degree and at an unprecedented pace. The fourth industrial revolution is expected to revolutionise the traditional way that value has been added. As the cost of implementing recent technologies continue to fall, international differences in labour costs will not be a deciding factor when choosing where to locate new production contracts. The global automotive OEMs could easily move production to the most suitable location based on gaps in the market or other requirements. South Africa does not have a competitive advantage in terms of labour; thus, must be at the forefront of newer evolving technologies to be cost competitive.

According to the World Economic Forum (WEF) (2017:5), five key technologies are expected to significantly impact supply chains either individually or together. The first key technology is the Internet of Things (IoT) which is a virtual interconnection of intelligent assets and devices to achieve improved user experience (Chipp et al., 2017:455). The IoT is expected to offer advanced connectivity of devices, systems, and services that transcends machine to machine communications and covers a wide range of protocols, domains, and applications (Xu, David & Kim, 2018:92; Autolive March issue, 2019:5). The second key technology is Artificial Intelligence (AI) or self-learning systems which is a broad term for machines that copy the cognitive abilities of human beings (WEF, 2017:6; Autolive March issue, 2019:5). Artificial systems that rationally complete difficult problems pose a threat to various types of employment but also provide significant new opportunities for economic growth (Xu et al., 2018:92). The third key technology is advanced robotics which can be described as devices that operate either semi of fully autonomously, they interact physically with people or their environment and can alter their behaviour premised upon sensor data (WEF, 2017:7; Xu et al., 2018:92). Advanced robotics can improve the quality of life by doing a wide range of activities. One such an activity is autonomous or driverless vehicles which will give rise to new growth opportunities. The fourth key technology is enterprise wearable and is described as innovative technologies which will integrate scientific and technical disciplines (Xu et al., 2018:92). It combines various fields to create new products through innovation. The fifth key technology is additive manufacturing which refers to the completely automated manufacturing process of developing three-dimensional objects from a digital blueprint or model (WEF, 2017:7; Xu et al., 2018:92). Additive manufacturing is one of the crucial technology disruptors because it will add new diversity to products and manufacturing strategies whilst creating growth opportunities for new business models.

The fourth industrial revolution will be significantly different from the previous ones. The evolution of global industries will be both euphoric and catastrophic because it will change lives and the way traditional business has been done (Xu et al., 2018:92). Income levels will rise, and many people's quality of life will improve with the fourth industrial revolution's progress. Transport and communication costs will decrease, logistics and global supply chains will become more effective, and the cost of trade will lessen which will open new markets and drive economic growth (Xu et al., 2018:92). Whilst the fourth industrial revolution is expected to change the dynamics of the business world, one of the major areas that will be disrupted in many countries, including South Africa, is the labour force. As a result, the challenges could include a higher inequality rate across the employment pool, or a big portion of personnel could be displaced by machines. The global automotive environment will be impacted by these and other disruptive recent technologies, for example taxis must compete against Uber and other ride-sharing applications. The entire automotive manufacturing landscape will be altered. South Africa, being integrated into the global automotive environment, needs to embrace these new disruptive technologies because its position will be re-evaluated by the head offices as the fourth industrial revolution progresses.

3.2.3.2 The impact of cleaner automotive fuels

Human activity that leads to climate change is one of the major challenges facing society in the twenty first century. Motor vehicles, including passenger cars, heavy-duty buses, and trucks are a major cause of air pollution affecting climate change and health conditions. Vehicle emissions are regarded as a primary source of pollutants and have been cited as the main cause for three million human premature deaths per year (Manners-Bell, 2018:112). The primary emissions from motor vehicles include Carbon Monoxide (CO), Particulate Matter (PM), Nitrogen Oxides (NOx), Volatile Organic Compounds (VOC), and unburned Hydrogen Carbons (HC). Carbon Dioxide (CO_2) emissions are associated with climate change and there has been a growing trend towards the reduction of CO_2 emissions. These polluting emissions arise from the state of vehicle technology, the quality of fuels used, and the maintenance levels of the vehicle parc (number of registered vehicles). The first step in reducing these emissions is to eliminate the lead in petrol and to reduce the fuel sulphur content.

Reducing emissions from motor vehicles require the introduction of cleaner fuels coupled with the advanced vehicle technology which can use these fuels (South African Petroleum Industry Association, 2008:2; NAAMSA, 2017a:1).

The past three decades, pollution control experts worldwide have concluded that cleaner fuels are a key factor to an effective clean air strategy. However, cleaner fuel's vital role has deepened to include all the economic benefits thereof. Fuel quality is not only seen as a critical component to eliminate or reduce pollutants, such as lead, but it is a prerequisite for the introduction of the latest vehicle emission control technologies, such as catalytic convertors and diesel particulate filters. Globally, vehicle manufacturers are moving towards more stringent engine requirements which reduce fuel consumption resulting in lower CO_2 emissions from new vehicles. The global prominent levels of CO_2 emissions by vehicles are contributing to the greenhouse effect which increases global temperatures and affects the climate (OICA, 2018:3). Many countries are heavily investing in research and development to find alternate methods to reduce CO_2 emissions. They are developing diverse CO_2 efficient vehicles which run on alternative fuels, such as biodiesel, ethanol, hydrogen, and natural gas or they use electric and hybrid vehicle technology (OICA, 2018:3). Vehicle manufacturers are not pursuing a single strategy but multiple ones to ensure that the new, cleaner fuels are globally acceptable.

The objective of harmonising the global cleaner fuels' effort is to maximise the reduction in CO_2 emissions by developing quality fuels to meet the customers' requirements, to be globally and environmentally acceptable, and to enhance vehicle performance in accordance with the latest engine emission technologies. According to the Worldwide Fuel Charter (WFC) (2013:1), five different categories of fuel quality have been identified for unleaded gasoline and diesel fuel. The level one category is for markets that have none or first level requirements for emission control. This is based primarily on fundamental vehicle engine performance and protection of emission control systems. These markets require US tier 0, Euro 1, or equivalent emission standards control. The level two categories are for markets with requirements for emission control or other market demands. These markets require

US tier 1, Euro 2, Euro 3, or equivalent emission standards control. The level three categories are for markets with higher stringent requirements for emission control or other market demands. These markets require US LEV, California LEV or ULEV, Euro 4, JP2005 or equivalent emission standards control. The level four categories are for markets with advanced requirements for emission control. These markets require US tier 2, US tier 3, US 2007 / 2010 heavy duty on highway, US non road tier 4, California LEV 2, Euro 4, Euro 5, Euro 6, JP2009 or equivalent emission standards control. Category four fuels enable sophisticated NOx and particulate matter after treatment technologies. The level five categories are for markets with highly advanced requirements for emission control and fuel efficiency. These markets require US 2017 light duty fuel economy, US heavy duty fuel economy, California LEV 3, or equivalent emission standards control. Governments worldwide are ensuring that vehicle manufacturers are at the forefront of cleaner fuel technology because of the benefits to consumers, society, and the global trading markets.

South Africa’s main export destination, the European Union (EU), passed a law banning diesel vehicles owing to the high emissions of PM and NOx which is known to cause respiratory disease (Engineeringnews 2018c; Manners-Bell, 2018:114). Other countries are planning to ban diesel vehicles with a total ban expected by 2025 (Manners-Bell, 2018:113-119; International Council on Clean Transportation; 2020:2). The German government aims to discard the older diesel vehicles, which have Euro 4 or Euro 5 fuel technology, for the modern Euro 6 fuel technology vehicles by offering trade-in incentives and rebates (Engineeringnews, 2018d; Manners-Bell, 2018:114). In Germany, out of over 15 million diesel vehicles in 2018, only 2.7 million had Euro 6 technology (Engineeringnews, 2018c). Consumers could get up to 6 000 Euros for their older diesel model vehicles to trade in for a newer model. This has prompted a shift towards the Euro 6 fuel technology vehicles or the use of alternative engine technologies. European vehicle manufacturers have been heavily investing in electric vehicle technology since the decline in diesel vehicles. Table 3.3 highlights the market share of diesel vehicles in Europe from 2010 to 2020.

Table 3.3: Market share of diesel vehicles in Europe from 2010 to 2020

Year	**Diesel vehicles market share (%)**
2010	51
2011	55
2012	55
2013	53
2014	53
2015	52
2016	49
2017	44
2018	36
2019	31
2020	29

Source: (International Council on Clean Transportation, 2020:35; International Council on Clean Transportation, 2021:35)

As pointed out in table 3.3, the EU's diesel vehicle market share declined from 55% in 2012 to 29% in 2020. The decline can be attributed to a loss in trust from consumers about diesel specific bans announced by several EU cities (International Council on Clean Transportation, 2021:4). The EU is extremely important for South Africa, any developments and changes that occur in the EU will have a direct and measurable impact on the South African automotive industry's overall performance (AIEC, 2022:41). According to the International Council on Clean Transportation (ICCT) (2020:2), the change to more fuel-efficient high technology vehicles is inevitable and will outstrip the EU market in the next few years. South Africa will need to rapidly keep up if it wishes to continue exporting high technology automotive products to this market and still be competitive.

The automobile business is volume driven where economies of scale are critical for vehicle manufacturers to achieve lower costs and other benefits. Vehicle manufacturers will not develop an older fuel consumption, six-cylinder engine for a specific market because it will either be too expensive owing to no economies of scale to amortise the cost of production, or it will be manufactured at a very high premium. The supplier who manufactures that specific older generation engine technology will charge a high premium to keep the production line running. However, the reality is that South Africa's contribution to global vehicle production in 2021 was only 0.62% (AIEC, 2022:6), which means that vehicle manufacturers are not going to try to invest heavily into manufacturing a vehicle which can operate in 0.62% of the global market. Because one of the objectives, under the South African Automotive Masterplan (SAAM) 2021-2035, is to grow South Africa's vehicle production to 1% of global vehicle output, which is estimated at about 1.4 million vehicles per annum by 2035, significant growth opportunities exist for the South African automotive industry but these opportunities will be for new technology vehicles.

South Africa and the African continent are falling behind the global trend of introducing cleaner fuels. South Africa needs to rapidly upgrade its fuel quality standards to pursue markets which are reliant on Internal Combustion Engine (ICE) technology vehicles using Euro 6 fuel quality. The upgrade from the current Euro 2 to Euro 6 vehicle technology can reduce CO_2 vehicle emissions by up to 15% across the vehicle parc. Whilst the global level is above Euro 3 fuel standards, the African continent is below Euro 3 fuel standards. Euro 6 fuel quality will soon become the benchmark in fuel quality because the global vehicle manufacturers are continuously developing newer engines with superior technologies to achieve improved performance and lower emissions (WFC, 2013:2; Engineeringnews, 2018c). According to NAAMSA (2017a:2), the latest vehicles with the new four-way, catalytic convertor will be launched in Europe in 2018. This means that for the first time since the introduction of unleaded petrol in South Africa in 1996, the regular petrol engine vehicles which are widely available in Europe cannot be marketed in South Africa. The South African public will not have access to these latest low emission vehicle technologies owing to the inferior fuel quality still being used. Moreover, South Africa will continue to fall behind the rest of the world because having to produce export vehicles for high technology markets, as well as vehicles for low technology markets result in inefficiencies, and negatively impacts the industry's global competitiveness. This will have a negative impact on the South African automotive industry's sustainability in the long run. The transition to Euro 6 fuel quality will facilitate a large-scale advent of hybrid vehicle technology which will open new growth opportunities for the domestic vehicle manufacturers.

3.2.3.3 Electric Vehicles (EVs)

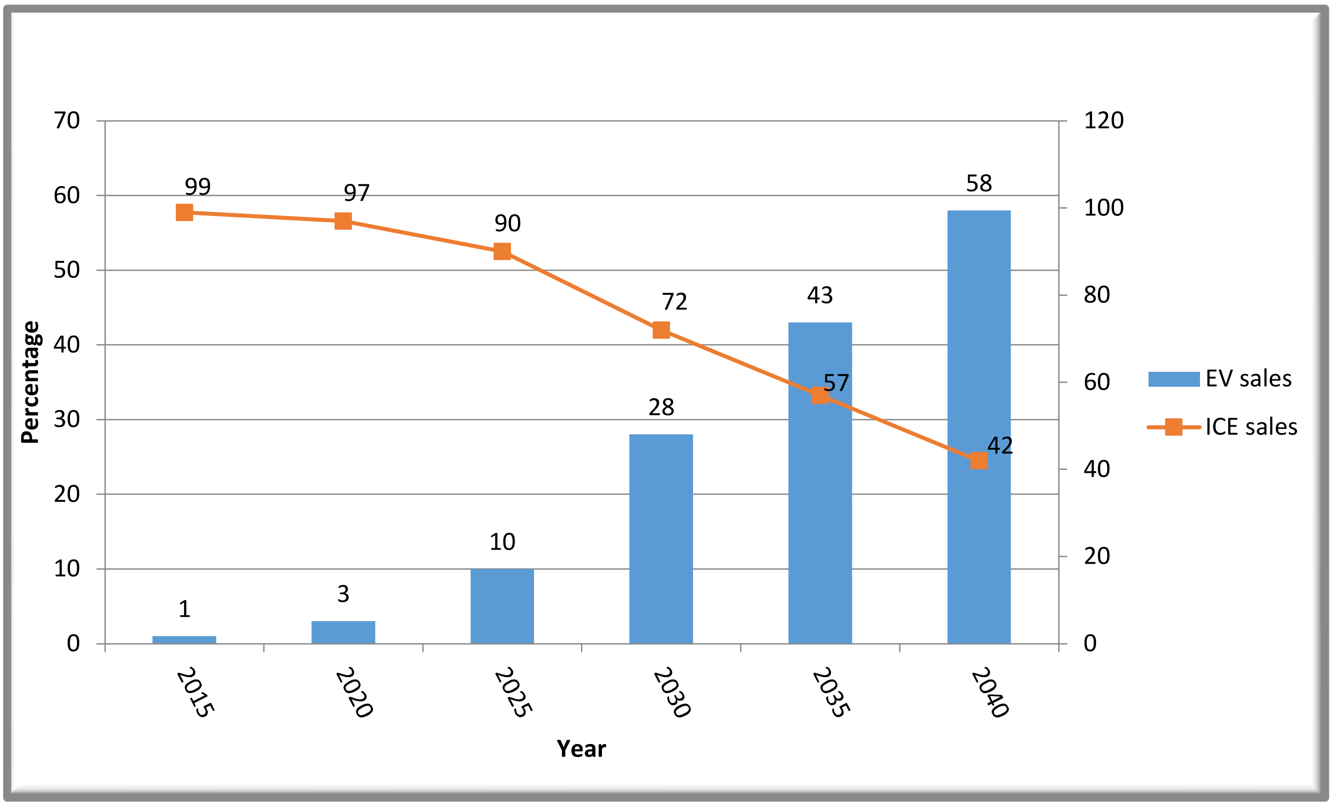
The global automotive industry landscape is in constant change because of new regulations and requirements as defined by governments. The one key objective that governments from around the world are striving towards, is for a cleaner environment for the human population to live in. There has been a rapid evolution in alternative engine technologies with low or no emissions owing to the stricter emission control regulations imposed by governments (Barnes & Black, 2017:10; Manners-Bell, 2018:113; AIEC, 2021:110). Because of these stricter emission regulations worldwide, the Electric Vehicles (EVs) trend has gained traction (Engineeringnews, 2018e; AIEC, 2021:44). EVs offer an important, alternative solution to internal combustion engines in the effort to reduce emissions (OICA, 2017; AIEC, 2021:44). The introduction of EVs in global markets has been supported by a range of government policies and financial incentives, such as tax breaks and toll-free payments (Engineeringnews, 2018e). EVs have also been supported by various governments worldwide to decrease the transport industry's carbon emissions, especially those of countries with higher air pollution levels (Engineeringnews, 2018f; Manners-Bell, 2018:113).

Since the backlash against high emissions vehicles, the movement towards Plug-in Hybrid-Electric Vehicles (PHEVs), as well as Battery Electric Vehicles (BEVs) has gathered more prominence and this momentum will continue (Barnes & Black, 2017:10). Until the year 2025, PHEVs are expected to play an important role with the move towards electric vehicles. However, according to Bloomberg New Energy

Finance (BNEF) (2021:2), because of the engineering complexities of PHEV platforms and the cost thereof, from 2025 onwards, BEVs will be more attractive and are expected to take over and account for the majority of EV sales. BNEF (2021:1) highlights five underlying key factors that will see to the progressive adoption of EVs in the coming years:

- Short-term regulatory support in key markets like the USA, Europe, and China.
- Decreasing lithium-ion battery prices.
- Increased electric vehicle commitments from global vehicle manufacturers.
- Growing consumer acceptance, sparked by competitively priced electric vehicles across all vehicle classes.
- The growing role of car sharing, ride hailing, and autonomous driving.

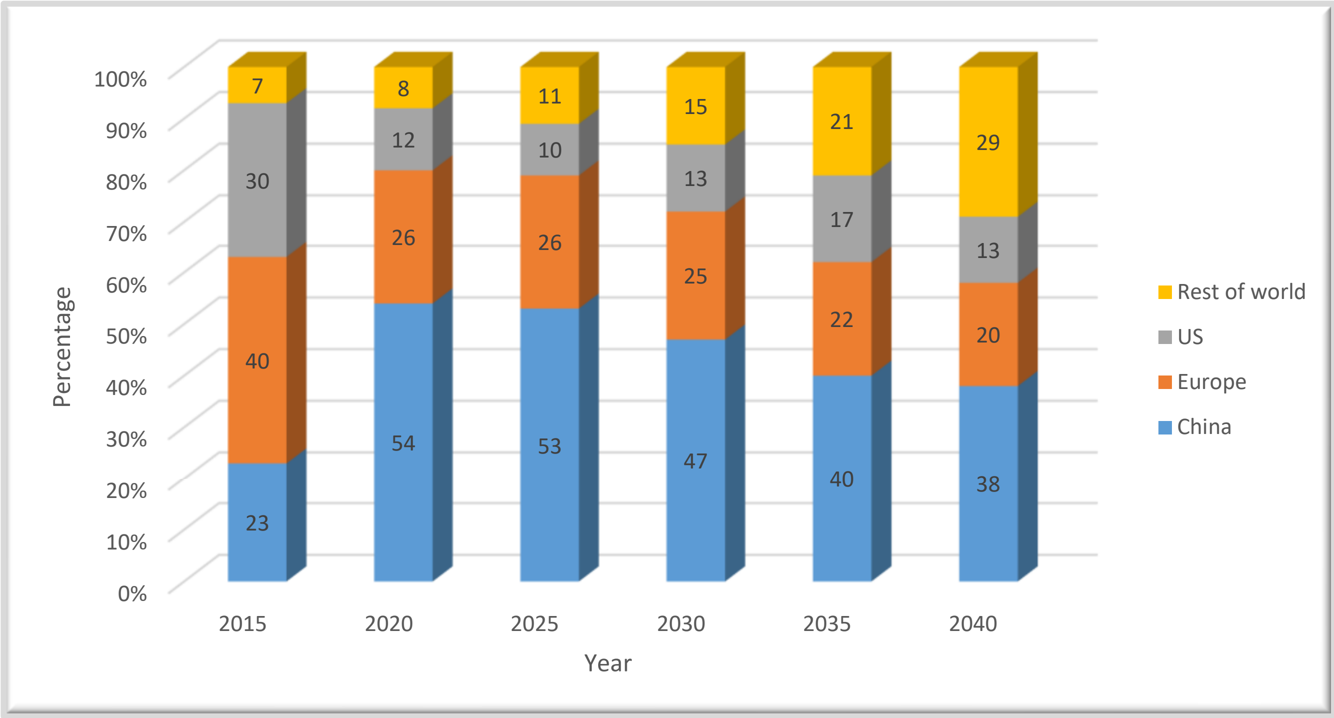
According to BNEF (2021:1), 10% of global passenger vehicle sales will comprise of electric vehicles by 2025, rising to 28% by 2030, and rapidly rising to 54% by 2040. Figure 3.1 displays the global passenger vehicle sales forecast of ICE and EVs from 2015 to 2040.



<u>Figure 3.1: Global passenger vehicle sales forecast of ICE and EVs from 2015 to 2040</u>

<u>Source: (BNEF, 2021:1)</u>

Figure 3.1 highlights that the global passenger vehicle sales forecast of EVs up to 2025 is relatively low, however, from 2025 to 2030 the move towards EVs will start gaining traction. During 2021, global EVs' sales more than doubled from 3.24 million units in 2020 to 6.6 million units representing 11.7% of the global passenger car market (AIEC, 2022:38). EVs will become economical on an unsubsidised, total cost of ownership basis across mass market vehicle classes. The decrease of battery prices will result in price competitive electric vehicles being sold in all major light duty vehicle segments before 2030, dawning in a period of robust growth for EVs (BNEF, 2021:1). It is expected that by 2030 there will be parity between the cost of an ICE vehicle and the cost of an electric vehicle, and at this point it will spark the mass adoption of EVs in most markets (AIEC, 2021:44; BNEF, 2021:1). Figure 3.2 highlights the annual global electric vehicle sales forecast by market from 2015 to 2040.



<u>Figure 3.2: Annual global electric vehicle sales forecast by market from 2015 to 2040</u>

<u>Source: (BNEF, 2021:2)</u>

Figure 3.2 shows that China and Europe will dominate the global electric vehicle market with a combined market share of over 72% by 2030. The size of these markets, tougher CO_2 regulations, China's EV credit system, fuel economy regulations, and government support will be the primary drivers of electric vehicle sales (AIEC, 2021:44). Strong government support for the period 2015 to 2025 will spark demand for electric vehicle adoption in these markets. Europe transcended China as the hub for EV growth and for the first time since 2015, EV sales in Europe superseded EV sales in China (AIEC, 2021:44). EVs' outlook in the long run seems prosperous, as fundamental cost and technology improvements supersede the short-term impacts of the pandemic. Governments worldwide have also announced the plan to shift from ICE vehicles to BEVs using various innovative strategies. The global automotive OEMs are quickly adapting to comply with new stringent regulations being implemented in China and Europe and are launching newer compatible models whilst

also taking advantage of the government incentives on offer. But what does this mean for the South African automotive industry?

South Africa is falling behind other markets with the shift towards hybrid or electric vehicle adoption, and this is not currently sustainable (Engineeringnews, 2018g). Domestic hybrid petrol and diesel vehicle sales comprised 678 units in 2021, increasing from 232 units in 2020 (AIEC, 2022:17). Electric vehicle sales increased from 92 units in 2020 to 218 units in 2021 (AIEC, 2022:17). Electric vehicles with zero emissions are more expensive than the internal combustion engines and South Africa offers no incentives for purchasing an electric vehicle. Thus, sales have been stagnant in South Africa whilst the global rollout of EVs is rapidly advancing.

The global rollout of EVs is inevitable whether South Africa is on board or not. The rapid evolution of the South African automotive industry is necessary for the sustainability thereof in the long run. The only way to have a successful automotive manufacturing base is to keep up with technological developments. Who will South Africa sell vehicles to if the vehicles are out-dated or do not meet other markets' stringent requirements? The South African automotive industry cannot be running on one development technology track whilst the rest of the world is way ahead on the same track (Barnes & Black, 2017:10). Developed economies have a saturated vehicle demand and a replacement cycle that is heading towards BEVs. Developing economies have a growing middle class which leads to a growth potential for new vehicles. Consumers are becoming smarter and technologically more educated and are demanding newer technology vehicles at a modest price. The transition towards newer automotive technologies, such as EVs, needs to be seamless because South Africa cannot afford to operate on two parallel technology tracks, manufacturing both old technology and new types of vehicles because it is already struggling to attain economies of scale. South Africa needs to be on a progressive path by manufacturing new technology vehicles which has a huge growth potential, rather than being on a path which is stagnant with older generation technology whose market is declining.

South Africa's rapid adoption of EVs is critical for the domestic automotive industry's long-term success and growth. The South African government will have to balance the trade-off between the sale of electric vehicles and the reliance on the fuel tax from ICE vehicles. The South African automotive industry contributed 4.3% to national GDP in 2021 (AIEC, 2022:6), whilst the Organisation Undoing Tax Abuse (OUTA) (2021) points out that the fuel tax revenue is the South African Revenue Services' (SARS) fourth largest income stream at R85 billion per annum. It poses a serious conundrum for government because fuel tax revenue is derived from consumption, unlike EV usage which requires electricity whose cost is already exorbitant. South Africa needs to be able to compete for production contracts to supply markets that require electric vehicle technology. South African automotive manufacturers will need to be at the forefront of these new technologies to capitalise on the huge growth opportunities which exist.

3.2.3.4 Autonomous Vehicles (AVs)

The shape of the global automotive environment is continuously transforming at an unprecedented rate. Vehicle technology is rapidly evolving, ranging from enhanced safety requirements, environmental regulations, ever more demanding customers, upgrades to infotainment, and mobility market changes in different economies. The technological advancements in vehicle technology have created a continuum between conventional, fully human driven vehicles and Autonomous Vehicles (AVs) which partially, or fully, drive themselves with no driver required (Anderson, Kalra, Stanley, Sorensen, Samaras & Oluwatola, 2016:2). Within this continuum are technologies that allow a vehicle to assist and make decisions for a human driver. These technologies include crash warning systems, adaptive cruise control, lane keeping systems, and self-parking technology. A five-level hierarchy to help explain this continuum has been identified (Anderson et al., 2016:2; Litman, 2018:4):

- Level 0 (No automation). The driver is always in full control of the primary vehicle functions (brake, steering, throttle, and motive power). The driver alone is responsible for monitoring the roadway for safe vehicle operation.

- Level 1 (Function-specific operation). Automation at this level involves one or more specific control functions. If multiple functions are automated, they can operate independently from each other. The driver has overall control and is responsible for the safe operation of the vehicle. The driver can cede limited authority over a primary control where the vehicle can automatically assume limited authority over that primary control (such as electronic stability control).
- Level 2 (Partial automation). This level involves automation of at least two primary functions designed to work simultaneously to relieve the driver of performing those functions. The driver is still responsible for the safe operation of the vehicle and is expected to be available at any given time to control the primary functions.
- Level 3 (Limited self-driving automation). This level of automation allows the driver to cede full control of all safety critical functions. The driver is expected to be available for occasional control with sufficient notice time.
- Level 4 (Full self-driving automation). This level of automation enables the vehicle to perform all safety critical functions and monitor roadway conditions for a complete trip. The driver is expected to insert the navigation for the trip and not be available to perform any other functions.

AVs are expected to gain traction from the year 2025, with approximately one million level 4 new vehicles by 2030. By 2035, there would be an estimated 75% adoption rate for new level 4 AVs (Black, Barnes & Monaco, 2018:47). This will fundamentally affect production in markets and developing economies such as South Africa. Figure 3.3 displays the adoption rate of AVs from 2015 to 2035.

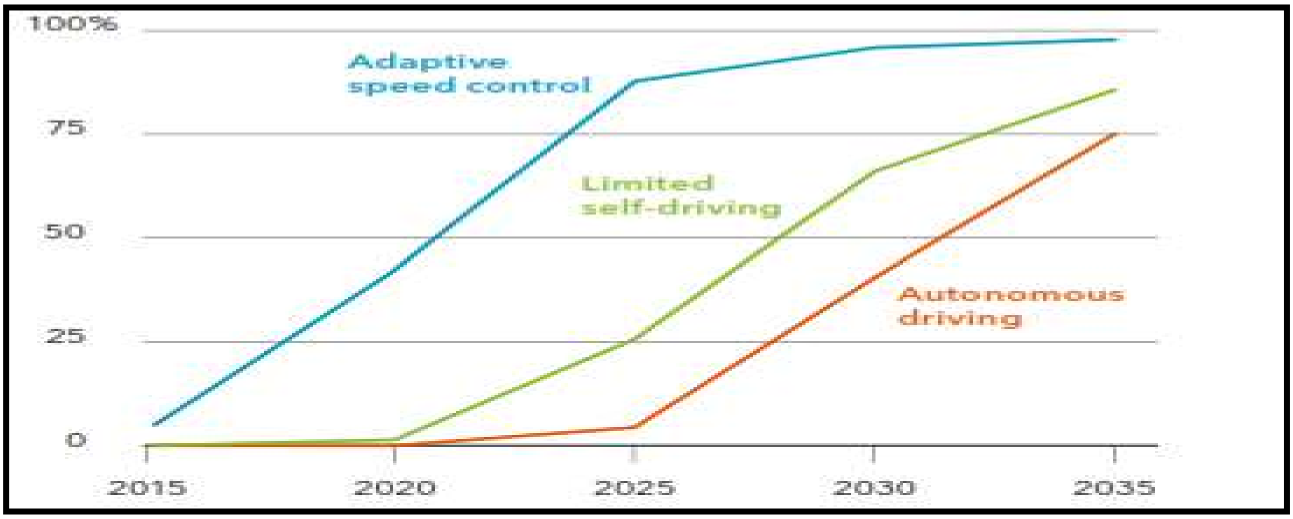


Figure 3.3: Adoption rate of AVs from 2015 to 2035

Source: (Blackrock Investment Institute, 2017:4)

Figure 3.3 pointed out that there is a paradigm shift in the mobility of consumers. As this new technology becomes ubiquitous, production in domestic and international markets will be reshaped, and domestic markets may similarly be affected as the benefits of AVs are widely demonstrated (Black et al., 2018:47). It will cause a major structural shift in both market and production infrastructure (Black et al., 2018:47). As AVs roll out, it will transform manufacturing for the global automotive manufacturers. Figure 3.3 pointed out that AVs will only be widely adopted from 2035 because there are some challenges which need to be clarified and resolved before it can be fully implemented.

Government regulations and engineering standards are policy instruments used to guide manufacturers to adhere to safety, health, and environment regulations. The issue of insurance and liability can pose a real problem in the event of an accident (Autolive September issue, 2018:7). A regulatory framework is required to determine which party is responsible, the vehicle user, the owner, or the vehicle manufacturer. Consumer acceptance will play a crucial role in AV technology’s future market penetration (Autolive September issue, 2018:7). Societal fears and ethical issues could limit their market adoption and will need to be resolved before AVs can enter the market. The high cost of AVs could present a problem for consumers; thus, limit the adoption of AVs. Once these mandatory requirements have been resolved, AV technology will pave the way to a new future for vehicle manufacturing.

AVs will present growth opportunities for the global automotive manufacturers. The shift towards AVs will cause yet another schism between developed and developing economies because developing economies are already falling quite far behind developed economies. The emergence of AVs will influence the growth in vehicle consumption across different developing markets, such as Sub-Saharan Africa (Black et al., 2018:47). South Africa could prepare to position itself strategically to benefit as this change occurs. This could create a unique growth opportunity for South Africa because it will be many years before AVs can be widely adopted. Toyota, wanting to be at the forefront of these technologies, announced a R7 billion deal in 2018 with Uber as part of a bid to get more AVs on the road (Autolive September issue, 2018:7).

3.2.3.5 The impact of an uncertain political landscape

Governments worldwide actively support their domestic automotive industries because of the great economic benefits it brings to the country. Free trading relations, which have been the backbone of the globalisation process, are being challenged because of worldwide trade tensions and it caused global trade growth in 2019 to slow down to its weakest level since the global financial crisis that occurred in 2008 (AIEC, 2020:43). When trading patterns are being altered, uncertainty in the global and South African automotive industries remain high. Governments try to stabilise trading relationships among countries to avoid the negative effects of uncertainties in the trading environment. Stable trading relationships between South Africa, the USA, the EU, and the UK are highly important for the domestic automotive industry. In 2021, the EU was South Africa’s largest trading partner and the domestic automotive industry’s most important regional export destination accounting for R124.7 billion (60.1%) of total automotive exports of R207.5 billion (AIEC, 2022:41).

South African vehicles and automotive components, which are exported to the EU, need to contain a minimum of 60% local content in terms of the rules of origin to qualify for a zero-tariff duty (AIEC, 2022:42). The definition of local content includes the value of components and sub-components originally sourced from the EU, as well as South African parts, labour, raw materials, manufacturing costs, transport, and profit margins (AIEC, 2022:42). The EU and UK markets are extremely important for the domestic automotive industry and political developments are being closely monitored because a great deal is at stake for South Africa. In 2021, Germany was the top export destination in the EU with over R66 billion worth of automotive exports, and the UK was in second place with over R17 billion (AIEC, 2022:44). The UK was the top vehicle export destination from 2014 to 2021 (AIEC, 2022:22), and it was South Africa's 8th largest country of automotive imports in 2020, with over R5.4 billion worth of automotive imports (AIEC, 2022:69). The Brexit deal was concluded just before the transitional deadline of 31 December 2020, with the formal departure of the UK from the EU on 31 January 2020. To provide stability and certainty to the trading relations between the UK and South Africa, the two countries have reached an agreement that largely replicates the terms of the Southern African Development Community (SADC)-EU-Economic Partnership Agreement. It was of paramount importance that an agreement was reached so that the rule of origin would not be impacted, which could have meant that South African automotive imports from the UK no longer qualified for local content and were disqualified from zero-tariffs into the EU seeing that the 60% local content was not being met.

The other important trading relation is between South Africa and the USA. The USA-Mexico-Canada region was South Africa's third largest export region in 2021 (AIEC, 2022:54). Out of South Africa's total automotive exports of R207.5 billion in 2021, R20.32 billion (9.8%) amounted from this region. The USA dominated this region, South Africa's exports to the USA amounted to R18.85 billion of the R20.32 billion, thereby highlighting the importance of the USA market to South Africa (AIEC, 2022:54). The African Growth and Opportunity Act (AGOA) is important to South Africa's manufacturing industry. The General Systems of Preferences (GSP), which the USA grants developing Sub-Saharan African countries, aid South African exports to the USA because it allows duty-free access of certain goods into the USA. Trade between South Africa and the USA has accelerated owing to AGOA. The fundamental principle of AGOA is growth and development of trade with Africa. In 2015, AGOA was extended to 2025 under the Trade Preferences Extension Act of 2015. Since the beginning of AGOA, South Africa's automotive exports to the USA increased by 300.6% while import increased by 551.2% from 2001 to 2021 (AIEC, 2022:55).

The benefits achieved under AGOA have been the backbone to the success of the South African automotive industry in the USA market. Under AGOA, 98% of South African exports to the USA enter the country without any tariffs or quotas (AIEC, 2020:59). The duties on passenger cars and commercial vehicles vary from 2.5% to 25%. To satisfy the rule of origin requirements, a minimum of 35% of the value added on the output should come from the production activities in the country claiming AGOA benefit. This solution benefitted South Africa and the USA because it brought a host of benefits to both countries' economies by positively sustaining employment levels and sparking momentum in regional development (AIEC, 2020:59). However, in May 2018, the previous administration launched an investigation under Section 232 to determine whether automobiles and/or automotive components are being imported into the USA in such quantities or under such circumstances as to threaten to impair the national security, then necessary remedial steps will be undertaken (AIEC, 2021:62). The outcome of the investigation is still pending but if the proposed 25% import duty under Section 232 are imposed on automotive parts, including those coming from South Africa, it would diminish the AGOA benefits which South Africa receives from the USA.

Developments in the UK and the USA are causing the trading environment to become even more volatile, and it increases vehicle manufacturers' uncertainty. It is for these reasons that there has been an emphasis on localisation in terms of protecting and developing a country's competitive position in the global market and manufacturing arena (AIEC, 2020:32). The government intends to achieve a minimum of 60% local content in South African manufactured vehicles by 2035; thus, the dependency on high value imported components will diminish significantly in future (Barnes, 2017:8; AIEC, 2022:32).

3.2.3.6 The impact of alternate transport systems

Many spheres of the automotive business are rapidly changing seeing that the digital revolution causes major disruptions and consumers are making a stand as to which innovations they value most (AIEC, 2020:5). Vehicle manufacturers need to be at the forefront of these trends and technologies if they want to compete relentlessly. To remain competitive in such an uncharted landscape, requires new methods of understanding consumers and the market. Technological trends, such as economical vehicles, electric vehicles, autonomous vehicles, and ride-sharing applications are set to alter the industry at an unprecedented rate. A major trend amongst the new generation of consumers is the millennials' preference of ride-sharing services, such as Uber, car2go or Lyft, rather than owning the actual vehicle or even using public transportation.

Future mobility is still in its developmental phase and has a long way before it can reach its peak. The emerging mobility patterns of young adults are shaping the industry wherein on-demand ride-sharing services are experiencing a surge in growth (Deloitte, 2017:1). These ride-sharing providers are altering the way people move by seamlessly connecting drivers to passengers. Ridesharing extends the benefits of auto mobility to individuals without having them bear the costs of owning the vehicle or the effort of using public transportation. According to Hill (2018:2), Uber's business model is to subsidise almost half of its fare because it wants to flood the streets with taxi-like cars to grab market share and eventually market pricing power. Although this is a real benefit to the service user, it presents fierce competition not only to other ride-sharing services but also to public transportation. According to Hill (2018:5), in the USA, ride-sharing services are destroying revenue from public transportation which it desperately needs to sustain itself. Public transportation will lose its value even further as these and other trends gain more traction.

The COVID-19 pandemic has had a debilitating impact on ride-sharing services as people have become more cautious about the way they travel. Uber and Lyft's users have dropped approximately 80% since the COVID-19 pandemic, but there has been a steady recovery in 2020 and 2021 (Elliot, 2021). According to Elliot (2021), ride-sharing services should have bounced back in 2021 as lockdown measures are further relaxed, and data has shown that there has been a recovery of about 85% of people using ride-sharing services again.

Another global phenomenon that is altering millennials' mobility needs is the concept of car sharing. Car sharing has seen significant growth from 2014 to 2016 especially in larger cities where more people are avoiding the costs of car ownership (Deloitte, 2017:2). In 2016, 50% of the global car sharing market was represented by Europe with 5.8 million users and 68 000 cars (Deloitte, 2017:2). Germany represents the largest car sharing market in Europe where growth has increased from 260 000 users in 2012 to approximately 1.2 million users by 2016 (Deloitte, 2017:2). Car sharing concepts will become even more economically viable with the introduction of autonomous vehicles. According to PricewaterhouseCoopers (PWC) (2018), by 2030, the transport sector will require 138 million less cars in Europe and the USA, and one third of kilometres driven will be shared. Searching for a shared vehicle in a surrounding area will become obsolete, but it will be possible to order vehicles to wherever the user happens to be via a convenient on-demand service (PWC; 2018:7). These global disruptors are altering the industry at an unprecedented pace by changing the purchasing patterns of millennials who prefer to use these services to owning the actual vehicle. For South Africa it means that exporting to Germany, its main export destination, will be severely impacted because the millennials prefer using these on-demand services to purchasing the actual vehicle.

3.2.3.7 The impact of changing consumer trends

The rapid pace at which technological innovation and advancements are occurring is giving rise to a new era wherein people live today. The global automotive industry has undoubtedly enjoyed many years of growth and has been insulated by technological advancements compared to other industries (OICA, 2018:2). The global automotive industry is now on the verge of a technological evolution, and it is going to be significantly transformed. Globally, the car market is a fierce environment with intense competition between OEMs and there is constant evolution to increase market share (OICA, 2018:2). There is not a single country in the world that can fully satisfy the wide and diverse automotive demands of its residents from its own production (OICA, 2018:2). Therefore, so many different models and brands are being offered to consumers in a single market such as South Africa.

Modern or smart vehicles are now considered to be rolling computers (AIEC, 2019:36). Keeping up with consumer demands and expectations are becoming increasingly difficult, especially in the automotive industry which requires long lead and production cycle times. A vehicle that, at conception, is perceived to be a perfect fit for the market or markets might be lacking certain new features that consumers prefer by the time it rolls out onto the market. Vehicle manufacturers cannot alter production or roll it back to make quick changes. However, the slow pace to market might not always be detrimental to the manufacturer but can also present some opportunities. It provides sufficient lead time for vehicle manufacturers to innovate and develop new vehicles that can address gaps in the market which can be sustainable until competitors catch up. Consumers are always searching for new products on the market and being the first to market will leave the vehicle manufacturer’s footprint for that brand or model of vehicle.

To sell more vehicles globally, vehicle manufacturers need to understand their consumers better because if they change their buying habits, then manufacturers need to align their production strategies to these habits. South African motorists are more likely to drive a Light Commercial Vehicle (LCV) as it has both commercial and leisure vehicle applications (AIEC, 2022:16). The top ten most popular models sold in South Africa in 2020 included five LCV models, namely the Toyota Hilux, Ford Ranger, Isuzu D-Max, Toyota Hi-Ace, and the Nissan NP200, and five passenger cars, namely the Volkswagen Polo Vivo, Volkswagen Polo, Toyota Starlet (imported), Toyota Fortuner, and the Toyota Urban Cruiser (imported) (AIEC, 2022:16). The popular segments are a clear indication of the purchasing patterns in the South African market. The global automotive OEMs need to be at the forefront of these purchasing patterns to compete relentlessly. A wide range of custom-made offerings and solutions to meet the ever-changing customer demands will be instrumental to the recipe for success. The business environment is becoming more turbulent as newer technologies, changing customer expectations, new market players, and the way vehicle purchasing occur will alter the industry.

The old methods of selling vehicles have been revolutionised with the advent of social media and technology (Autolive June issue, 2021:1). Consumers can get all the information they require about a vehicle at the touch of their fingertips. The trend is that consumers are becoming technologically educated and highly informed which is weighing in on their purchasing decision. They can get quick access to comparable sales data, car reviews, dealer reviews, comparable rival models, among others, without even leaving their homes. The internet has become the go-to information source for vehicle consumers in South Africa (Schnehage, 2017:1; Autolive April issue, 2021:16). According to Schnehage (2017:1), in South Africa, the time each consumer spends on researching cars grew to approximately 14.44 hours in 2017 and made up 59% of the total vehicle purchasing process. According to Autotrader (2020:46), from 2019 heading into 2020, 92% of consumers have already researched the vehicle online which they intend to purchase, and it made up approximately 80% of the total vehicle purchasing process. Consumers are logging into the dealer's website, spending more time researching vehicles, equipping themselves with all the information, and experiencing the dealer's virtual showroom before they even set foot into a dealership.

The virtual showroom is now considered to be the dealership of the future. Thus, the dealer's website should be as intuitive and appealing as possible. A virtual showroom offering a potential customer all the information they require in an easy to digest manner, will be able to persuade that customer to visit the actual dealership to conclude the transaction. They will have all the information on hand to narrow down their choices and make an informed final decision in a short time span. The other technology that dealers can use to their customers' benefit is virtual reality. Virtual reality will allow customers to walk through a dealership, look around at all the vehicles, and even take a vehicle for a test drive without leaving the comfort of their homes (Schnehage, 2017:3; Autolive April issue, 2021:16). Live Online Retail (LOR) technologies are gaining a lot of momentum and transforming the traditional ways of interacting with customers. The trend, which is being focused on, is offering customer convenience and value through state-of-the-art technology (Autolive April issue, 2021:16). It is up to the dealer to find solutions on how best to employ LOR in a world where the traditional manner of purchasing has evolved.

The global automotive environment was examined to analyse the latest changes to enable the South African automotive industry to be at the forefront of these changes. It is evident that major changes are occurring in the global automotive industry which are transforming the industry at an unprecedented rate, so much so that it will soon become the survival of the fittest. The study's focus is to search for growth opportunities for the domestic new light vehicle market in South Africa seeing that the sustainability of the South African automotive industry in the long run is critical to the economy and employment. Two countries that, over the past decade, have had similarities to South Africa regarding the manifestation and development of its automotive industry must also be briefly examined. The success of the Thailand automotive industry and the demise of the Australian automotive manufacturing industry must be examined in the context of the global automotive environment with regards to searching for growth opportunities for South Africa and its domestic automotive industry. The Australian automotive industry case will be briefly discussed to highlight the importance of an automotive manufacturing industry in a country and the impact of sound policy decision-making by government. The Thailand automotive industry will be briefly discussed thereafter.

The Australian automotive industry will be discussed next.

3.3 The Australian automotive industry

3.3.1 Background to the Australian automotive industry

The demise of the Australian automotive manufacturing industry in 2017 marked the end of a critical industry in the Australian economy and presents an ideal case to examine because of the many similarities to the South African automotive industry. Furthermore, South Africa's Motor Industry Development Programme (MIDP) was based on the Australian Button Car Plan. South Africa must be aware because the South African automotive industry is far more important to the South African economy than Australia's was to their economy, and should something like this occur, it would be catastrophic for South Africa. What must be examined are: What can South Africa learn from both these countries to grow the domestic automotive industry, and what should South Africa avoid which could result in the closure of the domestic automotive industry.

The Australian automotive industry manifested in the 1900's with Ford being the first major vehicle manufacturer. This is chronologically the same time when the motor industry in South Africa started. From the early days of vehicle manufacturing until 1985, the industry had been substantially protected by high tariffs and import quotas. In 1978, import duties stood at 57.5 % with quotas in place to control the volume of imports (Stanford, 2017:201). In 1984, the Australian government released their policy statement on the implementation of the first Motor Industry Development Plan, also known as the Australian Button Car Plan, which would transform the industry into globally becoming much more competitive. From being heavily protected in the 1980s and 1990s, the Australian Button Car Plan had been a significant driver for import growth into the Australian vehicle market and the market was aggressively liberalised through this trade policy regime (Stanford, 2017:201). Under the Button Plan, the Australian government supported vehicle exports by providing import credits, but this was illegal under World Trade Organisation (WTO) rules. According to the Automotive Supply Chain Competitiveness Initiative (ASCCI) (2015a:4), the Australian Button Car Plan terminated in the year 2000 and it had been successful in driving productivity in the Australian automotive industry. The Automotive Competitiveness and Incentive Scheme (ACIS) replaced the Button Car Plan from 2001 onwards.

The ACIS was established in 2001 as part of the Australian government's post-2000 assistance package for its automotive industry (Australian Customs Service, 2008:13). According to the Australian Customs Service (ACS) (2008:13), the purpose of the scheme was to provide transitional assistance to encourage competitive investment and innovation in the Australian automotive industry, and to achieve sustainable growth in the domestic and international markets in the context of trade liberalisation. The ACIS was originally established to run for five years, until 31 December 2005, but in anticipation of further tariff reductions, the ACIS was extended in 2005 to run until 2015 so that the industry could achieve sustainable growth as tariffs declined. In 2008, the Australian government decided to introduce a New Car Plan for a Greener Future which would make the Australian automotive industry more economically and environmentally sustainable by 2020 (Economics References Committee, 2015:9). The ACIS was replaced in 2009 with the Automotive Transformation Scheme (ATS).

The ATS commenced on 1 January 2011 and was legislated to run through to 31 December 2021, however, the ATS terminated when Ford, Holden, and Toyota ceased manufacturing motor vehicles in Australia. The ATS enabled the government to co-investment in companies involved in local vehicle manufacturing, such as motor vehicle manufacturers, automotive component manufacturers, automotive machine tool, automotive tooling manufacturers, and automotive services providers. The three major OEMs that benefitted under the ATS were Ford, Holden, and Toyota, however, all three have ceased manufacturing by 2017.

The contributing factors that led to the demise of the Australian automotive manufacturing industry will be discussed next.

3.3.2 The demise of the Australian automotive manufacturing industry

The Australian automotive industry was once a major automotive manufacturer with the country manufacturing almost as many vehicles than the consumers purchased each year (Stanford, 2017:198). The Australian automotive manufacturing and assembly operations ceased in 2017 (Stanford, 2017:198). The Australian automotive manufacturing industry's demise cannot be ascribed to a single cause. The underlying reasons were a multi-faceted affair which happened over several decades (ASCCI, 2015a:3; National Bargaining Forum, 2016:12). The following table highlights the primary contributing factors which resulted in the demise of the Australian automotive industry and provides the impact and effect of these contributing factors.

Table 3.4: Primary contributing factors which resulted in the demise of the Australian automotive industry

Contributing factor	**Impact**	**Effect**
Federal Economic Policy	From the 1980s, the Australian government started aggressively liberating the domestic market. The government favoured trade liberalisation with open and free market policies. Import tariffs declined from nearly 60% in 1984, to 15% in 2000, and to 5% in 2009 (ASCCI, 2015a:4).	The Australian government's policy was aimed at reducing support to the industry at a time when support was most needed. Domestic market production lost to cheaper imported vehicles. Local vehicle assemblers could not replace the lost units of imports with new exporting contracts (ASCCI, 2015a:4; Truett & Truett, 2018:4348).
Automotive Industrial Assistance Programmes	From the mid-1960s, a combination of import quotas, local content requirements, and high import tariffs ensured the protection of domestic manufacturers. From the 1980's, the Australian government aggressively liberated the domestic market through the industry programmes known as the Button Plan, the ACIS, and finally the ATS. These programmes reduced the level of government support with the aim of providing minimal support to the industry (Truett & Truett, 2018:4345).	There is sufficient international evidence to substantiate the need for government support to sustain the domestic automotive industry (National Bargaining Forum, 2016:13; Beer, 2018:422). Without government support, an outcome such as the Australian automotive industry was inevitable (National Bargaining Forum, 2016:13).

Cost Competitiveness	Australia had a low-cost manufacturing base prior to 2008 but by 2014, it had one of the most expensive manufacturing bases in the world (National Bargaining Forum, 2016:16). Australian vehicle manufacturers were not geared to operate in a high-cost operating environment (National Bargaining Forum, 2016:16).	Australia had a small domestic market which made it more difficult to attain economies of scale benefits and made exporting necessary to achieve cost benefits and compete in the global market. The Australian government's support was scaling down at the same time when the Australian dollar's appreciation and cheaper imported vehicles were eroding the industry's competitiveness (Stanford, 2017:203).
Foreign exchange and impact on export programmes	Exchange rates play a pivotal role in determining the profitability of automotive manufacturers. The Australian dollar strengthened which gave rise to the hefty increase in imported vehicles. The government did not provide additional assistance during the period of high exchange rates to offset the cost disadvantages that manufacturers were experiencing (National Bargaining Forum, 2016:17).	Australian manufactured vehicles were more expensive carrying a cost premium of almost 20% relative to other vehicle manufacturers in the world (ASCCI, 2015a:4; National Bargaining Forum, 2016:17). Domestic OEMs could not compete with imports seeing that imported vehicles were much cheaper, therefore, flooding the domestic market. The strong Australian dollar made it increasingly difficult for the domestic OEMs to compete in the global market.
Trade Agreements	Australia has many Free Trade Agreements (FTAs) with several countries. The Australian government favoured trade liberalisation and viewed all tariffs which are implied on imported goods as unwarranted costs on the economy (National Bargaining Forum, 2016:17). Australia has only a 5% import duty on vehicles, and this is waived if there is a preferential trade agreement.	Australian vehicle exports did not benefit from its various FTAs. There was no mutual benefit in trade agreements for the exporting of vehicles. The other countries have protective measures in place, with import tariffs up to 100% to support its local industry.
Market Fragmentation	The Australian market was heavily fragmented owing to the large quantities of	Imports represented 91% of the domestic market demand of 1 113 224 units in 2014

	imports penetrating the domestic market. Trade liberalisation, increased competition from emerging economies, and changing consumer preferences accentuated the fragmentation of the domestic market.	(National Bargaining Forum, 2016:19). Domestic OEMs could not achieve economies of scale benefits which is a critical component in the manufacturing of vehicles (National Bargaining Forum, 2016:17; Truett & Truett, 2018:4354).

Sources: (ASCCI, 2015a:3-6; National Bargaining Forum, 2016:4-20; Stanford, 2017:203; Beer, 2018:422; Truett & Truett, 2018:4345-4355;)

Table 3.4 denoted that the demise of the Australian automotive industry was multi-faceted. The low production and the heavy importation of vehicles set the industry on a downward spiral. Table 3.5 highlights the Australian passenger motor vehicle production, exports, and imports from 1990 to 2014, and sales from 2005 to 2014.

Table 3.5: Australian passenger motor vehicle production, exports, and imports from 1990 to 2014, and sales from 2005 to 2014

Year	Production	Sales	Imports	Exports
1990	403 872	-	115 151	25 620
1991	324 590	-	123 708	27 604
1992	284 675	-	147 406	25 627
1993	228 667	-	158 663	26 328
1994	311 432	-	182 256	22 253
1995	316 642	-	214 843	22 693
1996	350 993	-	243 848	39 544
1997	322 448	-	281 267	54 999
1998	336 579	-	316 704	58 389
1999	350 857	-	288 176	83 205
2000	353 754	-	319 471	101 018
2001	353 430	-	330 464	117 661
2002	353 462	-	303 802	112 088
2003	383 209	-	341 355	120 178
2004	411 406	-	351 959	131 474
2005	394 713	988 269	418 583	142 022
2006	330 900	962 666	456 950	132 742
2007	334 617	1 049 982	484 708	140 243
2008	329 556	1 012 164	486 540	161 956
2009	227 283	937 328	405 090	72 915
2010	244 007	1 035 574	536 436	94 095
2011	224 193	1 008 437	469 891	74 385
2012	221 605	1 112 032	588 216	89 420
2013	215 926	1 136 227	702 513	77 034
2014	180 311	1 113 230	932 919	70 661

Sources: (National Bargaining Forum, 2016:5; Truett & Truett, 2018:4348; OICA, 2019:1)

As shown in table 3.5, imports dominated the domestic market with exports being miniscule. The domestic market is meant to anchor the automotive industry whilst exporting remains the key to growing competitiveness. In 2017, vehicle manufacturing ceased to exist with the final number of 98 632 units rolling of production lines (OICA, 2019). Even though vehicle manufacturing ceased in 2017, vehicle sales increased in 2016 to 1 178 133 units and in 2017 to 1 188 677 units. This means that consumers are still being offered a wide range of vehicles at competitive prices, however, these vehicles are not Australian manufactured. The Australian manufactured vehicle was carrying a cost premium of approximately 20% and consumers were switching to more fuel-efficient, economical, imported vehicles (Bopage & Sharma, 2014:451). This meant that consumers benefitted from the rise in imported vehicles penetrating the domestic market, which then made the adoption of buying imported vehicles seamless while the industry was shutting down. However, the demise of the Australian automotive manufacturing industry had ripple effects across the national economy. Approximately 40 000 people lost their jobs, and the economy lost all the spillover effects which are associated with having a domestic automotive industry. A comprehensive cost-benefit analysis was not done to determine the cost of support provided relative to the economic benefits secured from having a vehicle production sector in Australia (ASCCI, 2015a:5). The full effects of the Australian government's decision to let its automotive manufacturing industry shut down will be only tested with the passage of time.

The central lessons from the demise of the Australian automotive manufacturing industry will be discussed next.

3.3.3 Central lessons from the demise of the Australian automotive manufacturing industry

The importance of an automotive industry in a country cannot be over-emphasised. Table 3.6 discusses the central lessons that South Africa can learn from the demise of the Australian automotive manufacturing industry and based on these deductions, what it should avoid.

Table 3.6: Central lessons for the South African automotive industry

Central lesson	Impact	Deduction
Policy Coherence and Certainty	The demise of the Australian automotive manufacturing industry provides evidence to the positive role played by long-term policy certainty in ensuring a viable automotive manufacturing industry. Without a long-term regulatory business environment, it is increasingly difficult for vehicle manufacturers to attain economies of scale and to be successful. The moment policymakers shifted their mind-set with this regard, the industry was effectively lost. Policy certainty is the Achilles heel which facilitates major investment decisions by the automotive OEMs and other suppliers.	The importance of a stable, long-term policy framework cannot be overemphasised to support the growth of a domestic automotive industry. It is important that the entire state-supporting architecture and related policies are synchronised to support industrial growth. The SAAM 2021-2035 will continue to provide long-term policy certainty to investors and automotive OEMs, and this provides a safe environment for head offices to make their decisions (AIEC, 2021:37). Evaluation of the SAAM at regular intervals will aim to address shortcomings or distortions in the programme and realign it to achieve the objectives of the programme.
Alignment of Industrial and Trade Policy	Australia had a range FTAs with some of the largest automotive countries. These FTAs led to the elimination of tariffs and other trade barriers which facilitated the large volumes of automotive imports into the Australian economy. Australian automotive manufacturers could not compete with the foreign competition and by 2012, 85% of the market was dominated by imports (ASCCI, 2015a:4).	It is of paramount importance that any reduction or removal of tariffs to levels which would not make automotive manufacturing economically viable, be abolished. South Africa's FTAs must ensure that they confine to policy alignment and cohesions, and that adequate protection is maintained in the domestic market. This will ensure heightened competition, as well as automotive manufacturing in South Africa in the long run.
Importance of Innovation and Technological Capabilities	Australia was one of only thirteen countries that had the capability to produce a car from concept to delivery. The Australian automotive industry was the main driver for research and	The continuous investment in research and development is critical for the sustainability of the domestic automotive industry in the long run. South Africa can benefit from investing in achieving unique capabilities in the design and

	development investment in the manufacturing arena. The demise of the Australian automotive industry will significantly impact research and development investments, as well as national employment (Beer, 2018:425).	development of the automotive industry. Aside from the spillover benefits to other manufacturing industries, as the fourth industrial revolution unfolds, South Africa would look attractive to head office decision makers when awarding production contracts based on these unique technological capabilities.
Appropriate Responses to Dynamic Market and Economic Conditions	The global automotive industry is becoming increasingly competitive with automotive OEMs from emerging economies, with comparatively low-cost structures, featuring significantly in export markets. As the trading environment becomes even more dynamic, incentives and other forms of support are widely used in attracting investments in the automotive industry. Production contracts can be based on the economic conditions and the support structures that a country is offering and is often a deciding factor.	It is critical that South African automotive manufacturers, and all other relevant stakeholders, are proactive in responding to the dynamics of an increasingly competitive and changing trading environment which will be accentuated by the fourth industrial revolution. All industry stakeholders need to collaborate and work together in searching for new innovative ways to increase cost competitiveness, adopt newer technologies to gain a competitive advantage, and find ways to counteract and compete with other emerging economies entering the African markets.
Stakeholder Engagement	Stakeholder engagement within the Australian automotive industry was fragmented among business, labour, government, and other relevant social partners (National Bargaining Forum, 2016:30). The viability of an automotive manufacturing industry requires continuous engagement at all levels which was clearly lacking in Australia as the Australian government's position was that the economy was better off without the industry (ASCCI, 2015a:5).	The need for continuous stakeholders' engagement is of paramount importance and is vital for ensuring a common industry agenda. Labour and business within South Africa need to highlight the challenges impacting local automotive manufacturing and this should influence appropriate policy decisions. These engagements should not only focus on the sustainability of the industry, but a broader focus on fostering job creation and raising the standard of living for the people.

Multinational Corporations (MNC) Considerations for Investment	MNCs aim to achieve efficiency by minimising their cost and maximising economies of scale while reducing duplication. As such, they invest in diverse locations to achieve different advantages from host countries to drive the maximum returns in their home base.	There is a range of factors that prompts an MNC to invest abroad. Factors such as market size and growth prospects, viable or growing domestic markets to sell more goods, stable political environment, policy certainty, raw materials availability, legal framework and governance, competitive supply base, workplace stability and flexibility, and countries where factors of production are cheaper (National Bargaining Forum, 2016:30). The importance and benefits of securing higher levels of FDI was discussed in chapter 2.

Sources: (ASCCI, 2015a:5; National Bargaining Forum, 2016:20-32; Beer, 2018:425; AIEC, 2021:37)

The Thailand automotive industry will now be briefly discussed.

3.4 The Thailand automotive industry

3.4.1 Background to the Thailand automotive industry

Thailand and South Africa have much in common with the manifestation of their automotive industries. Thailand's automotive industry was established over 50 years ago, and with an import substitution policy it became an export-oriented manufacturing base. From 1961, Thailand implemented a continuity policy to support industry development. The initial objective was to reduce imports to develop the emerging automotive industry of Thailand. During 1977–1997, Thailand promoted investments to create value added activities and developed export capacity by joining the WTO, implementing a free trade policy, and taking part in ASEAN Free Trade Area (AFTA). The Thailand automotive industry has been constantly developing for over 50 years with staunch support from government and the public sector. According to the Board of Investment (BOI) (2017:2) of Thailand, the country is the largest automotive manufacturer among Southeast Asian countries; it is one of the top automotive manufacturers in the world and is the ASEAN's automotive hub.

The contributing factors that led to the success of the Thailand automotive industry will be discussed next.

3.4.2 The success of the Thailand automotive industry

The development of Thailand's automotive industry has been more successful than South Africa's. Even though the macro-economic indicators between South Africa and Thailand are similar, the Thailand automotive industry's development trajectory has outperformed the South African automotive industry's development trajectory. The following table highlights five broad categories that contributed to the success of the Thailand automotive industry.

Table 3.7: Five broad categories that contributed to the success of the Thailand automotive industry

Contributing factor	**Impact**	**Effect**
Automotive industry development	The development of Thailand's automotive industry has been guided by a strategic framework known as a Masterplan. Since its inception, the Masterplan has played a critical role in defining industry development objectives and in situating, coordinating, and aligning industry policy instruments and development interventions which span other broad themes. The Masterplan's vision was to become the automotive	The first Masterplan (2002 – 2006) saw major advances in investments, manufacturing and export growth with total vehicles manufactured increasing by 162.4% and automotive exports by 208% over this period (ASCCI, 2015b:5). Since the growing success of the first Masterplan, the second Masterplan (2007-2011) and the third Masterplan (2012-2016) treaded a similar path to enable the success of the Thailand automotive industry. The goal of the Masterplan (2012-2016) was to transform

	manufacturing base in Asia with a strong domestic supplier base (Thailand Automotive Institute, 2012:3; ASCCI, 2015b:6; ASCCI, 2016:17).	Thailand into a global centre for green automotive manufacturing (Thailand Automotive Institute, 2012:3; BOI, 2017:6). The Masterplan provided a robust framework for aligning the strategies and policies enacted by the disparate range of organisations involved in promulgating and enacting regulations which affect the conditions of the local market (ASCCI, 2015b:6; ASCCI, 2016:17).
Domestic market access	The Masterplan has emphasised the importance of both the domestic market and the export market in developing its domestic automotive manufacturing industry (Thailand Automotive Institute, 2012:6). The condition of the domestic market and that of the manufacturing industry are closely linked. Thus, elevated levels of protection are complemented by market shaping instruments which encourage domestic consumption of specific types of vehicles in relation to others.	Thailand's approach of imposing high levels of tariffs to encourage local production was successful because it did not compromise the industry's competitiveness (ASCCI, 2015b:6). The high levels of market protection have converted growing a demand from an emerging middle class to production growth. There are varying levels of excise taxes to various vehicle categories which has resulted in the industry being highly competitive, achieving economies of scale and specialising in certain technologies (ASCCI, 2015b:6).
Incentive schemes	Thailand's incentive scheme is synchronised to the objectives outlined in the Masterplan. Three types of incentives were available for the industry. The first was prioritised types of OEM investment incentives, the second was activity-based incentives and the third was merit-based incentives.	OEMs had to meet certain production requirements to benefit from the first incentive. They could benefit from corporate income tax exemption if they met the requirements. OEMs had to achieve a 100 000 units per year in the first five years of production. Activity-based incentives also offered corporate income tax exemption with various secondary forms of additional support available (ASCCI, 2016:24). This was determined by the relative importance of the manufacturing activity being conducted. Merit-based incentives focused on the nature of

		the investment rather than the product being produced because of the investment. OEMs and suppliers could receive a 200% corporate income tax exemption for research and development activities (ASCCI, 2016:24). The effect of these incentive schemes resulted in five new eco car investments being made. A total capacity of 678 000 units per year could be manufactured by these five plants (ASCCI, 2016:24).
Trade Agreements	The enactment of the AFTA has enabled preferential access to a large and growing regional market for Thailand (ASCCI, 2016:21). Thailand also has FTAs with Japan, Australia, and New Zealand.	Thailand is well positioned to act as a manufacturing hub for the rest of the world. Access to a large growing regional market allowed Thailand to be identified as a high potential, high local content location by Japanese OEMs which further enabled Thailand to become a hub for both Completely Built-Up (CBU) and Completely Knocked Down (CKD) exports. In 2015, Australia, the Philippines and Indonesia were the main export destinations for Thailand's manufactured automotive products (BOI, 2017:3). In 2015, vehicle exports to Australia amounted to over 4 million US dollars and to Indonesia over 2.6 million US dollars (BOI, 2017:3).
Operational performance	The Masterplan prioritises human resource development as a key building block. The OEMs in Thailand are competitive.	The training interventions are aligned with specific technical skills required by industry. The industry adopts best practices to respond to rising cost pressures. The industry is adopting automation and newer technologies to be even more competitive.

Sources: (Thailand Automotive Institute, 2012:3; ASCCI, 2015b:5-8; ASCCI, 2016:17-19; BOI, 2017:2-6)

Table 3.7 showed that the success of the Thailand automotive industry has been driven by different themes. From inception, the Thailand automotive industry was aided by the government because they were able to respond rapidly to changing market conditions. Between 1994 and 2014, domestic light vehicle production increased by 347.8% from 420 000 units to 1 880 000 units. The world production ranking position of the Thailand automotive industry also increased. The following table highlights the production and world ranking position of Thailand from 2000 to 2020, and sales from 2005 to 2020.

Table 3.8: World production and ranking position of Thailand from 2000 to 2020, and sales from 2005 to 2020

Year	**Production**	**Sales**	**World production ranking**
2000	411 721	-	19th
2001	459 418	-	17th
2002	584 951	-	16th
2003	742 062	-	16th
2004	927 981	-	15th
2005	1 122 712	692 506	14th
2006	1 194 426	674 953	15th
2007	1 287 346	631 181	14th
2008	1 393 742	615 270	14th
2009	999 378	548 870	14th
2010	1 644 513	800 357	12th
2011	1 457 798	794 081	15th
2012	2 429 142	1 423 580	10th
2013	2 457 057	1 330 672	9th
2014	1 880 587	881 832	12th
2015	1 915 420	799 632	12th
2016	1 944 417	768 788	12th
2017	1 988 823	1 006 062	12th
2018	2 167 694	1 041 739	11th
2019	2 013 710	1 007 552	11th
2020	1 427 074	792 146	11th

Source: (OICA, 2022:1)

Table 3.8 exhibited that the Thailand automotive industry has been successful in growing their domestic automotive industry with a population size similar to South Africa. They manufactured more than one million vehicles in 2005 which is considered an international benchmark. South Africa is still struggling to attain this, however, the projection under the SAAM 2021-2035 is to achieve this between 2025 and 2030.

The lessons and opportunities that South Africa can learn from the Thailand automotive industry will be discussed next.

3.4.3 Lessons and opportunities from the success of the Thailand automotive industry

Every country in the world is searching for new innovate ways to promote their domestic automotive industries because of the myriad of economic benefits it brings to the country. South Africa is no different, in fact, the search is more intense because the domestic automotive industry is still relatively small compared to global standards. The analysis of Thailand's development trajectory can present some lessons and opportunities to act as a guideline in South Africa's future development. Table 3.9 discusses the central lessons and deductions derived, and based on these deductions, what opportunities it may have for the South African automotive industry.

Table 3.9: Lessons and deductions for the South African automotive industry

Central lesson	**Impact**	**Deduction**
Thailand's First-time Buyer Incentive (2011-2013)	The Thailand government aimed at promoting car ownership among low- and middle-income households and to stimulate economic growth through the automobile and related industries. Participants who met the criteria would receive 100 000 Thai Baht as rebate. Whilst this programme stimulated and increased sales in the first year, it had the opposite impact forthwith. The programme increased household debt and loan accounts and vehicle sales dropped.	The South African government does not have excess funding to support such a programme. The South African government could however reward first-time vehicle buyers with a tax or Value Added Tax (VAT) free incentive which will not only stimulate domestic sales but also rely on the contribution being yielded from fuel levies, toll fees, annual licencing fees, maintenance and service costs, and other taxes that contribute to the fiscus. What the government would be doing is to incentivise upfront to reap its yield over time. This approach could prove to be successful because domestic new vehicle sales will be stimulated contributing to the fiscus over time.
The Importance of the Domestic Market	Successive versions of Thailand's automotive industry policy stressed the importance of the domestic and export market in developing its domestic automotive manufacturing industry. Thailand's domestic market is central to the development of its automotive industry, and it is off the back of its domestic market strategy that it has positioned itself as both a CBU and CKD export hub.	High levels of protection and market shaping instruments push demand towards prioritised vehicle segments. South Africa's previous Motor Industry Development Programme (MIDP) and current Automotive Production Development Programme (APDP) aim to leverage the domestic market to enable increased production for a narrower set of platforms. These policy dispensations have yielded success in areas such as production growth and exports, but South Africa is still challenged by the high level of CBU imports, fragmented domestic market demand, investments in a diverse range of automotive technologies, lower effective levels of

		protection at various levels of the value chain and ultimately limited growth in local content (ASCCI, 2015b:9; ASCCI, 2016:33).
Alignment of Industrial and Trade Policy	Thailand's industrial and trade policies are closely linked. The alignment of policy instruments and development mechanisms appear to have been a catalyst in enabling this outcome. The successive versions of the Master plan focused on a single vision and associated objectives for the industry.	It could prove to be successful and advantageous that the South African automotive industry has a similar coordinating mechanism that articulates a single vision with associated objectives set for the industry. The vision must be clearly formulated, adequately resourced and attainable to ultimately lead to the success of the industry for the benefit of all stakeholders. The SAAM 2021-2035 is the new industry policy to articulate a single vision with associated objectives.
The Role of Regional Markets and Trade Agreements	It is important to note, and it has been mentioned previously, the domestic market anchored Thailand's automotive industry which then enabled it to become a preferred investment destination for Japanese automotive OEMs. Thailand's FTAs and trade agreements positioned it well to act as a hub for automotive manufacturing among the ASEAN economies.	South Africa as a single market is still relatively small in global terms and even with different forms of market shaping instruments, this will likely remain the case. The African continent, as discussed later in the chapter, presents itself as a viable, mutually beneficial, regional market for the South African automotive industry. Regional market integration is critical for growth of the industry where the reliance on government incentives to compete effectively in distant export markets will diminish. South Africa needs to optimise the fit between its domestic market and other countries in Africa.
Incentive Mechanisms	Thailand's incentives are aligned to the objectives outlined in the Masterplan. These incentives are designed to promote investments in the manufacturing of prioritised vehicle types and designated supplier parts.	Incentive mechanisms in South Africa need to be aligned and linked to the objectives of the SAAM 2021-2035. It needs to be simple and uncomplicated. The incentives' mechanisms need to be reviewed at regular intervals. The industry's contribution to attaining the set

		targets must be closely evaluated. If the industry fails to meet the milestones set for 2035, the industry's policy support framework will need to be fundamentally altered.
Human Resource Development in Support of Capability and Competitiveness	Thailand has consistently prioritised human resource development in support of establishing a capable and competitive domestic automotive industry and automotive supply base (ASCCI, 2016:36). The importance of human resource development was identified in the first Masterplan and followed through in the successive versions. Thailand and Japan have cooperated in the upgrading of skills development seeing that Japanese corporations made large scale investments in Thailand.	The challenges with human resource capability, capacity, and productivity are more serious in South Africa than in Thailand. Human capital is a fundamental factor in the determination of sustainable operational competitiveness. The vital role that human resource development plays in developing lower tier suppliers should be prioritised in future supplier development programmes. South Africa is not getting support from any other advanced economy; therefore, human resource development interventions must include direct cooperation with the public and private sectors.

Sources: (ASCCI, 2015b:8-12; ASCCI, 2016:26-36; BOI, 2017:2-6)

The African continent as a potential automotive marketplace will be discussed next.

3.5 Africa

3.5.1 Background

The African continent is the second fastest developing continent in the world, after Asia, and offers the highest return on investment of any region (AIEC, 2013:45; AIEC, 2020:43). The African growth rates have been growing substantially but manufacturing has not kept up. The level of industrialisation remains low, and manufacturing has decreased as a share of Gross Domestic Product (GDP) (Black, Makundi & McLennan, 2017:2). Industrialisation is linked to economic development, but in Africa this link remains weak. Africa's contribution to global manufacturing is approximately 2% and to global trade approximately 3% (AIEC, 2022:46). Africa's challenge is to move away from an economic growth pattern heavily reliant on consumption and commodity exports onto a more sustainable developmental path based on industrialisation. The importance of industrialisation cannot be overemphasised if the African continent is going to grow at a faster pace.

The African continent is the automotive industry's final frontier for growth (AIEC, 2020:50; AIEC, 2021:52). A considerable amount of business opportunities exists across the continent driven by an insatiable demand for Africa's resources, a rapidly growing population with an unprecedented rise in consumer demand, and the related infrastructural development. A large middle-class will grow across Sub-Saharan Africa over the next 15 years (Barnes, Black, Comrie & Hartogh, 2018b:24). It is anticipated that the middle class in Sub-Saharan Africa will grow from 137 million in 2009 to 341 million by 2030, an anticipated growth rate of 149%. This substantiates that the Sub-Saharan African market will play a critical role in the demand of new vehicles across the spectrum of passenger vehicles, Light Commercial Vehicles (LCVs), medium and heavy commercial vehicles, and motorcycles (Barnes et al., 2018b:26).

As the continent becomes more populous, companies that have been entrenched in Africa will be able to sell faster into the expanding African markets. The early investors in Africa would have cemented the foundation and will have a competitive advantage of domestic market knowledge, established relationships, and deep distribution channels to outcompete rivals who invest later (AIEC, 2019:50; AIEC, 2021:54). There is no single strategy which can be duplicated in each country, each African country is independent which require companies to develop specific business strategies. The African continent is seen as a gateway for growth in automotive vehicle production and consumption. The mobility needs of the African middle class are rapidly growing.

There is immense potential for new vehicle optimisation as afrilennials, opposed to millennials, still desire to have their own vehicles (AIEC, 2019:50). They are the first generation of the middle class that is actively in asset-catch-up mode. Africa's estimated vehicle parc was approximately 52.5 million units (AIEC, 2021:52). The following table shows how Africa's and the global average motorisation and GDP growth rate changed from 2005 to 2021.

Table 3.10: Africa's and the global average motorisation rate from 2005 to 2021

Year	**Africa's motorisation rate**	**Global average motorisation rate**	**Africa's GDP growth rate**	**Global GDP growth rate**
2005	27/1000	133/1000	4.9%	3.9%
2014	41/1000	178/1000	4.84%	2.87%
2021	45/1000	203/1000	5.86%	5.88%

Source: (Black, Makundi & McLennan, 2017:5; OICA, 2022:1; Statista, 2022:1)

Table 3.10 states that in the decade from 2005 to 2015, Africa's motorisation rate increased by 34.15% but in the following decade until 2021, it only increased by 8.89%. This must be compared with the average global motorisation growth rates of 25.28% and 12.32% for the same time periods. Merven, Stone, Hughes and Cohen (2012:32) postulate that there is a close relationship between the motorisation rate and GDP per capita income globally. Africa's lower motorisation growth rate since 2014 can be attributed to lower purchasing power (a modest increase of 1.02% in GDP) and the impact of the COVID-19 pandemic (AIEC, 2021:52). These factors have impacted Africa more severely and, as such, Africa's motorisation rate of 45 vehicles per 1 000 people in 2021 is far lower than the global average of 203 vehicles per 1000 people (AIEC, 2022:45).

3.5.2 Africa's position in the global automotive environment

Over the past decade, the African continent has gained much attention from the global automotive OEMs and a broad range of automotive stakeholders (AIEC, 2018:40; AIEC, 2020:43). The African continent represents an untapped opportunity for the global automotive OEMs to broaden their business seeing that there is a potential of 850 million consumers, a steady rise in consumer spending, and new vehicle sales are estimated to reach two million units in the next five to ten years (AIEC, 2019:50; AIEC, 2021:52). The following table shows Africa's vehicle production and sales from 2011 to 2021.

Table 3.11: Africa's vehicle production from 2011 to 2021

Year	**Vehicle Production**	**New Vehicle Sales**
2011	556 637	1 446 927
2012	586 396	1 569 463
2013	625 655	1 653 587
2014	719 608	1 717 921
2015	960 305	1 577 535
2016	1 025 292	1 315 163
2017	1 003 859	1 195 765
2018	1 102 036	1 235 507
2019	1 105 147	1 177 247
2020	800 001	924 046
2021	931 056	1 150 000

Source: (OICA, 2022:1)

Table 3.11 highlighted that from 2015 to 2021 there had been no growth in new vehicle sales in Africa, hence the low motorisation rate. This can be attributed to various reasons such as low purchasing power, low road infrastructure, an absence of suitable vehicle financing options, fierce competition from low-cost imported used vehicles, and an underperforming GDP in two of the largest economies in Africa; South Africa and

Nigeria (AIEC, 2017:46; AIEC, 2019:50; AIEC, 2021:49; AIEC, 2022:45). The COVID-19 pandemic has had a crippling impact on new vehicle sales in Africa with a decline of 22.46% from 2019 to 2020 (AIEC, 2021:52). Africa's total production declined by almost 35% while new vehicle sales declined by almost 23%. According to the AIEC (2021:52), there was a 3.7% year-on-year decline in Africa's Sub-Saharan economies because of the global COVID-19 pandemic which plunged Africa into its first recession in 25 years. The pandemic zoomed in on the heavy reliance on high commodity prices and the export of raw materials which did not play too well as economies across the world were shut down. It reiterated the growing importance of industrialisation on the African continent and the shift towards alternate growth prospects.

Africa remains vital to the South African automotive industry, and the industry plays a key role in the industrialisation efforts happening on the African continent. Africa was the second largest export region for the South African automotive industry, accounting for R34.96 billion (16.8%) of South Africa's total automotive exports of R207.5 billion in 2021 (AIEC, 2022:45). The African continent's market share comprised 1.16% of global vehicle production in 2021 (AIEC, 2022:45). This means that there is still a considerable growth potential for selling new vehicles in Africa. The main new African vehicle markets were represented by South Africa and the northern African countries. South Africa, with 499 087 units, accounted for 53.6% of Africa's total vehicle production, while Morocco with 403 007 units, Egypt with 23 754 units, and Algeria with 5 208 units accounted for the balance (AIEC, 2022:45). The African new vehicle consumer market with all its potential still needs to be unlocked. Vehicle financing options are still limited and brutal competition with low-cost imported used vehicles are weighing down new vehicle sales.

Two economic challenges are dampening growth in Africa. The first economic challenge is that each African country needs to be analysed independently to determine whether they have a regulatory business environment which is critical to OEMs investing large sums of money in setting up a manufacturing or assembly plant (AIEC, 2022:46). The other economic challenge is the competition with the second-hand vehicle market because the duties on new vehicles exceed those of the used car market and there is no incentive to stimulate new car sales. Second-hand and grey vehicle imports constitute more than 80% of vehicle sales in Africa (AIEC, 2021:78). The primary regions where these vehicles originate from are the United States of America (USA), Europe, and Japan because there is a lack in regulatory policy in Africa that prohibits these imports (AIEC, 2020:49; AIEC, 2021:53). There are twenty-two African countries that have no restrictions on importing second-hand vehicles, while twenty-seven countries have age limits of between three and fifteen years on the vehicles they import.

Passenger car imports still dominate most African markets but there is a decline from 2014. The aim is to get an acceptable ratio which enables integrated automotive manufacturing, whilst ensuring the safety of the consumer without major disruption to the existing used-car market. Ultimately, all second-hand vehicles should come from vehicles that were assembled on the continent, or alternatively, they should have been imported as new vehicles as part of an automotive programme. South Africa and northern African countries do not allow the importation of used vehicles; thus, the reason for the successful growth and development of their automotive industries (AIEC, 2022:26). By getting consumers to buy new vehicles in the domestic market, has a ripple effect amongst the entire value chain with many spillover benefits to the economy. Many African countries have now realised the value of an automotive manufacturing sector and have developed policies to counteract the heavy importation of used vehicles into the domestic markets. Economic growth underpinned by political and policy stability is a pre-requisite for these prospects to occur.

South Africa's position in the African continent will be discussed next.

3.5.3 South Africa's position in the African continent

In Sub-Saharan Africa, South Africa is the only country whose vehicle manufacturing has reached the scale of being able to independently drive a cumulative process of linkage building (AIEC, 2022:47). The expertise developed in South Africa and its advantageous geographic location, positions it well to benefit from the higher demand of vehicles and automotive components on the continent. South Africa's closer proximity to African countries than other emerging markets, and the skill and deep knowledge of business conditions and practices between African countries entrench South Africa's role of being the best suited partner in becoming more involved with semi-knocked down assembly operations on the continent (AIEC, 2022:50). South Africa is also conducting a teaching and knowledge sharing role regarding car assembly operations in their industrialisation policies on the African continent.

The focus on Africa and the importance of regional integration and trade is synchronised with the aim of the SAAM 2021–2035. Regional economic integration exists when countries that are in the same geographical region form a treaty or membership (Hill, 2014:256; Wild & Wild, 2016:230). Member nations pursue regional economic integration to increase trade and investment which will increase the standard of living of the people in their country (Lamprecht & Tolmay, 2017:132; AIEC, 2021:53). Regional economic integration is critical to the future development of South Africa's automotive industry (Barnes & Black, 2017:5; AIEC, 2022:46). One of the conditions for vehicle manufacturing is a viable automotive space. For countries that neither constitute large markets nor adjoin such markets, an automotive space could take the form of a regional market where regional trade agreements allow easier market access to member states which effectively broadens the market (Black et al., 2017:17).

South Africa has the potential to be the gateway for Africa and its economic prospects are becoming more involved with the rest of the African continent (NAAMSA, 2018:13; AIEC, 2021:57). South Africa continues to actively participate in the African processes and continues to work together with other African countries in pursuing the development of the continent. The four main African trade arrangements that South Africa is involved with include the Southern African Customs Union (SACU), the Southern African Development Community (SADC), the Tripartite Free Trade Area (TFTA) (which includes SADC, East African Community, and Economic Community of West African States), and the African Continental Free Trade Area (AfCFTA). South Africa is geographically advantaged to pursue regional integration with the African market. Regional integration has been making slow but steady progress in Sub-Saharan Africa because the core objective is to improve the prospects of industrialisation by growing regional markets. One of the major impediments hindering the integration of the industry, is the costs of trade diversion which is substantial because of the large presence of low-priced second-hand vehicles in most African markets (Black et al., 2017:2; AIEC, 2021:57).

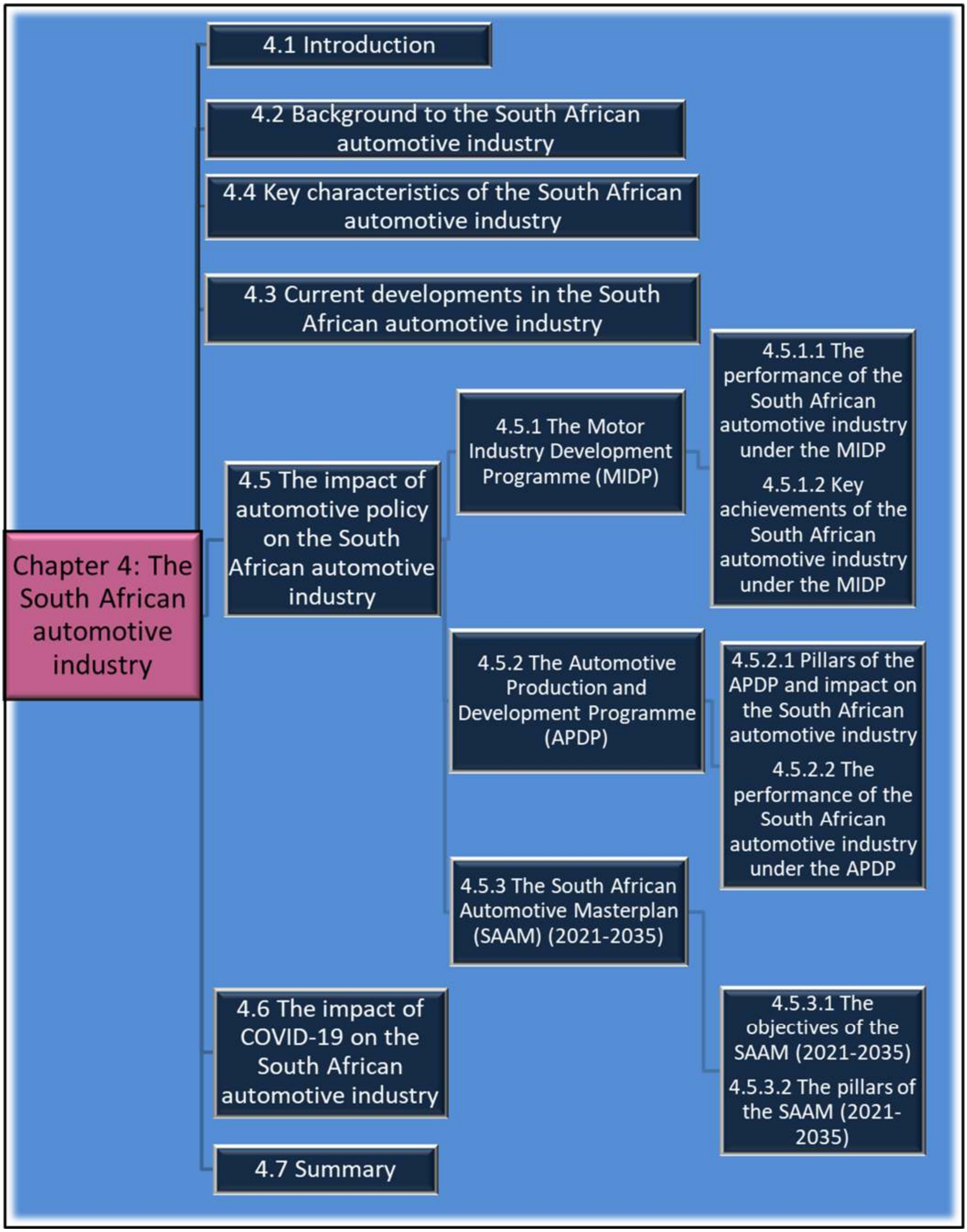
It will be in South Africa's interest to develop the new car market in Africa and to be part of a larger automotive regional production system. The aim is, therefore, the establishment of a Sub-Saharan African automotive development plan or automotive pact, built around South Africa, Nigeria, Kenya, Ghana, and potentially, one or two other larger economies (AIEC, 2021:53). The proposed African automotive pact will harness greater cooperation between key African countries to develop the consumer market on the continent, to increase the production capacity across a few hubs on the continent, and sourcing components from a wider pool of countries.

South Africa participates in the SADC which consists of fifteen Sub-Saharan African countries and provides accessibility to a market of approximately 363 million people and an estimated GDP of 627 billion US dollars (AIEC, 2022:50). Automotive exports to eight of the fifteen countries that make up the SADC topped the R1 billion mark in 2021 (AIEC, 2022:50). Integration within the TFTA is also very critical because it consists of twenty-six countries with a population of 740 million and a combined GDP of 1.3 trillion US dollars (AIEC, 2020:54). The aim of the TFTA is to amalgamate markets into a single unified market. The main benefit of the TFTA is a larger, growing regional market that transcends the small size of national economies, achieves economies of scale benefits, and provides a basis for intra-regional trade (AIEC, 2020:54). The TFTA is not only a fundamental pillar in supporting regional integration in Africa, but it is also a critical component for the AfCFTA.

The AfCFTA will amalgamate all African countries with a GDP of more than 3 trillion US dollars and a combined population of 1.3 billion people (AIEC, 2022:46). A larger market, economies of scale benefits in the production and selling of automotive products, and improved prospects of the African continent to attract investments are envisaged under the AfCFTA. There will be new export opportunities for South African automotive products in West and North Africa. The AfCFTA will promote the movement of goods and services among African countries which will result in the streamlining of customs documentation and processes enhancing trade facilitation (AIEC, 2022:46). The AfCFTA will combine market integration with industrial and infrastructure development to address Africa's productive capacity and supply related constraints, diversify the export base from reliance on raw materials to value-added products, and seek to improve the infrastructure deficit (AIEC, 2022:46). For South African based OEMs, exports to regional markets present an attractive proposition that needs to be exploited to attain higher volumes and economies of scale in the manufacturing of new vehicles. Africa is vital for the future of the domestic OEMs so that both South Africa and Africa can thrive.

3.6 Summary

Chapter 3 focused on the global and the African automotive environments. It highlighted the major changes which occurred, and which are heavily impacting the future of the industry. The Australian automotive industry was briefly discussed to ascertain which lessons South Africa can learn from the demise of their automotive industry in 2017. The Thailand automotive industry was then discussed to provide an insight into why the Thailand automotive industry is more successful than South Africa's even though both automotive industries had a similar manifestation. The chapter then went on to discuss Africa and the importance of the continent as a growing market. The chapter highlighted Africa's position in the global automotive environment and then South Africa's position in Africa. The importance of Africa to South Africa cannot be overemphasised if South Africa intends to substantially grow their domestic automotive industry. The African continent represents the final frontier for growth in the automotive industry and presents an untapped opportunity for the global automotive OEMs wanting to pursue growth. The following chapter will discuss the South African automotive industry in greater detail.



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Chapter 4

The South African Automotive Industry

4.1 Introduction

Chapter 3 concentrated in detail on the global and African automotive environment. Chapter 4 focuses on the South African automotive industry and provides a background to the origins thereof. The current developments in the South African automotive industry are discussed, highlighting the country's position in the global automotive environment. The key characteristics of the South African automotive industry are then discussed. The automotive policy regimes are very important in the South African context, and the impact thereof on the South African automotive industry is discussed starting with the implementation of the Motor Industry Development Programme (MIDP). The performance of the South African automotive industry under the MIDP and the key achievements attained under the MIDP will be highlighted. A discussion on the Automotive Production and Development Programme (APDP) follows where the pillars of the APDP and the performance of the South African automotive industry under the APDP is explained to highlight the position of the South African automotive industry. Thereafter, the South African Automotive Masterplan (SAAM) 2021-2035 is discussed, highlighting the new policy framework for the South African automotive industry by expounding on the objectives, the vision, and the pillars of the SAAM 2021-2035. Finally, the effect of the Coronavirus Disease 2019 (COVID-19) and its impact on the South African automotive industry is discussed considering the industry's position in the global automotive environment. The chapter provides a greater understanding of the South African automotive industry and how it interacts within the global automotive environment.

4.2 Background to the South African automotive industry

The South African automotive industry's developmental roots started from the introduction of tariffs during the early part of the 20th century and was inwards focused

(Automotive Industry Export Council, 2013:14). In South Africa, automotive manufacturing started in the 1920s. From inception, the South African government attempted to localise automotive vehicle manufacturing and component production. Automotive Original Equipment Manufacturers (OEMs) expanded their operations into South Africa because they anticipated tariff protection from the government (Barnes & Kaplinsky, 2000:798; Barnes & Morris, 2008:32). This became a reality from the mid-1920s when the government opted in favour of tariff protection to develop the local industry (Barnes, 2013:239). According to the Automotive Industry Export Council (AIEC) (2013:14), under the six local content programmes from 1961 to 1995, high tariffs were placed on Completely Built-Up Units (CBUs) which, when joined with a fast-growing market, resulted in many foreign owned OEMs establishing assembly plants in the domestic market. These foreign owned OEMs were mostly American, Japanese, and German. The minuscule level of value added by the domestic automotive industry made the government focus on the sector because it contributed 15% of total imports in 1960, and it offered the growth potential and synergies to other secondary and tertiary industries in South Africa (Barnes & Kaplinsky, 2000:798).

The MIDP, implemented on 1 September 1995, was the next big step in government intervention. The programme accounted for the international realities facing the automotive industry in South Africa at the time, namely trade liberalisation, globalisation of markets because of rapid technological change, demanding customer expectations, and markets which were constantly evolving (Barnes & Black, 2013:3). The implementation of the MIDP was meant to substantially heighten the global competitiveness of the domestic automotive industry which would ultimately result in the increased exports of CBUs and automotive components (Barnes, Black & Monaco, 2018a:3). The key strategies of the MIDP were to reduce protection whilst providing export assistance, which was obtained from the ability to offset import duties. By simultaneously reducing tariffs and promoting exports, the government targeted to achieve a higher degree of specialisation, increase economies of scale, and attain a greater level of productivity to raise the competitiveness of the domestic automotive industry (Barnes et al., 2018a:3). There has been an evolution of structural changes in the South African automotive industry ever since the MIDP was implemented. The industry has evolved to become the leading manufacturing sector in the country's economy (AIEC, 2013:17-18). The APDP, implemented in 2013, represented the next phase of elevating the industry to a higher level. The APDP did not achieve all its stated objectives and terminated in 2020. The SAAM 2021-2035 will provide the next phase of long-term policy certainty for the industry and will aim to elevate the industry to a higher level.

The current developments in the South African automotive industry will be discussed next and represents the core focus of the study.

4.3 Current developments in the South African automotive industry

The South African automotive industry can be regarded as a strategic South African asset and government recognises the critical importance of the automotive industry to spur economic development in the economy (Autolive June issue, 2019:3; AIEC, 2020:109). This is premised on its evidential contribution to export earnings, employment, and Gross Domestic Product (GDP) growth. Because the automotive industry is of extreme importance to the country's economy, the SAAM 2021-2035, and other key interventions in a variety of specialist fields, will seek to create a framework which aims to attract large sums of investments and scale up production in vehicles and automotive components to heighten the overall competitiveness of the South African automotive industry (AIEC, 2021:107). The competitiveness of the South African automotive industry is dependent on a myriad of factors whereof most are exogenous and outside the control of the automobile manufacturer. Table 4.1 shows the total sales of new vehicles in South Africa from 2005 to 2021.

Table 4.1: Total sales of new vehicles in South Africa from 2005 to 2021

Year	Total sales (Units)
2005	617 406
2006	714 315
2007	676 108
2008	533 387
2009	395 222
2010	492 907
2011	572 241
2012	623 921
2013	650 745
2014	644 504
2015	617 749
2016	547 406
2017	547 406
2018	552 227
2019	536 612
2020	380 207
2021	464 493

Source: (OICA, 2022:1)

Table 4.1 revealed the total sales figures for the South African automotive industry. Since 2013, there has been a decline in new vehicle sales owing to various factors, such as the slowdown in the domestic economy, increases in interest rates, inflationary pressures because of a weakening rand and consumers disposable income under severe pressure (AIEC, 2016:9; AIEC, 2017:16; AIEC, 2019:14). The effects of the COVID-19 pandemic resulted in a sharp decline in new vehicle sales from 2019 to 2020 (AIEC, 2021:16). A robust recovery of 22.2% in 2021 new vehicle sales highlighted the resilience of the South African automotive industry factoring the supply chain disruptions and insufficient model availability because of the global semi-conductor shortage that impacted the industry. The South African automotive industry, being integrated into the global automotive environment, is constantly changing and requires adapting to these changes to remain competitive. South Africa needs to compete relentlessly, and its competitiveness should be based on the effective management of its sources of competitive advantage (Du Plessis, Saayman & Van der Merwe, 2017:1). In line with the topic of the research, the favourable and unfavourable factors which impact the South African new vehicle market will now be discussed to highlight its sources of competitive advantage. Porter's five force model, as discussed in chapter 2, will be applied where applicable to establish the attractiveness of the South African automotive industry.

4.3.1 Favourable factors

- A strong performance of the South African economy. This factor could be either favourable or unfavourable depending on the economic climate of the country. South Africa's new vehicle sales are closely linked to the overall performance of the country's economy (AIEC, 2021:16). Economic growth of 3% translates into higher new vehicle sales because more people have additional disposable income which can be used to purchase new vehicles whilst an underperforming GDP has the opposite effect. The Absa Purchasing Managers Index (PMI) indicates the level of economic activity in a particular month where a value of 50 indicates no change, more than 50 indicates higher levels of economic activity and less than 50 indicates lower levels of economic activity. The average PMI value for 2020 and 2021 was 45 and 55 respectively, indicating a poor trading environment with low economic activity in South Africa (Autolive October issue, 2019:3; Tradingeconomics, 2022:1).

- Industrial policy. This factor is favourable because industrial policies, such as the previous MIDP and APDP, promote domestic OEMs to manufacture an increased number of selected volumes correlated to export contracts to achieve economies of scale. By pursuing this strategy, the domestic market model mix can be complemented with the low volume of imported models. These incentives helped to increase the competitiveness of the South African automotive industry by allowing domestic OEMs to rationalise platforms, increase production volumes, and thereby increasing competitiveness to facilitate exports (AIEC, 2013:20). The incentives were also being used for viable projects to compete with other vehicle manufacturing countries, and to offset some of the costs, such as the high logistical costs incurred when exporting South African assembled vehicles. South Africa's new vehicle sales benefitted from these incentives because it increased the competitiveness of the domestic based automotive OEMs which became integrated into the global sourcing strategies of the head offices.

- Consumer and business confidence levels can be linked to the buying power of buyers. This factor could either be favourable or unfavourable depending on the economic climate of the country. The current climate can be described as a consumption-based society with consumer confidence being a major driver (Autolive July issue, 2019:4). In 2021, the average business confidence level was 43 and the average consumer confidence level was -10 which is far below the 50 point no change level (Tradingeconomics, 2022:1). Business and consumer confidence levels are critical to new vehicle sales because South Africans need to feel safe that they can meet their debt obligations once they signed for a new vehicle. Low consumer confidence levels have a direct impact on whether a consumer will consider entering the buying cycle or wait for economic conditions to improve (TransUnion, 2019:1). If consumer and business confidence levels increase, new vehicle sales will be positively impacted because as consumers increase expenditure, the South African economy grows (Autolive October issue, 2019:3).

- A competitive trading environment can be linked to competitive rivalry between existing competitor organisations. This factor is favourable in the South African context as it has one of the most competitive trading environments in the world (AIEC, 2022:16). The domestic model mix is meant to satisfy a consumer driven market by providing a combination of domestically manufactured and imported models to the South African car market in a cost-effective way (AIEC, 2022:25). In 2021, 262 281 new light vehicles (passenger cars and LCVs) were imported to South Africa and comprised 60% of total light vehicle sales (AIEC, 2022:26). In 2021, 78.3% of passenger cars and 18.1% of LCVs sold in South Africa were imported (AIEC, 2022:26).

In terms of customer satisfaction levels on new vehicle purchases, Toyota dominated the vehicle quality survey in 2021 (AIEC, 2022:16). Chapter 2 discussed the marketing strategy process where strategic customer relationship management are one of the activities used to attain customer loyalty. These vehicle manufacturers' consistent efforts should be recognised because they ensure that South African motorists have world class products and getting value for their money.

The above factors can be sources of a sustainable competitive advantage for the South African new vehicle market.

4.3.2 Unfavourable factors

- Vehicle affordability can be linked to the bargaining power of suppliers. This factor could be favourable or unfavourable depending on the South African economy. Vehicle affordability is a serious problem for the South African new vehicle market owing to a host of associated costs, such as inflation, higher interest rates, fuel costs, insurance, and toll road and licensing fees which are driving up new vehicles' prices and putting pressure on households' disposable income (Automobil, 2016:10; AIEC, 2019:14). The result is that consumers are struggling with the affordability of new vehicles and are either downgrading by buying more affordable models or buying used cars. Table 1 in Appendix A highlights the macroeconomic indicators and changes for the South African automotive industry for 2017, 2018, 2019 and 2020. Table 1 in Appendix A indicates that the price increases of new and used vehicles are below the Consumer Price Index (CPI) and domestic OEMs are trimming heavy price increases to stimulate the beleaguered domestic market. In 2020, the most price-sensitive new vehicle price range is from R214 200 to R303 283, with a price elasticity of -1.95 which means a 1% price increase in this range results in a 1.95% decrease in demand (AIEC, 2021:16).

Table 1 in Appendix A shows the new to used vehicle ratio. In 2021, the ratio was 1:2.3 which meant that for every new vehicle being financed, 2.3 used vehicles were being financed (AIEC, 2022:15). According to TransUnion (2021:3), in 2020, the percentage of new and used vehicles being financed below R200 000 stood at 34.50% and a higher portion of this was for used vehicles. Vehicle finance between R200 000 to R300 000 and over R300 000 was relatively stable at 28.25% and 37.25% respectively. However, the number of finance deals has been declining from 2018 (TransUnion, 2019:2). According to TransUnion (2020:2), new vehicle finance deals declined by 7% while used vehicle finance deals declined by 15% in 2019 compared to 2018. According to TransUnion (2021:2), the trend continued in 2020 with new vehicle finance deals declining by a substantial 21.5% and used vehicles declining by 18.35%. Improving vehicle affordability in South Africa's new vehicle market could potentially have a positive impact on new vehicle demand and on the South African economy at large.

- Vehicle taxation. This factor is unfavourable. Vehicle taxation is a major factor impinging on the South African new vehicle market because it directly impacts the pricing of the vehicle. Harsh government taxes contribute to the final price of new vehicles. The taxes on an entry level vehicle amounts to almost 18% and this rises to as much as 42% on premium brands, which are vehicles costing between R200 000 to R900 000 (Engineeringnews, 2018b; Autolive February issue, 2019:1). The tax portion on luxury vehicles, i.e., vehicles costing more than R900 000, is even higher than 42% and this is a major contributor that significantly hampers the growth of the South African automotive industry's domestic market (Engineeringnews, 2018b; Autolive February issue, 2019:1). According to the South African Revenue Services (SARS) (2014:1-4), the Autolive February issue (2019:1), the National Association of Automobile Manufacturers of South Africa (NAAMSA) (2019:4), and Barnes, Grant & Ndlovu (2020:20-22), the taxes on new vehicles include:

Value Added Tax (VAT) at 15%. On a value of R100 000, the VAT is R15 000. As the value increases, the VAT portion increases.

Ad valorem (a Latin term meaning “on the value”) excise tax. Tables 2, 3, 4, and 5 in Appendix A are examples of how ad valorem excise tax is calculated on locally manufactured vehicles and imported vehicles (SARS, 2017:2-8). The higher the value of the vehicle, the higher the excise duty rate.

Carbon tax (CO_2). The levy on CO_2 emissions is determined by the vehicle category type, with CO_2 emissions level exceeding 95g/km and then multiplying this by the levy rate of R120 g/km for passenger cars or R160g/km for double cab light commercial vehicles to get the environmental levy payable. Table 6 in Appendix A provides a calculation of how much environmental levy is payable owing to excess emissions in a vehicle category.

Tyre tax. The rates for the environmental levy on tyres are R2.30/kg. So, vehicles with larger size tyres are charged more.

Fuel levies. In 2019, consumers paid R5.63/litre indirect taxes for petrol, and R5.49/litre for diesel. These indirect taxes comprise of the general fuel levy, customs and excise, and the road accident fund.

Interest. Many new vehicle buyers must pay interest as these taxes are included in their finance agreement. Table 7 in Appendix A provides a calculation of how much interest is payable using a prime interest rate of 10%.

Government needs to take drastic actions to stimulate the retail sales market across all sectors of the economy. This high tax structure makes new vehicle ownership increasingly difficult for many consumers (Autolive February issue, 2019:1). It is because of the high tax structure on new vehicles that South African manufactured vehicles are perceived as more expensive domestically than similar models exported and sold on international markets. Exported vehicles can, therefore, cost up to 50% less than what they would cost on the domestic market (Pawnmycar, 2017:1).

- Logistics costs. This factor is unfavourable. A country's competitiveness can be severely hampered by uncompetitive and high logistical costs (Havenga, Simpson, De Bod & Viljoen, 2014:1; Jacobs, Viviers & Steenkamp, 2014:16). There is an intrinsic link between a country's logistical costs and its productivity, competitiveness, and sustainable economic growth (Havenga et al., 2014:1; Jacobs et al., 2014:16). Logistics' performance is important for a country's economic growth and refers to cost, time, and complexity in completing import and export activities. According to Engineeringnews (2018h), South Africa dropped in the overall ranking of the logistics performance index from 20th position in 2016, to 33rd in 2018 out of 160 countries. South Africa's cargo dues on automotive vehicles and components are 149% higher than the global average (Ports Regulator, 2019:23). South Africa can be considered a transport intensive country and requires increasing levels of transport efficiency and effectiveness. A large portion of the economic activity occurs in Gauteng which is inland. This means that raw materials, components, and other parts used for automotive production need to be transported inland and to the major maritime ports thereby raising the inbound logistics costs.

  South Africa's automotive industry is situated in a poor geographical location if compared to the main automotive markets of the world (Kruss, McGrath, Peterson & Gastrow, 2015:26; AIEC, 2021:51). Regarding its international sources of supply and demand, South Africa is in a precarious position because it is also becoming highly export orientated. This means that a large portion of its production components are imported from countries such as Germany, Japan, and Thailand, while vehicle exports mostly go to the United Kingdom (UK), Japan, Germany, and France. These trading partners are quite a far distance away from South Africa, thereby compounding the outbound logistical costs faced by domestic manufacturers. Logistical costs are having a major negative impact on domestic new vehicle sales and on the competitiveness levels of the vehicle manufacturers (Autolive August issue, 2021:5).

- Labour costs. This factor could be favourable or unfavourable depending on wage agreements which must be matched with productivity. There is an abundant and cost-competitive labour pool in South Africa (AIEC, 2019:55). The threat of excessive wage demands by labour unions is, however, challenging.

- Exchange rate volatility. This factor could be favourable or unfavourable. The fluctuation of the exchange rate has an impact on the cost of imported raw materials and components used for automotive production. There is a higher cost for importing the premium brand vehicles where a large percentage of the models must be imported. It is for these reasons that the objective of the SAAM, regarding raising local content levels to over 60% in South African assembled vehicles, mitigates the dependency on a strong local currency. South African imports of automotive products are a function of (AIEC, 2021:76):

  The success of the APDP. The degree of imports is because of the success of the APDP because the benefits can only be used to offset the import duties on imported vehicles and eligible components.

  Domestic market demand. South Africa's domestic demand is met with a variety of domestic and imported vehicles. To offer imported vehicles at the best prices, the domestic automotive OEMs require the most favourable import duties. As such, the vehicles manufactured by the domestic OEMs are not necessarily meant for domestic sales but rather for the export market which will generate import credits to import the vehicles demanded by the local market.

  Exchange rate movements. The rand strengthened against other major currencies in 2021 (AIEC, 2022:68). The reaction of the rand to other currencies is important because of South African imports' source countries. In 2021, Germany remained the top imports country with over R51 billion worth of imports (AIEC, 2022:69). The rand appreciated against the euro by 6.9% on an annual average basis in 2021 (AIEC, 2022:68). This meant that imports from Germany decreased domestically manufactured vehicles' costing which ultimately impacted the vehicle's final price.

- Purchasing patterns and trends can be linked to both the threat from potential new entrants and possible substitute products. This factor could be favourable or unfavourable depending on the economic climate of the South African economy. The 2021 South African car market is characterised by a downgrading trend, moving away from the premium market segment in favour of entry level vehicles, Sports Utility Vehicles (SUVs), and cross overs (AIEC, 2022:15). Over the past two decades, the South African market changed with motorists opting to drive LCVs, such as bakkies, because it serves several purposes, i.e., leisure, commercial applications as well as safety and durability on deteriorating road infrastructure. The threat of the shutdown of internal combustion engine technology due to growing global green growth consensus means that South Africa will need to embrace Electric Vehicle (EV) technology at a faster pace. Domestic OEMs will need to upgrade their manufacturing facilities to keep with up competitors importing EVs into the domestic market.

- Government administered service costs. This factor is unfavourable. The security and stability of South Africa's electricity supply is a major production factor for the automotive OEMs. Since 2008, when load-shedding started, electricity saw a shortage of supply and a sharp rise in cost. This was because of large tariff increases which were needed to settle the capital expenditure used in upgrading and expanding the national grid. From 2007 to 2017, tariffs increased by 356% and is expected to rise to 490% by 2021 (mybroadband, 2019). Load-shedding, shortage of supply, and constant tariff increases have taken a toll on the entire South African automotive industry and impacted on its competitiveness (Autolive August issue, 2021:5).

Chapter 2 discussed the marketing strategy process where the above unfavourable factors are linked. The market-driven program development discussed pricing strategy as one of the key activities. Price is a critical factor in positioning a product such as a new vehicle. Chapter 2 highlights that the labour force as one of the marketing variables is very important in the marketing mix. The domestic automotive industry is in a rather peculiar position because it needs to be price competitive to achieve growth in the new vehicle market. However, being price competitive is challenging because of the factors that affect and contribute to the final price of a vehicle. This means that, on top of exports, South Africa will need to sell many more new vehicles domestically because 1% of the total global production will equate to almost 1.4 million vehicles. The only way that South Africa can achieve this is to promote the factors that increase sales of new vehicles and to demote the factors that weigh down on new vehicle sales. It is only with the total collaboration between all stakeholders, such as government, business, and labour that the South African automotive industry can achieve the aspirations set out in the SAAM 2021-2035.

The key characteristics of the South African automotive industry will be discussed next.

4.4 Key characteristics of the South African automotive industry

The key characteristics of the South African automotive industry can be synchronised to Porter's diamond model on the national competitive advantage which was discussed in chapter 2.

Firm strategy, structure, and rivalry. The automotive industry is the most important and leading manufacturing industry in South Africa (Barnes, Black, Comrie & Hartogh, 2018b:5). The automotive industry makes a significant contribution to the country's economy because of a wide range of industrial activity occurring in South Africa. In 2021, the manufacturing of automotive vehicles and components contributed 4.3% to South Africa's national GDP, commanded a market share of 0.62%, and ranked 21st in global vehicle manufacturing (AIEC, 2022:6). There are seven light vehicle manufacturers (passenger cars and LCVs) in the South African automotive industry. Three OEMs have expanded their activities to include the assembly of medium and heavy commercial vehicles. The South African automotive trading environment is extremely competitive and by the end of 2021, South Africa had a vehicle parc (number of registered vehicles) of 12.96 million, whereof 7.65 million (59%) constituted passenger cars (AIEC, 2022:16). In 2021, the average age of the passenger car parc was 10 years and three months (AIEC, 2022:16). South Africa is regarded globally as a second-tier player with production below one million units. The term, second-tier supplier, refers to the group of countries that produces less than one million vehicles annually. The ambition, under the SAAM 2021-2035, is to move South Africa from a second-tier player to a first-tier player. It could ensure that South Africa could be shortlisted for new generation models, especially with the move to Electric Vehicles, and could, in future, receive larger investments in terms of scale of production.

Demand. South Africa's liberalised trading environment is having a significant effect on the country's growth and future prosperity. Growth within the domestic automotive industry is dependent on certain requirements. There needs to be an efficient business platform to drive the industry to become progressively and internationally more competitive, exports need to grow, economic growth needs to be stimulated, and jobs need to be created. A key feature of the South African automotive industry is the way government, along with industry, constructively cooperate to optimise the contribution of the automotive industry to the economy under the Trade Related and Investment Measure (TRIM) (AIEC, 2022:32). The TRIM allows safe and secure Foreign Direct Investment (FDI) and allows duty rebates for localisation activities. The South African new vehicle market is still relatively small and foreign investors seeking higher returns are investing in the domestic economy because of future good potential. Chapter 2 discussed FDI. In 2020, South Africa recorded its highest level of FDI in the domestic automotive industry with an amount of R9.2 billion (AIEC, 2022:6). The seven automotive OEMs invested R8.8 billion in 2021, which is the second highest annual figure on record (AIEC, 2022:6). The component sector more than doubled their investment in South Africa from R2.4 billion in 2020 to a significant R5.7 billion in 2021 (AIEC, 2022:6). In 2021, Ford's USA head office announced a 1.1 billion US dollar investment in South Africa to produce the new Ranger, thus marking the largest investment ever made by Ford in South Africa.

Related and supporting industries. South Africa is the African continent's most sophisticated economy and considered as one of the most diversified exporting countries globally. The continued health of the domestic automotive industry cannot be overemphasised and is of utmost importance to the entire manufacturing industry in South Africa. The South African automotive industry is, therefore, a vital sector in the economy owing to its many synergies to other industries which depend on the success of the domestic automotive industry. The South African automotive industry establishes inter-industry links with the primary and tertiary sectors and is closely related to other manufacturing sub-sectors, such as leather, aluminium, stainless steel, textiles, and plastics, amongst others. The South African automotive manufacturing industry remains the most important manufacturing sector in the country because it is a key driver for economic growth and development (AIEC, 2020:106). Key pillars of the SAAM 2021-2035 are discussed later in this chapter but it aims to heighten supplier development through localisation, industry transformation, and the development of industry required technology and skills.

Factor conditions. The South African economy is in a strong position because of the diversity and variety of sectors and industries. South Africa is the African continent's industrial and financial super-power. In 2021, South Africa accounted for 53.6% of all vehicle manufacturing in Africa and represented the largest domestic market for vehicles (AIEC, 2022:36). South Africa, as the continent's economic muscle, is in an advantaged position to act as a base for investors to gain access into the increasingly growing African economies. South Africa has an abundance of raw materials to increase manufacturing capacity and further support domestic industries (AIEC, 2021:40). South Africa has developed and maintained a world-class automotive manufacturing value chain through ongoing government support and constructive collaboration with global OEMs, component manufacturers and labour. Although South Africa has certain factor conditions in its favour, it falls short with technology advancements such as New Energy Vehicles (NEVs) and EV technology. This challenge is two dimensional as it encompasses both a demand and supply side consideration, however, South Africa's transition is inevitable as it will be the future driving technology adopted by the global automotive industry.

Government effect. Government policies, such as the APDP and SAAM 2021-2035, provide long-term policy certainty for automotive component suppliers and vehicle manufacturers who want to tap into the South African market and African continent by investing in the automotive industry. Section 4.5 that follows discusses this variable in detail as part of the diamond model.

Chance. Chance was discussed in chapter 2 however, it does not account for the impact of global pandemics on a nation or the world economy. It also does not discuss the extent that a global pandemic such as the COVID 19 pandemic can have on a nation or world economy. Section 4.6 that follows discusses this variable in detail as part of the diamond model.

Using Porter's diamond model, the key characteristics of the South African automotive industry highlighted its current trading environment. The current trading conditions can be described as a turbulent environment wherein South Africa has to operate. South Africa's automotive manufacturers need to be strategic to ensure their survival and sustainable competitive advantage in the long-term. They will need to keep abreast of any changes by constantly scanning their internal and external environments using a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis as discussed in chapter 2. The following table presents the SWOT analysis of the South African automotive industry.

Table 4.2: SWOT analysis of the South African automotive industry

Strengths	**Weaknesses**
Strengths are resources or capabilities which an organisation possesses that gives it a superior advantage over its competitors in	Weaknesses are an impediment or deficiency in an organisation's resources or capabilities that leaves it at a disadvantage relative to its competitors in

satisfying the needs of the customer (Pearce & Robinson, 2013:151; Gurel & Tat, 2017:996). The following are strengths which have been identified within the South African automotive industry: • Steadfast government support in the form of the SAAM 2021–2035 which provides a long-term policy environment for automotive manufacturers to capitalise on. • Good infrastructure with flexible production capabilities in comparison to the rest of Africa. • South Africa is one of Africa's largest economies. • South Africa is the only country in Sub-Saharan Africa that has reached the scale to drive a cumulative process of linkage building in the motor industry (AIEC, 2017:47; AIEC, 2022:47). • The South African automotive industry is part of the global sourcing chain. • South Africa has a sophisticated financial and business sector. • South Africa is a member of various free trade agreements and arrangements. • Eight out of the top ten selling vehicles in 2021, were South African built cars and LCVs (AIEC, 2022:16). • Domestic manufacturers are productive in the manufacturing of vehicles and manufacture them at very high standards in	satisfying the needs of the customer (Pearce & Robinson, 2013:151; Gurel & Tat, 2017:996). The following are weaknesses which have been identified impacting the South African automotive industry: • Achieving economies of scale is a major challenge for South Africa's automotive manufacturers. • General competitiveness gap with competing global manufacturing locations. • There is a lack of manufacturing competitiveness from several South African automotive component manufacturers (NAAMSA, 2016:29). • High logistical costs owing to the distance from the world's main automotive markets. • Wage increases are not matched by productivity improvements. • South Africa has a heavy tax burden impinging on the disposable income of consumers. South Africa's marginal rate of 45% on personal income is the second highest in Africa. This is further compounded by an additional 15% VAT on after tax income. South Africa's company tax rate is 27% and 20% on dividends which is exorbitant and one of the highest in Africa. • The South African currency is volatile impacting pricing, planning, and vehicle affordability. The weak rand is affecting vehicle CPI. • The challenge for South Africa is to offer regional markets an alternative to importing used vehicles which currently dominates the Southern

terms of vehicle quality and customer service (Autolive November issue, 2017:1). • There is an ample selection of brands on offer in the domestic market and it offers consumers the widest choice-to-market-size ratio worldwide (AIEC, 2022:16). There are approximately 1 320 franchises and used motor vehicle dealers in the country (AIEC, 2018:10). • Domestic manufacturers can offer marketing incentives through preferential interest rates, discounts, and assistance with trade-in to promote new vehicle sales.	African Development Community (SADC) market (AIEC, 2021:57). • South Africa is using the lower fuel quality, namely Euro 2, while the main automotive markets are moving towards Euro 6 fuel quality.
Opportunities	**Threats**
Opportunities are a major, favourable situation in the business environment (Pearce & Robinson, 2013:150; Gurel & Tat, 2017:996). It could be one's own resources, technology, or expertise in specific capabilities which are required to compete more effectively in the business environment. The following are some opportunities which have been identified as having an impact on the South African automotive industry: • South Africa is geographically advantaged to pursue regional integration with the African market to increase exports under the AfCFTA and the Auto Pact (AIEC, 2020:50). • Attracting new vehicle assembly opportunities through improved	Threats are a serious, unfavourable situation in the business environment (Pearce & Robinson, 2013:151; Gurel & Tat, 2017:996). Threats are key obstacles to a business's current or desired position in the business environment. The following are some threats which have been identified as having an impact on the South African automotive industry: • The development of other African automotive industries, such as Morocco's, which is slowly catching up to South Africa's passenger car production (AIEC, 2021:52). • There is a slowing down in global markets and the domestic economy owing to the COVID-19 pandemic impacting new vehicle sales and exports. • The trade tensions between the United States of America (USA) and China are increasing the

competitiveness, exports, and stable government policy (NAAMSA, 2016:30). • Increased localisation of automotive components. • Expand the exports of catalytic convertors and other automotive products. • New trade agreements, particularly in Africa. • Producing more affordable vehicles. • Growing the South African middle class. • Beneficiation of South African resources for the automotive industry's benefit. • The introduction of environmentally friendly and fuel-efficient vehicles. • The rapid adaptation to the latest, cleaner fuel technologies and standards in the world. • The large-scale introduction of Electric Vehicles (EVs). • Restructure the payment of VAT on leased vehicles. The VAT can be paid proportionately for the period that the vehicle is leased. • The online shopping environment, such as virtual showrooms, will play a much larger role going forward as convenience will be the primary reason for online purchases. • Millennials, also known as Generation Y, is a cohort of people born between 1980 and 2000 and is described as a media and technologically educated generation with	global business environment's volatility (AIEC, 2019:37). • The effects of an uncertain Brexit which will impact the rule of origin for automotive exports to the European Union (EU) (AIEC, 2021:48). • The impact of the USA sanctions 232 which may attract duties on automotive imports from South Africa (AIEC, 2021:62). • There has been a surge of competition from the fast-growing automotive industries in some emerging markets, such as Thailand. • The rising costs of labour and electricity are compounding vehicle production costs. • Electricity supply is at risk in the country. • The labour environment is profoundly challenging. • High cost and low efficiency of logistics. • South Africa is falling behind the rest of the world in terms of fuel standards and quality (Nel & Du Plooy, 2013:552; NAAMSA, 2018). • The growing problem with refineries not functioning and growing logistical supply chain problems ensuring a constant supply of fuel

higher disposable incomes (Ryke, 2019:16). • Approximately 32% buyers are prepared to buy new vehicles online and this is anticipated to grow more (Autolive May issue, 2019:2). Black women constitute 46% of all online shoppers and this can prove to be a promising opportunity to increase new vehicle sales by targeting what they are searching for (Autolive May issue, 2019:2).	

Source: (Composed by author using additional sources as quoted in the table)

Table 4.2 highlighted the key characteristics of the South African automotive industry using a SWOT approach. The SWOT analysis shows that South Africa's outlook is challenging but various strengths and opportunities do exist to grow the domestic market.

The impact of automotive policy on the South African automotive industry will be discussed next.

4.5 The impact of automotive policy on the South African automotive industry

Government, being one of the elements in Porter's diamond model which was discussed in chapter 2, accounts for the effect that government has on national competitive advantage. By this, it means what role government plays to aid in its national competitive advantage. The South African government has exhibited its commitment to the domestic automotive industry by providing long-term policy support and it is the main reason for this vital sector's healthy position in the economy (AIEC, 2018:31). Therefore, it is important to understand the objectives and performance under the policy regimes, as well as how automotive companies adapted and responded to each policy regime.

4.5.1 The Motor Industry Development Programme (MIDP)

South Africa’s trade arena was liberalised in 1994 and the automotive industry entered its heightened globalisation phase from 1995 (Barnes, 2013:249). The implementation of the MIDP in 1995 was a major step forward in government intervention. The programme considered the international realities which South Africa’s automotive industry faced at the time, such as trade liberalisation, the globalisation of markets against the background of rapid technological innovation, and increasingly demanding customers and markets (AIEC, 2013:17; Barnes & Black, 2013:3). The MIDP was constructed to transform South Africa’s uncompetitive and costly automotive industry, thereby adjusting at a time when South Africa’s trade liberalisation was being accelerated. The MIDP offered generous incentives that were meant to encourage domestic firms to market themselves on global markets so that they realise economies of scale benefits and specialisation which could only occur with the opportunities of international trade (Barnes & Black, 2013:9). The MIDP intended to quickly increase the international competitiveness of the domestic automotive industry and to facilitate the increased exports of CBUs and automotive components (AIEC, 2013:17). The MIDP embedded the principle of export complementation, eliminated local content requirements, and gradually phased down support to the automotive industry (Barnes & Black, 2013:9). A key component of the MIDP was the initiation of the export-import complementation incentive scheme which meant that for firms to attain competitive access into the small domestic market, they could augment their volumes through exports either directly or indirectly through the value chain (AIEC, 2013:17).

4.5.1.1 The performance of the South African automotive industry under the MIDP

The MIDP strategically addressed the multitude of challenges which the South African automotive industry was facing. Since the implementation of the MIDP, a remarkable number of structural changes have taken place in South Africa’s automotive industry.

The domestic automotive industry has grown to become the leading manufacturing sector in the country, and the production of vehicle models has become rationalised substantially to achieve economies of scale benefits in the domestic and export markets (AIEC, 2013:19). Exports have sparked the South African automotive industry's growth with CBUs and automotive components growing significantly from virtually no exports before 1995, to a leading industrial activity by 2013 when the MIDP terminated (AIEC, 2013:19). Table 4.3 reveal the manufacturing of passenger car and LCVs from 1995 to 2012.

Table 4.3: Manufacturing of passenger cars and LCVs from 1995 to 2012

Passenger Vehicles Market					Light Commercial Vehicles Market			
Year	**Domestic**	**Exports**	**Total**	**Exports as a % of total**	**Domestic**	**Exports**	**Total**	**Exports as a % of total**
1995	233 512	8 976	242 488	3,7	127 363	6 356	133 719	4,8
1996	231 616	3 743	235 359	1,6	128 516	7 125	135 641	5,3
1997	215 784	10 458	226 242	4,6	113 204	8 000	121 204	6,6
1998	174 870	18 342	193 212	9,5	98 056	6 806	104 862	6,5
1999	159 944	52 347	212 291	24,7	95 326	6 581	101 907	6,5
2000	172 373	58 204	230 577	25,2	104 121	9 148	113 269	8,1
2001	172 052	97 599	269 651	36,2	113 111	10 229	123 340	8,3
2002	163 474	113 025	276 499	40,9	101 956	11 699	113 655	10,3
2003	176 340	114 909	291 249	39,5	102 007	11 283	113 290	10
2004	200 264	100 699	300 963	33,5	123 467	9 360	132 827	7
2005	210 976	113 899	324 875	35,1	146 933	25 589	172 522	14,8
2006	215 311	119 171	334 482	35,6	159 469	60 149	219 618	27,4
2007	169 558	106 460	276 018	38,6	156 626	64 127	220 753	29
2008	125 454	195 670	321 124	60,9	118 641	87 314	205 955	42,4
2009	94 379	128 602	222 981	57,7	85 663	45 514	131 177	34,7
2010	113 740	181 654	295 394	61,5	96 823	56 950	153 773	37
2011	124 736	187 529	312 265	60,1	108 704	84 125	192 829	43,6
2012	120 417	151 659	272 076	55,7	121 638	123 443	245 081	50,4

Source: (AIEC, 2013:29)

Table 4.3 reflects that since the implementation of the MIDP, the automotive industry has benefitted from steady growth in both domestic sales and exports. However, the table also reflects that the performance of the domestic automotive industry, being integrated into the global automotive industry, is impacted by global developments and events, such as the 1998 Asian crisis and the 2008 global financial crisis. The domestic automotive industry steadily increased its share of the South African trade balance under the MIDP. The entire automotive market landscape has changed since the implementation of the MIDP. On one side, there has been a dramatic increase in imports affecting the country's trade balance and on the other side, exports have risen substantially resulting in automotive exports comprising 12.1% of South Africa's total exports in 2012 when the MIDP terminated (AIEC, 2013:32). From 1995 to 2012 under the MIDP, automotive exports have grown at a compounded annual rate of 19.5% as shown in the following table.

Table 4.4: South African automotive sector's contribution to total South African exports and imports from 1995 to 2012

Year	Total South African exports (R billion)	Total automotive exports (R billion)	Automotive exports as a % of total South African exports	Total South African imports (R billion)	Total automotive imports (R billion)	Automotive imports as a % of total South African imports
1995	102,1	4,2	4,10%	101,1	16,4	16,20%
1996	115,4	5,1	4,40%	116,9	19,2	16,40%
1997	131,5	6,6	5,00%	129,8	17,2	13,30%
1998	145	10,1	6,90%	144	19,9	13,80%
1999	165,6	14,8	8,90%	147,4	22,8	15,50%
2000	210,4	20	9,50%	188,1	29,7	15,80%
2001	215,3	30	13,90%	215,4	38	17,60%
2002	314,1	40,1	12,80%	274,5	50,2	18,30%
2003	273,1	40,7	14,90%	257	49,8	19,40%
2004	292,1	39,2	13,40%	304,7	58	19,00%
2005	327,1	45,3	13,80%	349,2	72,5	20,80%
2006	394	54,7	13,90%	462,6	88,5	19,10%
2007	491,3	67,6	13,80%	561,2	102,2	18,20%
2008	656	94,2	14,40%	727,6	108,9	15,00%
2009	513,9	61	11,90%	541,2	79,9	14,80%
2010	590	69,5	11,80%	585,2	100,2	17,10%
2011	712,1	82,2	11,50%	729	120,8	16,60%
2012	717,9	86,9	12,10%	835,6	136,1	16,30%

Source: (AIEC, 2013:32)

Table 4.4 shows that the total amount of automotive exports had increased from R4.2 billion in 1995 to R86.9 billion in 2012. The South African automotive industry's trade deficit had widened to R49.2 billion in 2012 compared to R38.6 billion in 2011. The overall picture, regarding the domestic automotive industry's trade balance under the MIDP, indicates that exports have increased very rapidly, but imports have also expanded rapidly. This was because products, not manufactured in the relatively small domestic market, were imported. The following table displays the trade balance for the automotive industry and its net forex usage from 1995 to 2012.

Table 4.5: Trade balance for the automotive industry from 1995 to 2012

Year	Imports (R Billion)	Exports (R Billion)	Net Forex Usage (R Billion)
1995	16,4	4,2	-12,2
1996	19,2	5,1	-14,1
1997	17,2	6,6	-10,6
1998	19,9	10,0	-9,9
1999	22,8	14,8	-8,0
2000	29,7	20,0	-9,7
2001	38,0	30,0	-8,0
2002	50,2	40,1	-10,1
2003	49,8	40,7	-9,1
2004	58,0	39,2	-18,8
2005	72,5	45,3	-27,2
2006	88,5	54,7	-33,8
2007	102,5	67,6	-34,9
2008	108,9	94,2	-14,7
2009	79,9	61,0	-18,9
2010	100,2	69,5	-30,7
2011	120,8	82,2	-38,6
2012	136,1	86,9	- 49,2

Source: (AIEC, 2013:33)

Table 4.5 reveals that in 1999 and 2001, the South African automotive industry reflected its best net forex usage of –R8.0 billion, and in 2012 reflected the worst net forex usage of –R49.2 billion. Although there has been a large increase in CBUs and automotive components' export, the South African automotive industry relied on global design and technology, and imported high value products not manufactured domestically, making the industry a heavy foreign exchange user. Table 4.6 shows the industry's vehicle sales, production, GDP growth rate, and export and import data for cars from 1995 to 2012.

Table 4.6: Industry's vehicle sales, production, GDP growth rate, and export and import data for cars from 1995 to 2012

Year	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Domestically produced									
Local Sales	233 512	231 616	215 784	174 870	159 944	172 373	172 052	163 474	176 340
Exports (CBU)	8 976	3 743	10 458	18 342	52 347	58 204	97 599	113 025	114 909
Total domestic production	**242 488**	**235 359**	**226 242**	**193 212**	**212 291**	**230 577**	**269 651**	**276 499**	**291 249**
CBU Imports									
NAAMSA	7 246	18 268	23 978	28 951	29 426	51 749	67 008	68 128	70 919
Non-NAAMSA	15 059	23 500	28 000	31 000	25 000	10 000	12 500	10 000	11 000
Total car imports	**22 305**	**41 768**	**51 978**	**59 951**	**54 426**	**61 749**	**79 508**	**78 128**	**81 919**
Total local car market	**255 817**	**273 384**	**267 762**	**234 821**	**214 370**	**234 122**	**251 560**	**241 602**	**258 259**
GDP growth rate	**3,1%**	**4,3%**	**2,6%**	**0,5%**	**2,4%**	**4,4%**	**2,9%**	**3,7%**	**3,1%**
Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Domestically produced									
Local Sales	200 264	210 976	215 311	169 558	155 000	165 000	109 922	120 258	120 518
Exports (CBU)	100 699	113 899	119 171	106 460	206 300	207 000	181 048	186 299	151 660
Total domestic production	**300 963**	**324 875**	**334 482**	**276 018**	**361 300**	**372 000**	**290 970**	**306 557**	**272 178**
CBU Imports									
NAAMSA	100 889	165 869	211 501	214 873	195 000	200 000	185 617	218 963	257 159
Non-NAAMSA	26 500	43 023	54 746	50 222	65 000	67 000	44 012	62 453	65 979
Total car imports	**127 389**	**208 892**	**266 247**	**265 095**	**260 000**	**267 000**	**229 628**	**281 416**	**323 138**
Total local car market	**327 651**	**419 868**	**481 558**	**434 653**	**415 000**	**432 000**	**338 939**	**400 433**	**442 048**
GDP growth rate	**4,9%**	**5,0%**	**5,4%**	**5,1%**	**3,9%**	**4,7%**	**3,0%**	**3,2%**	**2,2%**

Source: (NAAMSA, 2019:1)

Table 4.7 shows the industry's vehicle sales, production, GDP growth rate, and export and import data for LCVs from 1995 to 2012.

Table 4.7: Industry's vehicle sales, production, GDP growth rate, and export and import data for LCVs from 1995 to 2012

Year	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Domestically produced									
Local sales	127 363	128 516	113 204	98 056	95 326	104 121	113 111	101 956	102 007
Exports	6 356	7 125	8 000	6 806	6 581	9 148	10 229	11 699	11 283
Total domestic production	**133 719**	**135 641**	**121 204**	**104 862**	**101 907**	**113 269**	**123 340**	**113 655**	**113 290**
CBU Imports									
NAAMSA	1 034	1 059	1 150	1 022	843	1 114	2 035	2 791	2 877
Non-NAAMSA	3 000	3 500	3 400	4 100	3 500	3 000	2 500	2 500	2 500
Total LCV imports	**4 034**	**4 559**	**4 550**	**5 122**	**4 343**	**4 114**	**4 535**	**5 291**	**5 377**
Total local LCV market	**131 397**	**133 075**	**117 754**	**103 178**	**99 669**	**108 235**	**117 646**	**107 247**	**107 384**
Total aggregate market	**399 967**	**421 076**	**399 275**	**351 510**	**325 775**	**354 632**	**382 529**	**363 184**	**382 600**
Total aggregate exports	**15 764**	**11 553**	**19 569**	**25 896**	**59 716**	**68 031**	**108 293**	**125 306**	**126 661**
GDP growth rate	**3,1%**	**4,3%**	**2,6%**	**0,5%**	**2,4%**	**4,4%**	**2,9%**	**3,7%**	**3,1%**
Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Domestically produced									
Local Sales	123 467	146 933	159 469	156 626	150 000	185 000	105 407	115 892	121 638
Exports	9 360	25 589	60 149	64 127	78 000	80 000	56 775	83 943	123 443
Total domestic production	**132 827**	**172 522**	**219 618**	**220 753**	**228 000**	**265 000**	**162 182**	**199 835**	**245 081**
CBU Imports									
NAAMSA	4 162	13 790	27 195	34 592	40 000	42 000	20741	26 520	30 000
Non-NAAMSA	4 776	9 409	13 013	13 168	16 000	18 000	5639	9586	9220
Total LCV imports	**8 938**	**23 199**	**40 208**	**47 760**	**56 000**	**60 000**	**26 380**	**36 106**	**39 220**
Total local LCV market	**132 405**	**170 132**	**199 677**	**204 386**	**206 000**	**245 000**	**131 611**	**151 814**	**160 654**
Total aggregate market	**481 520**	**617 406**	**714 315**	**676 108**	**660 000**	**719 000**	**768 000**	**481 520**	**617 406**
Total aggregate exports	**110 507**	**139 912**	**179 859**	**171 237**	**285 000**	**287 700**	**295 800**	**110 507**	**139 912**
GDP growth rate	**4,9%**	**5,0%**	**5,4%**	**5,1%**	**3,9%**	**4,7%**	**3,0%**	**3,2%**	**2,2%**

Source: (NAAMSA, 2019:1)

Tables 4.6 and 4.7 indicate that under the MIDP, the number of vehicle model platforms had been significantly rationalised from 41 to 13 vehicle models. Vehicle exports grew substantially but imports also grew in relation thereto because of the way the MIDP's incentives were designed. Domestically produced vehicles' local sales declined substantially because of the close relationship to the performance of the South African economy. The total domestic production of LCVs almost doubled, and exports of LCVs reached a record high in 2012. From exporting virtually miniscule volumes in 1995, export volumes increased significantly by the time the MIDP terminated in 2012, along with the myriad of benefits to other industries with synergies to the domestic automotive industry.

4.5.1.2 Key achievements of the South African automotive industry under the MIDP

The MIDP can be widely acknowledged for its positive contribution to the South African automotive industry regarding production and export volumes (Barnes et al., 2018a:3). The MIDP had mainly achieved its stated objectives and, in general, its contribution to the domestic automotive industry has been regarded as positive (AIEC, 2014:13; Barnes et al., 2018a:4). Under the MIDP, a significant number of positive outcomes occurred in South Africa, such as (AIEC, 2013:20; Khan, 2015:43):

- There has been an increase of more than 38% in the number of total vehicles manufactured, from 389 392 units in 1995 to 539 538 units in 2012.
- There has been an increase of more than 56% in the number of total new vehicle sales, from 399 967 units in 1995 to 624 035 units in 2012.
- There has been a high increase of more than 450% in OEMs capital expenditure, from R847 million in 1995 to R4.7 billion in 2012.
- There has been a considerable increase of more than 1 600% in the total number of vehicles exported, from 15 764 units in 1995 to 277 893 units in 2012. The total number of vehicles exported between 1995 and 2012 was 2 411 277 units.
- There has been an increase of more than 145% in the number of export destinations for vehicles and automotive components, from 62 in 1995 to 152 in 2012.

- There has been a decrease of more than 68% in the total number of vehicle model platforms, from 41 to 13.
- There has been an increase of more than 15% in total employment within the automotive components manufacturing, from 60 800 persons in 1995 to 70 000 persons in 2012. Total employment increased by 56% within retail, from 128 000 persons in 1995 to 200 000 persons in 2012.
- The total nominal export value of vehicles and automotive components between 1995 and 2012 was R772.2 billion.
- There has been an annual compounded growth rate of 19.5% in nominal rand value terms for CBUs and automotive component exports from 1995 to 2012.
- There has been a significant monetary increase in total automotive industry exports (CBUs and automotive components), from R4.2 billion in 1995 to R86.9 billion in 2012.

The MIDP had many positive outcomes and has been a major driver in enabling the domestic industry to compete on an international level. The South African automotive industry has become fully integrated into the global automotive industry. This means that the local industry is affected by international automotive structures and trends, and the industry is more exposed to determinants of international competitiveness, such as sourcing, manufacturing, and logistics costs. An important strategy of the automotive OEMs operating in South Africa will be to expand market share. This can be achieved by complementing various model mixes and consumer choices in the domestic and export markets through a combination of domestic manufacturing and vehicle imports. The MIDP ended in 2012 and in 2013 the APDP was promulgated.

4.5.2 The Automotive Production and Development Programme (APDP)

The APDP commenced in 2013 and the programme terminated in 2020. The core difference between the MIDP and APDP is that the MIDP focused on incentivising exports whilst the APDP focused on domestic value addition by raising the number of vehicles being manufactured in South Africa. The APDP also focused on improving the automotive industry’s economic performance with higher domestic automotive component manufacturing, sourcing, and employment levels thereby scaling up the contribution to the national GDP (AIEC, 2014:14).

4.5.2.1 Pillars of the APDP and impact on the South African automotive industry

- Automotive Investment Scheme (AIS). The AIS initiated the first cash-based incentive for the South African automotive industry. The AIS was in the form of a non-taxable cash grant and represented the only industry support of physical cost to the fiscus. The level of assistance available to qualifying investments in productive assets was a non-taxable cash grant of 20% which was paid to light motor vehicle manufacturers. Furthermore, an increased support of 25% was available for qualifying investments in productive assets to automotive component manufacturers and tooling companies, but they had to be approved by the Department of Trade and Industry (DTI) (AIEC, 2021:39). From the inception of the AIS to the end of 2020, the approved investments amounted to a total of R72.58 billion, while the approved incentives amounted to R20.07 billion (AIEC, 2021:39). Since the start of the AIS, 20 914 jobs have been created because of 549 projects being approved (AIEC, 2021:39).

- Production Incentive (PI). This pillar of the APDP represents a production-based incentive. Final manufacturers had access to the PI and the calculation was based on the value-added at the point of sale on certified South African manufactured motor vehicles and automotive components. The rebate mechanism was in the form of a tradable duty-free import credit which started in 2013 at a PI conversion factor of 55% of the designated local value-added. It reduced annually by 1% to reach 50% of the designated local value-added. The component duty rate multiplied by the incentive added up to the equivalent value, this represented from 5% to 11% (on components) of value-added in 2013, and was reduced to 4% by 2018 (AIEC, 2021:38). Vulnerable products received an additional PI amount of 80% in 2013 and 2014, but it reduced by 5% every year to reach 50% in 2020

(AIEC, 2021:38). Catalytic convertors were the exception where the PI remained at 65% of the value-added.

- Tariffs. Vehicles and automotive components imported into South Africa have a fixed tariff regime. The import duties on vehicles and automotive components were paused at 2012 levels (25% on light vehicles and 20% on original equipment components) up to 2021. A duty of 18% will be levied on vehicles imported from the EU because of a preferential arrangement under the South African Customs Union (SACU)-EU free trade agreement (AIEC, 2021:38). The tariffs were meant to provide an adequate level of protection whilst ensuring continuity in domestic vehicle manufacturing. The tariff structure under the APDP is meant to incentivise the industry and not to generate revenue (AIEC, 2021:38).

- Vehicle Assembly Allowance (VAA). This support was issued to vehicle manufacturers in the form of duty-free import credits. It was set at 20% of the ex-factory vehicle price in 2013, reduced to 19% in 2014, and 18% in 2015 (AIEC, 2021:38). The realisable component import duty rebate to the OEMs was the abovementioned value multiplied by the duty rate of 20%. The allowance multiplied by the duty rate amounted to the equivalent value to the OEMs'. In 2013, it represented 4% of the ex-factory vehicle price but was reduced to 3.6% in 2015. The objective of reducing the duty rate was to attract and encourage domestic vehicle manufacturers to substantially increase their manufacturing volumes (AIEC, 2021:38).

In November 2018, phase 2 of the APDP was adopted to support the SAAM 2021-2035.

4.5.2.2 The performance of the South African automotive industry under the APDP

The APDP provided the domestic automotive industry with certainty and a transparent policy environment which is important for long-term planning in an industry which is dependent thereon. This provided OEMs with a level of security regarding their investments in South Africa and they were also able to properly plan production lines, production inputs, and workforce requirements (AIEC, 2019:31). Government's aim for providing long-term policy certainty to investors in the automotive industry will continue so that the objectives of increased production volumes, heightened domestic value-addition, and higher levels of transformation across the value chain will be achieved. The South African government's commitment to this vital sector is the main reason for its ongoing health (AIEC, 2018:31). Long-term policy stability allows for increased levels of FDI in the domestic manufacturing facilities and enhances the sophisticated automotive component sector. Since the inception of the MIDP and then the APDP, capital investments, manufacturing, and exports have grown in the industry. Table 4.8 displays the manufacturing of passenger cars and LCVs from 2013 to 2020.

Table 4.8: Manufacturing of passenger cars and LCVs from 2013 to 2020

Passenger Vehicles Market					Light Commercial Vehicles Market			
Year	Domestic	Exports	Total	Exports as a % of total	Domestic	Exports	Total	Exports as a % of total
2013	113 357	151 892	265 249	57,2	127 051	121 345	248 396	48,9
2014	123 101	154 920	278 021	55,7	137 044	118 585	255 629	46,4
2015	111 890	228 459	340 349	66,2	140 870	102 664	243 534	42,1
2016	98 743	237 715	336 458	70,6	130 346	104 987	235 333	44,6
2017	100 528	230 047	330 575	69,6	136 438	105 862	242 300	43,7
2018	99 494	220 889	320 383	68,9	133 081	128 005	261 086	49,0
2019	88 608	260 057	348 665	74,6	129 338	125 112	254 450	49,1
2020	59 554	178 662	238 216	75,0	93 774	91 917	185 691	49,5

Sources (AIEC, 2017:18; AIEC, 2018:17; AIEC, 2019:19; AIEC, 2021:20)

Table 4.8 reflects that since the introduction of the APDP in 2013, there has been modest growth in the domestic market but a significant upward momentum in the export side. As mentioned previously, the domestic market is not large enough to generate sufficient economies of scale which makes exporting critical to obtain economies of scale benefits. South African manufactured vehicles are, therefore, not primarily meant for sale in the domestic market but are exported to generate import credits so that the best prices on imported vehicles can be offered to consumers by offsetting the import duties (AIEC, 2021:24). Table 4.9 shows the South African automotive sector's contribution to total South African exports and imports from 2013 to 2020.

Table 4.9: South African automotive sector's contribution to total South African exports and imports from 2013 to 2020

Year	Total South African exports (R billion)	Total automotive exports (R billion)	Automotive exports as a % of total South African exports	Total South African imports (R billion)	Total automotive imports (R billion)	Automotive imports as a % of total South African imports
2013	927,3	102,7	11,10	998,2	126,7	12,70
2014	988,2	115,7	11,70	1 083,5	131,5	12,10
2015	1 037,2	151,5	14,60	1 087,6	146,2	13,40
2016	1 099,9	171,1	15,60	1 098,9	147,9	13,50
2017	1 187,5	164,9	13,90	1 106,9	154,6	14,00
2018	1 246,9	178,8	14,30	1 235,6	162,0	13,10
2019	1 297,0	201,7	15,50	1 273,3	174,6	13,70
2020	1 262,8	175,7	13,90	1 080,0	127,5	11,80

Sources: (AIEC, 2014:79; AIEC, 2015:82; AIEC, 2016:80; AIEC, 2017:90; AIEC, 2018:93; AIEC, 2019:100; AIEC, 2020:106; AIEC, 2021:110)

Table 4.9 shows that under the APDP from 2013 to 2020, an increase of 71.8% occurred in the nominal automotive export value while the nominal import value was much slower with an increase of 0.6% (AIEC, 2021:110). South Africa's automotive industry is still relatively small compared to the rest of the world and accounted for only 0.58% of global vehicle production in 2020. As such, the industry is dependent on global design technology, technologically sophisticated plant and machinery, and high value imported components making the industry a heavy user of foreign exchange. Table 4.10 presents the trade balance of the South African automotive industry from 2013 to 2020.

Table 4.10: Trade balance of the domestic automotive industry from 2013 to 2020

Year	Imports (R Billion)	Exports (R Billion)	Net Forex Usage (R Billion)
2013	126,7	102,7	-24,0
2014	131,5	115,7	-15,8
2015	146,2	151,5	5,3
2016	147,9	171,1	23,2
2017	154,6	164,9	10,3
2018	162,0	178,8	16,8
2019	174,6	201,7	27,1
2020	127,5	175,7	48,2

Source: (AIEC, 2021:111)

Table 4.10 reflects the trade balance of the domestic automotive industry. South Africa's exports have been growing since the introduction of the APDP; thus, have a positive effect on the country's trade balance. Whilst the domestic automotive industry continued to increase its exports and share of the South African trade balance under the APDP, imports have increased in comparison. Automotive vehicles have been a catalyst for the South African automotive industry's healthy trade balance since 2008 (AIEC, 2021:110). The outflow of foreign exchange can be mainly attributed to the dependency on high technological plant and machinery, as well as high value imported components. Table 4.11 reveals the industry's vehicle sales, production, GDP growth rate, and export and import data for cars from 2013 to 2020.

Table 4.11: Industry's vehicle sales, production, GDP growth rate, and export and import data for cars from 2013 to 2020

Year	2013	2014	2015	2016	2017	2018	2019	2020
Domestically produced								
Local Sales	113 357	123 101	111 890	98 743	100 528	99 494	88 608	59 917
Exports (CBU)	151 892	154 920	228 459	237 715	230 047	220 889	260 057	178 299
Total domestic production	**265 249**	**278 021**	**340 349**	**336 458**	**330 575**	**320 383**	**348 665**	**238 216**
Re-exported imports	1 652	1 680	1 265	832	910	792	786	489
Total car imports	**338 592**	**317 516**	**301 772**	**263 354**	**268 496**	**266 545**	**267 556**	**187 113**
Total local car market	**450 297**	**438 937**	**412 397**	**361 265**	**368 114**	**365 247**	**355 378**	**246 541**
GDP growth rate	**2,5%**	**1,7%**	**1,3%**	**0,6%**	**1,3%**	**0,8%**	**0,2%**	**-6,4%**

Source: (NAAMSA, 2021:1)

Table 4.12 shows the industry's vehicle sales, production, GDP growth rate, and export and import data for LCVs from 2013 to 2020.

Table 4.12: Industry's vehicle sales, production, GDP growth rate, and export and import data for LCVs from 2013 to 2020

Year	2013	2014	2015	2016	2017	2018	2019	2020
Domestically produced								
Local Sales	127 051	137 044	140 870	130 346	136 438	133 081	129 338	93 966
Exports	121 345	118 585	102 664	104 987	105 862	128 005	125 112	91 725
Total domestic production	**248 396**	**255 629**	**243 534**	**235 333**	**242 300**	**261 086**	**254 450**	**185 691**
Re-exported imports	308	337	337	232	286	317	343	217
Total LCV imports	**41 253**	**37 104**	**34 279**	**29 22**	**27 165**	**26 761**	**24 226**	**17 163**
Total local LCV market	**167 996**	**173 811**	**174 812**	**159 316**	**163 317**	**159 525**	**153 221**	**110 912**
Total aggregate market	**649 217**	**644 257**	**617 650**	**547 552**	**557 704**	**552 227**	**536 612**	**380 206**
Total aggregate exports	**276 403**	**276 936**	**333 845**	**344 816**	**338 095**	**351 139**	**387 092**	**271 288**
Total domestic production	**537 034**	**558 187**	**615 444**	**599 812**	**600 138**	**610 060**	**631 921**	**447 218**
GDP growth rate	**2,5%**	**1,7%**	**1,3%**	**0,6%**	**1,3%**	**0,8%**	**0,2%**	**-6.4%**

Source: (NAAMSA, 2021:1)

Tables 4.11 and 4.12 highlighted that the South African automotive industry's performance under the APDP has been relatively stable even with the weak economic growth. Under the APDP, there has been some key achievements made thus far. Nine of the top 10 selling vehicles in South Africa during 2020 were South African-built passenger cars and LCVs (AIEC, 2021:17). The trend under the APDP in the South African new vehicle market is that LCVs have become more general because people buy them for both work and private use seeing that the various models accommodate the demands of the market.

Another trend under the APDP is that because domestic OEMs are encouraged to specialise in the manufacturing of selected models in higher volumes, it has led to the high importation of passenger and small vehicles not manufactured in the domestic market. Vehicles imported from the EU, with a lower than 1 000cc engine size, has a 0% import duty. The South African government wants to address the anomaly by setting a flat duty rate on imported vehicles with a below 1 000cc engine size and this includes EVs which have a 25% duty rate (AIEC, 2020:32). By setting a flat import duty rate of 18% on vehicles which have a lower than 1 000cc engine size would mean that small cars, passenger cars, and EVs are treated in a similar manner, which could result in the higher uptake of EVs. There will come a time when traditional vehicles will be much more expensive than EVs because of a smaller demand for traditional vehicles, and they could eventually become obsolete if the ambitious targets for EVs are realised. Besides the main goal of keeping pace on the technology track, South Africa can also achieve a competitive advantage by producing the batteries required for EVs as lithium and manganese are readily available in the country.

The APDP terminated at the end of 2020 and was replaced by the SAAM 2021-2035. The SAAM 2021–2035 will be discussed next and will highlight where the industry is heading.

4.5.3 The South African Automotive Masterplan (SAAM) 2021–2035

The SAAM 2021-2035 can also be linked to the supply chain strategies as discussed in chapter 2. The South African government's aim is to ensure certainty and continuity in a long-term policy environment for investors in the automotive sector. In an environment such as the automotive industry, long-term policy stability is crucial to achieve the objectives of increased production volumes, improved local value addition, visible transformation across the value chain, and a greater economic impact on the South African economy at large (AIEC, 2018:25). The stability of government aid since 1995 has been a tremendous upside for investor confidence but, despite hefty government support, neither the MIDP nor the APDP has managed to scale up South Africa's automotive industry's position as a second-tier player within global automotive value chains (Barnes & Black, 2017:2). The framework places localisation and value-addition at the focal point for any future support for the industry.

Government has set the target for increasing local content in South African manufactured vehicles at 60% by 2035, thereby significantly diminishing future dependency on high value imported components (Barnes, 2017:8; AIEC, 2019:100). The SAAM's vision is to achieve a globally competitive and transformed industry which actively contributes to the sustainable development of South Africa's productive economy, creating prosperity for industry stakeholders, and broader society (Barnes, 2017:7; AIEC, 2021:37).

4.5.3.1 The objectives of the SAAM 2021–2035

The SAAM's vision for the South African automotive industry will see fruition by achieving a set of key developmental objectives. The following table highlights the six objectives which have been identified as being central to the success of the SAAM, and its potential impact on the South African automotive industry.

Table 4.13: The SAAM's objectives up to 2035 and its potential impact on the South African automotive industry

SAAM's Objectives	Potential impact on the South African automotive industry
1) Grow South African vehicle production up to 1% of global vehicle output.	• CBU production to 1.39 million units annually by 2035 (129% higher than 2015 levels). • Increase total value of vehicle production to R314 billion.
2) Increase local content in South African assembled vehicles to 60%.	• Increase of R135 billion on 2015 local content levels. • 55% local content increase per vehicle produced by 2035.
3) Double employment in the automotive value chain.	• Employment growth by 112 000 people. • Aggregate employment from 112 000 to 224 000 by 2035.
4) Improve industry competitiveness levels to that of leading international competitors.	• Sustainable automotive industry based on comparative price and non-price competitiveness indicators. • Sustained export competitiveness.
5) Achieve transformation of the South African automotive value chain.	• 25% black-owned involvement at tier 2 and tier 3 component manufacturer levels, in dealership networks, and in authorised repair facilities. • Amplified skills development of black South Africans. • Enhanced employment equity at senior management, artisan, and professional employment levels across the automotive value chain.
6) Deepen value addition within South African automotive value chains.	• Growth of auto component exports and production for the aftermarket at the same rate than CBU local content increases. • Growth in research and development and other innovation metrics within the South African automotive value chain.

Sources: (Barnes, 2017:8; Barnes & Black, 2017:6; AIEC, 2021:37)

Table 4.13 highlighted the objectives of the SAAM that, if these objectives can be achieved, will permeate into a substantial contribution to the South African economy with production, local content, and employment increasing up to 2035. Table 4.14 presents the SAAM's projections by achieving its stated objectives.

Table 4.14: The SAAM's projections up to 2035

Key Performance Indicators	2015	2020	2025	2030	2035
Passenger vehicles (units)	341 025	449 619	560 308	698 245	870 141
LCVs (units)	242 974	286 049	339 737	403 501	479 232
Medium & Heavy Commercial Vehicles (M&HCVs) (units)	24 303	27 353	31 710	36 760	42 615
Total vehicles (units)	608 302	763 022	931 754	1 138 506	1 391 988
Average value of South African vehicles	225 804	225 804	225 804	225 804	225 804
Value of production (R millions)	137 357	172 293	210 394	257 079	314 317
Local content (%)	38.70	43.18	48.19	53.77	60
Local content value (R millions)	53 157	74 403	101 382	138 231	188 589
Employment	122 000	129 570	151 882	182 355	224 000

Source: (Barnes & Black, 2017:7)

Table 4.14 reveals the projections of the SAAM up to 2035. In 2020, the projections were not reached primarily owing to owing to factors such as the depressed economic environment, weakened rand exchange rate, unemployment, rising costs of vehicle ownership impacting affordability and the start of the COVID-19 pandemic which had a debilitating impact on the South African automotive industry and the world economy. The realisation of the SAAM does not only depend on the guidelines being correct, but it is more dependent on whether key industry stakeholders across the board believe in the vision and objectives thereof and are prepared to work together to achieve the outcomes which have been mutually agreed upon.

4.5.3.2 The pillars of the SAAM 2021–2035

The SAAM aims to secure increased levels of investments and production and allow the stakeholders to plan and invest with certainty (AIEC, 2020:32). The SAAM only provides the framework in which the domestic automotive stakeholders are going to operate within. The following figure shows the SAAM 2035 vision with the six pillars underpinning the vision and is discussed immediately thereafter.

Figure 4.1: The SAAM 2035 vision and six pillars

Sources: (Barnes et al., 2018b:24; AIEC, 2021:37)

The vision of the SAAM can be described in four components (Barnes et al., 2018b:18). The first component is to remarkably improve the industry's competitive position. The second component relates to the industry's contribution to the transformation of the South African economy which includes employment equity to the greater inclusion of black-owned firms. The third component relates to the sustainable development of the South African economy and includes aspects such as industry growth, employment levels, skills development, and environmentally friendly products and processes. The last component relates to the shared prosperity created by the industry and includes the financial health and wellbeing of firms within the value chain, fair remuneration of employees, and the holistic contribution of the value chain to the South African fiscus. The SAAM vision's backbone is represented by these four components, i.e., global competitiveness, industry transformation, sustainable development, and societal contribution (Barnes et al., 2018b:18). Each pillar of the SAAM and how it will support the vision of the SAAM will be discussed next (Barnes et al., 2018b:24-30; AIEC, 2021:37):

- Local market optimisation. South Africa's automotive environment is being fundamentally altered because of rapid technological developments occurring in vehicles, growing number of digital media applications impacting consumer behaviour, and global transition to a green mobility economy. Two fundamental occurrences need to happen for this pillar to be realised. Firstly, from 2017 to 2035, the domestic market needs to grow at a compounded average growth rate of at least 4.5% for passenger vehicles, 3.5% for LCVs, and 3% for M&HCVs to support vehicle production of 1.4 million units (Barnes et al., 2018b:24). Secondly, the South African vehicle manufacturers need to capture a substantially larger share of South Africa's vehicle market than they currently have (Barnes et al., 2018b:24).

- Regional market development. Currently, the South African automotive industry plays a disproportionately small manufacturing role outside of South Africa, impacting negatively on the entire region because of limited industrial activity, employment opportunities, and technology transfer (AIEC, 2019:51). Africa is vital for the future of the South African automotive OEMs as exports to the SADC accounted for 81.1%, or R28.36 billion, of its R34.96 billion automotive exports to the African continent in 2021 (AIEC, 2022:50). The development of regional markets is instrumental in the growth and development of the South African automotive industry. The way to optimise regional market development is to offer these markets a substitute to used vehicles.

There is no Sub-Saharan African economy that has a new vehicle market which exceeds 30 000 units of annual demand (Barnes et al., 2018b:25). The reasons therefor are mainly the small size of the market, lack of suitable financing options, and heavy importing of used vehicles. The new automotive opportunities that exist are the modernised vehicles with robust automotive technology which can be used as a replacement for used vehicles. For this pillar to truly support the vision of the SAAM, South Africa would need to lead the regional market development process for mutual benefit. The critical component would be to create a business case for establishing an Auto Pact with regional automotive and production blocs which positions Sub-Saharan Africa's markets as a viable automotive space. The African Association of Automotive Manufacturers (AAAM) was founded on the strategic view of the African continent. The AAAM aims to develop a self-sustaining and internationally competitive African automotive industry which will also ensure sustainability of the South African automotive industry in the long run.

- Localisation. One way of achieving global competitiveness is to increase the localisation levels in domestic automotive component and vehicle manufacturing. Any attempt to increase competitive levels and sustainable growth within the current structure of South Africa's automotive value chain are met with two main challenges (Barnes et al., 2018a:12; NAAMSA, 2018:28). The first challenge is to increase the levels of localisation which is regarded as a serious challenge because, in 2017, local content in South African assembled vehicles was below 40%, thereby jeopardising the growth potential and competitive levels of the South African automotive industry. South Africa is a tier-2 automotive manufacturer; therefore, the automotive industry has the potential to deepen and grow its local content from under 40% to over 60%. Firstly, South Africa's cost profile and productivity need to substantially improve to support widening and deepening localisation (Barnes et al, 2018b:27). Secondly, technology and skills must be made available before industry demands it (Barnes et al, 2018b:27). Thirdly, target specialisation within the automotive value chain and to strategically link South Africa's raw materials with emerging automotive opportunities (Barnes et al, 2018b:27).

The second challenge is to deepen the lower tiers of the automotive value chain. Localisation is supported by a well-developed automotive supply chain along with a mature industry. The South African automotive supply chain is underdeveloped where OEMs' gross value addition is 5%, tier 1 suppliers' gross value addition is 67%, and tiers 2 and 3 suppliers' gross value addition is only 28% (NAAMSA, 2018:28). The OEMs engage with the tier 1 supplier and are highly focused on developing and growing. However, this is not cascaded up to tiers 2 and 3 either because of a lack of communication, skill, no incentive, risk mitigation, or rather sourcing globally from competitive foreign competitors. South Africa is a low volume producing market and the right balance must be sought. The ideal South African automotive supply chain is when the OEMs' gross value addition is at approximately 5%, tier 1 suppliers' gross value addition is at approximately 45%, and tiers 3 and 4 suppliers' gross value addition is at approximately 50% (NAAMSA, 2018:31). To be globally competitive and for this pillar to truly support the vision of the SAAM, the need to increase levels of localisation is critical.

- Infrastructure development. It is of paramount importance to develop South Africa's automotive infrastructure because the automotive industry needs to operate within a world class, secure and stable environment which comprises of industrial parks, access to skilled labour, advanced logistical linkages, and associated transport infrastructure, such as land, air, and sea for this pillar to support the vision of the SAAM. South Africa's global competitors have already invested heavily in automotive specific infrastructure (Barnes et al., 2018b:27). To compete relentlessly among these leading global competitors, South Africa will need to invest in and have access to similar automotive infrastructure services. Besides direct automotive infrastructure services, associated services such as emerging and newer technology elements will need to be incorporated.

According to NAAMSA (2018:21), there are three main infrastructural challenges confronting participants in the automotive value chain. The first challenge is the introduction of cleaner fuels in South Africa, this is regarded as the most important challenge because it hampers the importation of cleaner burning and more fuel-efficient engines (Autolive September issue, 2018:2; AIEC, 2021:66). The threat of South Africa's low fuel quality standards put the country's production base at greater risk. South Africa can respond by addressing these infrastructural challenges and by finalising its clean fuel strategy so that new refineries investments can occur which will permeate with the introduction of Euro 6 clean fuels. The introduction of clean fuels can also result in an increase of 1.5% in the national GDP owing to the ripple effect on the associated industries benefitting from the upgrade of refineries (Autolive November issue, 2018:2). By investing and securing the availability of advanced fuel technologies, South Africa will ensure alignment between domestic market product demand and international market demand.

The second infrastructural challenge is the road, rail, and ports infrastructure. The road and rail infrastructure needs serious attention so that the South African automotive industry can grow. Paved roads in South Africa account for only 21% of all its roads which amounts to 154 000 kilometres of paved roads (Autolive September issue, 2018:2). Another 140 000 kilometres of roads are in the planning phase of being paved but there are few new roads being built. This impacts the capacity of the roads because increasing traffic will cause heavy deterioration of roads and will stunt the growth of motorisation which will halt the introduction of autonomous vehicles (NAAMSA, 2018:23). Rail and ports infrastructure also need to be upgraded if the South African automotive industry wishes to become globally competitive and produces more than a million cars annually. At full capacity, South African ports are designed to handle 850 000 units annually, but the available capacity is only 681 041 units annually (Ports Regulator, 2019:61). This means that should South Africa achieve its target of 1.4 million units annually by 2035, South African ports will need to be upgraded to accommodate the higher volumes.

The third infrastructural challenge is the need for a roadmap for alternative energy fuel sources; this is very important in the pursuit of increased growth and competitiveness. South Africa will need to invest in and position itself regarding alternative engine technologies with low or no emissions. Chapter 3 pointed out that even though electric vehicle use is currently low, by 2040, 54% of global vehicle sales will be electric (Bloomberg New Energy Finance, 2021:1). The Department of Trade, Industry and Competition (DTIC) (2021) commissioned an Auto Green Paper to establish a clear policy foundation for New Energy Vehicles (NEVs). The purpose of the paper is to enable the country to coordinate a long-term strategy that will position South Africa at the forefront of advanced vehicle and vehicle component manufacturing, complemented by a consumption leg, and increase South Africa's competitive position in the global race to electro-mobility solutions and technologies (DTIC, 2021:2). A large EV sales potential exists in South Africa if certain key factors can be addressed. The most important factor is the need for government's support through appropriate government policy, namely some incentives for the sale or production of EVs, or even tax breaks. Another key factor is the necessity for an accessible and affordable charging infrastructure. The current import tariff of 25% on EVs can be reduced to improve their affordability (Engineeringnews, 2019a). The mobility revolution is happening, and this is where the future is heading. South Africa needs to keep up with this revolution, or it will be left behind (Engineeringnews, 2019b). If South Africa wants to remain at the forefront on the African continent, the development and continuous innovation of EV technology are of utmost importance. If the technology is not being developed here, then global competitors will enter and saturate the African markets with the latest technological EVs, and this will have catastrophic consequences for the

South African automotive industry. To be globally competitive and for this pillar to truly support the vision of the SAAM, investment in these types of infrastructure is critical.

- Industry transformation. The development of an inclusive automotive value chain requires the total commitment of all relevant stakeholders. This pillar supports the positive transformation of the South African automotive industry and has various focus areas that will support the vision (Barnes et al., 2018b:28). Firstly, the focus on the employment profile being represented in the South African automotive industry. It is anticipated that a wide range of employee skills brought into the industry will represent the demographic profile of the South African economy and will be evident across the entire spectrum of the automotive industry employment categories. Secondly, the focus will be on skills development within the South African automotive value chain (Barnes et al., 2018b:22). Employee education is at the focal point because of the industry's advancements in technology which will require higher levels of management and technical skills that will be transferred into the South African economy. Thirdly, the focus will be on the South African automotive value chain to prioritise the lower tier Black-owned supplier development (Barnes et al., 2018b:21). The aim is to increase the involvement of majority Black-owned tier 2 and tier 3 automotive component manufacturers within South Africa's automotive industry to 25% by 2035 (Barnes et al., 2018b:21). In this regard the R6 billion Automotive Industry Transformation Fund (AITF) will play a major role. These three focus areas need to be continuously monitored up to 2035, with corrective procedures being enacted by government, industry, and labour to overcome the issues impacting the South African automotive industry so that the vision of the SAAM can be realised (Barnes et al., 2018b:21).

- Technology and associated skills development. The evolution of the global automotive industry is inevitable and South Africa will need to embrace the changes that are to come. The scope in technological advancements, such as the increasing use of nanotechnologies, active and passive safety features, material composites, infotainment technologies, additive manufacturing, and product recycling, are all critical technological developments which will feature up to 2035 (Barnes et al., 2018b:29). For this pillar to aid in the realisation of the SAAM vision, a roadmap must be developed to support the evolution of the industry and to align it with the rest of the world. South Africa needs to keep up with the automotive technology frontier. The global automotive industry's skills requirements are progressing in accordance with technological advancements. South Africa's global automotive competitors are proactively developing skills to be at the forefront of the industry's requirements and South Africa will need to follow suit to ensure that this pillar will support the vision of the SAAM.

The South African government's role and effect to nurture a national competitive advantage is shown through its commitment to the domestic automotive industry by the various policy mechanism it rolled out to support the industry. However, the COVID-19 pandemic has caused heavy disruption and a threat that could seriously damage one of the world's largest industries. The South African automotive industry's role-players need to factor this in as the SAAM unfolds from 2021. This will be discussed next.

4.6 The impact of Coronavirus Disease 2019 (COVID-19) on the South African automotive industry

Chance, being one of the elements in Porter's diamond model and discussed in chapter 2, accounts for the effect that chance has on national competitive advantage. However, chance as discussed and described by leading authors such as: (Porter, 1990), (Hill, 2014) and (Wild and Wild, 2016) did not explicitly factor global pandemics and its impact thereof on national competitive advantage.

The automotive industry worldwide has experienced unprecedented challenges because of global lockdowns that was implemented in all major automotive manufacturing countries to flatten the COVID-19 curve. South Africa is no exception to this. Through NAAMSA, the automotive industry has requested a postponement of at least six months with the implementation of the SAAM 2021-2035, which could delay achieving the Masterplan's objectives. South Africa's automotive industry is of paramount importance to the economy and the ongoing continuity of the automotive sector is extremely important to the future industrial and economic landscape of the country. Automotive manufacturing in South Africa employs 110 000 people directly and indirectly, with the broader automotive sector accounting for 457 000 people being employed (Deloitte, 2020:2). The South African automotive industry is the only manufacturing industry that has displayed evidential progress because of proactive policy support from government. COVID-19 has had a debilitating impact on the global business ecosystem. Governments worldwide, including South Africa, have ordered national lockdowns to curb the spread of COVID-19 resulting in automotive OEMs around the world shutting their manufacturing plants. According to Deloitte (2020), global demand for passenger vehicles declined by approximately 14% in 2020, translating into a decrease of over 13.5 million passenger vehicles not being manufactured.

The impact of COVID-19 on global goods trade is most likely to remain bleak throughout 2021 as international commerce has been halted with much uncertainty (AIEC, 2021:47). South Africa, being integrated into the global automotive industry, is exceedingly exposed to economic conditions in China and the global economy, and COVID-19 is expected to accentuate the problem even more by choking export-oriented industries and manufacturing. South African automotive companies that export will need to factor a variety of options into exporting within the world economy, and into monitoring global trading patterns in the short to medium term (AIEC, 2020:43).

The forecasted demand going forward looks bleak, meaning lost production will not be made up. As such, with the lower volumes being manufactured, the incentives under the AIS, which both the OEMs and component manufacturers enjoy under the APDP, will have to be renegotiated. Automotive OEMs are required to manufacture a minimum of 50 000 units within a three-year period, and component suppliers also benefit from the higher volumes being manufactured. The first six months of 2020 showed that despite a reduction in petrol prices, lower interest rates, below inflation vehicle price increases, low inflation rate, and hefty dealer incentives, consumers are at a standstill and very uncertain about the future. South Africa's national lockdown has caused unemployment rates to increase, it had a negative impact on the exchange rate and the annualised GDP growth rate, and the slump in ratings by the ratings agencies have all accentuated the pressure on disposable income levels (Autolive June issue, 2020:17). The knock to the vehicle rental industry has been devastating and resulted in a lack of year-old cars coming onto the used vehicle stands at dealerships (Autolive June issue, 2021:3). Consumer confidence levels are at an all-time low and larger, long-term purchases, for example a motor vehicle, are being held back. There is a depressed sentiment among consumers as payment holidays are ending, higher prices are starting to creep in, and growing financial strain are now taking its toll.

According to TransUnion (2021:1), the number of vehicles financed in 2020 was approximately 12% lower than in 2019. The Vehicle Pricing Index (VPI) is a measurement tool developed by using vehicle sales data from the entire South African automotive industry. The VPI highlights the relationship between new and used vehicles by analysing the increase in vehicle pricing from a basket of passenger vehicles, and it includes the top fifteen automotive manufacturers by volume (Autolive June issue, 2020:17; TransUnion, 2020:1). Consumers who are buying vehicles are choosing to buy used vehicles. In 2020, the used to new vehicle ratio was 2.27 which meant that for each new vehicle being financed, 2.27 used vehicles were financed (TransUnion, 2021:2). In 2020, demo models in the used vehicle market constituted approximately 6% of sales and 35% of used vehicles sold were under two years old. This highlights the state of consumer's disposable income in the South African car market.

The COVID-19 pandemic has had a substantial impact on the export side; there was a decline in total automotive export earnings from R201.7 billion in 2019 to R175.7 billion in 2020 (AIEC, 2021:6). Exporting is of paramount importance to the South African automotive industry. Europe, being the top export destination, accounted for a substantial 197 355 vehicles in 2020 amounting to 72.8% of total vehicle exports

(AIEC, 2021:22). The COVID-19 pandemic's impact on the EU has a direct and measurable effect on the performance of South Africa's automotive industry. Africa also represents an important focus region for South Africa because the continent represented the second largest export destination in 2020 (AIEC, 2020:52). Exporting remains a critical component for the South African automotive industry, and stakeholders will need to keep abreast of developments in the main automotive markets to generate adequate economies of scale and remarkably improve its international competitiveness as the pandemic progresses.

The global automotive industry has also been hit by a severe shortage of microchips, or semiconductors, which is proving to be a far more serious challenge than initially anticipated and it seems the recovery will be slow (Autolive April issue, 2021:1; Autolive August issue, 2021:5). In 2021, the global shortage of semi-conductors or computer chips, which are used in modern vehicles, resulted in a global vehicle production loss of approximately 7.1 million vehicles, thereby worsening various models. The impact thereof on the global automotive industry is substantial translating to an estimated financial loss of about R900 billion to the industry in 2021 (Autolive April issue, 2021:1; Autolive September issue, 2021:2). South African manufacturers are feeling the effects of this shortage too, especially the manufacturers of high value premium models that use microprocessors for features such as adaptive speed control. On a side note, only approximately 10% of global microchip production goes into motor vehicle manufacturing and the value thereof in an internal combustion engine is about R7 000 per vehicle; this amount doubles for a Battery Electric Vehicle (BEV) as it needs more sophisticated electronics to control power flow (Autolive April issue, 2021:2). Aside from the shortage of microprocessors, recently there is also a shortage of foam plastic, used in seat manufacturing, and rubber. These stock shortages have led to an increase in these components/parts' price and a decrease in manufacturers' competitiveness (Autolive September issue, 2021:2). The motor industry relies heavily on a Just-in-Time (JIT) delivery system and do not hold large quantities of stock on hand. All these challenges are a real calamity for the automotive industry still trying to adapt to the conditions of the pandemic which has debilitated economies across the world.

While noting the negatives associated with COVID-19, the positives also need to be highlighted. As the South African automotive industry is in recovery mode, the relevant stakeholders need to see the silver lining of the COVID-19 pandemic. Dealers are doing some creative marketing campaigns to ease the pressure on consumers. This includes payment holidays from manufacturers which allow the consumer to start paying their first instalment up to six months later so that this relaxed period will enable them to recover from the pandemic. The guaranteed buy back model can be enhanced to adapt it to each consumer's preferences and not be a one size fits all model. It can also be broadened to lower costing vehicles, as this may prove an innovating way to generate revenue whilst providing consumer assurance. South Africa's ageing car parc and low vehicle sales will create opportunities in the vehicle maintenance arena because consumers will spend money servicing their vehicles.

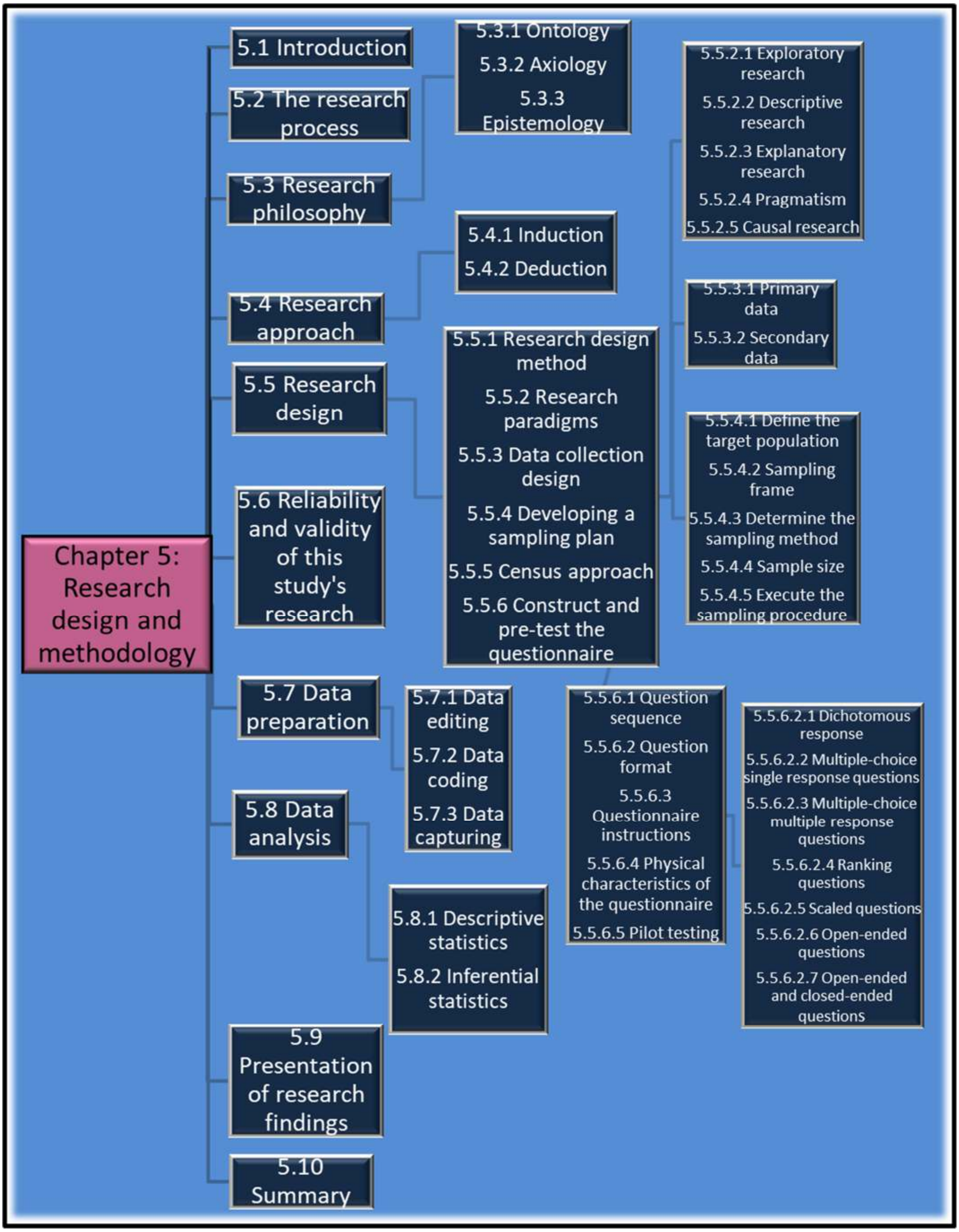
The digital world and online environment have become even more important seeing that the vehicle purchasing process needs to be completed with minimal physical contact. Prior to COVID-19, the emphasis on the online environment were already hyped up as the automotive OEMs and dealers were pursuing strategic innovation and digital transformation strategies (Autolive August issue, 2020:1; Autolive June issue, 2021:2). COVID-19 accentuated these developments and the focus on becoming customer centric has been ramped up. Chapter 2 discussed the digital marketing environment and its impact on the decision-making process involved in the purchasing process. Identifying new ways of doing business in the digital future will improve cost reductions, operational efficiencies, and faster response times. Online shopping channels have excelled during the pandemic and the acceleration of digital technologies to streamline vehicle purchases will gain momentum and allow for minimum physical contact. However, as motor vehicles are the second largest expense for most South Africans and more complex than smaller purchases, there will still be the need to go into a dealership to conclude the transaction.

The automotive OEMs in South Africa will have to consolidate their operations and make themselves look attractive because the possibility exists that the global automotive OEMs will decide to move their manufacturing operations to low-cost economies, such as South Africa, to reduce costs. South Africa is a great investment destination, and the country was highly ranked in certain World Economic Forum Global Competitiveness 2019 indicators; investors rely on these indicators when investing under these circumstances (AIEC, 2020:109).

The element of chance impacted on all four elements in Porter's diamond model and on national competitive advantage. The COVID-19 pandemic caused a revolution in the way businesses had to operate and adapt to the new ways of conducting business.

4.7 Summary

Chapter 4 focused on the South African automotive industry in detail. The policy evolution of South Africa's automotive industry has caused various structural changes to occur. Like various other developing countries, the South African automotive industry was highly inward focused and, in its initial stages, developed under protectionist policies. The current developments in South Africa's automotive industry emphasises the need for all stakeholders to relentlessly work together to heighten South Africa's competitiveness so that this will contribute towards achieving the SAAM's aspirations. A SWOT analysis highlighted different aspects of the South African automotive industry and what needs to be accomplished to grow the domestic market. The MIDP was briefly discussed to provide a background for the development and performance of the South African automotive industry to show which key achievements were attained under the MIDP. The APDP was briefly discussed where the pillars of the APDP and the performance of the South African automotive industry under the APDP was highlighted. Although exports and capital investments in the industry have surged under the APDP, South Africa is still relatively small in global terms and more needs to be done to increase its global ranking. The SAAM 2021–2035 highlights the new automotive framework as of 2021 and the objectives, the vision, and the pillars underpinning the framework were discussed. The SAAM wants to instil long-term confidence in investors who wish to invest in South Africa. The effect of the COVID-19 pandemic was discussed and its impact on the South African automotive industry was highlighted. The following chapter will discuss the research design and methodology in detail.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Chapter 5

Research Design and Methodology

5.1 Introduction

The secondary phase of the research study, which comprised the theoretical foundation whereupon this thesis was developed, can be found in chapters 2, 3, and 4. The research methodology, chapter 5, focuses on the research that was done to provide answers to the primary and secondary objectives, with the core focus on analysing growth opportunities in the domestic new light vehicle market in South Africa. In this chapter, the following aspects will be focused on: the research process, research philosophy, research approach, research design, data collection design, sampling design, the construction of the questionnaire, the reliability and validity of the study, and finally, data analysis and preparation to conduct the research. This chapter's aim is to review all the research methodology elements which were considered and used to answer the primary research question, namely: What are the growth opportunities for the domestic new light vehicle market in South Africa?

5.2 The research process

The research process is a series of linked stages and a sequential process involving several clearly defined steps (Aaker, Kumar, Leone & Day, 2013:43; Wiid & Diggines, 2015:40; Sekeran & Bougie, 2016:2). Figure 5.1 presents the research process followed in this study.

Figure 5.1: The research process

Source: (Cooper & Schindler, 2014:76; Saunders, Lewis & Thornhill, 2019:12)

The first three steps were executed in Chapters 1 to 4. The primary research objective as stated in chapter 1 is to analyse growth opportunities for the domestic new light vehicle market in South Africa by capturing the responses from the stakeholders who form part of the automotive industry.

In this chapter, steps 4 to 7 of the research process will be discussed in greater detail. Data analysis and the interpretation thereof, step 8 of the research process, will be introduced in this chapter, but a comprehensive discussion thereof occurs in chapter 6. The last step of the research process, namely conclusions and recommendations, will be mentioned in this chapter but a comprehensive discussion follows in chapter 7.

5.3 Research philosophy

The research philosophy relates to a system of beliefs and assumptions regarding the development of knowledge and the nature of that knowledge (Ragab & Arisha, 2017:2; Saunders et al., 2019:130). A researcher's research philosophy can determine the thoughts and assumptions wherein the researcher views the world. Karl Popper's three worlds theory of reality recognises a fundamental distinction between physical objects, subjective states, and the products of human creativity and inquiry (Holtz, 2016:3). This study is centred around Popper's third world theory and includes abstract objects such as scientific theories and stories. Popper's third world theory is created by human beings and corresponds to the current state of knowledge which guides the research philosophy.

The research philosophy is also a reflection of the values which will determine the researcher's data collection techniques. These thoughts and assumptions underpin the research strategy and methods which a researcher chooses as part of their strategy. Saunders et al. (2019:133) highlight three research assumptions to distinguish the different research philosophies, namely ontology, axiology, and epistemology. The manner wherein a researcher approaches the research process is influenced by these three research philosophies and it will be discussed next.

5.3.1 Ontology

Ontology is concerned with assumptions about the nature of reality (Biddle & Schafft, 2015:321; Bryman & Bell, 2015:14; Thomas, 2017:122; Saunders et al., 2019:133). This raises the questions regarding the assumptions researchers have about the way the world operates and their commitment to these views. It shapes the manner wherein the researcher will see and study the research objects. There are two main ontological perspectives, namely objectivism and subjectivism. Objectivism represents the position that social entities exist external to and independent of social actors (Bryman & Bell, 2015:14; Ragab & Arisha, 2017:3; Saunders et al., 2019:133). Subjectivism asserts that social phenomena are created from the perceptions and consequent actions of humans (Ragab & Arisha, 2017:3; Saunders et al., 2019:137). Because human social interactions are a continual process, social phenomena are in a constant state of revision. This basically means that it is important to study the details of a situation to understand what is happening, or even the reality occurring behind what is happening. For certain types of research, a researcher may choose to use both the objective and subjective lenses (Saunders et al., 2019:135).

5.3.2 Axiology

Axiology refers to the role of value and ethics in research (Biddle & Schafft, 2015:321; Saunders et al., 2019:134). One of the primary axiological choices the researcher faces is the extent of the impact their own values and beliefs will have on the research being undertaken (Hense & McFerran, 2016:408). By following an axiological philosophy, it is important for the researcher to demonstrate their skill in clearly expressing their values without it interfering with the judgements being made about the research. The conclusions which are drawn from the research must be unbiased regarding the researcher's values and beliefs.

5.3.3 Epistemology

Epistemology is concerned with what constitutes acceptable knowledge in a field of study (Biddle & Schafft, 2015:321; Bryman & Bell, 2015:10; Thomas, 2017:122; Saunders et al., 2019:133). The researcher who considers the necessary resources is more likely to be akin to a natural scientist (Flick, 2018:3). There are three aspects of epistemology, namely realism, interpretivism, and positivism. Realism refers to the sense of reality that objects have an existence independent of the human mind. Interpretivism advocates that the researcher needs to understand the differences between humans in their role as social actors (Bryman & Bell, 2015:10; Ragab & Arisha, 2017:2). Positivism refers to the researcher adopting a philosophical stance and collecting data about an observable reality to search for regularities and causal relationships to generate law-like generalisations (Bryman & Bell, 2015:10; Ragab & Arisha, 2017:2; Flick, 2018:13; Saunders et al., 2019:144).

For purposes of this study, the epistemological philosophy approach with the positivism aspect was adopted. This means that only phenomena that the researcher can observe will lead to the production of credible data. To generate a research strategy to collect these data, the researcher may use existing theory to develop hypotheses. These hypotheses will be tested and confirmed in whole or part, or refuted, leading to further development of theory which then may be tested by further research. It is important to note that by adopting this type of philosophy, the researcher does not have to start with existing theory. Another important component of the positivist approach is that the research is undertaken, as far as possible, in a value-free manner. It should be noted that a researcher who adopts a positivist approach will likely use a highly structured methodology to facilitate replication (Saunders et al., 2019:147). Furthermore, the emphasis will be on quantifiable observations that lend themselves to statistical analysis.

5.4 Research approach

A research project will typically contain theory, but this theory may not be made explicit in the design of the research. Saunders et al. (2019:152) highlight that a researcher may adopt two approaches of reasoning, namely inductive or deductive reasoning and they will be discussed further.

5.4.1 Induction

The purpose of induction is to allow the researcher to get a feel for what is happening so that they can better understand the nature of the problem (Bryman & Bell, 2015:6-7; Rahi, 2017:2). An analysis of the survey data allows the researcher to understand the situation and from this understanding a theory would be formulated. Saunders et al. (2019:153) highlight a few characteristics of an inductive approach:

- In an inductive inference, known premises are used to generate untested conclusions.
- Generalisations are from the specific to the general.
- Researchers following this approach would construct a rigid methodology that does not permit alternative explanations for what is happening.
- Research using this approach is likely to be particularly concerned with the context wherein such events were taking place.

Qualitative data and a variety of methods would be used to collect this data to establish different views of the phenomena.

5.4.2 Deduction

Deductive theory is the most common view of the relationship between theory and research (Bryman & Bell, 2015:6; Rahi, 2017:2). Deductive reasoning occurs when the conclusion is derived logically from a set of premises, the conclusion being true when all the premises are true. It involves the development of a theory which is then subjected to a rigorous test through a series of propositions. Saunders et al. (2019:153-154) highlight six sequential steps through which a deductive research approach will progress:

- Put forward a tentative idea, a premise, a hypothesis or set of hypotheses to form a theory.
- By using existing literature, or by specifying the conditions where under the theory is expected to hold, to deduce a testable proposition or number of propositions.
- Examine the premises and the logic of the argument that produced them, comparing this argument with existing theories to see if it offers a better understanding. If it does, then it continues.
- Test the premises by collecting appropriate data to measure the concepts or variables and analysing it.
- If the results of the analysis are not consistent with the premises (the tests fail), the theory is false and must either be rejected, or modified and the process restarted.
- If the results of the analysis are consistent with the premises, then the theory is corroborated.

Saunders et al. (2019:154) highlight four important characteristics that a deduction approach possesses. Firstly, there is the search to explain causal relationships between concepts and variables. Secondly, the research would use a highly structured methodology to facilitate replication, this is important to ensure reliability. Thirdly, it is important that concepts are operationalised in such a way that facts could be measured, often quantitatively. The fourth characteristic of deduction is generalisation where it is important to select the sample carefully and it must be a sufficient size.

For purposes of this study, a deductive approach was adopted because the research started with theory. Thereafter, it developed with the reading and analysis of secondary sources of literature, as well as academic literature. Lastly, the research strategy design was developed to test the theory.

5.5 Research design

Sekaran & Bougie (2016:95) define the research design as the blueprint for the way information will be gathered, measured, and analysed to answer the research question(s). The research design can be described as the framework for the collection and analysis of data (Bryman & Bell, 2015:28; Wiid & Diggines, 2015:62). A research design will typically contain the following components (Sekaran & Bougie 2016:96; Wiid & Diggines, 2015:63; Saunders et al., 2019:171-180):

- Research paradigms.
- Research design method.
- Data collection design.
- Sampling procedure.
- Development of research instrument.
- Pilot testing.

Each of these components in the research design will now be discussed independently.

5.5.1 Research paradigms

The following was the research paradigm considered and applied in this study:

5.5.1.1 Pragmatism

Pragmatism as a paradigm, point to an inquiry process that is built around combining the different strengths of qualitative and quantitative method. Pragmatism can be defined as research conducted to solve problems and a process where concepts and meanings are generalisations of past experiences which are revised based on specific research actions (Sekeran & Bougie, 2016:29; Saunders et al., 2019:151; Schoonenboom, 2019:288). Pragmatism refers to concepts which are relevant and support action i.e., to act upon the theories and beliefs (Saunders et al., 2019:151). A pragmatist approach usually starts off with a research problem and aims to contribute practical solutions that informs future practice (Saunders et al., 2019:151).

5.5.2 Research design method

The research design can be described as the blueprint for the collection, measurement, and analysis of data (Cooper & Schindler, 2014:125; Flick, 2018:30). The research design needs to be carefully tailored to the exact needs of the research problem (Sekaran & Bougie, 2016:95).

5.5.2.1 Exploratory research

Exploratory research studies can be defined as the exploration of a relatively unknown area (Wiid & Diggines, 2015:66; Sekeran & Bougie, 2016:43). Exploratory research is a valuable means of asking open questions to discover more information regarding the general nature of the research problem, as well as understanding the precise nature of the problem (Nardi, 2018:10; Saunders et al., 2019:187). Exploratory research can be conducted in several ways, such as research of the literature, interviewing experts on the subject, and focus group interviews. However, because this type of research is exploratory in nature, interviews are likely to be relatively unstructured. This kind of research's advantage is its flexibility and adaptability to change. The literature study conducted in chapters 2, 3 and 4 reflects the exploratory design of the study.

5.5.2.2 Descriptive research

Descriptive research can be defined as a statistical method used to identify patterns or trends in a situation, but not causal links among its different elements (Wiid & Diggines, 2015:67; Sekeran & Bougie, 2016:43). Descriptive research involves finding answers to questions, such as who, what, when, where, and how to answer the research questions and objectives (Cooper & Schindler, 2014:127; Nardi, 2018:10). The object of descriptive research is to gain an accurate profile of events, persons, situations, or the market environment (Aaker et al., 2013:66; Saunders et al., 2019:187). It is imperative to have a clear picture of the phenomena, whereon you wish to collect data, prior to the collection of data. Descriptive research was used in the empirical phase of the study to analyse growth opportunities for the domestic new light vehicle market in South Africa.

5.5.2.3 Explanatory research

Explanatory research can be defined as the collection and analysis of quantitative data followed by the collection and analysis of qualitative data to elaborate or explain the quantitative findings (Bryman & Bell, 2015: 439; Nardi, 2018:11). Explanatory research is designed to answer the why question and to provide reasons as to why or how certain social phenomena occur (Nardi, 2018:11). It is mostly used to explain why people vary in their attitudes and to be able to predict these opinions and behaviours with efficient, less complex reasons or causes. Explanatory research was used to ascertain the reasons for the difference in the survey results from the different groups of respondents through the open questions in the survey. Therefore, a combination of exploratory, explanatory, and descriptive research has been used in this study to answer the research objectives.

Both, quantitative and qualitative research methods addressed the research design requirement. Qualitative research seeks insights through a less structured, more flexible approach that usually emphasises words rather than quantification in the collection and analysis of data (Bryman & Bell, 2015:18; Thomas, 2017:119; Flick, 2018:2). Qualitative research is about exploring issues, understanding underlying reasons and motivations (Beech, 2015:33; Wiid & Diggines, 2015:64; Flick, 2018:2). approaches can be adopted to address the research problem. Quantitative research can be defined as the precise measurement of something using numbers (Bryman & Bell, 2015:18; Thomas, 2017:119). Quantitative research is the collection of data that involves larger, more representative respondent samples and the numerical calculation of results (Beech, 2015:33; Wiid & Diggines, 2015:95). The aim is to generalise about a specific population, based on the results of a representative sample of that population.

Mixed methods research has become a common term for mixing qualitative and quantitative data in a single study (Harrison & Reilly, 2011:8; Wiid & Diggines, 2015:65; McKim, 2017:202). For purposes of this study, a mixed methods research approach was adopted where both quantitative and qualitative research were combined in the research design. This is done for the broad purpose of breadth and depth of understanding and corroboration (Harrison & Reilly, 2011:8; McKim, 2017:203). Mixed methods research aims to answer the research questions that cannot be answered by using a single research approach (Sekeran & Bougie, 2016:106; Nardi, 2018:15; Doyle, Brady & Byrne, 2019:3; Saunders et al., 2019:182). These may be combined in a variety of ways which range from simple, convergent forms to complex, fully integrated forms. This has led to several dimensions of mixed methods research. The embedded mixed methods research was adopted for this study because both quantitative and qualitative research methods were used. This way, the priority of both methods varies where one has a dominant role and the other a supporting role, depending on the phase of the research (Saunders et al., 2019:184).

For purposes of this research, basic content and thematic analysis were done on the qualitative responses using ATLAS-ti™ software version 9.1.6. Content analysis is a method used for analysing written, verbal, or visual communication messages (Elo & Kyngas, 2008:107; Vaismoradi, Turunen & Bondas, 2013:400). Content analysis allows the researcher to test theoretical issues, to enhance understanding of the data, and to distil words into fewer content related categories. Thematic analysis is a method used for analysing qualitative data which entails searching across a data set to identify and report repeated patterns (Vaismoradi, Turunen & Bondas, 2013:400; Kiger & Varpio, 2020:2). Thematic analysis is an appropriate and powerful method to use when seeking to understand a set of experiences, thoughts, or behaviours across a data set (Kiger & Varpio, 2020:2).

The data collection design will now be discussed in greater detail.

5.5.3 Data collection design

The types and sources of information can be divided in primary and secondary data which will be discussed further.

5.5.3.1 Primary data

Primary data is when researchers collect their own data for the purpose of a particular study (Bless, Higson-Smith & Sithole, 2013:184; Wiid & Diggines, 2015:93; Thomas, 2017:58). Primary data may be qualitative or quantitative in nature and is discussed further below.

- Qualitative research is often associated with an interpretive philosophy because researchers need to understand the subjective and socially constructed meanings expressed by those who participate in research regarding the phenomenon being studied (Astalin, 2013:118; Flick, 2018:2; Saunders et al., 2019:179). To a large extent, qualitative research relies on detailed description by respondents to gain insight into a particular problem (Wiid & Diggines, 2015:95; Rahi, 2017:2). This kind of research approach is useful when examining attitudes, perceptions, motivation and understanding, and generates data that are frequently difficult to quantify.

- Quantitative research is associated with primary and secondary data and can be a product of all research strategies, as well as secondary data (Wiid & Diggines, 2015:95; Silva, 2017:9; Saunders et al., 2019:564). Quantitative and qualitative research are not in opposition to one another but rather can complement each other research (Thomas, 2017:119).

5.5.3.2 Secondary data

Secondary data can be described as the data collection of other research, done either in connection with other research problems, or as part of the usual gathering of social data for a population census (Bless et al., 2013:184; Wiid & Diggines, 2015:84; Thomas, 2017:59). Secondary data include both qualitative (non-numeric) and quantitative (numeric) data and are used mainly in descriptive and explanatory research. Secondary data can be differentiated into three main subgroups, namely documentary, survey based, and those compiled from multiple sources (Wiid & Diggines, 2015:85-88; Saunders et al., 2019:342). It will be further discussed below.

- Documentary text refers to organisations' databases, organisations' communication, reports, magazines, newspapers, diaries, and interview transcripts.
- Documentary non-text refers to television and radio, voice recordings, video recordings, web images, and photographs.
- Survey census refers to the government's population census.
- Continuous and regular surveys refer to government, family spending, and employee survey attitudes.
- Ad hoc surveys refer to government surveys, organisational surveys, and academic surveys.
- Multiple source snapshot refers to government publications, books, and journals.
- Multiple sources longitudinal refer to industry statistics and reports, government publications, EU publications, newspaper reports, books, and journals.

For purposes of this study, the following data were used: primary qualitative and quantitative data via an empirical survey, as well as secondary documentary data and data compiled from multiple sources such as the AIEC publications; publications done by the Department of Trade, Industry and Competition; publications by Lamprecht; publications by Barnes and other authors of the South African automotive industry. A complete list of the secondary documentary data can be found in the bibliography.

5.5.4 Developing a sampling plan

The process of selecting the right individuals, objects, or events as representatives for the entire population is known as sampling (Sekaran & Bougie, 2016:235; Rahi, 2017:3; Nardi, 2018:116). A sample is defined as a subset of a population (or universe) (Wiid & Diggines, 2015:183). Within this context a population is defined as the total group of people or entities from whom information is required (Wiid & Diggines, 2015:183). Wiid & Diggines (2015:187) classified the sampling process as six steps, however, Bryman & Bell (2015:240) and Saunders et al. (2019:293-324) narrowed it down to five main steps. These five steps will now be discussed in greater detail.

5.5.4.1 Define the target population

The target population is defined as the total group of people from whom information is needed (Wiid & Diggines, 2015:188). Sekaran & Bougie (2016:240) define the target population as the set of elements which the research focuses on. It is essential to describe the target population accurately. For purposes of this study, the target population will consist of the automotive Original Equipment Manufacturers (OEMs), the vehicle importers or groups, the National Automobile Dealers Association (NADA), the National Association of Automobile Manufacturers of South Africa (NAAMSA), and the African Association of Automotive Manufacturers (AAAM). All these role-players were selected because they represent the key stakeholders of the South African automotive industry.

The automotive OEMs are the vehicle manufacturers who, along with the vehicle importers or groups, represent some of the most important role-players in the South African automotive industry. The NADA group was chosen seeing that they represent 85% of the retail motor industry by representing the new vehicle dealerships and the independent vehicle dealers. The NAAMSA group represents the collective, non-competitive interests of the new vehicle manufacturing industry in South Africa. The AAAM group was chosen because they focus on growth on the African continent which is important for growth in the South African automotive industry.

5.5.4.2 Sampling frame

A sample frame is the list of all units wherefrom the sample is to be drawn (Wiid & Diggines, 2015:188; Sekaran & Bougie, 2016:240). This study's sample frame consisted of only those companies involved in the manufacturing and sales of automotive vehicles, and knowledgeable role-players and stakeholders representing the domestic automotive industry. The sample frame list consists of:

- There are seven automotive OEMs.
- There are twenty-one vehicle importers or groups.
- There are twenty-one members of NADA.
- There are twelve heavy commercial vehicle members of NAAMSA.
- There are seven chief executive officers of the AAAM.

The size of the sample frame is N = 68.

5.5.4.3 Determine the sampling method

The sampling methods can be classified as two broad categories, namely probability sampling or non-probability sampling (Bryman & Bell, 2015:318; Wiid & Diggines, 2015:190; Rahi, 2017:3). Probability sampling is when the probability of including each element of the population in a sample can be determined. Non-probability sampling is when the probability of including each element of the population in a sample is unknown. For purposes of this study, regarding some elements of the target population, a census has been done which included the seven automotive OEMs, the twenty-one vehicle importers or groups, the twenty-one members of NADA, and the twelve heavy commercial members of NAAMSA as presented in table 5.1.

The census approach requires that all the respondents in a population are asked to provide information. Such a survey is known as a census (Aaker et al., 2013:302; Wiid & Diggines, 2015:184). The person that was chosen from each organisation represented the views of the entire organisation. Further to this, every organisation relevant to this study was chosen to be surveyed. There was a census done on the seven automotive OEMs in South Africa, namely BMW, Ford, Isuzu, Mercedes-Benz, Nissan, Toyota, and Volkswagen. A senior representative, or executive, of each OEM was chosen to complete the survey. There was census done on the twenty-one vehicle importers or groups in South Africa, namely Audi, BAIC, European Automotive Imports, Fiat Chrysler Automobiles Group, Honda, Hyundai Auto, Isuzu, Jaguar Land Rover, Kia Motors, MOTUS, Mahindra & Mahindra, Mazda, Mini, Mitsubishi Motors, Opel, Peugeot, Porsche, Renault, Subaru, Suzuki, and Volvo. A senior representative, or executive, of each vehicle importer or group was chosen to complete the survey. There was a census done on the twenty-one members of the NADA group because the group represents more than 85% of the retail motor industry in South Africa. There was a census done on the twelve heavy commercial members of the NAAMSA group as they represent the heavy commercial division of NAAMSA in the country. Discretion was used by the researcher so that the chosen senior representative, or executive, was knowledgeable and able to provide the most valuable answers and information relating to the objectives of the study. For the last element, one respondent from the AAAM was chosen using a non-probability sampling method. Non-probability sampling can be broken down into four different approaches (Rowley, 2014:319; Wiid & Diggines, 2015:191; Sekeran & Bougie, 2016:255, 256; Nardi, 2018:125):

- Convenience sampling.
- Judgement sampling.
- Quota sampling.
- Snowball sampling.

A non-probability judgement sampling approach was adopted to select a single member of the AAAM for this study from the seven chief executive officers from the AAAM. This approach is where sample elements are subjectively and deliberately selected by the researcher to be a representative of the population (Wiid & Diggines, 2015:192; Sekeran & Bougie, 2016:248; Rahi, 2017:3). Only those elements that are most advantageously suited to provide the required information are chosen (Sekeran & Bougie, 2016:248). Judgement sampling is particularly useful when large samples are not necessary, where only ideas and insights are generated (Wiid & Diggines, 2015:192). Judgement sampling has been used in this study because of the limited number of people who have the sought-after information. The chairperson of AAAM was chosen deliberately because he/she was able to provide extensive knowledge on the South African automotive industry. Table 5.1 highlights the entire sampling approach followed on the different elements of the target population.

Table 5.1: Sampling approach on the target population

Organisation	Sampling Approach	Sample
Automotive OEMs	Census approach	7
Vehicle importers or groups	Census approach	21
NADA	Census approach	21
NAAMSA (heavy commercial members)	Census approach	12
AAAM (the chairperson chosen)	Judgement sampling approach	1
Total		**62**

Source: (Constructed by researcher)

5.5.4.4 Sample size

Based on the target population, census approach was used for four of the five organisations and judgment sampling was used to select the one AAAM member, thus the sample size was pre-determined by the target population, with a final sample of 62. To ensure that the best results are obtained, the seven automotive OEMs, the twenty-one vehicle importers or groups, the twenty-one committee members of NADA, the twelve heavy commercial members of NAAMSA, and the one member from the AAAM have been included.

5.5.4.5 Execute the sampling procedure

The researcher sent out an electronic questionnaire to all participants to complete online. For all participants that raised queries, a telephonic follow up was done to ensure that all participants understood the questionnaire to fully complete it. Once the questionnaire was completed, the researcher received the results and captured the data. Figure 5.2 depicts how the entire process was executed.

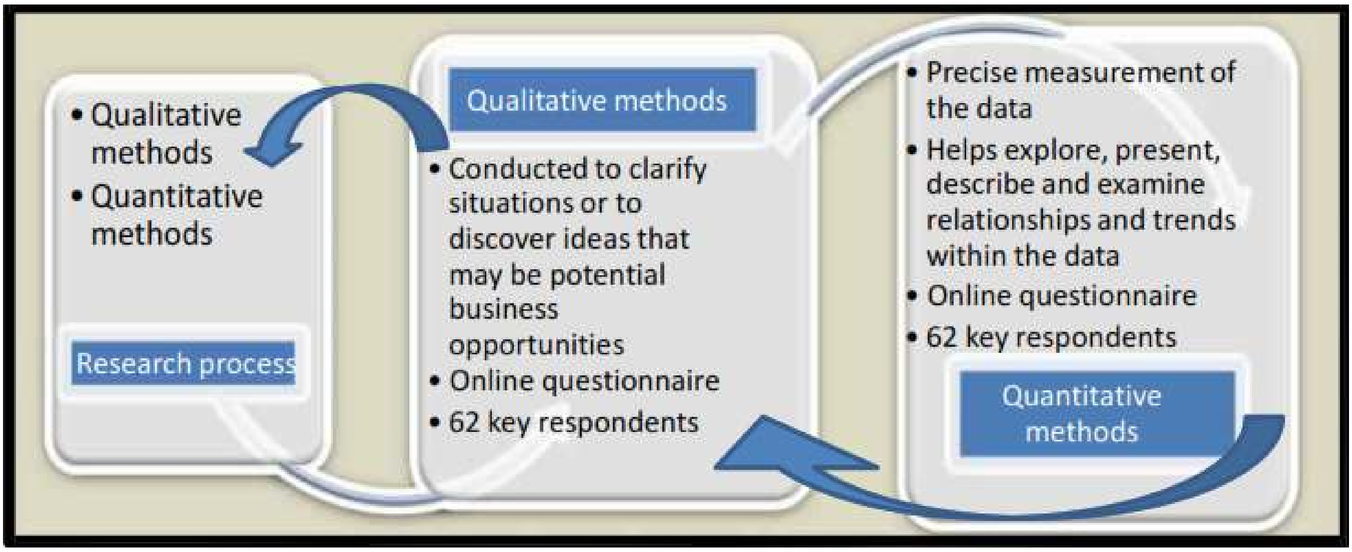


Figure 5.2: The process

Source: (Constructed by researcher)

5.5.5 Construct and pre-test the questionnaire.

Questionnaires are one of the most widely used means of collecting data, therefore, many researchers in business and management associate research with questionnaires (Rowley, 2014:308). A questionnaire will be used as an instrument to collect data and is designed to answer the central research question of this study. A questionnaire is a pre-formulated, written set of questions which respondents are asked to answer by recording their answers on the questionnaire (Sekaran & Bougie, 2016:142; Silva, 2017:4). A questionnaire is designed to achieve four related goals

(Zikmund, Babin, Carr & Griffin, 2013:334; Cooper & Schindler, 2014:301; Sekeran & Bougie, 2016:146-151):

- To maximise the relevance and accuracy of the collected data.
- To secure the participation and cooperation of target respondents.
- To facilitate the collection and analysis of the data.
- To support analysis goals.

The questionnaire used for this study is attached in Appendix C. The questionnaire is a critical component of the research process because it needs to ensure that the precise data required to answer the research question(s) and objectives are included, because it is unlikely that the researcher will have more than one opportunity to collect the data (Rowley, 2014:308; Saunders et al., 2019:504). The design of the questionnaire is important because it will affect the response rate and the reliability and validity of the collected data (Silva, 2017:4). The questions' design and logic, as well as the questionnaire were formulated to be clear and unambiguous, and it is directly related to the research problem and objectives. All respondents will receive the same questionnaire and they must answer all the questions in the questionnaire. The questionnaire structure and content will now be discussed.

5.5.5.1 Question sequence

When questions are structured in a questionnaire, they are sequenced in a predetermined order which the interviewer will read to the respondents. This way, all respondents are asked the same questions in the same order. Wiid & Diggines (2015:164) highlight that the questionnaire's layout is very important and that the questions should be in a logical order to improve the standard of interviewing and make the questionnaire easy to read and answer. Nardi (2018:96) points out that the first question should be simple and interesting to put the respondent at ease and to motivate the respondent to answer the rest of the questions. In this regard, the first question was developed to be simple, and the questions thereafter followed logically.

The funnel approach method was adopted which starts with general questions and then moved to more specific questions (Bless et al., 2013:206; Nardi, 2018:96). Section A of the questionnaire deals with general questions, section B with questions regarding the South African automotive industry, and section C with questions regarding the South African Automotive Masterplan (SAAM) 2021-2035, the South African government’s latest policy dispensation. The questions, in the questionnaire, are placed in the order that the respondents should answer them.

5.5.5.2 Question format

Cooper & Schindler (2014:302) identify two formats of questions whilst Saunders et al. (2019:505-516) and Thomas (2017:202) identify three formats of questions which are discussed next:

- Unstructured questions are informal in nature where there is no predetermined set of questions (Silva, 2017:9; Thomas, 2017:205). Questions are open-ended so that a richer insight into a specific topic, which the researcher wants to explore, can be gathered. The respondent has the liberty to talk freely about events, behaviours, and beliefs relating to the topic area. No unstructured questions were used in this study.

- Semi-structured questions are most used in business-to-business marketing research where the idea is to accommodate many different responses from companies (Silva, 2017:9; Thomas, 2017:206). They are also used when responses cannot be anticipated. The order of the questions may vary depending on the responses and flow of the conversation. These kinds of questions are mainly limited to off-line and online in-depth interviews and focus groups. No semi-structured questions were used in this study.

- Structured questions are a predetermined set of questions that have closed and open-ended responses (Silva, 2017:9; Thomas, 2017:204). Questionnaires are used with structured questions and/or unstructured responses in marketing research. For structured pre-formulated questions, responses/answers can either be structured (pre-formulated) or unstructured (post-formulated). Structured responses to structured questions are pre-determined and are also known as closed-ended responses and typical examples thereof include dichotomous, multiple-choice, or scaled responses (Wiid & Diggines, 2015:170; Thomas, 2017:220-222). Structured questions could also permeate into unstructured or open-ended responses and a typical example thereof is when a structured question contains an alternative which states: “Other (please specify)”. Structured, pre-formulated questions were used in this study’s questionnaire and the different types are explained below (see Appendix A where the survey instrument is attached).

5.5.5.2.1 Dichotomous response

These types of questions allow for the most basic form of closed-ended responses from participants, by offering only two possible responses, such as: “Yes/No” (Thomas, 2017:220). The participant’s response must be either one of the two options to be valid (Cooper & Schindler, 2014:308; Wiid & Diggines, 2015:170). Dichotomous questions generate nominal data and are much easier to analyse (Cooper & Schindler, 2014:308). However, it does not provide rich data which can be used in inferential statistical analyses. This study’s questionnaire contains three dichotomous questions, namely: 3, 14, and 19.

5.5.5.2.2 Multiple-choice single response questions

Multiple-choice, single response questions offer the respondent more than two alternatives from which the respondent can select, however, only one choice may be selected (Cooper & Schindler, 2014:308; Thomas, 2017:220). The response alternatives should include the set of all possible choices. The general guideline is to list all the most important alternatives and to include an alternative that says: “Other (Please specify)” as a safeguard to provide the respondent with an acceptable alternative if all the listed options do not fit the criteria (Cooper & Schindler, 2014:308). Multiple choice questions can be efficient, easy to answer, and less time consuming.

In this study, the questionnaire contains five multiple-choice, single response questions, namely: 2, 4, 7, 16, and 18.

5.5.5.2.3 Multiple-choice multiple response questions

As highlighted above, multiple-choice questions offer the respondent more than two alternatives to choose from. Multiple-choice, multiple response questions mean that respondents can choose more than a single option. In this study, the questionnaire contains no multiple-choice, multiple response questions.

5.5.5.2.4 Ranking questions

Ranking questions are used when a set of possibilities is offered and the participant must assess the importance of each relative to the others (Bless et al., 2013:210; Wiid & Diggines, 2015:170). Rank order questions are relative because respondents are asked to measure one option against another in terms of their criteria. In this study, the questionnaire contains no ranking questions.

5.5.5.2.5 Scaled questions

Scaled questions are often used to collect opinion data. The Likert scale is one of the most frequently used variations of summated rating scales (Wiid & Diggines, 2015:171; Thomas, 2017:221). A primary advantage of scaled responses is that scaling permits the measurement of the intensity of respondents' answers to multiple-choice responses (Wiid & Diggines, 2015:171; Nardi, 2018:80-81). The respondent is asked how strongly they agree or disagree with a statement or series of statements. The respondent will answer these questions which will reveal their perceptions, opinions, and attitudes towards the subject at hand. In this study, the questionnaire contains eight scaled response questions, namely: 6, 8, 9, 10, 11, 12, 13, and 17.

5.5.5.2.6 Open-ended questions

These kinds of questions allow respondents to provide answers in their own way and in their own words, also referred to as free-response questions (Cooper & Schindler, 2014:308). Open questions have a more exploratory nature because the researcher requires a much more detailed response. These types of questions are used widely in in-depth and semi-structured interviews. In this study, the questionnaire contains six open-ended questions, namely: 1, 5, 15, 20, 21, and 22.

5.5.5.2.7 Open-ended and closed-ended questions

These types of questions are a mixture of open-ended and closed-ended questions. An example thereof is a multiple-choice question which has an option that states: "Other (Please specify)". This additional option allows the respondents to answer in their own words and they are not limited to the options listed. In this study, the questionnaire contains four such questions, namely: 8, 9, 10, and 12.

The format of this study's questionnaire questions is illustrated in table 5.2.

Table 5.2: Format of questions

Types of questions	Questions in questionnaire
• Dichotomous questions.	Questions: 3, 14, and 19.
• Multiple-choice, single response questions.	Questions: 2, 4, 7, 16, and 18.
• Multiple-choice, multiple response questions.	Questions: Not used.
• Ranking questions.	Question: Not used.
• Scaled questions.	Questions: 6, 8, 9, 10, 11, 12, 13, and 17.
• Open-ended questions.	Questions: 1, 5, 15, 20, 21, and 22.

• Open-ended and closed-ended questions.	Questions: 8, 9, 10, and 12.

Source: (Constructed by researcher)

5.5.5.3 Questionnaire instructions

According to Cooper & Schindler (2014:320), instructions to the participants attempt to ensure that all participants are treated equally; thus, avoid building error into the results. Clarity and courtesy are two fundamental principles of good instructions. Instruction language needs to be unfailingly simple and polite and in a self-administrated questionnaire, instructions must be contained within the survey instrument (Cooper & Schindler, 2014:320). The questionnaire used in this study contained instructions within the questionnaire itself.

5.5.5.4 Physical characteristics of the questionnaire

The questionnaire's layout and appearance are critically important and must be regarded as such (Aaker et al., 2013:249; Zikmund et al., 2013:335; Silva 2017:4). The questionnaire should be designed in such a way that reading the questions and completing the responses are easy. It should be attractive to encourage the respondents to complete and return it, while not appearing too long. In this study, the questionnaire was divided into three parts to make it more structured and to simplify the analysis of data. The following sections can be identified in the questionnaire:

- Section A: Questions 1 to 3 covers general information.
- Section B: Questions 4 to 17 contains information on the South African automotive industry.
- Section C: Questions 18 to 22 deals with the SAAM 2021-2035.

The questionnaire concluded with a note of appreciation to the respondent for participating and contact details for the return of the questionnaires.

5.5.5.5 Pilot testing

Pre-testing the survey instrument is the final step in improving the survey results which will aid with overcoming any shortfalls in the survey instrument (Rowley, 2014:316; Silva, 2017:4-5). Pre-testing the questionnaire is a critical step for the following reasons (Cooper & Schindler, 2014:324; Bryman & Bell, 2015:196-197; Sekeran & Bougie, 2016:155; Nardi, 2018:102):

- Discovering ways which will increase participant interest.
- Keep participants motivated and engaged in completing the questionnaire.
- Discovering question content, wording, and sequencing problems.
- Exploring methods which will improve the overall quality of the survey data.

For purposes of pre-testing the questionnaire, the researcher conducted a pilot test with two respondents who would not form part of the target population but has knowledge and a link to the domestic automotive industry. Connelly (2008) advised 10% of the respondent base, while Saunders, Lewis, and Thornhill (2012:451) recommended a minimum of 10 people. However, it was difficult to find people who are knowledgeable about the South African automotive industry, and people with an advanced industry knowledge are a scarce commodity. Therefore, two knowledgeable individuals, with a total of 50 years' industry experience between them, were chosen for this purpose to improve the veracity of the survey instrument. The feedback was that the questionnaire encapsulated the different areas and challenges facing the South African automotive industry and suggested changes to question layout and structure. This was done to identify weaknesses within the questionnaire, whereafter all weaknesses were corrected and improved to finalise the questionnaire. Upon the finalisation of this survey instrument, the researcher applied for ethical clearance from the Unisa research ethical committee before the actual survey could be conducted.

Ethics is important because it promotes the aims of research, it governs conduct and ensures that researchers are held to accountability (Saunders et al, 2012:226; Resnik, 2015: 1-3; Saunders et al., 2019:159).

5.6 Reliability and validity of this study's research

Reliability is concerned with the consistency of measures (Cooper & Schindler, 2014:257; Beech, 2015:91; Thomas, 2017:144). An instrument that produces different scores every time it is used to measure a value has a low reliability and if it produces the same score many times is regarded as having a higher reliability. In most cases, the reliability of measurement is the degree to which that instrument produces equivalent results for repeated trials (Bless et al., 2013:222; Bryman & Bell, 2015:28). Saunders et al. (2019:212-213) highlight the reliability threats which the researcher must be wary of:

- Participant error. Any factor which adversely affects the manner wherein a participant performs.
- Participant bias. Any factor which induces a false response.
- Researcher error. Any factor which alters the researcher's interpretation.
- Researcher bias. Any factor which induces bias in the researcher's recording of responses.

Reliability is a key characteristic of good research quality. Cooper & Schindler (2014:260) note that reliability is a necessary contributor to validity but is not a sufficient condition for validity. This means that if a measure is not reliable it cannot be valid, and reliable measures are not always valid. Thus, reliability is not as valuable as validity, but it is much easier to assess (Cooper & Schindler, 2014:260). Validity has also been identified as a key characteristic of good research quality. Zikmund et al. (2013:307) define validity as the accuracy of a measure or the extent to which a score truthfully represents a concept. Validity refers to the extent to which a test measures what the researcher wants to measure (Cooper & Schindler, 2014:257; Beech, 2015:91; Nardi, 2018:64). There are different forms of validity, such as:

- Content validity. This refers to the extent to which it provides adequate coverage of the investigative questions guiding the study (Cooper & Schindler, 2014:257; Sekeran & Bougie, 2016:221; Thomas, 2017:146; Nardi, 2018:64). Content validity is a function of how well the dimensions and elements of a concept have been delineated. Content validity was used for this study as the instrument contains a representative sample of the universe of subject matter.

- Criterion-related validity. This refers to whether an instrument measures what it is expected to measure by comparing it to another measure that is known to be valid (Bless et al., 2013:231; Cooper & Schindler, 2014:258; Sekeran & Bougie, 2016:221; Nardi, 2018:65).

- Construct validity. This refers to the extent to which scores on an instrument reflect the desired construct rather than some other construct (Bless et al., 2013:233; Cooper & Schindler, 2014:259; Thomas, 2017:146; Nardi, 2018:64).

- Face validity. This concerns itself with how the instrument appears to the participant. It is important that an instrument should be tailored to the needs of the participants for whom it is intended (Bless et al., 2013:234; Thomas, 2017:146; Nardi, 2018:64).

There are two specific threats to qualitative research which can affect the validity of the research conclusions:

- Researcher bias. This involves the selection of data which fits the researcher's existing theory and goals.
- Reactivity. This involves the selection of data which stands out to the researcher.

To avoid possible threats and to test the validity of the researcher's conclusions, the following strategies was employed (Sekeran & Bougie, 2016:106; Thomas, 2017:152-153):

- Triangulation. This inculcates a variety of methods that can be used when collecting data allowing for counterbalancing of flaws which may be inherent. Several kinds of triangulation exist, such as method, data, researcher, or theory triangulation. In this study, method and data triangulation was used which entails mixed methods of data collection and analysis, as well as collecting data from multiple sources. The researcher conducted triangulation by discussing the results with two senior officials from government organisations, namely a senior director from NAACAM and the CEO of NAAMSA. Both responded and confirmed that the results/findings are an accurate reflection of the state of the South African automotive industry.
- Rich data. This includes interviews being conducted to enhance the data and it can be referred to again if needed.
- Respondent validation. This is to systematically solicit feedback about the data and conclusions from the interviewees to rule out misinterpretations.

By following these strategies, it enhanced the validity of the researcher's conclusions and was considered valid.

5.7 Data preparation

Data editing is customarily the first step in the analysis of raw data. Editing detects errors and omissions, corrects them if possible, and certifies that maximum data quality standards are achieved (Wiid & Diggines, 2015:223). The three forms of data preparation techniques include data editing, data coding and data capturing. Each of these will be discussed next.

5.7.1 Data editing

Data editing is the customary first step in the analysis of raw data. Editing detects errors and omissions, corrects them when possible, and certifies that maximum data quality standards are achieved (Wiid & Diggines, 2015:223). Cooper & Schindler (2014:377) state that an editor's purpose is to ensure that data are:

- Accurate.
- Consistent with the intent of the question and other information in the survey.
- Uniformly entered.
- Complete.
- Arranged to simplify coding and tabulation.

In this study, all completed questionnaires were inspected to ensure that questions were interpreted correctly and to ensure all the questions were answered. If any question had mistakenly not been answered, the researcher conducted a follow up with that specific respondent where the question was asked again. The answer was then captured to ensure the questionnaire was completed accurately.

5.7.2 Data coding

Data coding incorporates assigning numbers or other symbols to answers so that responses can be grouped into a limited number of categories (Cooper & Schindler, 2014:379; Wiid & Diggines, 2015:225). Data coding converts raw data into symbols, usually numbers, which are entered into a computer and tabulated. Some of the questions in the questionnaire have been coded.

5.7.3 Data capturing

To use a computer for data analysis, the codes from each questionnaire must be entered into an electronic format or data file that the computer can read. There are various methods which can be used for data capturing, such as Microsoft Word, Microsoft Excel, and statistical software packages such as the Statistical Package for Social Sciences (SPSS) (Rowley, 2014:323). Data was captured using the SPSS and Microsoft Excel computer programmes.

The following section will discuss step 8 of the research process, namely data analysis.

5.8 Quantitative and qualitative data analysis

Data analysis's aim is to draw conclusions from the mass of collected data (Aaker et al., 2013:345; Sekeran & Bougie, 2016:347). Quantitative data analysis is usually a process that involves reducing the data which has been gathered to a manageable size, developing summaries, identifying patterns, and to apply statistical techniques (Cooper & Schindler, 2014:86; Sekeran & Bougie, 2016:333). For qualitative data analysis, computer aided software packages will be used to organise the data. One of the most used general, statistical packages is the SPSS (Aaker et al., 2013:497). The other commonly used qualitative, data analysis, software package is the ATLAS-ti. (Saunders et al., 2019:562). The data analysing process will reveal themes, patterns, and relationships which are important to report, and which will be verified. The software packages, SPSS v27, and ATLAS-ti were used to aid with the presentation of this study's findings. Two types of quantitative, statistical data analysis techniques were used in this study, namely descriptive and inferential statistics, which will be discussed next.

5.8.1 Descriptive statistics

Zikmund et al. (2013:410) define descriptive statistics as the summary of data in a simple and understandable manner. Descriptive statistics can be defined as the researcher's ability to describe and compare variables numerically (Rowley, 2014:324; Wiid & Diggines, 2015:252; Thomas, 2017:260; Nardi, 2018:136). Statistics are used to describe a variable focus on two aspects, namely central tendency of the distribution, and variability. The term central tendency of the distribution describes a value that gives a general description of the bulk of the data. It is essentially an idea of the location of all the scores (Wiid & Diggines, 2015:252-253; Thomas, 2017:264). The three commonly used ways in business research for measuring the central tendency are (Bryman & Bell, 2015:247; Wiid & Diggines, 2015:253; Nardi, 2018:143-144):

- Mode. The value that occurs most frequently.
- Median. The middle value or mid-point after the data has been ranked.
- Mean. The value, often known as the average, which includes all data values in its calculation.

The three measures used to describe the spread of a distribution (the dispersion) are (Bless et al., 2013:261-264; Rowley, 2014:325; Bryman & Bell, 2015:247; Nardi, 2018:146-157):

- Range. This refers to the difference between the highest and the lowest score in the distribution.
- Variance. This refers to the average of the squared deviations from the mean of the distribution.
- Standard deviation. This is the mean of the individual deviations, or distances, of each score from the distribution mean. It is the square root of the variance.

The most frequently used descriptive statistics are means and percentages which include all data values in its calculation (Aaker et al., 2013:352; Rowley, 2014:325; Sekeran & Bougie, 2016:284). Once all the data has been gathered, frequency tables are used to display the different response categories of the variable, as well as the frequency of respondents for every category in the table. Cross tabulation is a powerful tool that researchers use to comprehend how two variables are related to each other (Cooper & Schindler, 2014:419; Rowley, 2014:325; Thomas, 2017:276). Cooper & Schindler (2014:419) define cross tabulation as a technique for comparing data from two or more categorical variables. The technique uses tables with rows and columns which correspond to the level, or code values, of each variable's categories.

5.8.2 Inferential statistics

The second type of statistics that a researcher can use to analyse data is inferential statistics. Whereas descriptive statistics are simple procedures used to condense information about a set of measures, inferential statistics refer to techniques used to create statements and to make decisions based on numerical information from samples relating to the entire population (Zikmund et al., 2013:410; Sekeran & Bougie, 2016:301).

There are two main groups of statistical significance tests, the first is parametric statistics and the second is non-parametric statistics. Parametric statistics are used with data that are normally distributed while non-parametric statistics are designed to be used when the researcher's data are not normally distributed (Cooper & Schindler, 2014:440; Wiid & Diggines, 2015:276). The following parametric test, to test for hypotheses, was used in this study:

- The independent t-test. This is a statistical test that is used to determine whether there is a significant difference between the mean scores of two groups and whether these groups are independent (Zikmund et al., 2013:534; Wiid & Diggines, 2015:286). The test is used to test differences between the means of the group. The power of the test is also dependent on the sample size and the variation of the data (Wiid & Diggines, 2015:286).

The following non-parametric tests, to test for hypotheses, were used in this study:

- The Pearson Chi-square test. This is one of the most important and commonly used tests of significance (Cooper & Schindler, 2014:445; Rowley, 2014:325; Nardi, 2018:166). It tests whether the observed, or actual frequency of a phenomenon, corresponds to the frequency which should have been recorded, i.e., whether what was expected if the hypothesis under the study was correct, occurred (Bless et al., 2013:296; Bryman & Bell, 2015:258; Nardi 2018:166). It is based on a comparison between observed frequencies and expected frequencies and is even more valuable for nominal and ordinal data (Cooper & Schindler, 2014:445).

- Mann-Whitney test. This is applied to two independent and uncorrelated groups which might, or might not, be of the same size (Cooper & Schindler, 2014:615; Sekeran & Bougie, 2016:303). It uses an ordinal scale of measurement and compares the order or rank of the data in the two groups with the purpose of assessing whether any differences in the ranks can be explained by chance factors alone (Bless et al., 2013:301-302; Sekeran & Bougie, 2016:302-303).

- Kruskal-Wallis test. This test can be related to the One-way Analysis of Variance (ANOVA) as both tests are similar (Wiid & Diggines, 2015:285). This is a very useful test because of two main characteristics. Firstly, it is a one-way analysis of variance by ranks meaning it has no restrictive prerequisites concerning population distribution, such as normality or homogeneity of the variances, and requires an ordinal scale of measurement (Cooper & Schindler, 2014:460). Secondly, it is considered an extension of the Mann-Whitney test since it essentially deals with the same type of problems but for more than two independent groups (Bless et al., 2013:303; Cooper & Schindler, 2014:617; Nardi, 2018:196-197).

Descriptive research designs often conclude with hypothesis testing. In classical tests of significance, two forms of hypotheses are used, namely the null hypothesis and the alternative hypothesis. The null hypothesis is a statement which indicates that no difference, or no correlation, exists between the parameter and the statistic, which are being compared, whilst the alternate hypothesis holds that there has been a change (Cooper & Schindler, 2014:432). Testing a hypothesis means, to reach a conclusion about the significance, or insignificance, of the difference between groups, and then to reject the hypothesis statement as being incorrect if it contradicts this conclusion.

Testing the probability of a pattern, such as a relationship between variables occurring by chance alone, is known as statistical significance testing (Cooper & Schindler, 2014:430; Nardi, 2018:150). The statistical significance level can be described as the probability value which determines the boundary between accepting and rejecting the hypothesis. The p-value refers to the probability value, i.e., the chance that an event would occur. For most applications, the chosen significance level is 0.05. If the probability of the test statistic is very low, <0.05 or lower, then the test indicates that there is a statistically significant relationship, which means rejecting the null hypothesis and accepting the alternate hypothesis.

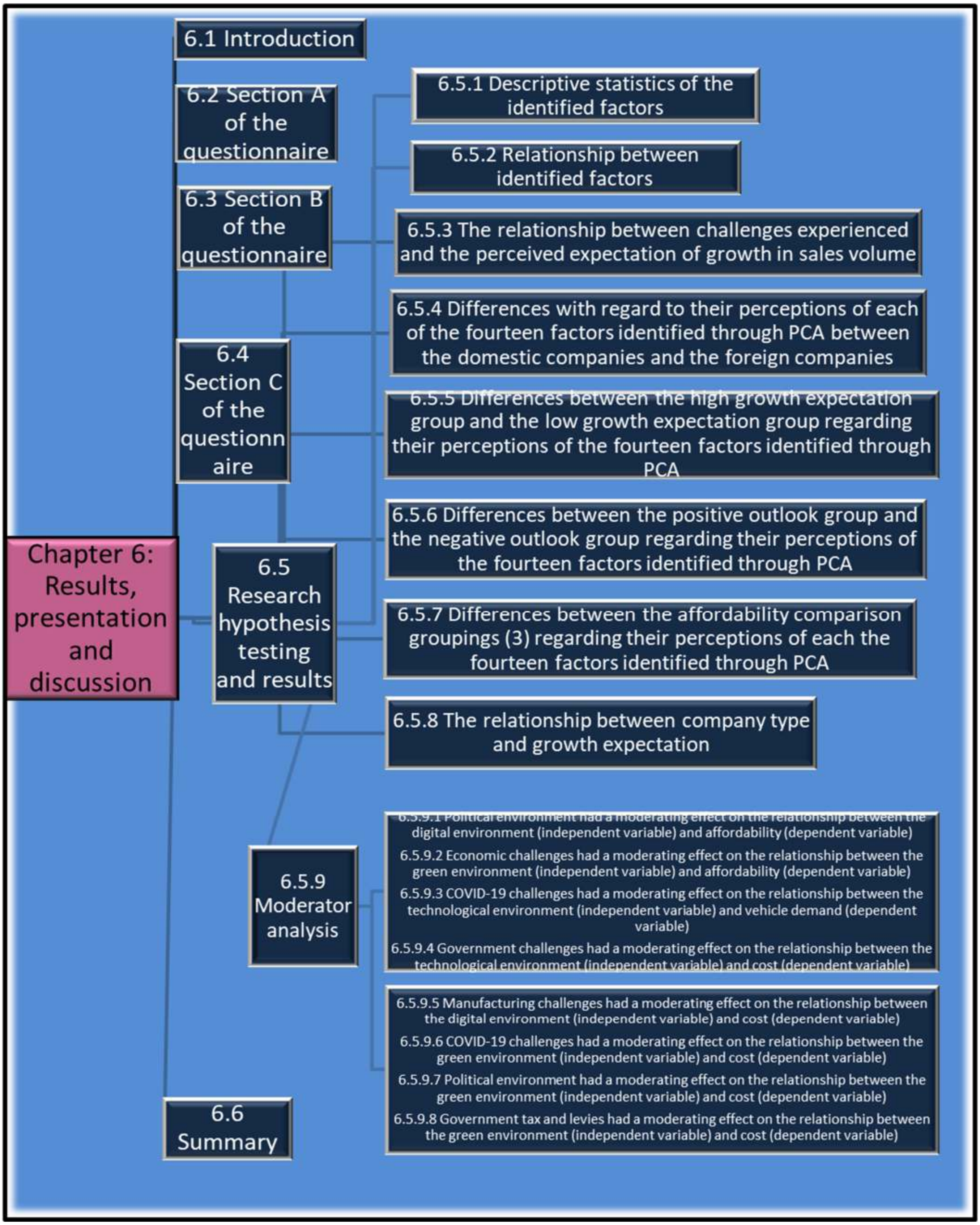
Because the researcher cannot make a statement, with absolute certainty, regarding the sample, the likelihood that errors may occur must be taken into consideration. A Type I error is made when the null hypothesis is rejected although it is, in fact, true (Cooper & Schindler, 2014:435; Sekeran & Bougie, 2016:301; Nardi, 2018:152). The probability of committing this error is given by the level of significance. A Type II error involves not rejecting the null hypothesis when it is false (Bless et al., 2013:278; Cooper & Schindler, 2014:435; Nardi, 2018:153). Once all the data is examined and analysed through descriptive and inferential statistics, the researcher will be able to draw conclusions from the data obtained in this study.

5.9 Presentation of research findings

This is the final step of the research process regarding this study. At this stage of the research process, the researcher prepares a report and transmits the findings and recommendations. The results may be communicated through several avenues, such as conference calls, letters, written report, oral presentation, or a combination of any of these methods (Cooper & Schindler, 2014:540; Sekeran & Bougie, 2016:353). For purposes of this study, the data findings, conclusions, and recommendations is presented in written format.

5.10 Summary

Chapter 5 focused on the research methodology which was used for the purpose of this study to analyse growth opportunities for the domestic new light vehicle market in South Africa. Steps 4 to 7 of the research process have been discussed in detail in this chapter. The research philosophy and the research approach were explained. The research design was defined and then the components within the research design were explained. The sampling procedure and data collection were discussed, and the research instrument was designed. The chapter then elaborated on the data analysis techniques, as well as a discussion on the presentation of findings to conclude the chapter. In the following chapter, the data analysis and interpretation of the study, which is step 8 of the research process, will be discussed.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6.6 Summary

Chapter 6

Results, Presentation and Discussion

6.1 Introduction

In this chapter, the results obtained from the empirical research on the growth opportunities for the domestic new light vehicle market in South Africa will be analysed. A mixed methods research approach, using both qualitative and quantitative formats of investigation, was followed. A total of sixty-two key role-players within the domestic automotive industry were identified. All sixty-two role-players were contacted and invited to participate in this study of which they all did. The questionnaire consisted of sections A, B, and C and all respondents were required to answer every question in the questionnaire.

The responses to the questions as analysed below relate to, and aim to, answer the primary and secondary objectives of the study. The primary objective of this study was to analyse growth opportunities for the domestic new light vehicle market in South Africa. The secondary objectives of this study were: to determine the driving factors which promote new vehicle sales in South Africa; to determine the constraint factors impacting new vehicle sales in South Africa; to investigate the impact of the global disruption in vehicle technology and fuel standards on the consumption patterns of the new vehicle market in South Africa; to investigate the different options available to the South African vehicle manufacturers to grow their new vehicle market share within the African region and in international markets; and to investigate the impact of the COVID-19 pandemic on South Africa’s new vehicle sales and future growth strategies.

Descriptive and inferential analyses were performed to assess the primary and secondary objectives of this study. The objective of the inferential analysis was to determine the most significant relationships and differences between variables. The data analysis, approach, philosophy, and interpretation processes were outlined in chapter 5. The research results will now be analysed, starting with descriptive statistics, and will follow the same sequence as the questions in the questionnaire.

6.2 Section A of the questionnaire

Section A of the questionnaire, covering **questions 1 to 3**, dealt with the respondents' general business information. This entailed information about the company they worked for, it included questions about the name of the company, the type of company they worked for, and whether most of the company was foreign or South African owned. The questionnaire followed up with more specific and detailed questions about the South African automotive industry. All respondents had to answer these questions. Table 6.1 highlights the automotive industry profile (question 2) of the 62 respondents that took part in the study.

Table 6.1: Automotive industry profile of the respondents of the study

Automotive industry profile of the respondents	N	%
Original Equipment Manufacturers (OEMs) (vehicle manufacturers)	7	11.29
Vehicle importers or groups	21	33.87
National Automotive Dealer Association (NADA) (dealership representatives)	21	33.87
National Association of Automobile Manufacturers of South Africa (NAAMSA) (heavy commercial members)	12	19.36
African Association of Automotive Manufacturers (AAAM) (chief executive officer)	1	1.61
Total	**62**	**100**

Source: (Constructed by researcher)

Question 3 was used to ascertain whether the respondent's company was mostly a South African owned company or mostly a foreign owned company. Figure 6.1 indicates the ownership distribution of all the different groups of respondents.

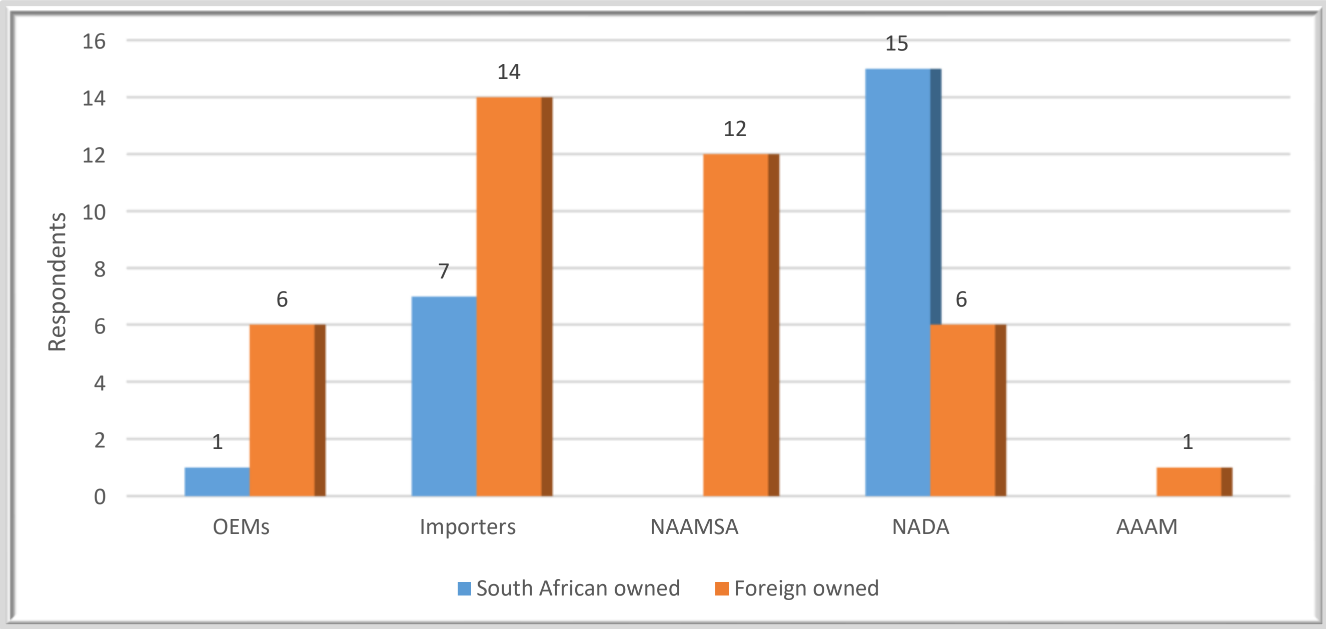


Figure 6.1: Ownership distribution

Almost two thirds of the respondents (63%/n=39) in figure 6.1 indicated that they are a foreign owned company highlighting the level of foreign ownership and investment in South Africa. Chapter 2 alluded to the importance of Foreign Direct Investment (FDI) in South Africa, and it is critical for achieving the objectives of the South African Automotive Masterplan (SAAM) 2021-2035. Since the implementation of the Motor Industry Development Programme (MIDP) in 1995, the domestic automotive industry has been an essential part of South Africa's economy (AIEC, 2013:17; Barnes & Black, 2013:3). Government realised the importance and immense contribution of the industry and has provided a stable and conducive operating environment for stakeholders to invest in South Africa. After three decades, these foreign owned stakeholders are still contributing to the economy and the automotive industry has become the largest manufacturing industry in South Africa, a large-scale employer, and a very successful exporter (AIEC, 2020:32).

The vision of the SAAM 2021-2035 is to expand manufacturing and to deepen value addition in South Africa which will ultimately lead to new investments in the local industry. The SAAM 2021-2035 is the current policy strategy to grow investments and the plan for the development of the South African automotive industry in the long run. Increasing the levels of FDI in South Africa will permeate into a myriad of benefits for the entire country and the domestic automotive industry would enjoy this spillover as much as under the previous policy dispensations (Hill, 2014:250).

6.3 Section B of the questionnaire

Section B of the questionnaire, covering **questions 4 to 17**, dealt with the South African automotive industry which all respondents had to answer. They had to provide their view on how the South African automotive market was performing and what challenges are being faced by both consumers and industry stakeholders. The results of each question will now be elucidated.

Question 4 required respondents to provide their personal level of expectation regarding the South African automotive industry to improve new vehicle sales volumes within the next two years. A five-point Likert rating scale from 1 (no expectation) to 5 (very high expectation) was used to obtain the considered responses for this question. Figure 6.2 exhibits the results of the different groups of respondents.

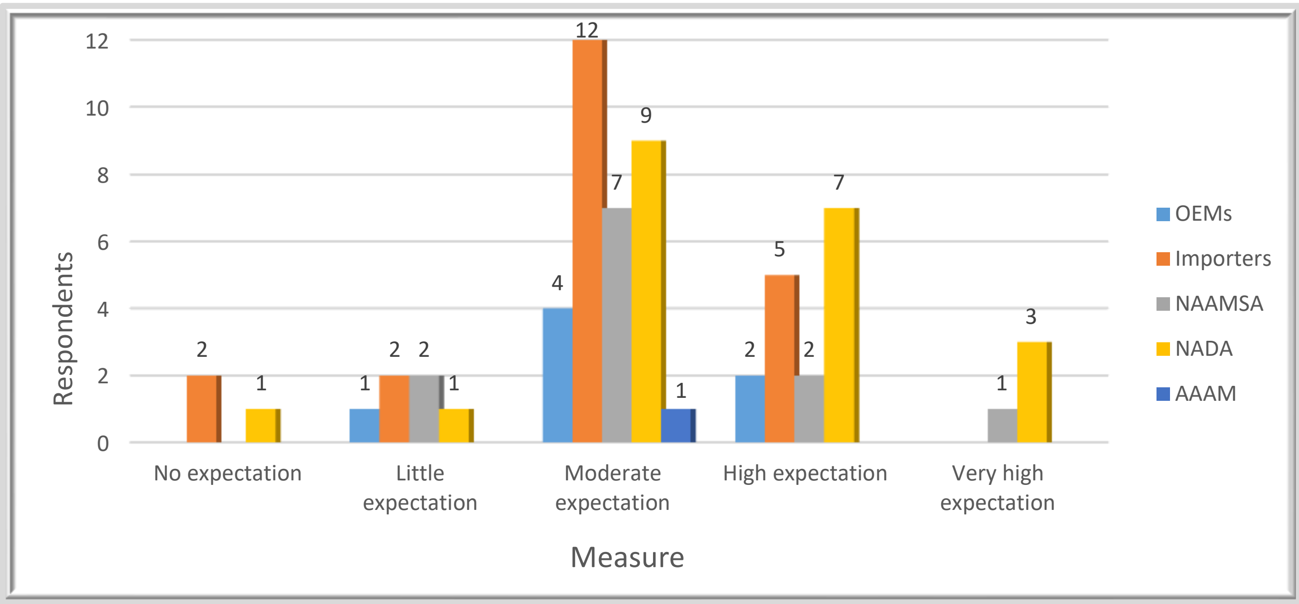


Figure 6.2: Level of expectations regarding the South African automotive industry to improve new vehicle sales' volumes within the next two years

In figure 6.2, a large majority of the respondents (85.5%/n=53%) indicated that the industry is expected to grow moderately to high within the next two years. Question 5 will be explained next.

Question 5 required respondents to explain why they chose their specific option in question 4. It was an open-ended question where respondents were able to express their views without being restricted to certain options or criteria. Basic content and thematic analysis of the responses was done by using ATLAS-ti to establish the theme and pattern of responses. Table 6.2 highlights the main growth themes of the sixty-two responses.

Table 6.2: Main growth themes

Main growth themes
South Africa's overall economy has not been conducive for business growth and success for the past five to seven years. The low interest rates will provide some relief for the foreseeable future but the low consumer confidence, rising levels of unemployment, and increased cost of living will minimise its positive effect. Vehicles are luxury goods and owing to the rising cost of these products in the market, affordability for the public will become increasingly difficult especially since the average household income is declining because of mass unemployment. Over the last ten years, there has been a shift in customer buying behaviour from premium to more entry level vehicles.
The pandemic has dampened the business environment and brought on a sluggish economy. There would be a COVID-19 recovery after losing 30% volume in 2020. There has been a 12% year-on-year growth increase in 2021 and there is an expectation that this will continue. Export volumes would start to grow as the recovery from the pandemic continues, but the weakening exchange rate could dampen the recovery. There will be a significant recovery from the pandemic, but it is the wrong base from which to measure. Prior to COVID-19, the economy was already in a weak position and now the situation is even more critical.
Shifts in economic activity will create new areas of growth but sales will fall behind economic recovery. The South African market is resilient and a high demand for commodities remains which will contribute to the increase in transport services, which will lead to higher truck sales. Sales are down and government has put restrictions on the capacity of people allowed to travel. This has had a huge impact on the sustainability of the business and one of the major customers are shutting down. Also, there are no new initiatives from the South African government regarding infrastructure development, power industries, and mining expansion which could work as enablers for the growth of the commercial vehicles industry. Government bus tender awards and growth in public transport will drive up sales.
Technology and new models being launched will hopefully stimulate the demand in the market. There will be a natural replacement cycle and higher income individuals are more likely to pursue

their planned purchases regardless of the prevailing economic environment. The likely increase in general economic performance should encourage first-time buyers to purchase new vehicles.

Table 6.2 explained why the respondents are centred around a moderate expectation for the South African automotive industry to improve new vehicle sales within the next two years. The key findings from the sixty-two responses can be arranged in a hierarchy order based on the number of times the same reason was given of which a percentage was allocated to each metric. Figure 6.3 displays the results of the sixty-two respondents with the total percentages of the main conclusions derived from table 6.2.

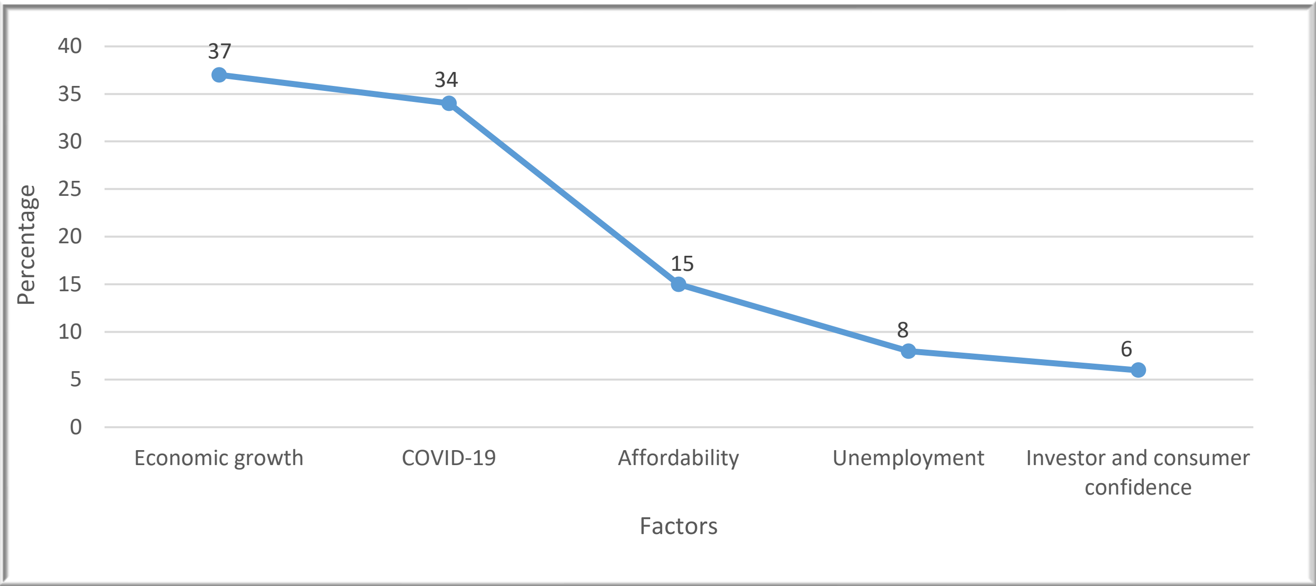


Figure 6.3: Five key expectation metrics for the South African automotive industry to improve new vehicle sales' volumes within the next two years

The first three metrics (economic growth, COVID-19, and affordability) in figure 6.3 are the main conclusions derived from table 6.2. Chapter 4 discussed that vehicle sales is a function of economic growth in South Africa (AIEC, 2021:16) and there is a modest expectation of significant economic growth in the next two years. Gross Domestic Product (GDP) must grow year-on-year by a minimum of 1% for the new car market to grow and 3% to facilitate double digit growth. A stable political environment in conjunction with strong economic reforms would stimulate investment and a renewed vehicle purchasing cycle. The poor economic situation and declining exchange rate are causing price increases and making new vehicles less attractive to purchase. The industry can use some assistance in regaining its high sales volumes as economic fundamentals remain weak.

Chapter 4 discussed that the new vehicle industry has taken a beating because of the pandemic. The COVID-19 pandemic has had a devastating impact on the South African automotive industry (AIEC, 2021:47). There is hope for a recovery, however, the level of improvement in the economy will largely depend on how quickly the government can control the pandemic. The speed at which the economy opens will ultimately determine the level of recovery in the domestic market. Businesses are under heavy financial strain and the average consumer is under immense pressure. Credit risk remains high, making vehicle affordability challenging which has resulted in renewed interest in buying used vehicles. New vehicle affordability is weakening, unemployment is worsening, and cars are bought on credit seeing that more than 95% of car sales must be financed, so access to credit remains important to drive sales (TransUnion, 2019:1). There would be slow growth until investor and consumer confidence has been restored (Autolive October issue, 2019:3).

Question 6 was used to determine the importance and impact of each criterion in table 6.3 on the final customer regarding new vehicle sales' growth in South Africa. A five-point Likert rating scale from 1 (no importance/no impact) to 5 (critical importance/critical impact) was used to obtain the considered responses for this question. The top row in each criterion refers to the mean importance value and the bottom column refers to the mean impact value. The mean value is used to study the trend. Table 6.3 presents the results of the different groups of respondents.

Table 6.3: The mean level of importance and impact of each criterion on the final customer who purchases a new vehicle

Criteria	**Mean**				
	OEMs (N=7)	**Importers (N=21)**	**NADA (N=21)**	**NAAMSA (N=12)**	**AAAM (N=1)**
Selling price of vehicles to the customer	**4.57**	**4.23**	**4.38**	**4.00**	**4**
	4.43	**4.23**	**4.38**	**4.00**	**4**
Customer able to obtain finance or a loan	**4.43**	**4.28**	**4.43**	**4.17**	**4**
	4.43	**4.00**	**4.29**	**4.33**	**4**
Customer opting for demo and used vehicle models over brand new vehicles	**3.71**	**3.33**	**3.43**	**2.83**	**4**
	3.71	**3.00**	**3.48**	**2.66**	**4**
Customer demand for South African manufactured vehicles	**2.71**	**2.24**	**2.24**	**2.41**	**2**
	3.00	**2.10**	**2.38**	**2.58**	**2**
Customer satisfaction levels with the different vehicle brands or models	**4.00**	**3.95**	**4.10**	**3.75**	**4**
	3.86	**3.52**	**3.57**	**3.91**	**4**

The combined mean value among all the groups in table 6.3 is that the selling price (mean of 4.24 for importance and 4.2 for impact) and the ability to secure finance or a loan (mean of 4.27 for importance and 4.21 for impact) to purchase the vehicle is of high to critical importance/impact for the conclusion of the transaction with the final customer. Chapter 4 discussed the impact of a vehicle's price and how the final price is calculated. The selling price is directly linked to vehicle affordability and whether the consumer will be able to repay the instalments. According to TransUnion (2021:1), new vehicle price increases are above inflation, and this trend will continue for the foreseeable future which is not good news for the consumer or the industry. Chapter 4 highlighted that vehicle affordability in South Africa is diminishing and credit access is becoming more difficult for the consumer. There was an approximate 30% decrease in finance applications in 2020 compared to 2019, and this is primarily due to the

COVID-19 pandemic which had resulted in a national lockdown and the closure off many businesses.

The combined mean value among all the groups, as shown in table 6.3, is that the customer opting for a demo or a used vehicle (mean of 3.46 for importance and 3.37 for impact) and the customer satisfaction levels with the different vehicle brands or models (mean of 3.96 for importance and 3.77 for impact) are having a moderate to high importance/impact, whilst customer demand for South African manufactured vehicles (mean of 2.32 for importance and 2.41 for impact) is of low to moderate importance/impact on the new vehicle market. Chapter 4 discussed the trend of used and new vehicle purchases and in 2021, the ratio of used to new vehicles was 2.3:1 which means that for every 2.3 used vehicles being financed, one new vehicle is being financed (AIEC, 2022:15). Again, this derives from the costing and selling prices of new vehicles which is having a significant impact on the new vehicle market share.

Chapter 4 discussed that the country has one of the most competitive trading environments in the world and, in 2021, offered the South African public no less than 43 passenger car brands and 3 077 model derivatives (AIEC, 2022:16). Similarly, in the light commercial segment there were 23 brands with 746 model derivatives which means that South Africans are spoilt for choice with a wide range and selection of vehicles (AIEC, 2022:16). The global OEMs are manufacturing a wider range of models to satisfy customers' expectations regarding greater choice, introducing model variations and body shapes with each model to allow customers to personalise and customise the vehicle to their preferences. This was also the result of the MIDP which allowed OEMs to offset the import duty liability generated through the export of automotive components, which meant that imported models not manufactured in the domestic market could be brought in at discounted rates (AIEC, 2021:24). Chapter 4 discussed the buying behaviour of consumers and that they will only purchase a vehicle if they are most satisfied with it. The current trend is that consumers are buying LCVs (bakkies) which can be used for both leisure and work purposes.

Question 7 required respondents to provide their view on the ability of South African consumers to afford new vehicles relative to consumers in other developing countries. Figure 6.4 shows the results of the different groups of respondents.

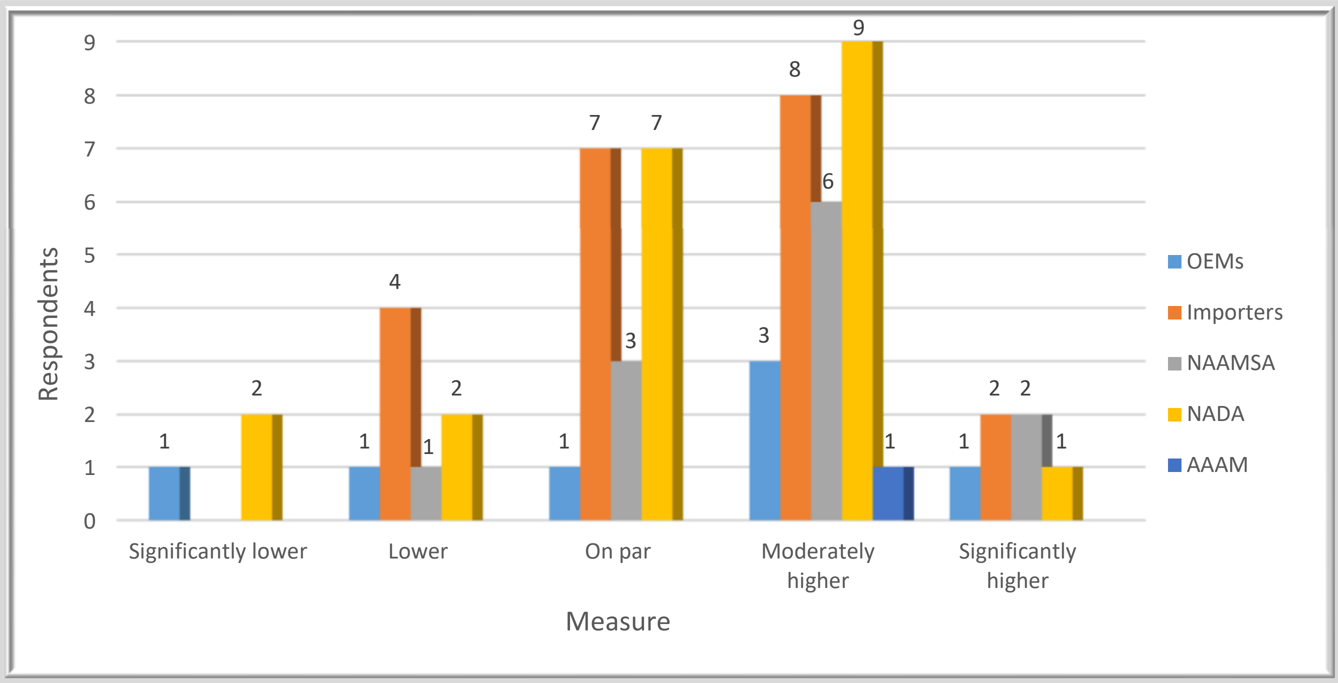


Figure 6.4: Level of South African consumers' ability to afford new vehicles relative to consumers in other developing countries

Most respondents (53.2%/n=33) in figure 6.4 stated that South African's ability to afford new vehicles are moderately to significantly higher than consumers in other developing countries. Only 29% of respondents stated that it is on par, and 17.7% stated that it is lower to significantly lower than in other developing countries. After receiving this question's results, the researcher realised that the question could have been misinterpreted by the respondents because it did not state which developing countries were being compared. However, the researcher is of the opinion that the respondents compared countries in Africa as the survey was focused on South Africa and Africa and the respondents, being involved in the South African automotive industry, all have a specific business interest in the South African and African markets.

Chapter 4 discussed consumers' ability to afford vehicles in the South African economy and the costs impacting disposable income levels. It is becoming taxing on consumers to afford new vehicles which results in the vehicle replacement cycle to be delayed owing to affordability and the uncertain economy. In an affordability driven marketplace, market conditions continued to be characterised by a downtrend with sales of entry level vehicles, small utility vehicles, and crossovers performing relatively well (AIEC, 2022:15). The used vehicle market is gaining traction based on price and affordability, and it emphasises consumers' choice to rather buy used vehicles (AIEC, 2022:15).

Question 8 required respondents to indicate how the costs of the criteria, listed in table 6.4, impacted the affordability of new vehicles for the final customer who purchases a new vehicle. A five-point Likert rating scale from 1 (no impact) to 5 (critical impact) was used to obtain the considered responses for this question. Table 6.4 indicates the results of the different groups of respondents.

Table 6.4: The mean impact of the costs relating to the affordability of new vehicles to the final customer

Criteria	**Mean**				
	OEMs (N=7)	**Importers (N=21)**	**NADA (N=21)**	**NAAMSA (N=12)**	**AAAM (N=1)**
Inflation	**3.14**	**3.33**	**3.62**	**3.58**	**3**
Rand exchange rate	**4.29**	**4.42**	**4.14**	**4.33**	**5**
Financing costs	**3.14**	**3.76**	**3.76**	**3.91**	**4**
Fuel levies	**3.29**	**3.00**	**3.43**	**3.00**	**2**
Tyre levies	**3.14**	**2.67**	**2.90**	**3.08**	**2**
Insurance costs	**3.57**	**3.85**	**3.52**	**3.58**	**3**
Maintenance and service plans costs	**3.29**	**3.19**	**3.43**	**3.25**	**3**
Vehicle fiscal tax (CO_2, ad valorem)	**3.86**	**3.09**	**3.38**	**3.00**	**3**

Table 6.4 denoted that the combined mean value among all the groups is that the rand exchange rate (mean of 4.44) has a high to critical impact on the affordability of a new vehicle. A wide range of vehicles and components are imported, and the exchange rate plays a significant role in determining the cost of a vehicle. Chapter 4 explained that one of the objectives of the SAAM 2021-2035 is to increase local content levels in South African assembled vehicles to 60%, which will negate the impact of a weak currency against foreign ones; thus, providing a higher level of certainty with the pricing of vehicles (AIEC, 2022:32).

The combined mean value among all the groups in table 6.4 indicates that fuel levies (mean of 2.94) and tyre levies (mean of 2.76) have a low to moderate impact on affordability. The combined mean value among all the groups in table 6.4 indicates that inflation (mean of 3.33), financing costs (mean of 3.71), insurance costs (mean of 3.50), maintenance and service plan costs (mean of 3.23), and vehicle fiscal tax (mean of 3.27) have a moderate to high impact on affordability. Chapter 4 discussed that the industry is currently experiencing above inflation rate vehicle price increases whilst disposable income levels are deteriorating, which makes it difficult for consumers to afford a new vehicle, causing a downtrend in new vehicle sales and a delayed vehicle replacement cycle (AIEC, 2022:7).

Question 9 required respondents to indicate the impact of the challenges, listed in table 6.5, on new vehicle sales' growth in the South African automotive industry. A five-point Likert rating scale from 1 (no impact) to 5 (critical impact) was used to obtain the considered responses for this question. Table 6.5 displays the results of the different groups of respondents.

Table 6.5: The mean impact of the challenges affecting the South African automotive industry's new vehicle sales' growth

Criteria	**Mean**				
	OEMs (N=7)	**Importers (N=21)**	**NADA (N=21)**	**NAAMSA (N=12)**	**AAAM (N=1)**
Political conditions	**3.86**	**3.90**	**3.57**	**4.00**	**2**
Stability of electricity supply	**3.29**	**3.33**	**3.62**	**3.33**	**3**
Rising costs of electricity	**3.29**	**3.33**	**3.52**	**3.75**	**3**
Port costs for importing and exporting	**3.29**	**3.38**	**3.95**	**3.67**	**3**
A volatile currency	**4.57**	**4.38**	**4.24**	**4.58**	**4**
Labour stability	**4.00**	**3.52**	**3.95**	**4.17**	**2**
Weak business confidence levels	**4.14**	**3.90**	**4.10**	**4.33**	**4**
Weak economic growth rate impacting disposable income levels	**4.43**	**4.38**	**4.29**	**4.42**	**5**

The combined mean value among all the groups, as revealed in table 6.5, is that the political conditions (mean of 3.47), stability of electricity supply (mean of 3.31), the rising cost of electricity (mean of 3.38), port costs when importing or exporting (mean of 3.46), and labour stability (mean of 3.53) have a moderate to high impact on new vehicle sales' growth in South Africa. Chapter 4 discussed the impact of electricity supply and the rising costs as factors of production and how the manufacturers have been affected since 2008 when load-shedding started (Autolive August issue, 2021:5). Chapter 4 discussed South Africa's cargo dues on automotive vehicles and components which are 149% higher than the global average (Ports Regulator, 2019:23). Chapter 4 discussed the challenges of labour costs where labour unions demand excessive wages in the domestic automotive industry. Even though there are three-year wage agreements in place, this does not deter labour stability which has an impact on new vehicle sales' growth because production is disrupted, and sales are impacted.

The combined mean value among all the groups, as pointed out in table 6.5, is that a volatile currency (mean of 4.35), weak business confidence levels (mean of 4.09), and a weak economic growth rate (mean of 4.50) have a high to critical impact on new vehicle sales' growth in South Africa. Chapter 4 discussed these aspects in detail and highlighted how the impact of exchange rate volatility can lead to uncertainties regarding vehicle costing and pricing. A strong South African economy will translate in higher new vehicle sales because more people will have additional disposable income which can be used to purchase new vehicles whilst an underperforming GDP has the opposite effect (AIEC, 2022:15). Consumers need to feel confident that they will be able to meet their financial obligations by repaying their motor finance. Low consumer confidence levels have a direct impact on whether a consumer will consider entering the buying cycle or rather wait for economic conditions to improve. These aspects are critical in growing new vehicle sales in South Africa and should be tackled as a matter of high priority.

Question 10 required respondents to indicate how they think the impact of the criteria, listed in table 6.6, would affect new vehicle sales' growth in South Africa going forward. A five-point Likert rating scale from 1 (no impact perceived) to 5 (critical impact perceived) was used to obtain the considered responses for this question. Table 6.6 highlights the results of the different groups of respondents.

Table 6.6: The perceived mean level of the impact of criteria which would affect new vehicle sales' growth in South Africa going forward

Criteria	**Mean**				
	OEMs (N=7)	**Importers (N=21)**	**NADA (N=21)**	**NAAMSA (N=12)**	**AAAM (N=1)**
The fourth industrial revolution	**3.00**	**3.00**	**3.33**	**2.92**	**1**
Introduction of clean automotive fuels (Euro 5 or 6)	**3.14**	**3.61**	**2.95**	**2.92**	**2**
Internal combustion engine technology	**3.57**	**3.38**	**3.33**	**2.92**	**2**
Hybrid engine technology	**2.29**	**3.00**	**2.71**	**2.25**	**3**
Electric vehicles	**2.43**	**3.00**	**2.67**	**2.58**	**2**
Autonomous driving vehicles	**1.57**	**1.95**	**2.14**	**1.75**	**1**
Trade wars	**3.00**	**2.95**	**2.33**	**2.83**	**1**
Alternate transport systems (Uber, Taxify, ride sharing, and others)	**2.86**	**2.71**	**2.86**	**3.17**	**2**
Government support (financial and policy)	**4.29**	**4.19**	**3.81**	**4.08**	**2**

The combined mean value among all the groups, as highlighted in table 6.6, is that autonomous driving vehicles (mean of 1.68) will have no to little impact on new vehicle sales' growth in South Africa going forward. The combined mean value among all the groups, as indicated in table 6.6, is that the fourth industrial revolution (mean of 2.65), the introduction of clean automotive fuels (mean of 2.92), hybrid engine technology (mean of 2.65), electric vehicles (mean of 2.54), trade wars (mean of 2.42), and alternate transport systems (mean of 2.72) will have little to moderate impact on new vehicle sales' growth in South Africa going forward. Chapter 3 discussed all these aspects in detail but what is important is that South Africa cannot continue to depend solely on manufacturing internal combustion engines seeing that the market is stagnant and diminishing (OICA, 2017; AIEC, 2021:44). It is necessary to shift South

Africa's vehicle manufacturing to electric vehicle manufacturing to continue to supply the main international markets with their growing demand. What is evident, as highlighted in chapter 1, is that South Africa cannot manufacture for both markets because there are huge difficulties in achieving economies of scale and it will promote inefficiencies.

The combined mean value among the all the groups, as indicated in table 6.6, is that internal combustion engine technology (mean of 3.04) and government policy (mean of 3.67) will have a moderate to high impact on new vehicle sales' growth in South Africa going forward. Chapter 4 discussed the importance of an industrial policy, such as the SAAM 2021-2035, which has been implemented to promote the domestic automotive industry whilst also looking attractive to foreign investors. Vehicle manufacturers need to achieve economies of scale and the only way to achieve this is through policy certainty and financial commitment from the government (AIEC, 2022:34). Without government support, no automotive industry can survive. This is also discussed in question 20.

Question 11 required respondents to indicate both the importance and the impact of each infrastructural criterion, listed in table 6.7, to improve new vehicle sales' growth in South Africa. A five-point Likert rating scale from 1 (no importance/no impact) to 5 (critical importance/critical impact) was used to obtain the considered responses for this question. The top row in each criterion refers to the mean importance value and the bottom row refers to the mean impact value. Table 6.7 presents the results of the different groups of respondents.

Table 6.7: The mean level of importance and impact of each infrastructural criterion to improve new vehicle sales' growth in South Africa

Criteria	Mean				
	OEMs (N=7)	Importers (N=21)	NADA (N=21)	NAAMSA (N=12)	AAAM (N=1)
Electric vehicle infrastructure	4.29	3.52	2.81	3.00	2
	4.29	3.28	2.81	3.33	2
Ports infrastructure	4.00	3.42	3.81	3.83	2
	4.00	3.42	3.86	3.83	2
Road and rail infrastructure	3.29	3.23	3.90	4.00	2
	3.29	3.28	3.90	4.08	2

The combined mean value in table 6.7 among all the groups is that electric vehicle infrastructure (mean of 3.12 for importance and 3.14 for impact), ports infrastructure (mean of 3.41 for importance and 3.42 for impact), and road and rail infrastructure (mean of 3.28 for importance and 3.31 for impact) will have a moderate to high importance/impact on new vehicle sales' growth in South Africa. There is a difference in focus between the groups (OEMs versus NADA and NAAMSA) because their business interests differ. For instance, the OEMs indicated that electric vehicle and ports infrastructure are of high to very high importance because, as vehicle manufacturers, they know where the main automotive markets are heading to drive new vehicle sales and manufacturing volumes. NADA and NAAMSA, on the other hand, indicated that road and rail infrastructure are of high importance because they perceive road and rail infrastructure as important for selling, stock requisitioning, and delivering vehicles to customers. This shows that these groups have different priorities regarding specific infrastructure is important to their business operations.

Chapter 4 discussed the importance of EVs, and that South Africa needs to create and enable an environment suitable for the adoption and uptake of EVs so that the country can catch up with global players (Manners-Bell, 2018:113; AIEC, 2021:44). South Africa has the potential to be on par with this track in its pursuit for increased growth and competitiveness, but the successful implementation of EVs hinges on some key factors. The most important factor is the need for appropriate government policy support, such as incentives for the sale or production of EVs, or even tax breaks. Lack of government support, an ailing ESKOM (Electricity Supply Commission) utility, no stability in electricity supply, slow infrastructure growth regarding car charging stations, and limited incentives for driving an electric vehicle are some of the main challenges facing South Africa. An interesting point worth noting is that the government seems to be at a crossroads regarding rapidly developing EV infrastructure. Chapter 3 pointed out that there will be a trade-off because South Africa cannot simultaneously be manufacturing old and new engine type vehicles for different markets. If an EV infrastructure is not quickly developed, it will result in the slow death of the South African automotive industry which will have a crippling impact on the South African economy. But on the flipside, to implement an EV infrastructure would mean the potential gradual loss of R85 billion per annum in fuel tax revenue which government depends on and will need to collect elsewhere (OUTA, 2021:1).

Road, rail, and ports infrastructure need to be upgraded if the South African automotive industry is going to become globally competitive and produce more than a million cars annually. Chapter 4 explained these aspects and that paved roads account for only 21% of South Africa’s total roads which amounts to 154 000 kilometres of paved roads, however, few new roads are being built and existing roads must be maintained (Autolive September issue, 2018:2). At full capacity, South African ports are designed to handle 850 000 units annually, but the available capacity is only 681 041 units annually (Ports Regulator, 2019:61). This means that should South Africa achieve its target of 1.4 million units annually by 2035, South African ports need to be upgraded to accommodate the higher volumes.

Question 12 required respondents to indicate the impact of the coronavirus (COVID-19) pandemic, using the criteria listed in table 6.8, on the South African automotive industry and new vehicle sales' growth in South Africa going forward. A five-point Likert rating scale from 1 (of no importance/no impact) to 5 (of critical importance/critical impact) was used to obtain the considered responses for this question. Table 6.8 displays the results of the different groups of respondents.

Table 6.8: The mean impact of the coronavirus (COVID-19) pandemic on the South African automotive industry and new vehicle sales growth in South Africa going forward

Criteria	**Mean**				
	OEMs (N=7)	**Importers (N=21)**	**NADA (N=21)**	**NAAMSA (N=12)**	**AAAM (N=1)**
Coronavirus lockdown	**4.86**	**4.76**	**4.81**	**4.50**	**5**
Increased prices of vehicles	**3.29**	**3.95**	**4.21**	**3.92**	**3**
Decreased affordability by consumers	**4.14**	**4.38**	**4.33**	**4.08**	**5**
Stock shortages (components/parts)	**4.29**	**3.86**	**3.86**	**4.17**	**3**
Decreased cost competitiveness	**3.00**	**3.43**	**3.43**	**3.92**	**4**
Just-in-Time supply requirements not met	**3.43**	**3.62**	**3.52**	**3.83**	**4**
Altered marketing strategies	**3.57**	**3.76**	**3.57**	**3.75**	**3**

The combined mean value among all the groups, as revealed in table 6.8, is that the coronavirus lockdown (mean of 4.79) has had a critical impact on the world economy and South Africa's automotive industry, and the COVID-19 pandemic has had a high to critical impact on the affordability by consumers (combined mean of 4.39). Chapter 4 discussed the impact of the COVID-19 pandemic on the South African economy and domestic automotive industry. The combined mean value among all the groups is that the COVID-19 pandemic has had a moderate to high impact on the prices of vehicles (mean of 3.67), stock shortages (mean of 3.84), decreased cost competitiveness (mean of 3.56), Just-in-Time (JIT) supply requirements not met (mean of 3.68), and altered marketing strategies (mean of 3.53). The important point worth noting, and discussed in chapter 4, is that consumers are battling with affordability and access to finance is becoming more difficult because many consumers have lost their jobs owing to the pandemic. As a result, the new vehicle market is struggling and is under severe pressure because consumers are buying down and moving to the used vehicle market (AIEC, 2021:108).

Chapter 4 discussed the impact of the pandemic on stock shortages and how it is having a negative impact on the JIT delivery system and costing. Stock shortages have led to price increases, thereby decreasing the cost competitiveness of manufacturers and the reliability of supply of production (Autolive September issue, 2021:2). Chapter 2 discussed the importance and principles of a JIT delivery system as demanded by the vehicle manufacturers (Manners-Bell, 2018:51). Some manufacturers were able to withstand the shortages for some time, but it seems that the shortages have caught up with all the manufacturers and now the situation has become critical (Autolive April issue, 2021:1; AIEC, 2022:36). The riots in Kwa-Zulu Natal worsened the situation even further as transport via land was interrupted and ports were shut down causing major delays. Toyota, being based in Kwa-Zulu Natal, was heavily affected and it resulted in a letter of complaint being sent from the chief executive officer of Toyota to the President of South Africa relating to future Toyota investments in the country. Chapter 4 furthermore discussed how manufacturers and dealers are becoming more and more creative with their marketing campaigns to ease the pressure on consumers. Some marketing strategies include guaranteed buy back options and payment holidays from manufacturers, to allow the consumer to start their first instalment up to six months after purchasing the vehicle, seeing that this relaxed period will enable them to recover from the current market conditions.

Question 13 required respondents to indicate the importance of, and impact of, the digital future criterion, listed in table 6.9, and the effect it will have on new vehicle sales' growth in South Africa going forward. A five-point Likert rating scale from 1 (no importance/no impact) to 5 (critical importance/critical impact) was used to obtain the considered responses for this question. The top row in each criterion refers to the mean importance value and the bottom row refers to the mean impact value. Table 6.9 denotes the results of the different groups of respondents.

Table 6.9: The mean level of importance and impact of each digital future criterion which will affect new vehicle sales' growth in South Africa going forward

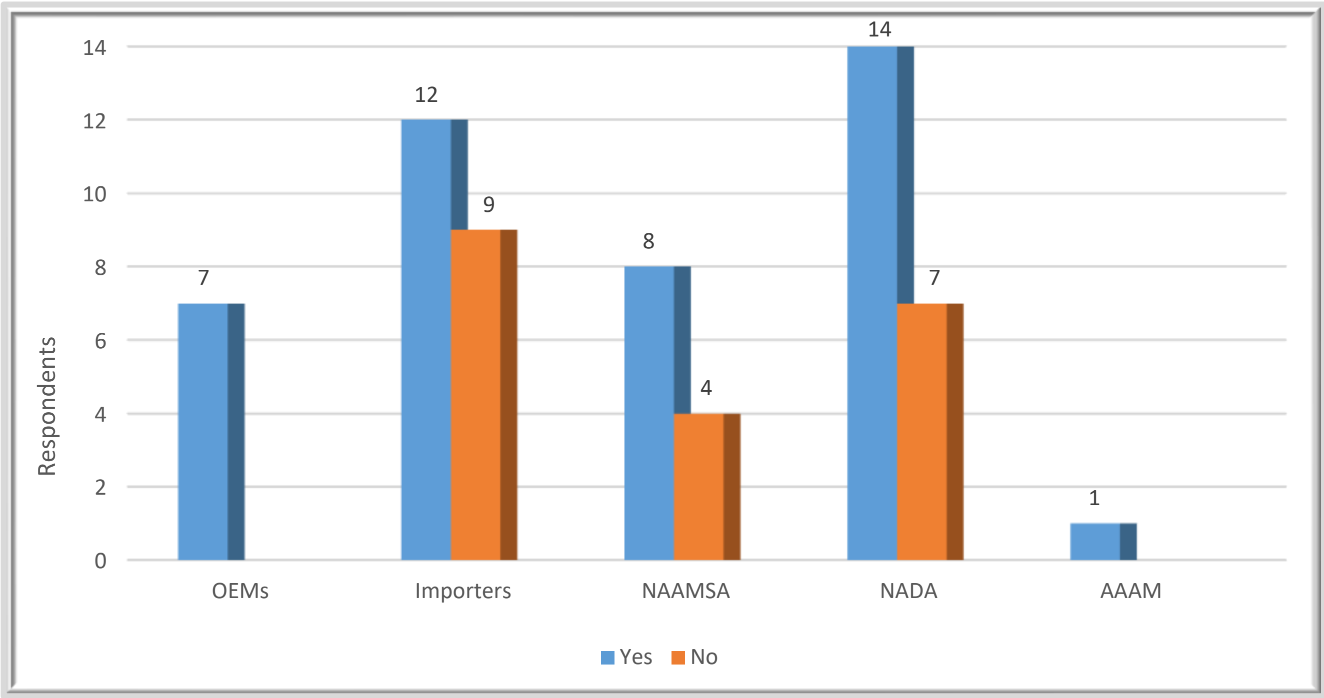
Criteria	Mean				
	OEMs (N=7)	Importers (N=21)	NADA (N=21)	NAAMSA (N=12)	AAAM (N=1)
Online consumer experience	4.57	4.00	4.24	4.00	5
	4.57	3.95	4.29	4.00	4
Online vehicle purchasing	4.29	3.38	4.00	3.75	4
	4.14	3.29	4.00	3.58	3
Online customer relationship management	4.57	4.00	4.24	3.91	3
	4.29	3.71	4.29	4.16	2
The virtual showroom	4.29	3.62	4.29	4.08	4
	4.14	3.48	4.29	3.91	4
Smart vehicles	2.86	2.95	3.67	3.50	3
	2.71	2.81	3.67	3.33	3

The combined mean value among all the groups, as shown in table 6.9, is that the online consumer experience (mean of 4.36 for importance and 4.16 for impact) will have a high to critical importance/impact on new vehicle sales' growth in South Africa going forward. The virtual showroom (mean of 4.06 for importance and 3.96 for impact) will have a high importance/impact on new vehicle sales' growth; whereas the online vehicle purchasing (mean of 3.88 for importance and 3.60 for impact), online customer relationship management (mean of 3.94 for importance and 3.69 for impact), and smart vehicles (mean of 3.20 for importance and 3.10 for impact) will have a moderate to high importance/impact on new vehicle sales' growth in South Africa going forward.

Chapter 3 discussed the importance of the online environment in the current trading environment which has grown exponentially in prominence because of the COVID-19 pandemic. It has become convenient, and the growing trend, for consumers to search online on a vehicle manufacturer's website for all the latest information regarding the vehicle they want to purchase (Autolive June issue, 2020:11; Autolive April issue, 2021:16). Chapter 4 highlighted that because vehicle purchases are consumers' second highest expense, they will still need to visit a dealership because there are so many additional options and specifications which need to be finalised in person (Autotrader, 2020:46). As much as digital technologies and e-commerce have advanced over the past few years and will continue to develop, the complete online vehicle purchase will not be a reality in the foreseeable future. Some of the issues that need to be considered are test driving the vehicle, upholstery options, optional features, engine specifications, colour choice, finance plans, and compliance with regulations, amongst others. The online process can only take the consumer to a certain part of the transaction, thereafter the consumer must complete the purchase journey at the dealership.

Chapter 3 discussed the virtual showroom which is closely linked to the online consumer's experience and online vehicle purchasing as discussed above. The first leg of the consumer's purchasing journey is to log onto a vehicle manufacturer's website and to start their virtual journey. The virtual showroom is now considered as the dealership of the future and needs to be enticing so that the consumer wants to continue onto the next leg of their vehicle purchasing journey. Chapter 2 discussed the importance of customer relationship management and customers are regarded as the lifeblood of the business because they bring income and profits to the business (Botha & Bothma, 2015:148; Ziliani & Ieva, 2016:275; Tolmay & Venter, 2017:2). Chapter 3 discussed smart vehicles which are now considered to be rolling computers (AIEC, 2019:36). Keeping up with customer expectations in an increasingly demand driven environment is adding to the challenges facing the South African automotive industry. The more technology is included in the vehicle, the pricier the vehicle becomes, therefore, only catering for the premium market owing to the affordability of these vehicles. Growth in new vehicle sales is increasing in the entry level segments and not in the premium segments (AIEC, 2021:16).

Question 14 required respondents to indicate whether the African continent could be perceived as a significant growth market for South Africa to increase new vehicle sales in view of the African Continental Free Trade Area developments. Figure 6.5 indicates the results of the different groups of respondents.



<u>Figure 6.5: The African continent to be a significant growth market for South Africa to increase new vehicle sales in view of the African Continental Free Trade Area developments</u>

In figure 6.5, more than two thirds of the respondents (67.74%/n=42) indicated that the African continent would be a significant growth market for South Africa to increase new vehicle sales. These respondents did not need to answer question 15 and went on to answer question 16. Only the 32.26% respondents who did not perceive the African continent as significant for South Africa’s new vehicle sales’ growth needed to answer question 15 and provide reason(s) which will be discussed in question 15.

Question 15 only respondents who answered question 14 in the negative had to complete question 15. They had to explain their reasoning why they did not perceive the African continent as a significant growth market for South Africa. Basic content and thematic analysis of the responses was done by using ATLAS-ti and table 6.10 highlights the three main themes of the twenty responses.

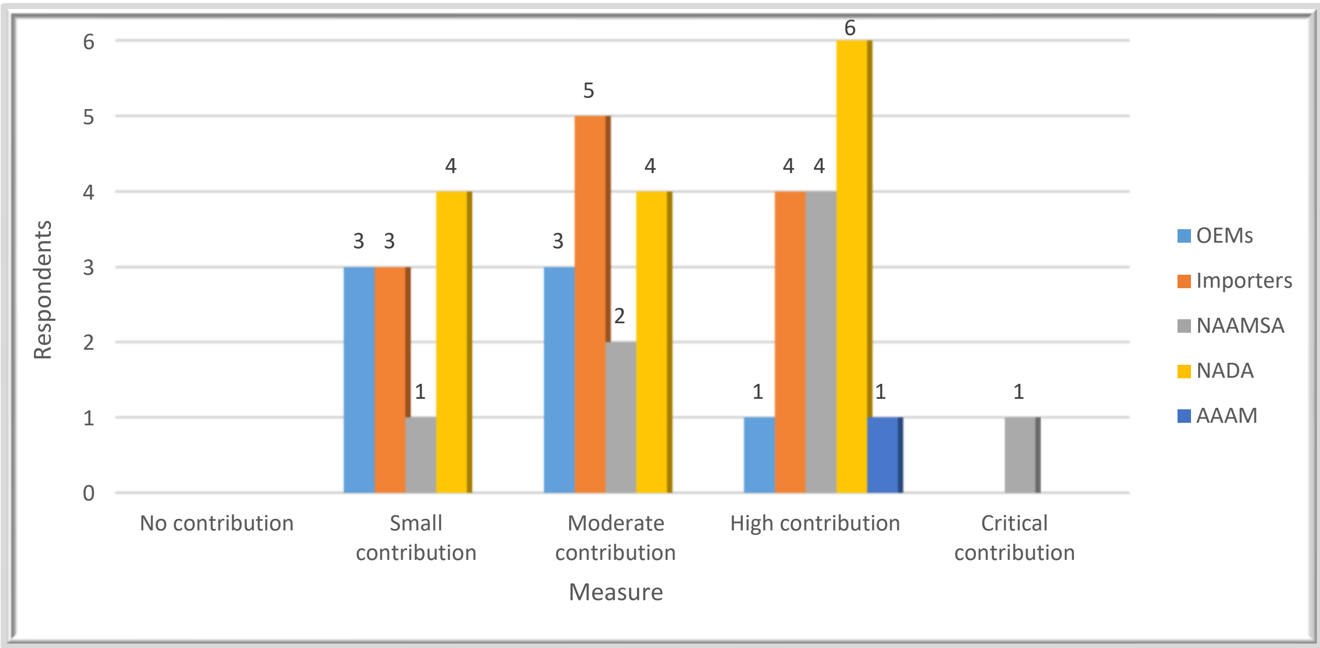
Table 6.10: Main themes of the responses from the respondents who did not perceive the African continent to be a significant growth market for South Africa

Main themes from the responses
Various African countries' economies are certainly not in good shape. The growth prospects have been further dampened by volatile political environments in many African countries. The current pandemic has complicated the problems even more by weakened investor confidence and loss of income across segments and societies. Most African countries are too poor to support high numbers of new vehicle sales. For African countries to grow new vehicle sales, they will first have to address concerns like unemployment, average household income, private sector growth, road infrastructure, corruption, political and economic stability, and grey product imports. It's a long-term opportunity with little impact, and African governments are too unstable as growth continues to be start-stop.
The vehicle market in Africa is dominated by cheap imports from the developed world. Without a change in legislation and the enforcement thereof, the African continent will continue to be the dumping ground for used vehicles from other parts of the world supporting vehicle sales from these countries. Importers are not trading in most of these African markets and, therefore, do not foresee growth in the next two to three years. From a brand perspective, as an importer and not a manufacturer, most African markets are already covered by current distribution and importer agreements; thus, there is little opportunity for direct growth in these markets.
The vehicle offerings and the car market in other African countries are in many instances very different from what South Africa offers. Some of the African countries have a very low level of vehicle affordability which is the foundational requirement for volume manufacturing.

Table 6.10 discussed the primary reasoning of the twenty respondents. One of the most important economic challenges Africa is facing is, each African country needs to have a regulatory business environment as discussed in chapter 3 (AIEC, 2022:46). Chapter 3 also highlighted another very important economic challenge which is the

competition with the second-hand vehicle market. The duties on new vehicles in these markets exceed those of the used car market and there is no incentive to stimulate new car sales. The conclusion derived from this question is that Africa appears to be an attractive market but, owing to various challenges, it is not. These challenges were previously discussed (for instance, grey imports). The COVID-19 pandemic exacerbated the challenges facing African countries making growth prospects for new vehicle sales even weaker (AIEC, 2021:52).

Question 16 required respondents, who perceived the African continent as a significant growth market for South Africa, to highlight the contribution level to the South African automotive industry in promoting new vehicle sales. A five-point Likert rating scale from 1 (no contribution) to 5 (critical contribution) was used to obtain the considered responses for this question. Figure 6.6 presents the results of the different groups of respondents.



<u>Figure 6.6: The African continent's level of contribution to the South African automotive industry in promoting new vehicle sales</u>

In figure 6.6, forty-two (67.74%) respondents perceived the African continent as a significant growth market for South Africa. A large majority of these forty-two respondents (73.81%/n=31) indicated that the African continent would have a moderate to high contribution. Chapter 3 discussed the importance of the African continent and its potential as a growth market because it is the second fastest growing continent in the world, after Asia, and offers the highest return on investment of any region (AIEC, 2020:43). The African growth rates have been growing substantially and as the continent becomes more populous, the automotive OEMs that have entrenched themselves in these markets would be able to benefit from the burgeoning African markets (AIEC, 2022:45).

Question 17 required respondents to indicate both the importance and the impact of the criteria, listed in table 6.11, to South African vehicle manufacturers when deciding to pursue the African markets. A five-point Likert rating scale from 1 (no importance/no impact) to 5 (critical importance/critical impact) was used to obtain the considered responses for this question. The top row in each criterion refers to the mean importance value and the bottom row refers to the mean impact value. Table 6.11 shows the results of the different groups of respondents.

Table 6.11: The mean level of importance and impact of the following criteria to South African vehicle manufacturers when deciding to pursue the African markets

Criteria	**Mean**				
	OEMs (N=7)	**Importers (N=12)**	**NADA (N=14)**	**NAAMSA (N=8)**	**AAAM (N=1)**
Regulatory business environment	**4.71**	**4.25**	**4.29**	**4.38**	**5**
	4.71	**4.33**	**4.29**	**4.38**	**5**
Duty-free access on new vehicles	**4.00**	**4.00**	**4.14**	**4.50**	**5**
	4.00	**4.08**	**4.14**	**4.50**	**5**
Trade agreements	**4.14**	**4.08**	**3.93**	**4.38**	**4**
	4.14	**3.92**	**3.86**	**4.25**	**4**
Ban the import of used vehicles	**4.29**	**4.08**	**4.43**	**4.50**	**4**
	4.43	**3.92**	**4.29**	**4.38**	**4**
Stability in the economic environment	**4.29**	**4.00**	**4.29**	**4.50**	**4**
	4.43	**4.17**	**4.07**	**4.38**	**4**
Clean fuels (Euro 5 or 6)	**3.29**	**3.75**	**3.50**	**3.13**	**2**
	3.43	**3.58**	**3.36**	**3.00**	**2**
Customs matters and procedures	**3.86**	**3.75**	**4.07**	**4.25**	**5**
	3.86	**3.58**	**4.14**	**4.25**	**5**

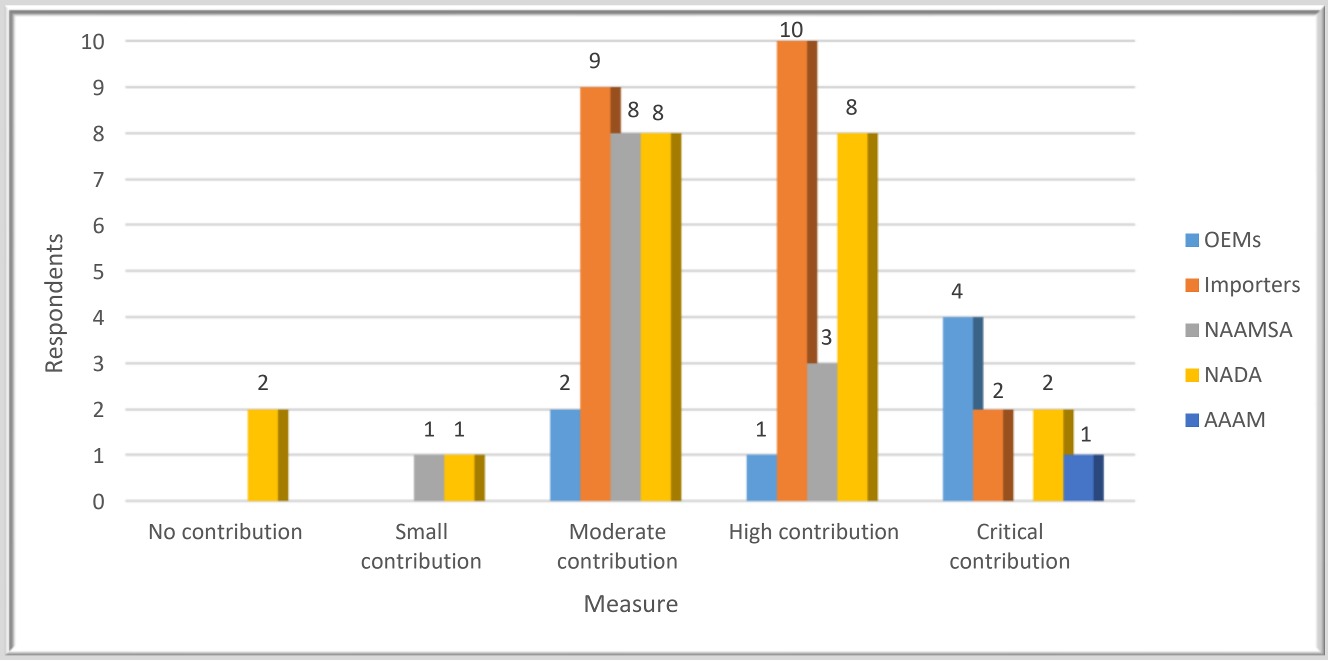
Based on the criteria in table 6.11, respondents had to highlight the importance and impact of the set criteria and the combined mean value among all the groups is that a regulatory business environment (mean of 4.53 for importance and 4.54 for impact), duty-free access on new vehicles (mean of 4.33 for importance and 4.34 for impact), trade agreements (a mean of 4.11 for importance and 4.03 for impact), ban the import of new vehicles (mean of 4.26 for importance and 4.20 for impact), stability in the economic environment (mean of 4.22 for importance and 4.21 for impact), and customs matters and procedures (mean of 4.19 for importance and 4.17 for impact) are of high to critical importance and impact the decision making of vehicle manufacturers who want to pursue the African markets. Only clean fuels had a combined mean value (mean of 3.13 for importance and 3.07 for impact) and are of moderate to high importance and impact in the decision making for vehicle manufacturers wanting to pursue the African markets. Chapter 3 discussed the importance of a regulatory business environment and that duties on new vehicles cannot exceed those of used vehicles. Trade agreements play a significant role in promoting a framework that will ensure the safety of OEMs' investments. Banning the importation of used vehicles would be a trade agreement that could be a catalyst for the OEMs wanting to pursue the African markets. Chapter 3 noted that South Africa and northern African countries do not allow the importation of used vehicles and it is the reason for the successful growth and development of their automotive industries (AIEC, 2020:49). The potential for new vehicle sales could reach two million units per annum in the next five to ten years if these measures were to be enforced.

Chapter 3 discussed the necessity of a stable economic environment because it is crucial to OEMs wanting to invest in these markets. A new vehicle market will not survive where there is too much uncertainty because no OEM would want to invest heavily, or at all, in these conditions. Chapter 2 highlighted the importance of a JIT framework which OEMs strictly adhere to. From the time the vehicle is exported until it reaches the final customer, there needs to be a continuous flow without any delays from the customs and ports administrators. Chapter 4 discussed the transition to clean fuels and the impact it could potentially have on the domestic automotive industry. South Africa is challenged with the implementation of clean fuels but the transition to clean fuels is imperative to ensure the longevity of the South African automotive industry (NAAMSA, 2017a:1). South Africa has the most mature automotive market in Africa and has the capabilities and capacity to export to the rest of the continent at considerably faster turnaround times than global OEMs. This is because of the maturity of the South African market in terms of the number of brands available locally and stock capacities from both OEMs and importers. However, South Africa's low fuel quality standards put the country's production base at greater risk.

6.4 Section C of the questionnaire

Section C of the questionnaire, covering **questions 18 to 22**, dealt with government policy in the form of the South African Automotive Masterplan (SAAM) 2021-2035 and required all respondents to provide their views on the new policy dispensation. The results of these questions will now be elucidated.

Question 18 required respondents to indicate the perceived contribution of the SAAM 2021-2035 on the South African automotive industry. A five-point Likert rating scale from 1 (no contribution) to 5 (critical contribution) was used to obtain the considered responses for this question. Figure 6.7 exhibits the results of the different groups of respondents.



<u>**Figure 6.7: The perceived contribution of the South African Automotive Masterplan 2021-2035 on the South African automotive industry**</u>

In figure 6.7, only four (6.45%) respondents indicated a none or minimal contribution while most of the respondents (93.55%) indicated that the SAAM 2021-2035 would make a moderate to critical contribution to the South African automotive industry. Chapter 4 discussed the SAAM 2021-2035 in detail and highlighted the vision and objectives of the SAAM 2021-2035. Suffice it to say, if the vision and objectives can be achieved, it would have a considerable impact on the entire South African automotive industry and all stakeholders would benefit.

Question 19 required respondents to indicate whether the South African automotive industry would be able to achieve manufacturing volumes of 1.4 million units annually by 2035. Figure 6.8 presents the results of the different groups of respondents.

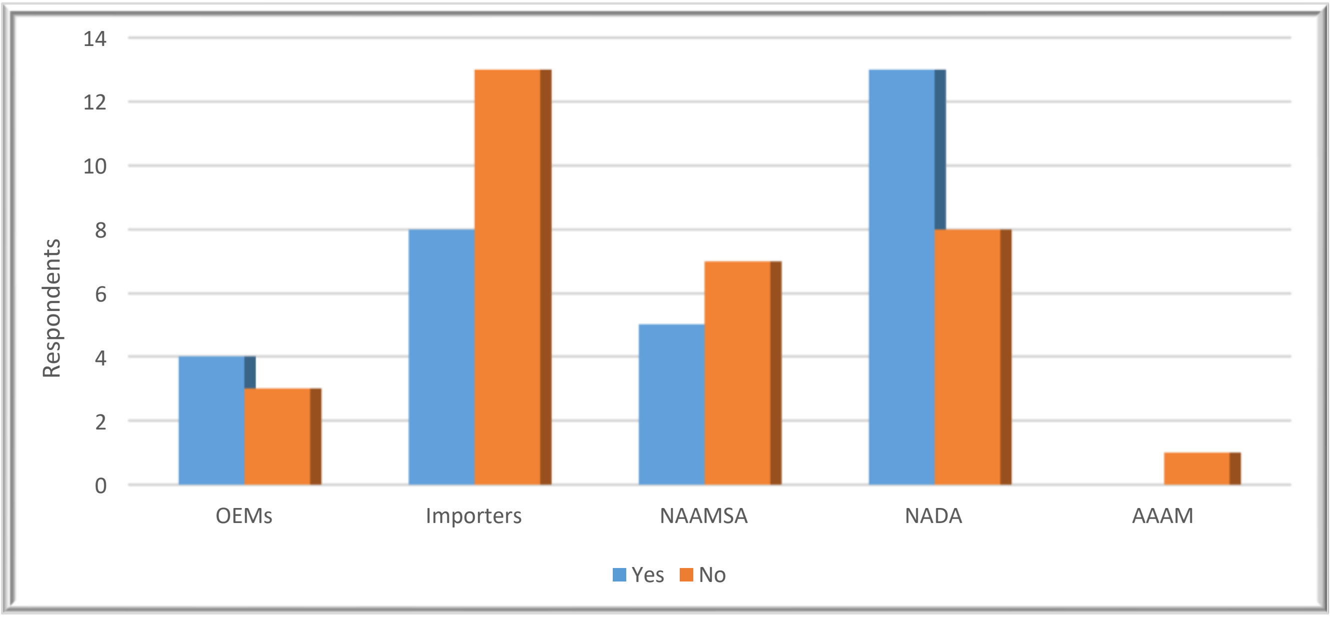


Figure 6.8: The South African automotive industry's ability to achieve manufacturing volumes of 1.4 million units annually by 2035

The respondents in figure 6.8 were similarly split with thirty-two (51.61%) respondents stating that the South African automotive industry would not be able to achieve these volumes, while thirty (48.39%) respondents do think that these volumes are achievable by 2035. Question 20, which follows next, deals with the reasoning provided.

Question 20 required respondents to explain their answer to question 19. Basic content analysis of the responses was done by using ATLAS-ti and tables 6.12 and 6.13 denotes the main themes of the responses.

Table 6.12: Summary of the responses from the respondents who indicated that the South African automotive industry would not be able to achieve manufacturing volumes of 1.4 million units annually by 2035

Summary of the responses
The target of 1.4 million vehicles by 2035 is now in jeopardy because of the pandemic and much will depend on the global economy's medium-term recovery. Government tax is too high, and GDP is too low to support a growth in per capita income to afford a new vehicle. The economy has not been growing even prior to COVID-19. Since the pandemic, the government does not have enough money because most of the funds are now being directed to managing the pandemic, which is the priority. It is a tough economic situation with political instability. The cost of new vehicles is far too high, and affordability has deteriorated.
There are many factors at play, such as the improvement of electricity supply, high overhead costs owing to alternative power installations by manufacturers, employee strikes, and economic instability. Labour will play too big a role, thereby making South African cars uncompetitive globally. Unstable or unpredictable actions by organised labour unions could negatively affect supply chains and disrupt the continuous supply to export destinations. Volatility in the exchange rate has a turbulent effect on imports and exports as currency weaknesses offset manufacturing efficiency resulting in lower cost exports. The ambitious targets will need tremendous government support and the key stakeholders will need to expand their manufacturing in a depressed economic environment which is plagued by the added burden of the current pandemic. Customer incentives to buy local, consumer confidence, and the high unemployment rate are obstacles that have not been addressed which will become hurdles in this target range. Unless supported by more exports, the target cannot be reached. More exports also mean greater levels of competitiveness and stability in labour negotiations.
South Africa is geographically too far removed from major motor industry hubs such as Europe. South Africa also lacks the competitive edge to compete with South America and India in this arena. The inability to drive EV manufacturing will restrict export volumes. The lack of investment in ports and rail infrastructure in the short term will handicap the motor industry in the long term. Component suppliers have not advanced their manufacturing capability and will be unable to meet demand and pricing in ten years' time. Fuel refining is in decline, productivity

is poor, and current labour legislation does not provide the right environment to scale up motor manufacturing to this level.
South Africa’s current growth projections and structural reform challenges, coupled with ever increasing competitiveness of other emerging markets wanting to engage in global vehicle manufacturing, could potentially prevent the achievement of the targets. It will be a challenge for the South African automotive manufacturing sector to meet the investment and development requirements so that the rapidly changing needs for products to export markets could be met. Export markets will demand, for example, alternate drivetrain and fuel technologies which will require significant investment in tooling, component supply, as well as elevated and diversified skills levels. Local demand for new vehicles will not increase to a level to sustain the additional production over the next decade. Currently, half of South Africa’s exports are to the European market which is evolving and moving away from Internal Combustion Engine (ICE) technology. Europe is phasing out diesel engines completely, petrol engines are still available, but they are adopting EVs at large. Without producing vehicles with this electric technology, South Africa will not continue to export vehicles in bulk in future. South Africa would not be able to increase production to the targeted 1.4 million units unless new or other markets are found to export to.

The key findings from the thirty-two responses, as indicated in table 6.12, can be arranged in a hierarchy order based on the number of times the same reason was given, where a percentage was allocated to each metric. Figure 6.9 reveals the results of the thirty-two respondents with the total percentages of the five most important factors impacting not being able to achieve the 1.4 million manufacturing target by 2035.

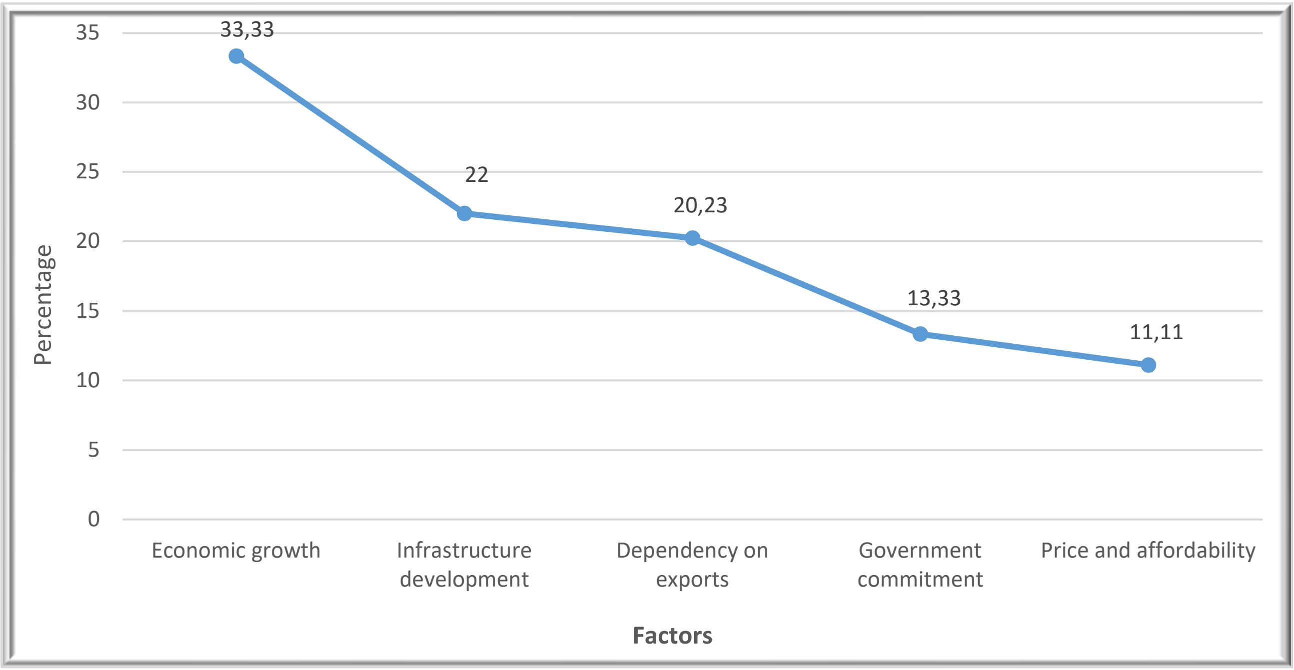


Figure 6.9: Five key metrics which impact not being able to achieve the 1.4 million manufacturing target by 2035

The first three metrics (economic growth, infrastructure development and dependency on exports) in figure 6.9 are the main challenges which will limit South Africa from achieving these targets. The respondents did not perceive labour related concerns as an important factor, only three respondents mentioned labour as a concern. As highlighted in chapter 4, labour could be a favourable or unfavourable factor. There are three-year wage agreements in place to reduce the risk of labour related challenges, however, as proven in 2022, there is still a possibility that labour problems may emerge. Table 6.13 highlights the main themes of the responses from the respondents that stated that the South African automotive industry would be able to achieve manufacturing volumes of 1.4 million units annually by 2035.

Table 6.13: Summary of the responses from the respondents who indicated that the South African automotive industry would be able to achieve manufacturing volumes of 1.4 million units annually by 2035

Summary of the responses
The targets can be achieved with government support and commitment from all the OEMs. All key stakeholders need to commit to the development and implementation of the SAAM 2021-2035 and the required institutional structures must be put in place to aggressively prepare and drive some of the ambitious targets set for 2035. With OEMs making significant investments in new platforms, the component supply base is beginning to leverage larger volumes, which drives the competitiveness of vehicles; thus, it may allow for greater exports of more affordable vehicles. This may happen if the OEMs can manage to expand their export volumes to the rest of Africa and other key markets, but this is critically dependent on economic growth and political stability. OEMs are committed to investing more to increase capacity in manufacturing and exports. Europe is moving away from older engines and exporting to these markets will prove futile if there is no immediate policy change to incentivise EVs to keep up with these markets.
There is a host of external factors which impact the domestic industry, and the economy has already proven that the domestic industry cannot do it on its own. The domestic market is too small to support this objective and there is a heavy dependence on export growth. All the Japanese OEMs are exporting cars from South Africa. In some cases, more than 80% of their volume is for exports and export contracts are critical to achieve this. Africa is a continent with huge potential to increase new vehicle exports because the young population is one of the most relevant drivers for the future growth thereof. The positive population growth in Africa could make this achievable.
The pre-requisite will be global economic recovery. The target could be achieved if socio-economic stability is realised. High labour, port and transport costs must be eliminated and new investments by government in technology, fuel, road, and rail are desperately needed to make this achievable. It is dependent on the ability to reach the local electric and hybrid vehicle market's capacity as global demand shifts towards these. South Africa needs to be able to manufacture for export and local demand. Manufacturing costs will need to be kept competitive (electricity and labour). Special Economic Zones (SEZs) are key to achieving this growth.

The key findings from the thirty responses, as highlighted in table 6.13, can be arranged in a hierarchy order based on the number of times the same reason was given of which a percentage was allocated to each metric. Figure 6.10 displays the results of the thirty respondents with the total percentages of the five most important factors for being able to achieve the 1.4 million manufacturing target by 2035.

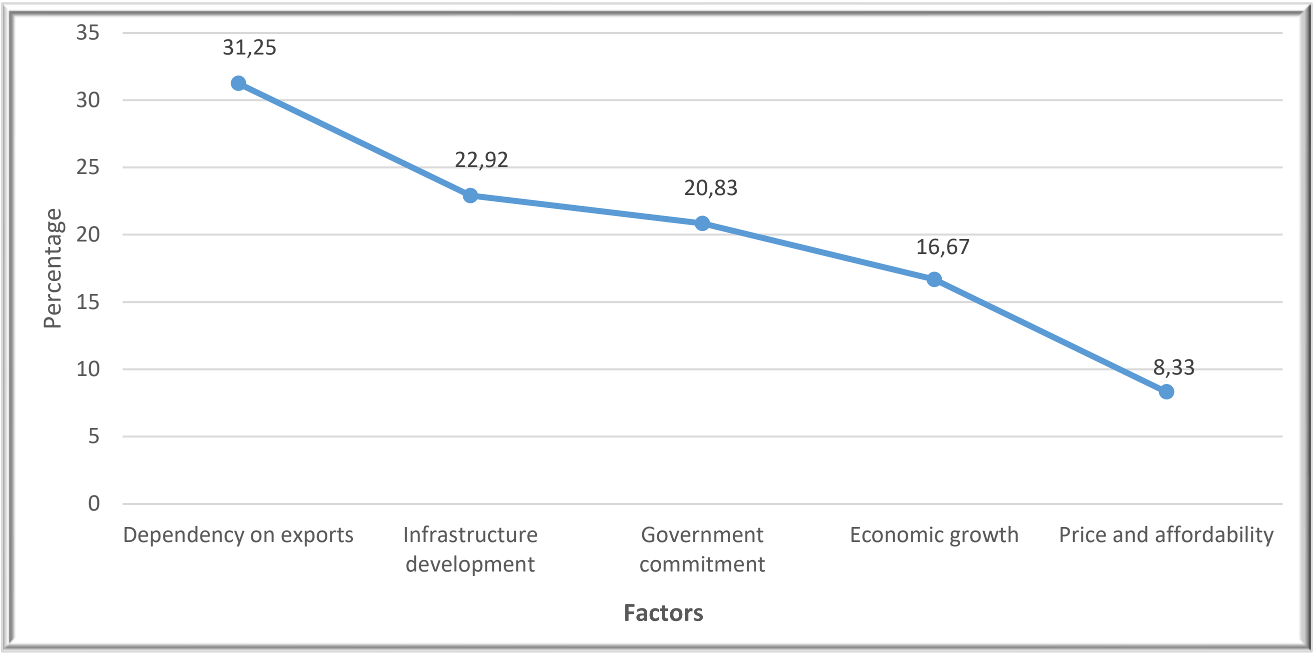


Figure 6.10: The key factors which impact being able to achieve the 1.4 million manufacturing target by 2035

The first three metrics (export dependency, infrastructure development, and government's commitment) in figure 6.10 are the most important factors that will pave the way for South Africa to achieve these targets. Exporting is critical to the South African automotive industry's success because most of its production is meant for the export markets. Chapter 1 discussed the domestic and export value of passenger cars and Light Commercial Vehicles (LCVs) manufactured in South Africa. From 2012 to 2021, an average of 66.6% of passenger car production were exported whilst an average of 47.7% LCV production were exported (AIEC, 2017:18; AIEC, 2018:17; AIEC, 2019:19; AIEC, 2020:20; AIEC, 2021:20; AIEC, 2022:20). Export is the backbone of achieving the intended target of 1.4 million units by 2035, without exports South Africa has no hope of achieving this. Export has a large impact on economic growth and is a catalyst for driving up business activity in the markets.

Higher levels of economic growth are needed in South Africa and in the rest of the world to balance the global production and consumption of vehicles. Chapter 1 explained that to achieve market optimisation, the domestic and export markets need to grow in relation to the higher intended production targets. As discussed in chapter 1, the South African domestic market is still small and not sufficient to drive economies of scale as required by the OEMs; thus, the emphasis on exporting is magnified. However, to achieve higher levels of economic growth, South Africa will have to follow the same path as its counterparts so that South Africa is not left behind. This means, for the South African automotive industry to establish an economy of scale will require heavy capital investments into the South African automotive market so that the infrastructure could be upgraded and developed to the same levels as the leading automotive markets of the world. To achieve higher export levels, South Africa's infrastructure needs to be synchronised to that of the markets it is supplying. More than half of South Africa's automotive production is exported to Europe. According to Autolive April issue (2021:11), a survey was done in Europe with 7 000 evenly split ICE and EV motorists. The key findings from this survey are as follows:

- 90% of the EV motorists felt the change to an EV was the right move, 74% felt more relaxed using an EV, and 77% found it to be a smoother drive than an ICE vehicle.
- 97% of the EV motorists found the transition from an ICE vehicle to an EV easier.
- 70% of the EV motorists found that the range autonomy of the EV is better than expected before purchase and counteracts the 58% of ICE owners that believe EVs offer low driving range.
- 34% of the EV motorists decided to switch because of the advanced technology offered in EVs, while 31% of ICE owners were considering the change to an EV for the same reason.
- All the motorists were concerned about the environmental impact and sustainability of ICE vehicles, with 85% of all the motorists stating that EVs are environmentally friendly. Of the total, 40% of EV motorists switched for this reason while 49% of ICE motorists are considering the switch to an EV.
- Of the total, 83% of EV motorists stated that the EV has lower running costs than an ICE vehicle.

70% of European drivers stated that they would consider buying an EV as their next vehicle and the most common reason being environmental benefits offered by a zero emissions vehicle. South Africa’s infrastructure development needs to be upgraded as a matter of urgency or it could result in the slow death of the domestic automotive industry. Developing the correct and suitable infrastructure requires commitment from both government and the private sector. Government’s commitment is critical to ensure that the South African automotive industry is on the right track to achieve the target as set out. Government should provide a stable policy environment, which is underpinned with financial incentives for the OEMs, and they must ensure that South Africa’s infrastructure is upgraded in accordance with the markets it is supplying to ensure business continuity (AIEC, 2018:31; AIEC, 2022:32). Government and the private sector’s commitment will ensure that the correct infrastructure is developed and implemented to put South Africa at the forefront of the latest in automotive technologies, such as EV technology.

Both groups ranked price and affordability as fifth, the reason being, the focus is on the export market with the rand exchange rate being the major determinant of the final price in these markets. Chapter 4 discussed that South African manufactured vehicles which are exported, can cost up to 50% less on the export markets than what they would cost on the domestic market (Pawnmycar, 2017). Chapter 4 discussed the tax structure on vehicles in detail and the following question also discusses the impact of tax on the cost of a vehicle in South Africa. Although price and affordability are key components for an individual owning a vehicle, the focus of this question was to ascertain whether South Africa could produce 1.4 million units annually by 2035. More than half of South Africa’s production are meant for exports which means that South Africa still needs to be competitive in these markets, but also needs to first have the correct product to compete in this arena. South Africa, by upgrading its infrastructure, will not only be at the forefront of automotive technology and on a growth track for years to come, but will also be the flagship country in Africa to mentor other African countries with advanced technology.

Question 21 required respondents to indicate the most important factors which detract from new vehicle sales in South Africa. Basic content analysis of the responses was done by using ATLAS-ti and table 6.14 highlights the main themes of the sixty-two responses.

Table 6.14: Summary of the crux of the responses regarding the key factors which detract from new vehicle sales in South Africa

Summary of the responses
High unemployment rates, a weak and volatile currency, low economic growth and GDP, high government taxation, and lack of government subsidies for new vehicles detract from new vehicle sales in South Africa. High cost of utilities, import duties, ad valorem excise duty, Value Added Tax (VAT), fuel, Carbon Dioxide (CO_2) tax, and environmental levies impact new vehicle sales. More than half of the vehicles sold in the domestic market are imported. It all boils down to price; cars have become too expensive while disposable income levels have been deteriorating. Affordability is a key issue and government needs to review all taxation measures which apply to the motor industry because it heavily impacts the final pricing of vehicles. The middle class, who are the main consumers of new vehicles, is shrinking. There has been a decline in purchasing power in the general population with limited access to finance and high finance costs.
The domestic economy cannot support the manufacturing volumes, so the industry depends on the export market and on obtaining more export contracts. Weak economic growth and low consumer confidence dampens new vehicle sales in the country. Income inequality, household income against debt, access to vehicle financing, and vehicle insurance costs limit new vehicle sales. Remove all old or used vehicles, which do not comply with minimum safety and homologation standards, from the market. Government needs to invest in new infrastructure (rail or ports) and upgrade the fuel refineries if it wants to be on a path of growth. There are no new investment opportunities, limited to no initiatives regarding government spending on infrastructure, very few or limited public or private sector joint projects, unfavourable labour laws, and a lack of skilled manpower or labour. The labour instability and political conditions of the country weighs down on new vehicle sales

Table 6.14 summarised the responses and highlights the most important factors which detract from new vehicle sales in South Africa. The key findings from the results can be arranged in a hierarchy order based on the number of times the same reason was given of which a percentage was allocated to each metric. Figure 6.11 presents the results of the sixty-two respondents with the total percentages of the most important factors which detract from new vehicle sales in South Africa.

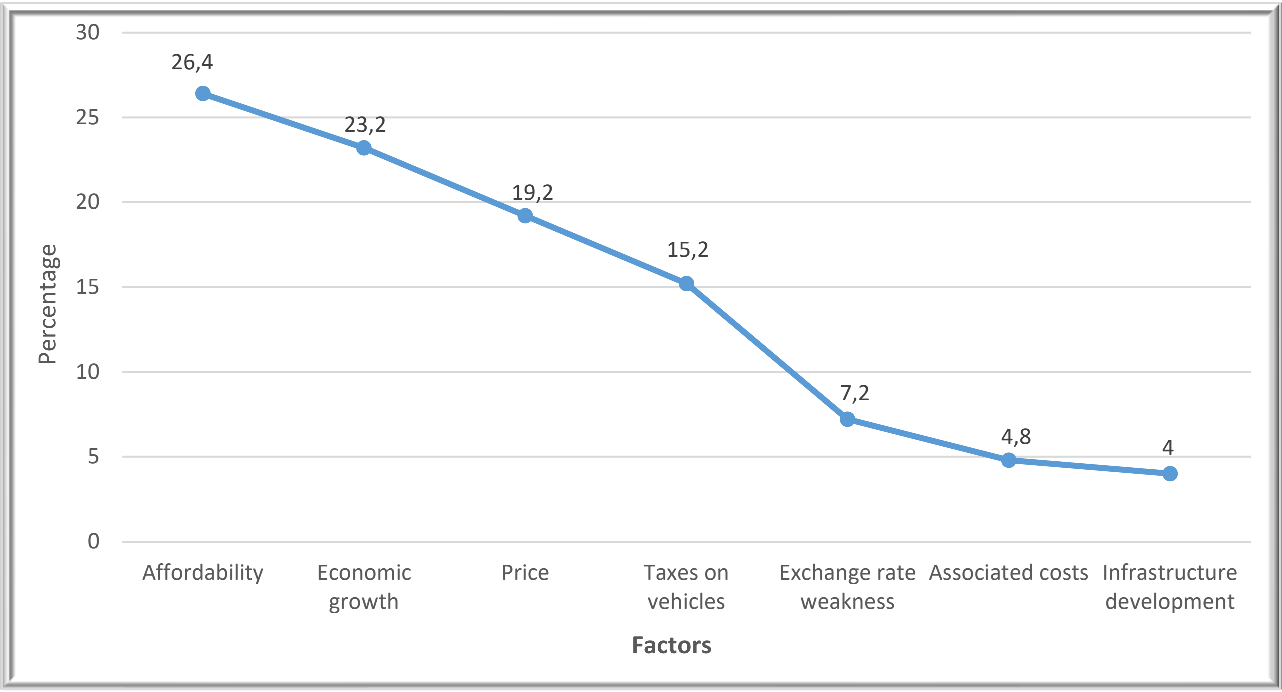


Figure 6.11: The key factors which detract from new vehicle sales in South Africa

The first four metrics (affordability, economic growth, price, and tax on vehicles) in figure 6.11 are the most important factors having a debilitating impact on new vehicle sales in South Africa. Chapter 4 discussed these metrics in detail and these results reinforce the secondary research results. The first step in the direction of growing new vehicle sales in South Africa is to address these challenges.

Question 22 required respondents to indicate the most important factor(s) which promote new vehicle sales in South Africa. Basic content analysis of the responses was done by using ATLAS-ti and table 6.15 exhibits the main themes of the sixty-two responses.

Table 6.15: Summary of the crux of the responses regarding the key factors which promote new vehicle sales in South Africa

Summary of the responses
Strong economic growth with sustainable foreign investments, and Gross Domestic Product (GDP) and per capita income growth will promote new vehicle sales in South Africa. Affordability, stable exchange rate, cost of ownership, low interest rates, and reducing other associated costs like fuel, insurance, import duties, and tax will help drive sales. Increased employment leads to a higher number of people who are eligible to purchase cars. A bigger middle class will result in higher domestic consumption of vehicles which is critical to the numbers that government wants to achieve. Price, value for money, good customer service, and affordable aftersales is key to keep customers happy and drive sales.
Higher levels of investment in the country, both foreign and domestic, are required to create more job opportunities and to have a direct effect on the consumption of new vehicles. Investor confidence would help consumers feel confident to purchase pricier items, such as a new vehicle. Government's commitment to continue support by subsidising consumers when purchasing domestically manufactured vehicles, and by designating local content for vehicles for government procurement.
Technology and expanding product offering to meet varied demands of consumers. Digital visibility, digital purchase platforms, refreshed product offering, and new model line-ups are required. Embracing the digital world, technology, specs, quality, and local build of vehicles will promote new vehicle sales in South Africa.
Stimulus packages and financing mechanisms which make access to private transport more affordable. Change the mind-set of consumers regarding vehicle ownership. Address financing costs and offer affordable finance options. Government should reassess their policy regarding license renewal and create an incentive to scrap older vehicles. South Africa has an efficient banking system, but it inhibits the ability to grow when people cannot access finance. The political climate needs to be stable, and someone needs to take the mantle and be mature enough to want to grow the market in South Africa. The transport department needs to create new routes for the bus industry. The exorbitant licence fees on buses should be lowered to promote tourism.

Government should issue more tenders and do it faster to promote economic recovery for all industries and to get people back to work.

Table 6.15 summarised the responses and highlights the most important factors which promote new vehicle sales in South Africa. The key findings from the results can be arranged in a hierarchy order based on the number of times the same reason was given of which a percentage was allocated to each metric. Figure 6.12 shows the results of the sixty-two respondents with the total percentages of the most important factors which promote new vehicle sales in South Africa.

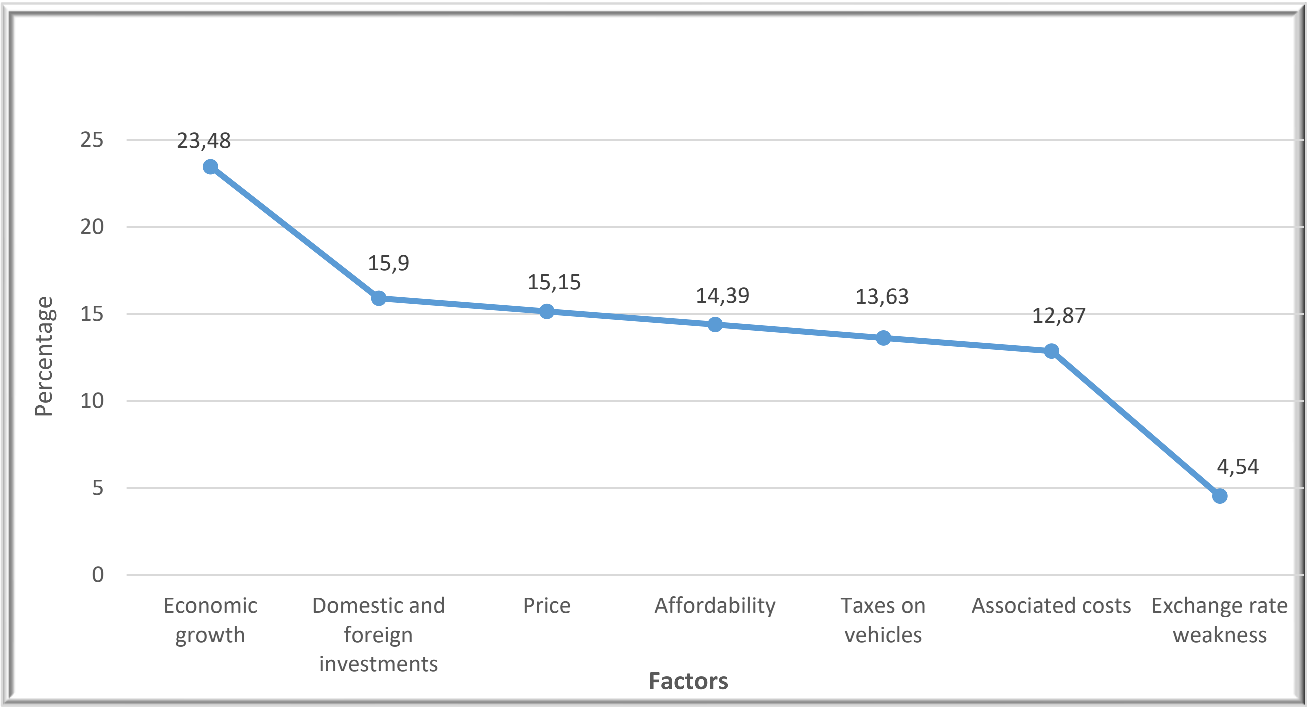


Figure 6.12: The key factors which promote new vehicle sales in South Africa

The first five metrics (economic growth, domestic and foreign investment, price, affordability, and tax on vehicles) in figure 6.12 accounted for the most important factors which would promote new vehicle sales in South Africa if they were addressed. Chapter 4 discussed these metrics in detail and the results confirm the background research undertaken. Government must invest in the economy for consumers and the country to benefit in the long run. The government's mind-set will have to be forward thinking to address these challenges so that the multiplier effect can be achieved in the years ahead to ensure a healthy and dynamic South African automotive industry.

6.5 Research hypothesis testing and results

The following sections discuss the statistical hypotheses testing of research objectives six and seven, namely:

- To determine the differences between foreign and locally owned companies; high and low growth expectancy groups; positive and negative growth outlook groups; and relative affordability groups regarding (see Appendix C for questionnaire):
  (i) the importance of growth drivers (question 6 of the questionnaire).
  (ii) the business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire).
  (iii) the business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire).
  (iv) the business impact of the different criteria impacting on new vehicle sales' growth (see these criteria in question 10 of the questionnaire).
  (v) the business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire).
  (vi) the importance of the digital future criteria impacting new vehicle sales' growth (see these criteria in question 13 of the questionnaire).
  (vii) the importance of the different criteria for South Africa's vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire).

- To determine the relationship between the expectation of growth of new vehicle sales in South Africa and:
  (i) company type.
  (ii) each of the challenges to new vehicle sales' growth.

To statistically test the above research hypotheses, the following statistical hypotheses were formulated:

- H1: There is a difference between the domestic companies and the foreign companies regarding their perceptions of each of the identified 14 factors.
- H2: There is a difference between the high growth expectation group and the low growth expectation group regarding their perceptions of each of the identified 14 factors.
- H3: There is a difference between the positive and negative growth outlook groups regarding their perceptions of each of the identified 14 factors.
- H4: There is a difference between the affordability comparison groupings regarding their perceptions of each of the identified 14 factors.
- H5: There is a relationship between company type and growth expectation.
- H6: There is a relationship between each of the challenges experienced and the perceived expectation of growth in new sales volume.

The fourteen identified factors mentioned in the first four hypotheses are the following:

- Vehicle affordability
- Vehicle demand
- Internal vehicle cost
- Government tax and levies
- Government challenges
- Economic challenges
- Green environment
- Political environment
- Technological environment
- Manufacturing challenges
- COVID-19 challenges
- Digital environment
- Regulatory business environment
- Duty-free access on new vehicles

Before the hypotheses were tested, Principal Component Analysis (PCA) were performed on questions 6 (importance), 8 (business impact), 9 (business impact), 10 (business impact), 12 (business impact), 13 (importance), and 17 (importance) of the survey. The purpose was to determine whether meaningful linear combinations exist in the data that can be combined into summary indices as opposed to the identification of latent factors which would require the use of exploratory factor analysis. Streiner (2003) highlights the difference between sets of items, which represent an underlying latent factor, and those that can be seen as forming an index. Streiner (2003) highlighted the role and misuse of the internal consistency measure, Cronbach Alpha in this instance, when constructing summary indices of data where the items might not be correlated or only weakly correlated. Thus, for completeness purposes only, the Cronbach Alpha measure is provided as well as the alternative measure, Spearman-Brown, in the case of two item factors.

PCA can be used to identify correlated variables so that the number of variables can be reduced and the same amount of variance, with fewer variables, can be explained. Exploratory Factor Analysis (EFA), on the other hand, identifies the constructs which may, or may not, be apparent from direct analysis (Wiid & Diggines, 2015:242). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy's value provides a measure of the correlation structure of the items with which the PCA analysis was conducted. KMO is a statistic which indicates the proportion of variance in the variables which might be caused by underlying factors. The KMO value ranges from 0 to 1 where a value higher than 0.5 indicates that it is appropriate to conduct a PCA. In addition, the Bartlett's Test of Sphericity is also conducted to test the null hypothesis that the correlation matrix is an identity matrix, which would indicate that the variables are unrelated and, therefore, unsuitable for structure detection. If the p-value is smaller than 0.05, the null hypothesis can be rejected, and it indicates a correlation matrix that differs from the identity matrix which is suitable for PCA.

PCA with varimax rotation was conducted to determine the dimensionality of each of the subsections. Components with eigenvalues above 1 were accepted in the factor structures. Cronbach Alpha coefficient was used to determine the internal consistency (reliability) of each of the identified factors, or components, with thresholds stated in the literature as 0.5 (acceptable); 0.6 (satisfactory for exploratory research), and 0.7 for previously used instruments (Hinton, Brownlow, McMurray & Cozens, 2004). Table 6.16 (importance) highlights the summary of the PCA for question 6.

Table 6.16: Summary of the PCA for question 6 (importance)

Factors	**KMO & Bartlett's Test (sig. value)**	**Eigenvalues**	**Total variance explained**	**Cronbach Alpha / Spearman Brown (2 item factors)**	**Component loadings**	
		Component 1 1.863		Component 1 .523		
	.627 $p < 0.001$	Component 2 1.042	58.1%	Component 2 .506	Component 1	Component 2
Selling price of vehicles to the customer					.816	
Customer able to obtain finance or a loan						.824
Customer opting for demo and used vehicle models over brand new vehicles					.655	
Customer demand for South African manufactured vehicles						.794
Customer satisfaction levels with the different vehicle brands or models					.662	

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant ($p < .001$) for the criteria in question 6, thereby indicating that a PCA was appropriate (Wiid & Diggines, 2015:245). For question 6, two components have been identified based on the eigenvalue criterion (eigenvalue greater than one) (Wiid & Diggines, 2015:243).

Seeing that the Cronbach Alpha coefficient values was 0.523 for component 1 and the Spearman-Brown coefficient was 0.506 for component 2, they were considered acceptable (Eisinga, Te Grotenhuis & Pelzer, 2012:637-642). The Spearman-Brown coefficient was used because it is the most appropriate measure of reliability in the case of two item components (Eisinga et al., 2012:637-642). The items which cluster on the same component suggest that component 1 represents vehicle affordability while the items on component 2 represent vehicle demand. Chapter 4 discussed how components 1 and 2 are linked to new vehicle sales by highlighting the favourable and unfavourable factors impacting new vehicle sales.

A similar analysis was done for question 8. Table 6.17 exhibits the summary of the PCA for question 8.

Table 6.17: Summary of the PCA for question 8

Factor	**KMO & Bartlett's Test (sig. value)**	**Eigenvalues**	**Total variance explained**	**Cronbach Alpha**	**Component loadings**		
	.717 p < 0.001	Component 1 3.128 Component 2 1.316	69.7%	Component 1 .724 Component 2 .752	Component 1	Component 2	Component 3
Inflation					.656		
Rand exchange rate							.935
Financing costs					.765		
Fuel levies						.809	
Tyre levies						.836	
Insurance costs					.720		
Maintenance and service plans costs					.680		

Factor	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha	Component loadings		
	.717 $p < 0.001$	Component 1 3.128 Component 2 1.316	69.7%	Component 1 .724 Component 2 .752	Component 1	Component 2	Component 3
Vehicle fiscal tax (CO_2, ad valorem)						.731	.454

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant ($p< .001$) for the criteria in question 8, thereby indicating that a PCA was appropriate (Wiid & Diggines, 2015:245). For question 8, three components have been identified based on the eigenvalue criterion (eigenvalue greater than one) (Wiid & Diggines, 2015:243). Item 8 double loaded on components 2 and 3. After investigating, it was decided to keep item 8 with component 2 which was loaded the highest. This resulted in component 3 consisting of only one item, which is not considered a component because single items do not constitute a component. Because the Cronbach Alpha coefficient values were 0.724 for component 1, and 0.752 for component 2, they are above the acknowledged exploratory threshold of 0.6 reliability, it was considered satisfactory. The items which cluster on the same component suggest that component 1 represents individual vehicle costs while the items on component 2 represent government tax and levies. Chapter 4 discussed how components 1 and 2 relate to the cost of vehicle ownership and its impact on new vehicle sales.

A similar analysis was done for question 9. Table 6.18 highlights the summary of the PCA for question 9.

Table 6.18: Summary of the PCA for question 9

Factors	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha	Component loadings	
	.684 p < 0.001	Component 1 3.712 Component 2 1.426	64.2%	Component 1 .788 Component 2 .730	Component 1	Component 2
Political conditions					.524	
Stability of electricity supply					.957	
Rising costs of electricity					.894	
Port costs for importing and exporting					.517	.440
A volatile currency					.466	.615
Labour stability					.565	.462
Weak business confidence levels						.788
Weak economic growth rate impacting disposable income levels						.901

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant ($p< .001$) for the criteria in question 9, thereby indicating that a PCA was appropriate (Wiid & Diggines, 2015:245). For question 9, two components have been identified based on the eigenvalue criterion (eigenvalue greater than one) (Wiid & Diggines, 2015:243). Items 4, 5 and 6 double loaded on components 1 and 2. After investigating, it was decided to keep item 6 with component 1, and items 4 and 5 with component 2. Seeing that the Cronbach Alpha coefficient values were 0.788 for component 1, and 0.730 for component 2, they are above the acknowledged threshold of 0.7 reliability, it was considered satisfactory. The items which cluster on the same component suggest that component 1 represents governmental challenges while the items on component 2 represent economic challenges. Chapter 4 discussed how components 1 and 2 impact new vehicle sales and highlighted these aspects in detail.

A similar analysis was done for question 10. Table 6.19 presents the summary of the PCA for question 10.

Table 6.19: Summary of the PCA for question 10

Factors	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha / Spearman Brown (2 item factors)	Component loadings		
	.704 p < 0.001	Component 1 2.882 Component 2 1.376 Component 3 1.314	61.9%	Component 1 .710 Component 2 .563	Component 1	Component 2	Component 3
The fourth industrial revolution					.333	.347	.426
Introduction of clean automotive fuels (Euro 5 or 6)					.809		
Internal combustion engine technology					.689	.324	.368
Hybrid engine technology					.709		.451
Electric vehicles					.701		
Autonomous driving vehicles							.847
Trade wars					.607		
Alternate transport systems (Uber, Taxify, ride sharing, and others)						.702	.377

Factors	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha / Spearman Brown (2 item factors)	Component loadings		
	.704 $p < 0.001$	Component 1 2.882 Component 2 1.376 Component 3 1.314	61.9%	Component 1 .710 Component 2 .563	Component 1	Component 2	Component 3
Government support (financial and policy)						.835	

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant ($p< .001$) for the criteria in question 10, thereby indicating that a PCA was appropriate (Wiid & Diggines, 2015:245). For question 10, three components have been identified based on the eigenvalue criterion (eigenvalue greater than one) (Wiid & Diggines, 2015:243). Items 1 and 3 triple loaded on components 1, 2 and 3 and items 4 and 8 double loaded. After investigating, it was decided to keep item 1 with component 3 because a loading higher than 0.40 is considered meaningful (Wiid & Diggines, 2015:248). It was decided to keep items 3 and 4 with component 1, and item 8 with component 2 as it loaded the highest of these components. The Cronbach Alpha coefficient value was 0.710 for component 1 and the Spearman-Brown coefficient was 0.563 for component 2 and 0.356 for component 3. However, component 3 was still considered because, according to Streiner's (2003) argument, the focus of the PCA was not to identify latent factors but indices of linear combinations of items. The items which cluster on the same component suggest that component 1 represents the green environment and the items on component 2 represents the political environment. Component 3 represents the technological environment. Chapter 3 contains a discussion on how component 1 links to the green environment. Government has an influence on the items listed in component 2, and chapters 3 and 4 contain a discussion on how it is linked to the political environment. Government's support of the South African automotive industry, in the form of long-term policy and financial incentives, is instrumental to the on-going health of the industry and to attract investments.

A similar analysis was done for question 12. Table 6.20 shows the summary of the PCA for question 12.

Table 6.20: Summary of the PCA for question 12

Factors	**KMO & Bartlett's Test (sig. value)**	**Eigenvalues**	**Total variance explained**	**Cronbach Alpha**	**Component loadings**	
	.655 p < 0.001	Component 1 3.005 Component 2 1.490	64.2%	Component 1 .776 Component 2 .723	Component 1	Component 2
Coronavirus lockdown						.724
Increased prices of vehicles						.793
Decreased affordability by consumers						.874
Stock shortages (components/parts)					.823	
Decreased cost competitiveness					.626	.358
Just-in-Time supply requirements not met					.773	

Factors	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha	Component loadings	
	.655 p < 0.001	Component 1 3.005 Component 2 1.490	64.2%	Component 1 .776 Component 2 .723	Component 1	Component 2
Altered marketing strategies					.813	

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant ($p< .001$) for the criteria in question 12, thereby indicating that a PCA was appropriate (Wiid & Diggines, 2015:245). For question 12, two components have been identified based on the eigenvalue criterion (eigenvalue greater than one) (Wiid & Diggines, 2015:243). Only item 5 double loaded on components 1 and 2. After investigating, it was decided to keep item 5 with component 1 as it loaded the highest in this component. Seeing that the Cronbach Alpha coefficient values were 0.776 for component 1 and 0.723 for component 2, both are above the acknowledged threshold of 0.7 reliability and was considered satisfactory. The items which cluster on the same component suggest that component 1 represents the vehicle manufacturing challenges while the items on component 2 represent the impact of the coronavirus lockdown. Chapter 4 discussed vehicle manufacturing challenges and the impact of the coronavirus lockdown. Chapter 4 also discussed how these components impact new vehicle sales.

A similar analysis was done for question 13, however, all the items loaded onto a single component. Table 6.21 displays the KMO and Bartlett's Test result as well as explains the variance.

Table 6.21: KMO, Bartlett's Test and variance

Factors	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha	Component loadings
	.814 p < 0.001	Component 1 2.848	56.9%	.804	Component 1
Online consumer experience					0.686
Online vehicle purchasing					0.861
Online customer relationship management					0.767
The virtual showroom					0.862
Smart vehicles					0.551

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant (p< .001) for the criteria in question 13 (Wiid & Diggines, 2015:245). Because the Cronbach Alpha coefficient value was 0.804 for component 1 and above the acknowledged threshold of 0.7 reliability, it was considered satisfactory. All items clustered on one component suggesting that this component represents the digital environment's importance. Chapters 2 and 3 discussed how component 1 relates to the digital environment and its impact on new vehicle sales.

A similar analysis was done for question 17. Table 6.22 highlights the summary of the PCA for question 17.

Table 6.22: Summary of the PCA for question 17

Factors	KMO & Bartlett's Test (sig. value)	Eigenvalues	Total variance explained	Cronbach Alpha	Component loadings		
	.561 p < 0.001	Component 1 2.251 Component 2 1.371 Component 3 1.010	66.1%	.668	Component 1	Component 2	Component 3
Regulatory business environment					.517	-.475*	
Duty-free access on new vehicles					.802		
Trade agreements					.857		
Ban the import of used vehicles					.648		
Stability in the economic environment						.734	
Clean fuels (Euro 5 or 6)							.923
Customs matters and procedures						.730	

The KMO measure of sampling adequacy was above the recommended threshold of 0.5 and the Bartlett's Test of Sphericity was statistically significant (p< .001) for the criteria in question 17, thereby indicating that a PCA was appropriate (Wiid & Diggines, 2015:245). For question 17, three components have been identified based on the eigenvalue criterion (eigenvalue greater than one) (Wiid & Diggines, 2015:243). Only item 1 double loaded on components 1 and 2. After investigating, it was decided to keep item 1 with component 1 as it loaded the highest in this component. Item 6 was the only item which loaded onto component 3, therefore, component 3 was not considered because single items do not constitute a component. Seeing that the Cronbach Alpha coefficient value was 0.668 for component 1 and above the acknowledged exploratory threshold of 0.6 reliability, it was considered satisfactory. The Spearman-Brown coefficient for component 2 was 0.385. Following the argument of Streiner (2003) as argued before, component 2 was thus considered in further analyses. Components 1 and 2 represent the regulatory business environment and duty-free access on new vehicles which are below the acceptable value of 0.5. Chapter 3 discussed the African economic environment and how component 1 impacts new vehicle sales in Africa.

6.5.1 Descriptive statistics of the identified factors

Table 6.23 presents the descriptive statistics of the newly identified factors/components because of the principal component analyses conducted.

Table 6.23: Descriptive statistics of the identified factors

	Vehicle affordability	Vehicle demand	Internal vehicle cost	Government tax and levies	Government challenges	Economic challenges	Green environment	Political environment	Technological environment	Manufacturing challenges	COVID-19 challenges	Digital environment	Duty free access on new vehicles	Regulatory business environment
N	62	62	62	62	62	62	62	62	62	61	62	62	43	43
	0	0	0	0	0	0	0	0	0	1	0	0	19	19
Mean	3,8226	3,3548	3,5484	3,1183	3,6331	4,1452	2,9258	3,4194	2,4919	3,6721	4,3387	3,8710	4,1163	4,2500
Median	4,0000	3,0000	3,5000	3,0000	3,7500	4,0000	3,0000	3,5000	2,5000	3,7500	4,3333	3,8000	4,0000	4,2500
Standard deviation	0,57170	0,69180	0,59513	0,89544	0,73373	0,59978	0,62854	0,76925	0,63046	0,73533	0,56778	0,62316	4,9806	0,56695
Skewness	-1,374	0,890	0,004	0,174	-0,120	-0,228	0,237	-1,032	0,031	-0,646	-0,746	-0,147	-0,041	-0,745
Kurtosis	5,576	0,145	0,066	-0,586	-0,309	-0,518	-0,022	1,936	-0,398	1,978	0,222	-0,349	0,005	0,337
Minimum	1,33	2,50	2,25	1,33	1,75	2,75	1,40	1,00	1,00	1,00	2,67	2,40	3	2,75
Maximum	5	5	5	5	5	5	4,6	5	4	5	5	5	5	5

The descriptive statistics in table 6.24 showed that COVID-19 related challenges had the highest mean value (4.3387) followed by economic challenges (4.1452), thereby indicating that both COVID-19 related challenges and economic challenges were perceived as having a large to critical impact on new vehicle sales' growth. The regulatory business environment is of critical importance (4.25) to South Africa's vehicle manufacturers when deciding to pursue the African markets. The green environment has the lowest mean value (2.9258), indicating that the green environment criteria are seen to have a moderate impact on new vehicle sales' growth. The Skewness and kurtosis values are between -2 and 2, thereby the assumption of normality, a prerequisite for parametric statistical analyses, can be assumed for these variables except for vehicle affordability which had a kurtosis value above 2. However, Kline (2011) states that a kurtosis value ranging from -7 to 7 is acceptable for regression and structural equation modelling.

The main premise of the inferential analysis, which will follow, is to test the statistical hypotheses (H1 to H6) derived from the primary and secondary objectives of the study. The independent t-test, Kruskal-Wallis, one way analysis of variance by ranks, Pearson Chi-Square test of independence, correlation and regression analyses were used to test the hypotheses.

6.5.2 Relationship between identified factors

Correlation analysis, as described by Bettany-Saltikov and Whittaker (2013:6), refers to inferential statistical tests which are carried out with the purpose of determining relationships between variables. Correlation is a statistical measure that indicates the extent to which two or more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel, while a negative correlation indicates the extent to which one variable increases as the other decreases. In this study, correlation analyses were conducted using Pearson Correlation Coefficient to determine the strength and direction of the statistical relationship between each of the factors identified in the principal component analyses. As indicated by Cohen, Cohen, West and Aiken (2013), weak, moderate and strong correlation coefficients are presented and identified by using thresholds of less than 0,3 (<0,3) for weak correlation, and between 0,3 and 0,5 for moderate correlation, and all values equal to or greater than 0,5 (≥0,5) for strong correlation. However, the discussion of the results will focus only on moderate and strong correlation coefficients. The following table shows the correlation analysis.

Table 6.24: Correlation analysis

	Vehicle affordability	Vehicle demand	Internal vehicle cost	Government tax and levies	Government challenges	Economic challenges	Green environment	Political environment	Technological environment	Manufacturing challenges	COVID-19 challenges	Digital environment	Duty free access on new vehicles	Regulatory business environment
Vehicle affordability	1													
Vehicle demand	.272	1												
Internal vehicle cost	.367	.391	1											
Government tax and levies	.212	.099	.410	1										
Government challenges	.227	.083	.180	.157	1									
Economic challenges	.375	.185	.330	.436	.561	1								
Green environment	.182	.227	.268	.121	.239	.188	1							
Political environment	.290	.193	.135	-.041	.273	.248	.310	1						
Technological environment	.352	.401	.345	.045	.118	.128	.321	.261	1					
Manufacturing challenges	.284	.373	.407	.342	.424	.436	.290	.436	.232	1				
COVID-19 challenges	.211	-.047	.290	.160	.175	.427	.148	.232	.115	.344	1			
Digital environment	.475	.340	.320	.169	.345	.426	.131	.187	.269	.301	.271	1		
Duty free access on new vehicles	.138	.202	.102	-.186	.134	-.057	-.030	.009	.149	.124	.189	.313	1	
Regulatory business environment	.135	-.034	.148	.000	.348	.363	.309	.368	-.307	.022	.298	.228	.179	1

* Correlation is significant at the 0.05 level (2–tailed). ** Correlation is significant at the 0.01 level (2-tailed).

A strong positive, statistically significant relationship was found between:

- Economic challenges and government challenges (0.561).

Positive, moderate, statistically significant relationships were found between:

- Internal vehicle cost with vehicle affordability (0.367) and vehicle demand (0.391).
- Government tax and levies with internal vehicle cost (0.410).
- Economic challenges with vehicle affordability (0.375), internal vehicle cost (0.330), and government tax and levies (0.436).
- Political environment with green environment (0.310).
- Technological environment with vehicle affordability (0.352), vehicle demand (0.401), internal vehicle cost (0.345), and the green environment (0.321).
- Manufacturing challenges with vehicle demand (0.373), internal vehicle cost (0.407), government tax and levies (0.342), government challenges (0.424), economic challenges (0.436), and the political environment (0.436).
- COVID-19 challenges with economic challenges (0.427) and manufacturing challenges (0.344).
- Digital environment with vehicle affordability (0.475), vehicle demand (0.340), internal vehicle cost (0.320), government challenges (0.345), economic challenges (0.426), and manufacturing challenges (0.301).
- Duty free access on new vehicles with the digital environment (0.313).
- Regulatory business environment with government challenges (0.348), economic challenges (0.363), green environment (0.309), and the political environment (0.368).

A negative, moderate (-0.307), statistically significant relationship was found between the regulatory business environment and technological environment. This could be because there is no policy in place to limit the importation of used vehicles, new technology vehicle sales are hampered.

6.5.3 The relationship between challenges experienced and the perceived expectation of growth in sales volume

Inferential statistics were used to answer hypothesis 6 (H6) of the study to test the statistical significance and strength of the relationship between the perceived expectation of growth and the different challenges. Pearson's correlation coefficients were used to evaluate the strength and statistical significance of the relationships. Growth was measured by using the binary variable, created from question 4 in the questionnaire, namely: "What is your personal level of expectation regarding the South African automotive industry to improve new vehicle sales' volumes within the next two years?" The binary variable consists of a low growth and a high growth expectation category and it was created by combining the responses of "no to moderate growth expectation" into the low growth expectation category, and the "high to very high growth expectation" into the high growth expectancy category. The correlation between a binary and continuous variable is known as a point bi-serial correlation, however, the formula is the same as the one used for the Pearson correlation coefficient. Therefore, it can be calculated in the statistical software using the Pearson correlation coefficient. The results are revealed in table 6.25.

Table 6.25: Correlation results

Test statistics	Pearson correlation	Sig.(2-tailed)
Vehicle affordability	-0,088	0,495
Vehicle demand	0,020	0,876
Internal vehicle cost	-0,100	0,437
Government tax and levies	0,115	0,372
Government challenges	0,004	0,974
Economic challenges	-0,154	0,232
Green environment	-0,084	0,517
Political environment	-0,153	0,235
Technological environment	0,147	0,255
Manufacturing challenges	0,039	0,767
COVID-19 challenges	-0,313	0,013
Digital environment	0,044	0,737
Regulatory business environment	-0,384	0,011
Duty-free access on new vehicles	-0,104	0,507

The results indicate that a statistically significant relationship exist at the 5% level of significance regarding the COVID-19 challenges (p = 0.013) and a regulatory business environment (p = 0.011). Therefore, hypothesis 6 was supported with two (2) of the challenges. Hypothesis 6 was not supported with the other twelve (12) challenges. These results confirmed that perceived business growth is limited due to the debilitating impact of COVID-19 on the South African automotive industry and the world economy. The results also indicated that business growth expectation is being hindered by regulatory business environment challenges which must become favourable for automotive OEMs' operations by having adequate protection and assistance from government.

6.5.4 Differences between the domestic companies and the foreign companies regarding their perceptions of each of the fourteen factors identified through PCA

The hypothesis (H1) to be tested is:

$H1_0$: There is no statistically significant difference between the domestic companies and the foreign companies regarding their perceptions of each of the factors identified through PCA.

$H1_1$: There is a statistically significant difference between the domestic companies and the foreign companies regarding their perceptions of each of the factors identified through PCA.

To test H1, the independent t-test has been used to determine whether statistically significant differences exist between the domestic and the foreign companies regarding their perceptions of each of the fourteen factors identified through the PCA. The mean and standard deviation of the factors per group are presented in the following table.

Table 6.26: Mean and standard deviation per group

Factor	Group	N	Mean	Std. Deviation
Vehicle affordability	Foreign	39	3,7692	0,68464
	Domestic	23	3,9130	0,28810
Vehicle demand	Foreign	39	3,2436	0,69653
	Domestic	23	3,5435	0,65562
Internal vehicle cost	Foreign	39	3,4679	0,60202
	Domestic	23	3,6848	0,57017
Government tax levies	Foreign	39	3,1453	0,89767
	Domestic	23	3,0725	0,90986
Government challenges	Foreign	39	3,6410	0,68776
	Domestic	23	3,6196	0,82182
Economic challenges	Foreign	39	4,1603	0,63476
	Domestic	23	4,1196	0,54808
Green environment	Foreign	39	2,8872	0,64039
	Domestic	23	2,9913	0,61638
Political environment	Foreign	39	3,4615	0,78961
	Domestic	23	3,3478	0,74521
Technological environment	Foreign	39	2,2949	0,61471
	Domestic	23	2,8261	0,51365
Manufacturing challenges	Foreign	38	3,7303	0,64562
	Domestic	23	3,5761	0,87072
COVID-19 challenges	Foreign	39	4,2393	0,56687
	Domestic	23	4,5072	0,54001
Digital environment	Foreign	39	3,7436	0,60166
	Domestic	23	4,0870	0,61148
Regulatory business environment	Foreign	28	4,2321	0,60449
	Domestic	15	4,2833	0,50768
Duty-free access on new vehicles	Foreign	28	4,1071	0,49735
	Domestic	15	4,1333	0,51640

The following table shows the independent samples t-test.

Table 6.27: Independent samples t-test

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Vehicle affordability	Equal variances assumed	6,340	0,014	-0,956	60	0,343
	Equal variances not assumed			-1,150	55,589	0,255
Vehicle demand	Equal variances assumed	0,207	0,651	-1,673	60	0,100
	Equal variances not assumed			-1,700	48,575	0,096
Internal vehicle cost	Equal variances assumed	0,272	0,604	-1,397	60	0,168
	Equal variances not assumed			-1,417	48,341	0,163
Government tax levies	Equal variances assumed	0,000	0,988	0,307	60	0,760
	Equal variances not assumed			0,306	45,775	0,761
Government challenges	Equal variances assumed	0,386	0,537	0,110	60	0,913
	Equal variances not assumed			0,105	39,978	0,917
Economic challenges	Equal variances assumed	0,898	0,347	0,256	60	0,799
	Equal variances not assumed			0,266	51,804	0,791
Green environment	Equal variances assumed	0,586	0,447	-0,627	60	0,533
	Equal variances not assumed			-0,633	47,727	0,530
Political environment	Equal variances assumed	0,126	0,724	0,559	60	0,578
	Equal variances not assumed			0,568	48,474	0,573
Technological environment	Equal variances assumed	0,538	0,466	-3,486	60	0,001
	Equal variances not assumed			-3,652	52,978	0,001
Manufacturing challenges	Equal variances assumed	1,096	0,300	0,791	59	0,432
	Equal variances not assumed			0,736	36,664	0,467
COVID-19 challenges	Equal variances assumed	0,102	0,751	-1,829	60	0,072
	Equal variances not assumed			-1,853	48,120	0,070
Digital environment	Equal variances assumed	0,284	0,596	-2,158	60	0,035
	Equal variances not assumed			-2,149	45,674	0,037
Regulatory business environment	Equal variances assumed	0,709	0,405	-0,279	41	0,782
	Equal variances not assumed			-0,294	33,363	0,770
Duty-free access on new vehicles	Equal variances assumed	0,010	0,922	-0,162	41	0,872
	Equal variances not assumed			-0,161	27,810	0,874

The null hypothesis of equal variances assumed could not be rejected ($p > 0.05$), thus equal variances could be assumed, except for vehicle affordability in which case the t-statistics for equal variances not assumed will be used. The results indicate that a statistically significant difference exists ($p = 0.001$), at the 1% level of significance, between the foreign and the domestic companies regarding their perceptions of the technological environment. The results also indicate that a statistically significant difference exists ($p = 0.035$), at the 5% level of significance, between the foreign companies and the domestic companies regarding their perceptions of the digital environment. Finally, the results indicate that a statistically significant difference exists ($p = 0.072$), at the 10% level of significance, between the foreign and the domestic companies regarding their perceptions of the COVID-19 challenges.

Therefore, H1 was supported with three of the fourteen factors, namely technological and digital environment as well as COVID-19 challenges.

<u>6.5.5 Differences between the high growth expectation group and the low growth expectation group regarding their perceptions of the fourteen factors identified through PCA</u>

The hypothesis (H2) to be tested is:

$H2_0$: There is no statistically significant difference between the high growth expectation group and the low growth expectation group regarding their perceptions of each of the fourteen factors identified through PCA.

$H2_{1:}$ There is a statistically significant difference between the high growth expectation group and the low growth expectation group regarding their perceptions of each of the fourteen factors identified through PCA.

The independent t-test has also been used to determine whether statistically significant differences exist between the high expectation group (from high to very high growth expectation) and the low expectation group (from no to moderate growth expectation) regarding their perceptions of the fourteen factors identified through PCA.

The mean and standard deviation of the perception values per group are revealed in the following table.

Table 6.28: Mean and standard deviation per group

Factor	Groups	N	Mean	Std. Deviation
Vehicle affordability	Low growth expectation	42	3,8571	0,55163
	High growth expectation	20	3,7500	0,62008
Vehicle demand	Low growth expectation	42	3,3452	0,70268
	High growth expectation	20	3,3750	0,68585
Internal vehicle cost	Low growth expectation	42	3,5893	0,52910
	High growth expectation	20	3,4625	0,72218
Government tax levies	Low growth expectation	42	3,0476	0,85404
	High growth expectation	20	3,2667	0,98289
Government challenges	Low growth expectation	42	3,6310	0,76157
	High growth expectation	20	3,6375	0,69051
Economic challenges	Low growth expectation	42	4,2083	0,54638
	High growth expectation	20	4,0125	0,69526
Green environment	Low growth expectation	42	2,9619	0,60282
	High growth expectation	20	2,8500	0,68939
Political environment	Low growth expectation	42	3,5000	0,70711
	High growth expectation	20	3,2500	0,88109
Technological environment	Low growth expectation	42	2,4286	0,66783
	High growth expectation	20	2,6250	0,53496
Manufacturing challenges	Low growth expectation	42	3,6524	0,76624
	High growth expectation	20	3,7125	0,68477
COVID-19 challenges	Low growth expectation	42	4,4603	0,44753
	High growth expectation	20	4,0833	0,70814
Digital environment	Low growth expectation	42	3,8524	0,66561
	High growth expectation	20	3,9100	0,53695
Regulatory business environment	Low growth expectation	30	4,3917	0,43886
	High growth expectation	13	3,9231	0,70256
Duty-free access on new vehicles	Low growth expectation	30	4,1500	0,45769
	High growth expectation	13	4,0385	0,59377

The following table presents the independent samples t-test.

Table 6.29: Independent samples t-test

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Vehicle affordability	Equal variances assumed	0,557	0,458	0,687	60	0,495
	Equal variances not assumed			0,659	33,795	0,515
Vehicle demand	Equal variances assumed	0,038	0,847	-0,157	60	0,876
	Equal variances not assumed			-0,158	38,306	0,875
Internal vehicle cost	Equal variances assumed	2,552	0,115	0,782	60	0,437
	Equal variances not assumed			0,701	29,074	0,489
Government tax levies	Equal variances assumed	0,265	0,609	-0,899	60	0,372
	Equal variances not assumed			-0,855	33,133	0,399
Government challenges	Equal variances assumed	0,043	0,837	-0,033	60	0,974
	Equal variances not assumed			-0,034	41,010	0,973
Economic challenges	Equal variances assumed	1,262	0,266	1,206	60	0,232
	Equal variances not assumed			1,107	30,592	0,277
Green environment	Equal variances assumed	0,402	0,529	0,652	60	0,517
	Equal variances not assumed			0,622	33,308	0,538
Political environment	Equal variances assumed	2,957	0,091	1,201	60	0,235
	Equal variances not assumed			1,110	31,087	0,275
Technological environment	Equal variances assumed	0,824	0,368	-1,150	60	0,255
	Equal variances not assumed			-1,244	45,939	0,220
Manufacturing challenges	Equal variances assumed	0,021	0,855	-0,297	59	0,767
	Equal variances not assumed			-0,309	41,877	0,759
COVID-19 challenges	Equal variances assumed	8,843	0,004	2,552	60	0,013
	Equal variances not assumed			2,182	26,471	0,038
Digital environment	Equal variances assumed	1,412	0,239	-0,338	60	0,737
	Equal variances not assumed			-0,365	45,652	0,717
Regulatory business environment	Equal variances assumed	2,596	0,115	2,664	41	0,011
	Equal variances not assumed			2,224	16,209	0,041
Duty-free access on new vehicles	Equal variances assumed	0,015	0,903	0,670	41	0,507
	Equal variances not assumed			0,604	18,468	0,553

The null hypothesis of equal variances assumed could not be rejected ($p > 0.05$), thus equal variances can be assumed, except for COVID-19 challenges in which case the t-statistics for equal variances not assumed will be used. The results indicate that a statistically significant difference exists ($p = 0.013$ and $p = 0.011$), at the 5% level of significance, between the high growth expectation group and the low growth expectation group regarding their perceptions of the COVID-19 challenges and the regulatory business environment.

Therefore, H2 was supported with two of the fourteen factors, namely COVID-19 challenges, and the regulatory business environment.

6.5.6 Differences between the positive outlook group and the negative outlook group regarding their perceptions of the fourteen factors identified through PCA

The hypothesis (H3) to be tested is:

$H3_0$: There is no statistically significant difference between the positive outlook group and the negative outlook group regarding their perceptions of each of the fourteen factors identified through PCA.

$H3_{1:}$ There is a statistically significant difference between the positive outlook group and the negative outlook group regarding their perceptions of each of the fourteen factors identified through PCA.

The independent t-test has also been used to determine whether statistically significant differences exist between the positive outlook group (those who perceive that the South African automotive industry could achieve manufacturing volumes of 1.4 million units annually by 2035) and the negative outlook group (those who perceive that the South African automotive industry could not achieve manufacturing volumes of 1.4 million units annually by 2035) regarding their perceptions. The mean and standard deviation of the factors per group are exhibited in the following table.

Table 6.30: Mean and standard deviation per group

Factor	Group	N	Mean	Std. Deviation
Vehicle affordability	Positive	30	3,8778	0,51404
	Negative	32	3,7708	0,62469
Vehicle demand	Positive	30	3,4167	0,74375
	Negative	32	3,2969	0,64582
Internal vehicle cost	Positive	30	3,5000	0,65653
	Negative	32	3,5938	0,53788
Government tax levies	Positive	30	2,9889	0,84637
	Negative	32	3,2396	0,93607
Government challenges	Positive	30	3,5833	0,65434
	Negative	32	3,6797	0,80881
Economic challenges	Positive	30	3,9667	0,59355
	Negative	32	4,3125	0,56440
Green environment	Positive	30	2,9267	0,64216
	Negative	32	2,9250	0,62579
Political environment	Positive	30	3,5167	0,68837
	Negative	32	3,3281	0,83868
Technological environment	Positive	30	2,6000	0,54772
	Negative	32	2,3906	0,69252
Manufacturing challenges	Positive	30	3,6250	0,60796
	Negative	32	3,7177	0,84839
COVID-19 challenges	Positive	30	4,3111	0,51739
	Negative	32	4,3646	0,61847
Digital environment	Positive	30	3,8000	0,60344
	Negative	32	3,9375	0,64345
Regulatory business environment	Positive	23	4,2283	0,46413
	Negative	20	4,2750	0,67814
Duty-free access on new vehicles	Positive	23	4,1957	0,47047
	Negative	20	4,0250	0,52503

The following table highlights the independent samples t-test.

Table 6.31: Independent samples t-test

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Vehicle affordability	Equal variances assumed	0,321	0,573	0,733	60	0,466
	Equal variances not assumed			0,738	59,033	0,463
Vehicle demand	Equal variances assumed	1,394	0,242	0,678	60	0,500
	Equal variances not assumed			0,675	57,576	0,502
Internal vehicle cost	Equal variances assumed	0,020	0,887	-0,617	60	0,540
	Equal variances not assumed			-0,613	56,173	0,543
Government tax levies	Equal variances assumed	1,690	0,199	-1,104	60	0,274
	Equal variances not assumed			-1,107	59,926	0,273
Government challenges	Equal variances assumed	0,929	0,339	-0,514	60	0,609
	Equal variances not assumed			-0,517	58,773	0,607
Economic challenges	Equal variances assumed	0,074	0,786	-2,352	60	0,022
	Equal variances not assumed			-2,348	59,206	0,022
Green environment	Equal variances assumed	0,038	0,845	0,010	60	0,992
	Equal variances not assumed			0,010	59,503	0,992
Political environment	Equal variances assumed	0,278	0,600	0,964	60	0,339
	Equal variances not assumed			0,970	58,996	0,336
Technological environment	Equal variances assumed	1,702	0,197	1,315	60	0,194
	Equal variances not assumed			1,325	58,384	0,190
Manufacturing challenges	Equal variances assumed	0,721	0,399	-0,489	60	0,626
	Equal variances not assumed			-0,492	54,431	0,625
COVID-19 challenges	Equal variances assumed	1,898	0,173	-0,368	60	0,714
	Equal variances not assumed			-0,370	59,258	0,713
Digital environment	Equal variances assumed	1,712	0,176	-0,866	60	0,390
	Equal variances not assumed			-0,868	60,000	0,389
Regulatory business environment	Equal variances assumed	2,456	0,125	-0,267	41	0,791
	Equal variances not assumed			-0,260	32,915	0,797
Duty-free access on new vehicles	Equal variances assumed	0,001	0,973	1,124	41	0,267
	Equal variances not assumed			1,115	38,560	0,272

The null hypothesis of equal variances assumed could not be rejected ($p > 0.05$); thus, equal variances can be assumed for all 14 factors. The results indicate that a statistically significant difference exists ($p = 0.022$), at the 5% level of significance, between the positive outlook group and the negative outlook group regarding their perceptions of economic challenges. The positive outlook group believes that the South African economy will bounce back underpinned by government support and heightened exports to achieve the stated targets, thus have a lower mean value regarding economic challenges.

Therefore, H3 was supported with only one of the fourteen factors, namely economic challenges.

6.5.7 Differences between the affordability comparison groupings (3) regarding their perceptions of each the fourteen factors identified through PCA

The following hypothesis (H4) was tested, and the results are indicated in table 6.32:

$H4_0$: The three groups do not differ regarding their perceptions of each of the fourteen factors identified through PCA.

$H4_{1:}$ The three groups differ regarding their perceptions of each of the fourteen factors identified through PCA.

Nonparametric statistics are suitable when the variable being analysed does not conform to any known or continuous distribution (Zikmund, Babin, Carr & Griffin, 2013:516). The Kruskal-Wallis test can be used when three or more independent groups need to be compared regarding a single variable. This test is useful when the sample groups are small, the distribution of the data is not normal, or if the data type is ordinal. As the sample group sizes were small (11,18 and 33 respectively), the Kruskal-Wallis test has been used to test for differences between the three groups (group one significantly lower, group two on par, and group three significantly higher levels) regarding whether new vehicles are affordable to the final customer in South Africa relative to other developing countries.

Table 6.32: Kruskal-Wallis test results

Test statistics	**Kruskal-Wallis H**	**df**	**Asymp. Sig.**
Vehicle affordability	6,535	2	0,065
Vehicle demand	0,254	2	0,825
Internal vehicle cost	8,287	2	0,973
Government tax and levies	2,862	2	0,878
Government challenges	0,153	2	0,709
Economic challenges	3,954	2	0,700
Green environment	1,180	2	0,057
Political environment	1,141	2	0,706
Technological environment	1,637	2	0,128
Manufacturing challenges	0,841	2	0,698
COVID-19 challenges	0,285	2	0,210
Digital environment	4,755	2	0,063
Regulatory business environment	6,124	2	0,570
Duty-free access on new vehicles	1,227	2	0,047

The results indicate a statistically significant difference, at the 10% level of significance, between the three groups regarding vehicle affordability (p = 0.065), the green environment (p = 0.057), and the digital environment (p = 0.063). Furthermore, there is a statistically significant difference, at the 5% level of significance, between the three groups regarding duty-free access on new vehicles (p = 0.047). None of the other factors showed any statistically significant differences between the three groups (all the p-values were above 0.1).

Therefore, H4 was supported with four of the fourteen factors, namely vehicle affordability, the green environment, the digital environment, and duty-free access on new vehicles.

Table 6.33 exhibits the mean ranks as indicated in the output of the Kruskal-Wallis test of the four factors where a statistically significant difference between the three groups were found.

Table 6.33: Mean ranks

Variables	Groups	N	Mean
Vehicle affordability	1. Significantly lower	11	30,77
	2. On par	18	23,25
	3. Significantly higher	33	36,24
	Total	62	
Green environment	1. Significantly lower	11	36,36
	2. On par	18	28,94
	3. Significantly higher	33	31,27
	Total	62	
Digital environment	1. Significantly lower	11	28,36
	2. On par	18	25,08
	3. Significantly higher	33	36,05
	Total	62	
Duty-free access on new vehicles	1. Significantly lower	8	25,56
	2. On par	10	23,00
	3. Significantly higher	25	20,46
	Total	43	

The mean ranks indicate that group three (significantly higher) tends to regard vehicle affordability and the digital environment as more important than the other groups, and that group one (significantly lower) tends to regard the green environment in terms of business impact and duty-free access on new vehicles higher than the other two groups.

6.5.8 The relationship between company type and growth expectation

The Pearson Chi-Square test of independence is used when both variables are nominal. It is used to calculate the probability that a relationship between two variables, found in a sample, is because of chance (random sampling error). It does this by measuring the difference between the actual frequencies in each cell of a table and the frequencies one would expect to find if there were no relationship between the variables in the population from which the random sample has been drawn. The larger these differences are, the less likely it is that they occurred by chance. In cases where the Pearson Chi-Square test could not be used (in cases where more than 20% of the cells had an expected frequency of less than 5), the Cramer V value, a measure of the strength of the association between the two variables, and its associated significance value will be used. The following hypothesis was formulated:

$H5_0$: No relationship exists between the type of company and their perceptions on expected growth.

$H5_1$: A relationship exists between the type of company and their perceptions on expected growth.

The types of companies compared were the vehicle OEMs, the vehicle importers, the National Automotive Dealers Association, the heavy commercial members of NAAMSA, and the African Association of Automotive Manufacturers.

The Pearson Chi-Square test has been used to test this hypothesis and the results are revealed in the following table.

Table 6.34: Pearson Chi-Square results

	Value	**Df**	**Asymp. Sig. (2 sided)**
Pearson Chi-Square	8.607[a]	12	0.736

The results indicate that there is not a statistically significant relationship ($p = 0.736$) between the type of company and their perceptions on growth. This, therefore, implies that the groups have the same perceptions on growth.

Thus, the null hypothesis cannot be rejected and cannot support hypothesis 5.

Furthermore, the researcher, based on the results, decided to explore the potential moderation effect of the moderator on the relationships between the independent variable and the dependent variable.

6.5.9 Moderator analysis

A moderator analysis is used to determine whether the relationship between two variables is moderated by a third variable (Sekeran & Bougie, 2016:72-74). Moderators are variables that change the size (or direction) of the relationship between the independent variable and the dependent variable. Testing for moderation effects were conducted on the following set of variables:

- Affordability, vehicle demand, and cost are the dependent variables.
- The political environment, economic challenges, COVID-19 challenges, government challenges, manufacturing challenges, and government tax and levies were considered as the moderators.
- The green environment, digital environment, and technological environment are the independent variables.

It was not known whether potential moderating effects, as identified, existed in the South African automotive industry. The analyses were, therefore, considered exploratory as a first research attempt to uncover moderation effects. Hayes process macro, the analysis used to test for moderation effects, requires the OLS assumptions of linearity, normality and homoscedasticity of residuals and independence to be met. Because a single independent variable was used, multi-collinearity testing was not applicable. The correlation matrix (see table 6.25) implies linear relationships between the independent and dependent variables. Heterogeneity was explored using the scatterplot of standardized predicted values against standardized residual values as recommended by many authors, notably e.g., Hair, Black, Babin and Anderson (2009). Potential heteroskedasticity was addressed by applying the heteroskedasticity-consistent inference option. In total, 54 moderating effect tests were done, using the process macro tool in SPSS V26 (Hayes & Rockwood, 2016:1), of which only eight tests were observed to have moderating effects. The 54 moderation tests considered all potential combinations of independent variables, moderator, and dependent variables. Each regression contains a different combination of independent variable, moderator, and dependent variable and the moderation decision is based on a confidence interval obtained through bootstrapping and relates to the statistical significance of the interaction term. The bootstrapping method relates to the process of resampling and estimating the statistics of a population by sampling a dataset with replacements. Bootstrapping provides an efficient way to ensure that the models are stable and reliable, therefore, the confidence interval was used to determine the existence of a moderation effect. A maximum of a 10% level of statistical significance was used. The following moderating effects were established:

6.5.9.1 Political environment had a moderating effect on the relationship between the digital environment (independent variable) and affordability (dependent variable)

The interaction between the digital environment and the political environment was found to be statistically significant ($\beta = -.2602$, $p<0.05$, CI (-.5042, -0.0171)). Therefore, the political environment is a moderator between the digital environment and affordability. Furthermore, at one standard deviation below the mean value of the moderator, 2.65, the conditional effect is .5654, CI (.3107, .8201), $p<0.01$; at the mean level of the moderator, 3.42, the conditional effect is .3649, CI (.1600, .5697), $p<0.01$; and at one standard deviation above the mean value of the moderator, 4.19, the conditional effect is .1644, CI (-.1344, .4632), $p>0.05$. The moderating effect is illustrated in figure 6.13.

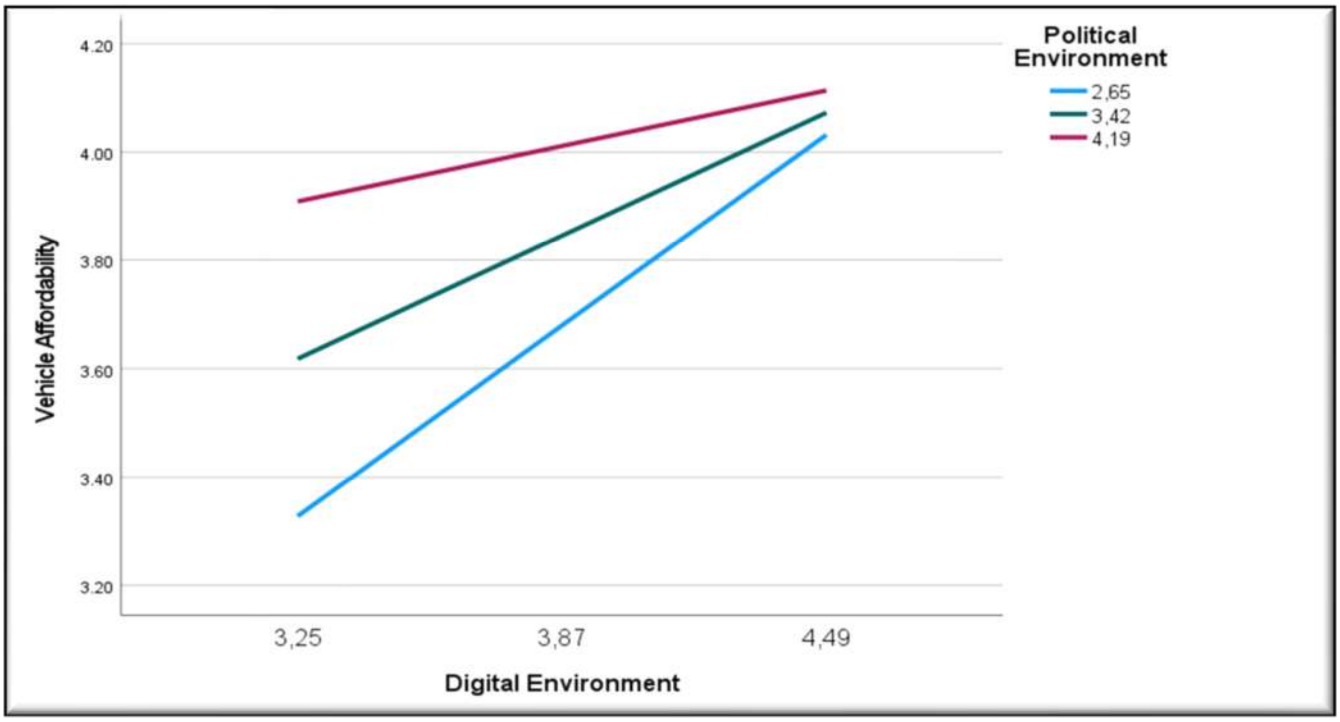
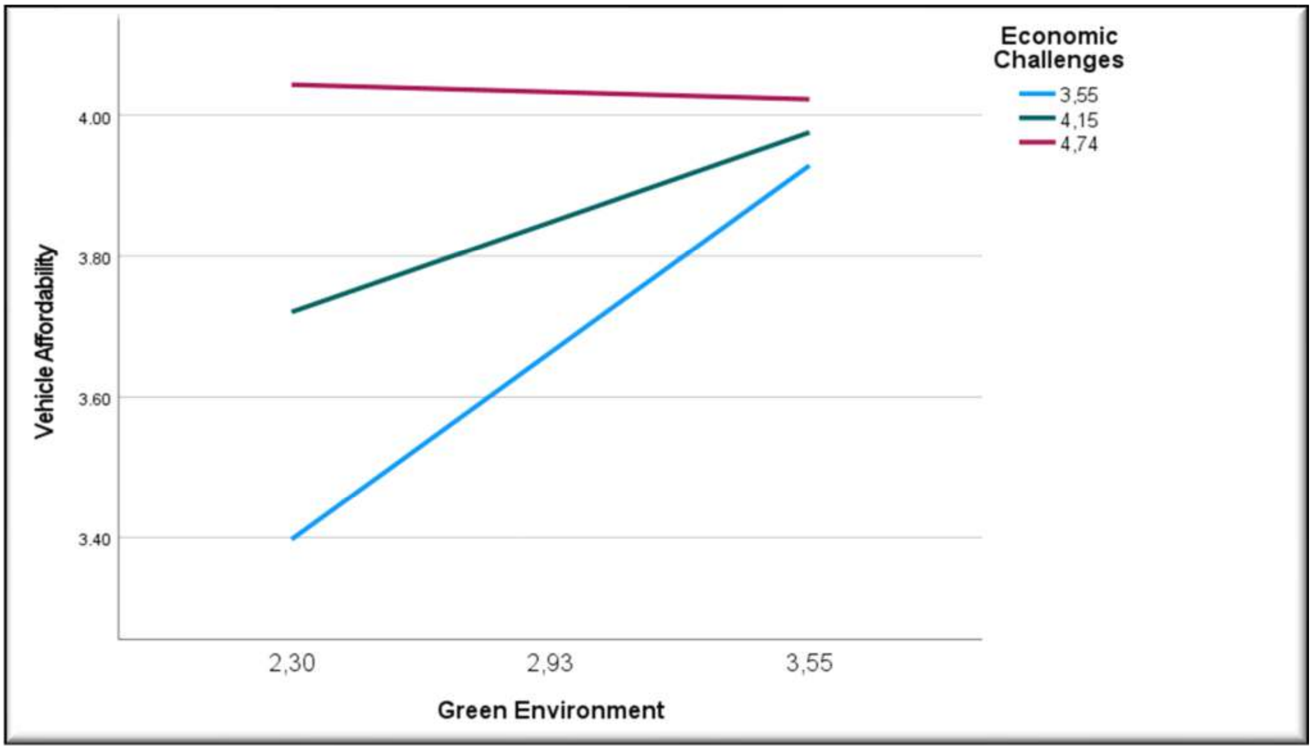


Figure 6.13: Political environment as a moderator between the digital environment and affordability

Figure 6.13 indicates that, as the value of the digital environment variable increases, vehicle affordability increases sharply for the moderator value at one standard deviation below the mean, slightly less for the moderator value at the mean, and only a slight increase at one standard deviation above the mean (which was not statistically significant). This means that changes and influences in the political environment, such as government legislation in terms of Electric Vehicle (EV) transitioning, or carbon tax, have an impact on the relationship between the digital environment and affordability. It means the relationship between the two variables is dependent on, or moderated by, the political environment. Chapter 4 discussed that EVs have a 25% import duty rate, but government wants to address this anomaly by setting a flat import duty of 18% which would result in EVs becoming more affordable in the domestic market, thereby reducing the moderating effect of the political environment.

6.5.9.2 Economic challenges had a moderating effect on the relationship between the green environment (independent variable) and affordability (dependent variable)

The interaction between the green environment and economic challenges was found to be statistically significant (β = -.3660, $p<0.05$, CI (-.7264, -0.0057)). Therefore, economic challenges are a moderator between the green environment and affordability. Furthermore, at one standard deviation below the mean value of the moderator, 3.55, the conditional effect is .4226, CI (.0423, .8030), $p<0.05$; at the mean level of the moderator, 4.15, the conditional effect is .2031, CI (-.0339, .4401), $p<0.10$; and at one standard deviation above the mean value of the moderator, 4.74, the conditional effect is -.0164, CI (-.2636, .2307), $p>0.05$. The moderating effect is shown in figure 6.14.



<u>Figure 6.14: Economic challenges as a moderator between the green environment and affordability</u>

Figure 6.14 indicates that as the value of the green environment variable increases, vehicle affordability increases sharply for the moderator value at one standard deviation below the mean, slightly less for the moderator value at the mean, and decrease very marginally at one standard deviation above the mean (which was not statistically significant). This means that economic challenges, such as employment levels, taxes and duties, or policy changes, have an impact on the relationship between the green environment and affordability. It means the relationship between the two variables is dependent on, or moderated by, economic challenges. Chapter 3 discussed the introduction of cleaner automotive fuels and that South Africa's main export destination, the EU, is transitioning to environmentally friendly vehicles such as EVs. Environmentally friendly vehicles, such as EVs, must become more affordable in the domestic market to ensure a widespread uptake and to support local manufacturing, thereby reducing the moderating effect of economic challenges.

6.5.9.3 COVID-19 challenges had a moderating effect on the relationship between the technological environment (independent variable) and vehicle demand (dependent variable)

The interaction between the technological environment and vehicle demand was found to be statistically significant ($\beta = -.5117$, $p<0.05$, CI (-.9911, -0.0323)). Therefore, COVID-19 challenges are a moderator between the technological environment and vehicle demand. Furthermore, at one standard deviation below the mean value of the moderator, 3.77, the conditional effect is .7818, CI (.3815, 1.1821), $p<0.01$; at the mean level of the moderator, 4.34, the conditional effect is .4913, CI (.2340, .7486), $p<0.01$; and at one standard deviation above the mean value of the moderator, 4.91, the conditional effect is .2008, CI (-.1462, .5477), $p>0.05$. The moderating effect is presented in figure 6.15.

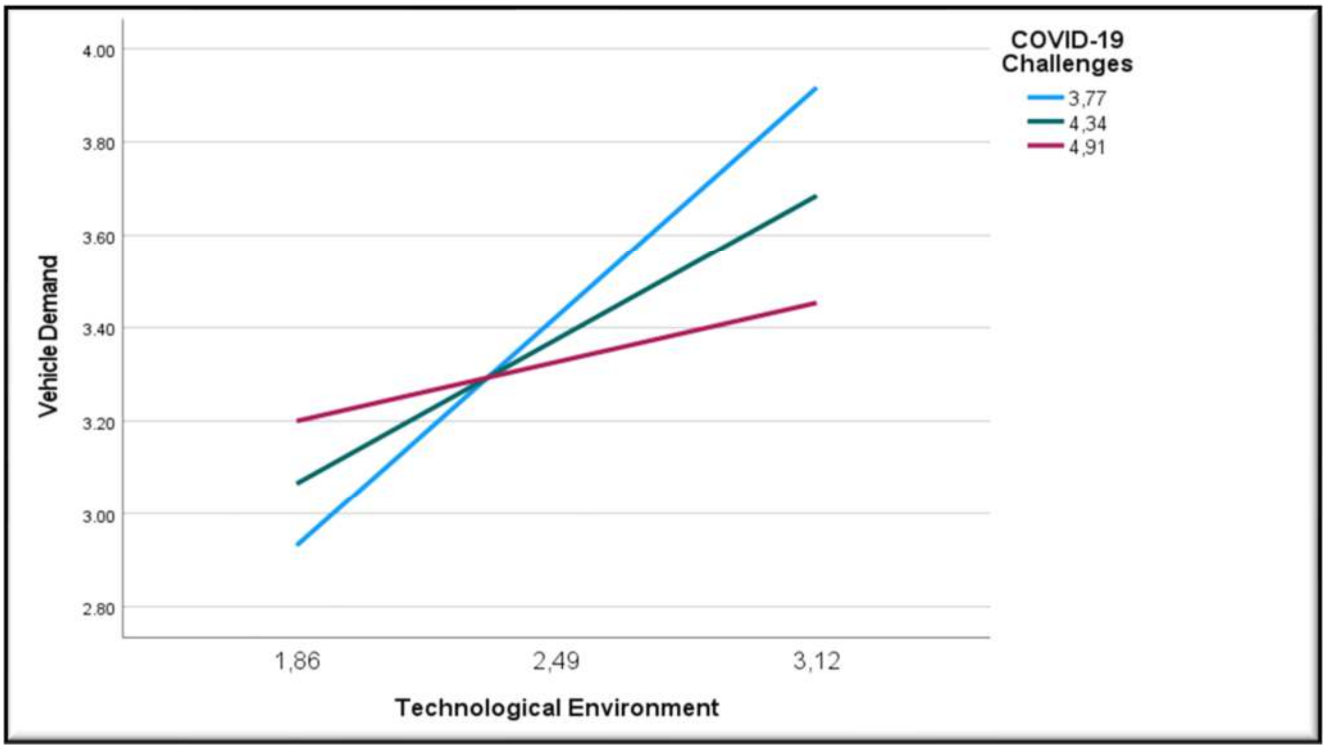


Figure 6.15: COVID-19 challenges as a moderator between the technological environment and vehicle demand

Figure 6.15 indicates that as the value of the technological environment variable increases, vehicle demand increases sharply for the moderator value at one standard deviation below the mean, slightly less for the moderator value at the mean, and only marginally (much less) at one standard deviation above the mean (which was not statistically significant). This means that COVID-19 challenges, such as shortage of parts and supply chain disruptions, have an impact on the relationship between the technological environment and vehicle demand. It means the relationship between the two variables is dependent on, or moderated by, COVID-19 challenges. Chapter 4 discussed that because of the impact of the COVID-19 pandemic, global demand for passenger vehicles declined by more than 13.5 million units in 2020. Chapter 4 also discussed that in 2021, the global shortage of microchips caused a huge challenge for new vehicle manufacturing with an estimated financial loss of about R900 billion to the industry. The moderating effect of the COVID-19 challenges has been severe to the global automotive industry.

6.5.9.4 Government challenges had a moderating effect on the relationship between the technological environment (independent variable) and cost (dependent variable)

The interaction between the technological environment and cost was found to be statistically significant (β = -.2518, $p<0.10$, CI (-.5526, 0.0490)). Therefore, government challenges are a moderator between the technological environment and cost. Furthermore, at one standard deviation below the mean value of the moderator, 2.90, the conditional effect is .4746, CI (.1748, .7744), $p<0.01$; at the mean level of the moderator, 3.63, the conditional effect is .2898, CI (.0621, .5176), $p<0.05$; and at one standard deviation above the mean value of the moderator, 4.37, the conditional effect is .1051, CI (-.2285, .4387), $p>0.05$. The moderating effect is revealed in figure 6.16.

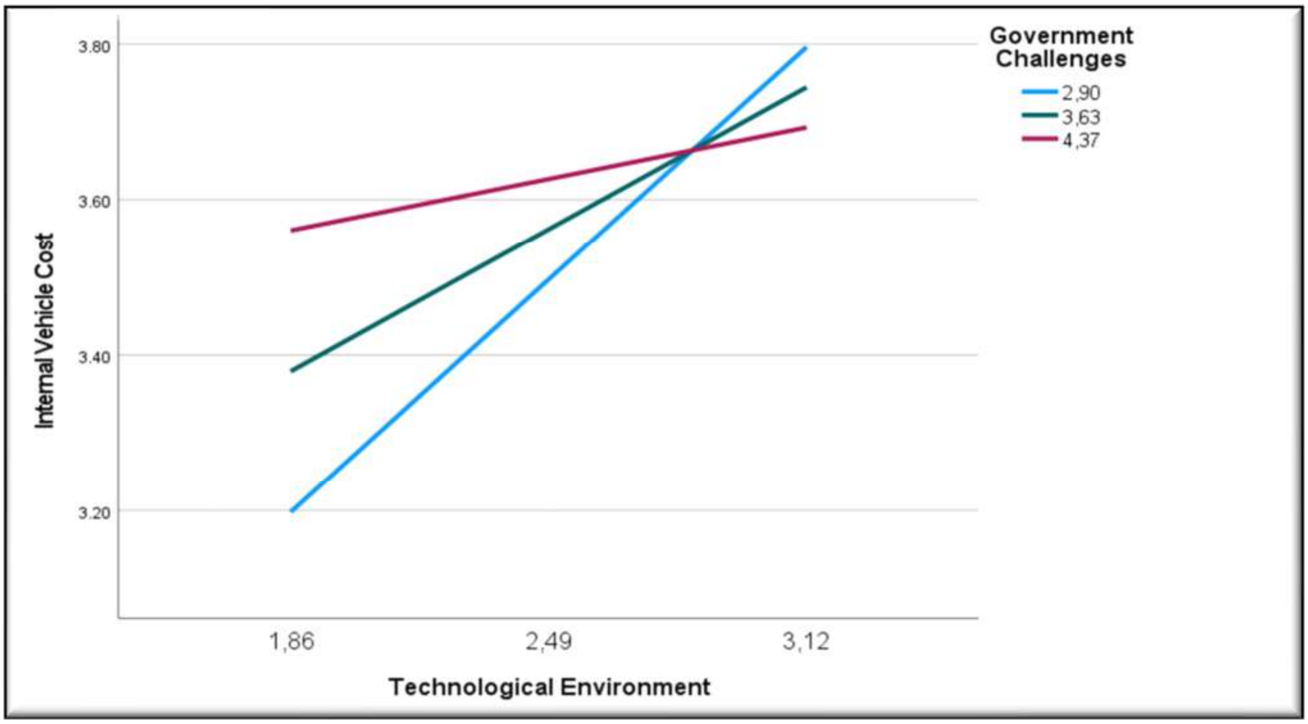


Figure 6.16: Government challenges as a moderator between the technological environment and cost

Figure 6.16 indicates that as the value of the technological environment variable increases, internal vehicle cost increases sharply for the moderator value at one standard deviation below the mean, slightly less for the moderator value at the mean, and only marginally at one standard deviation above the mean (which was not statistically significant). This means that government challenges have an impact on the relationship between the technological environment and cost. It means the relationship between the two variables is dependent on, or moderated by, government challenges. Chapter 4 discussed government challenges such as infrastructure development in the South African automotive industry. The introduction of cleaner automotive fuels, upgrading the roads, rail and ports infrastructure, and the use of alternate energy fuel sources, such as New Energy Vehicles (NEVs), are critically important because South Africa needs to stay up to date with the technology track whilst remaining cost effective. Government challenges have a strong moderating effect and can be reduced as government addresses the challenges in the technological environment to help with vehicle cost.

6.5.9.5 Manufacturing challenges had a moderating effect on the relationship between the digital environment (independent variable) and cost (dependent variable)

The interaction between the digital environment and cost was found to be statistically significant (β = -.2520, $p<0.10$, CI (-.5203, 0.0162)). Therefore, manufacturing challenges are a moderator between the digital environment and cost. Furthermore, at one standard deviation below the mean value of the moderator, 2.94, the conditional effect is .4089, CI (.0947, .7231), $p<0.05$; at the mean level of the moderator, 3.67, the conditional effect is .2236, CI (-.0060, .4531), $p<0.10$; and at one standard deviation above the mean value of the moderator, 4.41, the conditional effect is .0382, CI (-.2524, .3289), $p>0.05$. The moderating effect is illustrated in figure 6.17.

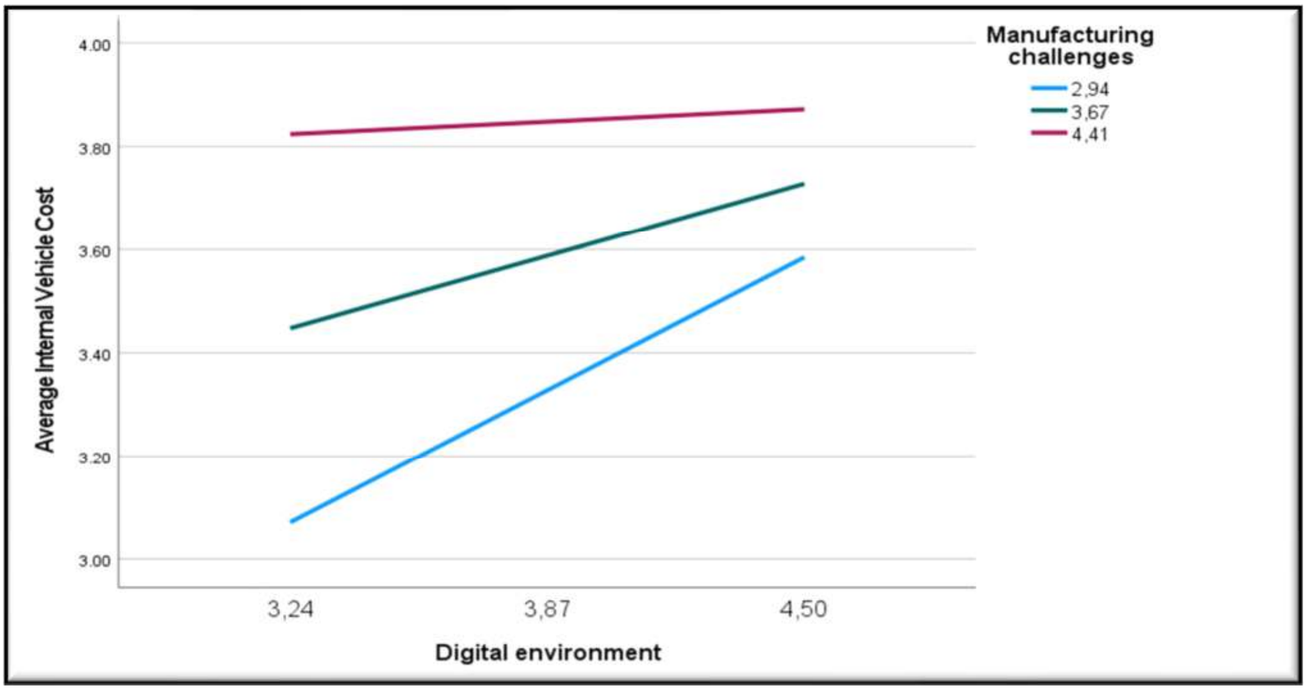


Figure 6.17: Manufacturing challenges as a moderator between the digital environment and cost

Figure 6.17 indicates that as the value of the digital environment variable increases, internal vehicle cost increases for the moderator value at one standard deviation below the mean, slightly less for the moderator value at the mean, and a very small, marginal increase at one standard deviation above the mean (which was not statistically significant). This means that manufacturing challenges have an impact on the relationship between the digital environment and cost. It means the relationship between the two variables is dependent on, or moderated by, manufacturing challenges. Chapter 4 discussed manufacturing challenges such as increasing localisation levels to achieve global competitiveness in automotive vehicle manufacturing. South Africa is regarded as a tier 2 supplier which means it can deepen and grow its local content levels to over 60% which will improve South Africa's cost profile and productivity. Related industries can capitalise by manufacturing specialised components needed by domestic vehicle manufacturers, thereby reducing the moderating effect of manufacturing challenges.

6.5.9.6 COVID-19 challenges had a moderating effect on the relationship between the green environment (independent variable) and cost (dependent variable)

The interaction between the green environment and cost was found to be statistically significant (β = -.5343, p<0.05, CI (-.9828, -0.0858)). Therefore, COVID-19 challenges are a moderator between the green environment and cost. Furthermore, at one standard deviation below the mean value of the moderator, 3.77, the conditional effect is .6218, CI (.2161, 1.0276), p<0.01; at the mean level of the moderator, 4.34, the conditional effect is .3185, CI (.0799, .5570), p<0.01; and at one standard deviation above the mean value of the moderator, 4.91, the conditional effect is .0151, CI (-.2657, .2959), p>0.05. The moderating effect is displayed in figure 6.18.

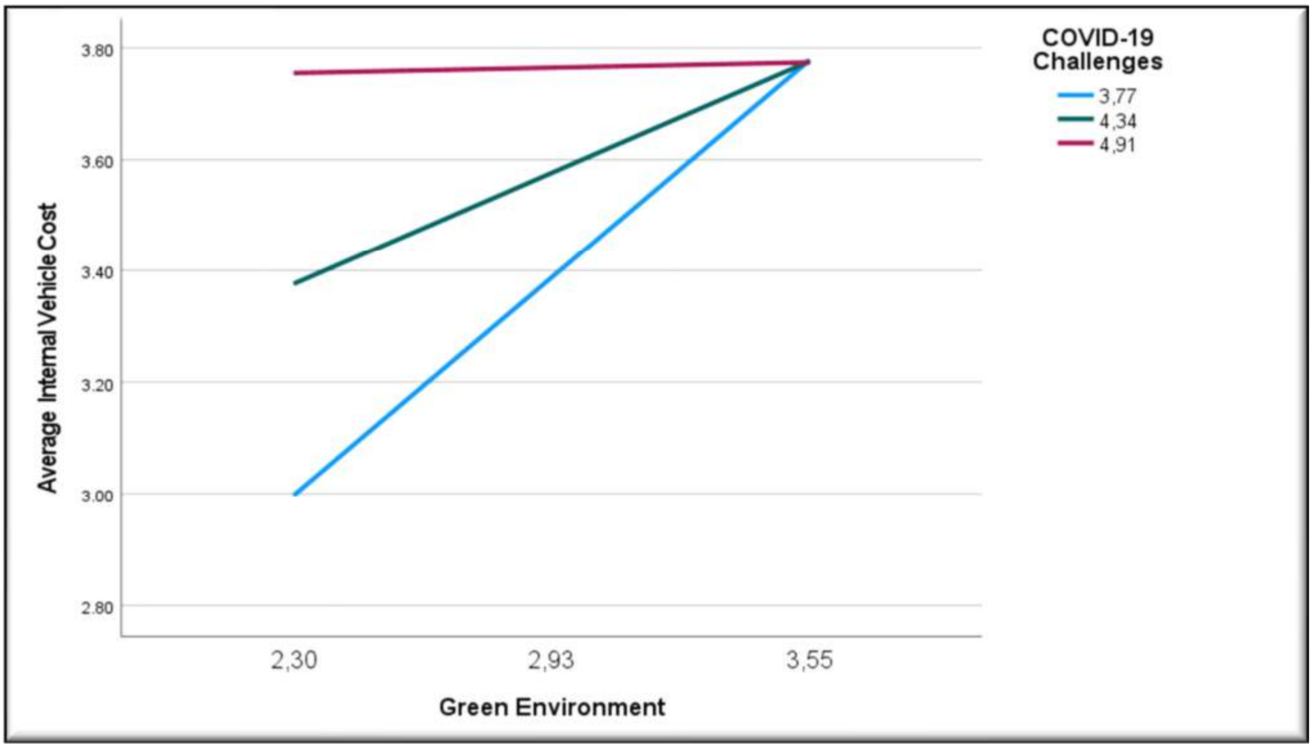


Figure 6.18: COVID-19 challenges as a moderator between the green environment and cost

Figure 6.18 indicates that as the value of the green environment variable increases, internal vehicle cost increases sharply for the moderator value at one standard deviation below the mean, at a much lower gradient for the moderator value at the mean, and an almost negligible increase at one standard deviation above the mean (which was not statistically significant). This means that COVID-19 challenges have an impact on the relationship between the green environment and cost. It means the relationship between the two variables is dependent on, or moderated by, COVID-19 challenges. Chapter 4 discussed the impact of COVID-19 on the global automotive industry and South Africa is integrated into the global automotive industry. COVID-19 challenges have a strong moderating effect because the global shortage of microchips choked vehicle manufacturing as well as spiked the price of these components, ultimately raising the vehicle costing. The impact on NEVs was more severe as it requires almost double the number of microchips than an internal combustion vehicle. However, the moderating effect of COVID-19 challenges is being reduced as governments around the world have found solutions to counter the impact of the COVID-19 pandemic.

6.5.9.7 Political environment had a moderating effect on the relationship between the green environment (independent variable) and cost (dependent variable)

The interaction between the green environment and cost was found to be statistically significant (β = -.3214, $p<0.05$, CI (.0406, 0.6022)). Therefore, the political environment is a moderator between the green environment and cost. Furthermore, at one standard deviation below the mean value of the moderator, 2.65, the conditional effect is .0155, CI (-.3422, .3732), $p>0.05$; at the mean level of the moderator, 3.42, the conditional effect is .2627, CI (.0221, .5034), $p<0.05$; and at one standard deviation above the mean value of the moderator, 4.19, the conditional effect is .5100, CI (.2250, .7950), $p<0.01$. The moderating effect is revealed in figure 6.19.

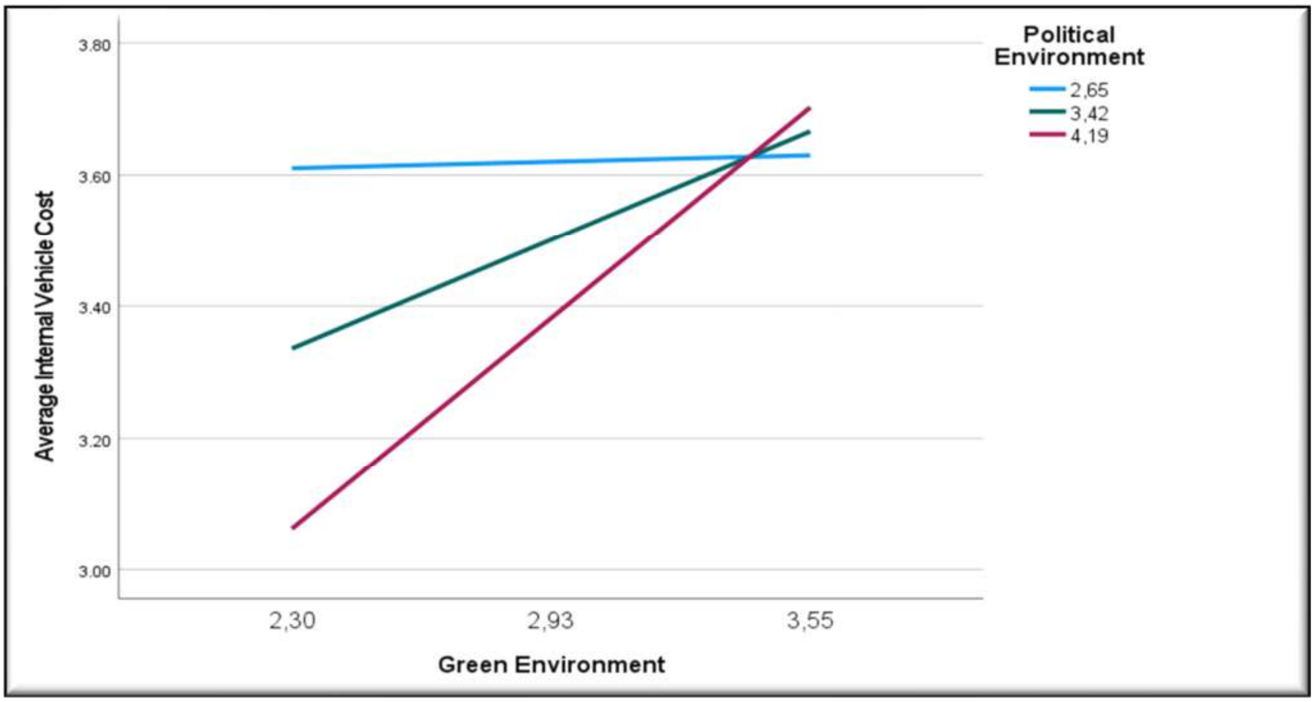


Figure 6.19: Political environment as a moderator between the green environment and cost

Figure 6.19 indicates that as the value of the green environment variable increases, internal vehicle cost for the moderator value at one standard deviation below the mean increases very marginally with the gradient almost negligible (which was not statistically significant), the moderator value at the mean increases fairly, and one standard deviation above the mean increases sharply. This means that the political environment has an impact on the relationship between the green environment and cost. It means the relationship between the two variables is dependent on, or moderated by, the political environment. Chapter 1 discussed that South Africa still struggles with issues such as fuel standards and quality, and vehicles are the main producers of carbon dioxide. The political environment has a strong moderating effect as it is responsible for ensuring that the motoring public has access to the latest low emission vehicle technology and making vehicle costs affordable, thereby reducing the moderating effect.

6.5.9.8 Government tax and levies had a moderating effect on the relationship between the green environment (independent variable) and cost (dependent variable)

The interaction between the green environment and cost was found to be statistically significant (β = -.2306, $p<0.05$, CI (-.4433, -0.0180)). Therefore, the government tax and levies are a moderator between the green environment and cost. Furthermore, at one standard deviation below the mean value of the moderator, 2.22, the conditional effect is .4699, CI (.1492, .7906), $p<0.01$; at the mean level of the moderator, 3.12, the conditional effect is .2634, CI (.0444, .4823), $p<0.05$; and at one standard deviation above the mean value of the moderator, 4.01, the conditional effect is .0568, CI (-.1992, .3129), $p>0.05$. The moderating effect is presented in figure 6.20.

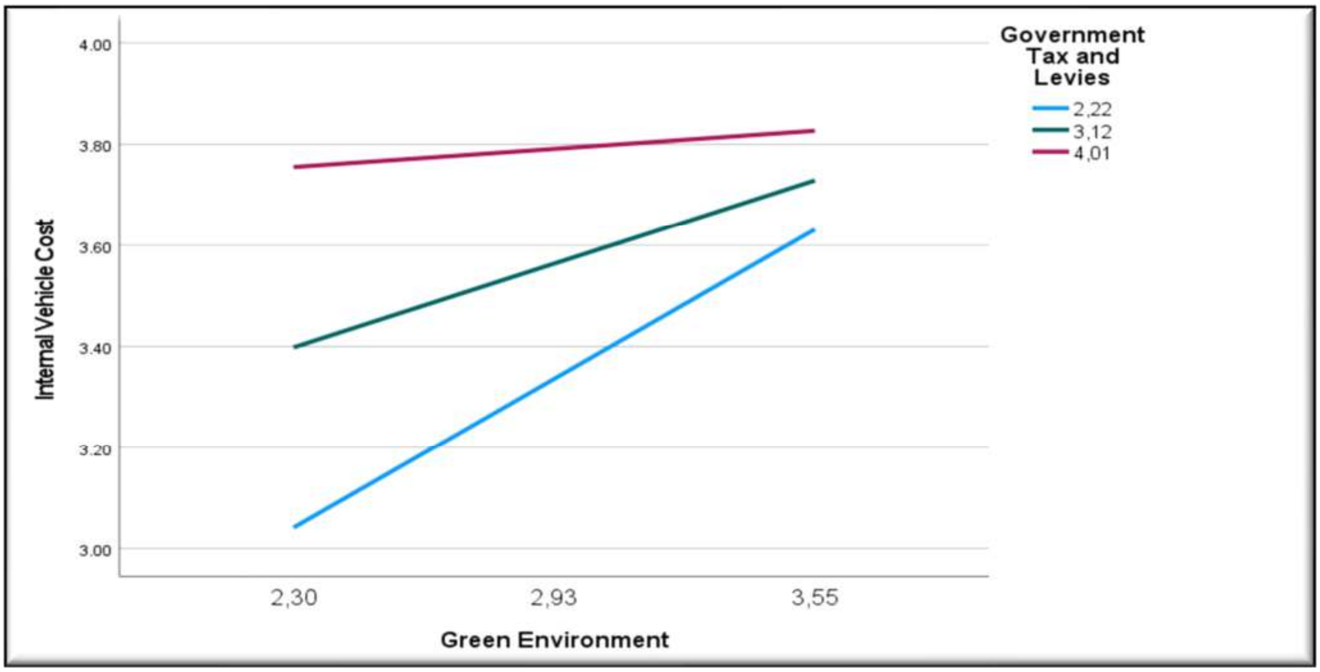


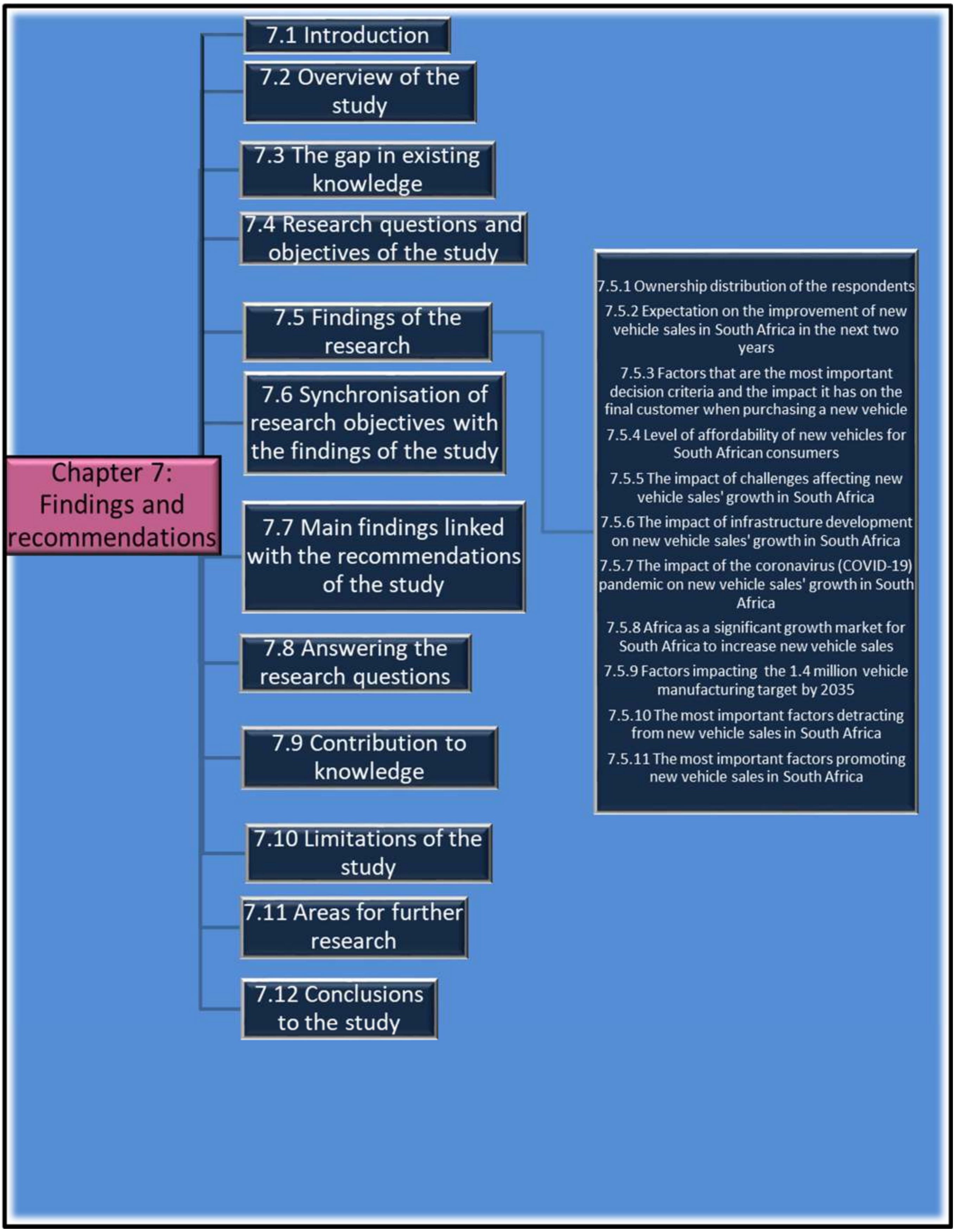
Figure 6.20: Government tax and levies as a moderator between the green environment and cost

Figure 6.20 indicates that as the value of the green environment variable increases, internal vehicle cost increases sharply for the moderator value at one standard deviation below the mean, slightly less for the moderator value at the mean, and only a slight increase at one standard deviation above the mean (which was not statistically significant). This means that government tax and levies have an impact on the relationship between the green environment and cost. It means the relationship between the two variables is dependent on, or moderated by, government tax and levies. Chapter 4 discussed the various taxes associated with vehicle ownership.

Government tax and levies have a strong moderating effect on the dependent and independent variables. Government can remove the taxes on EVs which will lower the dependent variable, positively impacting the independent variable and reducing the moderating effect.

6.6 Summary

Chapter 6 focused on the analysis and presentation of the research results of the empirical study to establish and measure the growth opportunities for the domestic new light vehicle market in South Africa. The analysis was done by following the same sequence as the questionnaire structure. Section A dealt with general information about the respondents. Section B dealt with information regarding the South African automotive industry and the respondents had to answer all these questions. If a respondent answered question 14 in the negative, they could motivate this choice in question 15, then they had to skip questions 16 and 17 because they did not perceive the African continent to be a significant growth market to increase new vehicle sales. Section C dealt with government policy, namely the SAAM 2021-2035, and all respondents were required to express their views on the current policy dispensation and what factor(s) limit(s) and promote(s) new vehicle sales in South Africa. The objective of the additional inferential analysis was to test the hypotheses obtained from the primary and secondary objectives of the study. The aim was to have a superior understanding of the growth opportunities for the domestic new light vehicle market in South Africa. The final chapter, which follows next, discusses the main conclusions which were drawn and provides the recommendations relating to the research's results.


Chapter 7: Findings and recommendations
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7.2 Overview of the study
7.3 The gap in existing knowledge
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Chapter 7

Conclusions and Recommendations

7.1 Introduction

The purpose of the thesis is to determine the growth opportunities for the domestic new light vehicle market in South Africa. The collected data was analysed by means of descriptive and inferential statistics, as presented in chapter 6. The primary and secondary objectives of this study were investigated by using descriptive research with the help of a structured questionnaire. Chapter 7 provides an overview of the study, indicates the gap in existing knowledge, answers the research questions, and synchronises the research objectives with the results obtained. The research objectives are firstly stated and thereafter the major conclusions are revisited. The research objectives are then reviewed and synchronised with the conclusions of the study. Following the above, the main conclusions are linked with the recommendations regarding growth opportunities for the domestic new light vehicle market in South Africa. The contribution to knowledge is provided and the limitations of the study are discussed. Suggestions for future research relating to the automotive industry in general is provided. The conclusions and recommendations will follow the same sequence as they were discussed and analysed in chapter 6. The recommendations should be considered by all relevant role-players, such as government officials, industry role-players, and other stakeholders in the South African automotive industry. The recommendations aim to assist in improving the current state of the domestic automotive industry which could have a positive outcome on the entire automotive landscape in South Africa.

7.2 Overview of the study

The study researched the South African automotive industry in detail with the primary focus on analysing growth opportunities for the domestic new light vehicle market. The various policy mechanisms, namely the Motor Industry Development Programme

(MIDP) and the Automotive Development and Development Programme (APDP), were discussed and the South African automotive industry's development, growth and integration into the global automotive industry supply chain were highlighted. The South African Automotive Masterplan (SAAM) 2021-2035 was discussed to indicate how government intends to move the industry towards (AIEC, 2022:32). The importance of the South African automotive industry cannot be overemphasised because the industry grew in stature to become South Africa's largest manufacturing industry which supports many related industries and the economy. There are many issues impacting the South African automotive industry's competitiveness which need immediate attention. International competitiveness, economies of scale, clean fuels, the COVID-19 pandemic, infrastructure development, and the global rollout of Electric Vehicles (EVs) to promote a greener environment are some of the key issues impacting the South African automotive landscape (AIEC, 2022:36-38).

The study followed a mixed methods research design with a positivistic research philosophy supported by qualitative and quantitative data collection methods. An embedded mixed methods approach was used to obtain data which was useful in the interpretation or triangulation of results. The field of study was directed to five different survey populations, namely the Original Equipment Manufacturers (OEMs), the vehicle importers, the National Automobile Dealers Association (NADA), the National Association of Automobile Manufacturers of South Africa (NAAMSA) and the African Association of Automotive Manufacturers (AAAM). Exploratory research and descriptive research were used to complement one another to obtain the results.

After an extensive study of the applicable literature, the research gap in existing knowledge emanated and will be briefly discussed next.

7.3 The gap in existing knowledge

The study researched and analysed growth opportunities for the South African domestic new light vehicle market in an increasingly changing business environment. Table 1.2 discussed the gap in the body of knowledge in detail. The study achieved results by using descriptive and empirical research strategies which led to the identification of different growth opportunities available to the South African automotive industry. The market is in constant change because of the fourth industrial revolution, the push towards cleaner fuels and a greener environment, EVs, rapidly changing technologies, and the COVID-19 pandemic which accelerated global market developments, such as the digital environment. These developments represent new dimensions and an uncharted landscape which impact the competitiveness and growth opportunities of the South African automotive industry. Higher order inferential statistics and moderator analysis was done on the results. Moderator analysis testing represented a first-time analysis of such tests conducted on the South African automotive industry. The gap in existing knowledge focuses on the importance of the South African automotive industry remaining competitive and keeping abreast of the changes. The South African government, in conjunction with the relevant stakeholders, have a joint responsibility to overcome these challenges.

Several research questions and objectives were developed to support the purpose of the study and will be discussed next.

7.4 Research questions and objectives of the study

The main research question of the study is:

- What are the growth opportunities for the domestic new light vehicle market in South Africa?

The supporting research questions of the study are:

- What are the driving factors which promote new vehicle sales in South Africa?
- What are the constraint factors dampening new vehicle sales in South Africa?
- What are the global disruptions in vehicle technology and fuel standards' impact on the consumption patterns of new vehicles in South Africa?
- What different options can be used to grow the new vehicle market share within the African region and in international markets?

- How big an impact has the Coronavirus Disease 2019 (COVID-19) pandemic had on new vehicle sales and future growth strategies in South Africa?
- To determine the differences between foreign and locally owned companies; high and low growth expectancy groups; positive and negative growth outlook groups; and relative affordability groups regarding (see Appendix C for questionnaire):
  - (i) the importance of growth drivers (question 6 of the questionnaire)?
  - (ii) the business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire)?
  - (iii) the business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire)?
  - (iv) the business impact of the different criteria impacting on new vehicle sales' growth (see these criteria in question 10 of the questionnaire)?
  - (v) the business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire)?
  - (vi) the importance of the digital future criteria impacting new vehicle sales' growth (see these criteria in question 13 of the questionnaire)?
  - (vii) the importance of the different criteria for South Africa's vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire)?

- To determine the relationship between the expectation of growth of new vehicle sales in South Africa and:
  - (i) company type?
  - (ii) each of the challenges to new vehicle sales' growth?

The primary objective of the study is to determine:

- Growth opportunities for the domestic new light vehicle market in South Africa.

More specifically, the primary aim of this study is to establish and analyse the growth opportunities of the South African automotive industry, by capturing the responses of the main role-players and stakeholders directly involved with the industry.

In addition, the secondary objectives of the study are:

- To determine the driving factors which promote new vehicle sales in South Africa.
- To determine the constraint factors impacting new vehicle sales in South Africa.
- To investigate the impact of the global disruption in vehicle technology and fuel standards on the consumption patterns of the new vehicle market in South Africa.
- To investigate the different options available to the South African vehicle manufacturers to grow their new vehicle market share within the African region and in international markets.
- To investigate the impact of the COVID-19 pandemic on South Africa's new vehicle sales and future growth strategies.
- To determine the differences between foreign and locally owned companies; high and low growth expectancy groups; positive and negative growth outlook groups; and relative affordability groups regarding (see Appendix C for questionnaire):
  (i) the importance of growth drivers (question 6 of the questionnaire).
  (ii) the business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire).
  (iii) the business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire).
  (iv) the business impact of the different criteria impacting on new vehicle sales' growth (see these criteria in question 10 of the questionnaire).
  (v) the business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire).
  (vi) the importance of the digital future criteria impacting new vehicle sales' growth (see these criteria in question 13 of the questionnaire).
  (vii) the importance of the different criteria for South Africa's vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire).
- To determine the relationship between the expectation of growth of new vehicle sales in South Africa and:
  (i) company type.
  (ii) each of the challenges to new vehicle sales' growth.

Having highlighted the research questions and objectives of the study, the conclusions of the research will be discussed next.

7.5 Conclusions of the research

The descriptive and inferential analyses which were conducted in chapter 6 will be summarised in the sections that follow.

7.5.1 Ownership distribution of the respondents

Almost two thirds (62.9%) of respondents are part of a foreign owned company. Foreign owned companies in the motor industry contribute significantly to the South African economy by Foreign Direct Investments (FDI) and by creating business and employment opportunities. Foreign owned businesses are dominant in the South African automobile industry and their business objectives must be aligned with the South African economy.

7.5.2 Expectation on the improvement of new vehicle sales in South Africa in the next two years

More than half (53.2%) of respondents expect the industry to grow moderately within the next two years. A multitude of reasons are provided for this expectation with the primary ones being a sluggish economy, a decrease in disposable income levels, low consumer confidence levels, low affordability of new vehicles, mass unemployment levels, and a slow rebound from the impact of the COVID-19 pandemic which has crippled the world economy (AIEC, 2021:108).

7.5.3 Key factors and their impact on the final domestic customer who purchases a new vehicle

According to the respondents, the most important decision-making criteria which the final customer is faced with when purchasing a new vehicle are:

- The selling price.
- The ability to secure finance.
- The customer's satisfaction levels with vehicle brands and models.
- The option of buying a demo or used vehicle.
- The specific customer demand for South African manufactured vehicles.

The selling price of new vehicles in South Africa is higher than those of competitive automobile manufacturing countries, and one of the main reasons therefor is taxes which range from 18% on an entry level vehicle to 42% on the premium brands (Autotrader, 2017:1; Autolive February issue, 2019:1). Chapter 4, section 4.3.1 and 4.3.2 discussed this in detail. The selling price is also dependent on whether the customer will be able to secure finance for the new vehicle. The other factors are important but interdependent on the selling price and securing finance for the new vehicle. Finally, there are other exogenous factors which influences the purchasing decision of the final customer, notably the impact of the COVID-19 supply chain disruptions faced by the global and South African automotive industry.

7.5.4 Level of affordability of new vehicles for South African consumers

More than half (53.2%) of respondents indicated that South African consumers' affordability levels are under strain in comparison to other developing countries. Although the respondents indicated that South African consumers have a higher ability to afford new vehicles than consumers in similar countries, affordability is becoming a strenuous issue in the South African economy with disposable income levels under immense pressure (AIEC, 2020:16: AIEC, 2021:17).

7.5.5 The impact of challenges affecting new vehicle sales' growth in South Africa

Among the different challenges faced by the respondents, the most severe are:

- All respondents are severely impacted by the weak economic growth rate, and it has a knock-on effect on the entire automotive industry.

- The volatile currency has caused drastic price fluctuations where manufacturers can no longer insulate the industry from below inflation rate increases.
- Weak business confidence levels are having a destabilising effect on new vehicle sales because businesses and consumers do not feel confident in meeting their monthly repayments.

There is a consensus among all the respondents that the industry faces other challenges too, but the abovementioned three challenges are pre-dominant and, if tackled efficiently, would make the other challenges dissipate. Chapter 4, section 4.3.1 and 4.3.2 discussed this in detail.

<u>7.5.6 The impact of infrastructure development on new vehicle sales' growth in South Africa</u>

Among the infrastructure developmental challenges stated by the respondents, the most important are:

- Electric vehicle infrastructure, implying the service and supply of electricity recharging points.
- Road and rail infrastructure which is a supply chain problem relating to the import and export of automobiles and component parts.
- Ports infrastructure which is also a supply chain problem like the road and rail infrastructure problem.

There is a consensus among all the respondents that the abovementioned three areas of South Africa's infrastructure need to be upgraded for the South African automotive industry to move forward and to grow to the levels intended and desired by government. Chapter 4, section 4.5.3 discussed this in detail. The Department of Trade, Industry and Competition's (DTIC) Auto Green Paper (2021), on the advancement of new energy vehicles in South Africa, highlighted the rationale for the domestic industry's accelerated transformation into the electro-mobility landscape. Infrastructure, when relating to logistics costs, is one of the key pillars of the SAAM 2021-2035 required to achieve the Masterplan's objectives, while COVID-19 supply chain disruptions have resulted in higher logistics costs for the domestic automotive industry (AIEC, 2022:33).

7.5.7 The impact of the COVID-19 pandemic on new vehicle sales' growth in South Africa

There is a consensus among all the respondents that the COVID-19 pandemic had severely impacted new vehicle sales' growth in South Africa. This is in line with global vehicle sales which also struggled in 2020 and are only now recovering. The following are the most important:

- The COVID-19 lockdown in South Africa, and in other parts of the world, disrupted the global automotive industry in various ways.
- Consumers' disposable income has taken a knock and is under immense pressure.
- Stock shortages are a result of the various lockdown measures and the consequent global supply chain disruptions are causing huge delays in the manufacturing cycle.
- Concomitant to the global supply chain challenges, Just-in-Time (JIT) supply requirements were not met which meant delays with manufacturing and price increases on new vehicles, which in turn were forwarded onto the customers.

South Africa is home to an array of motor vehicle manufacturers from around the world, but the COVID-19 pandemic has brought supply chains to their knees, thereby putting all manufacturers in a similar position (AIEC, 2021:5). In 2021, the global shortage of semi-conductors or computer chips, which are used in modern vehicles, resulted in a global vehicle production loss of approximately 7.1 million vehicles, thereby worsening various models and about R900 billion financial loss to the industry (Autolive April issue, 2021:1; Autolive September issue, 2021:2).

7.5.8 Africa as a significant growth market for South Africa to increase new vehicle sales

More than two thirds (67.74%) of respondents indicated that the African continent would be a significant growth market for South Africa to increase new vehicle sales. The majority (73.81%) of these respondents indicated that Africa would have a moderate to high contribution to South African new vehicle sales. There is a consensus among all the respondents that Africa represents an untapped opportunity to pursue, provided the following measures are in place:

- A regulatory business environment provides certainty to vehicle manufacturers who want to start automotive vehicle and component manufacturing in Africa.
- Duty-free access on new vehicles so that the new vehicle market can be more competitive against used vehicles in these markets.
- Ban the import of used vehicles because it destroys the African new vehicle market.
- Stability in the economic environment is necessary to ensure a positive effect on disposable income levels which will unlock opportunities for new vehicle sales.
- Customs' matters and procedures must be streamlined to ensure automotive vehicles and components' swifter cross border movement to and from South Africa.

Should the abovementioned measures be strictly adhered to, respondents agree that Africa can offer a higher return on investment than other regions as discussed in chapter 3. Regional market demand is one of the key pillars of the SAAM 2021-2035 to achieve the objectives of the Masterplan (AIEC, 2022:32). The African Continental Free Trade Area (AfCFTA) and the Auto Pact could unlock expanded market access opportunities for South African manufactured vehicles and Semi Knocked Down (SKD) kits outside of the Southern African Development Community (SADC) (AIEC, 2022:46). Should free trade become a reality on the continent and should the vehicle manufacturing hubs arise in line with appropriate automotive policy regimes, it could comprise 81.1% of the automotive export value into Africa and into other regions west, east, and north of the continent (AIEC, 2022:50).

<u>7.5.9 Factors impacting the 1.4 million vehicle manufacturing target by 2035</u>

The respondents were split regarding manufacturing 1.4 million vehicles by 2035, with 51.61% indicating possible achievement of the target and 48.39% indicating non-achievement of the target. The following factors are the most important:

- Economic growth is fundamental to the robust growth in new vehicle sales which has a spill-over effect across the economy.
- Export dependency represents the backbone of South Africa's automotive vehicle manufacturing.
- Infrastructure development is crucial to putting South Africa among the leaders in automotive infrastructure and will be critical as newer technologies, such as Euro 6 fuel technology and EVs, start dominating new vehicle sales.
- As the main role-player, the government's commitment towards supporting the vision and objectives of the SAAM 2021-2035 is critical for ensuring the success of the South African automotive industry.
- Pricing and affordability are a critical issue because the COVID-19 pandemic debilitated disposable income levels even further and caused price increases.

The respondents who indicated that South Africa would not be able to achieve the 1.4 million manufacturing target, also highlighted the abovementioned factors as key achievements required for realising the target. However, since 2020, the SAAM's 2021-2035 objectives gained momentum because of the executive oversight committee's work-streams, which are chaired by the National Association of Automobile Manufacturers of South Africa's (NAAMSA) member chief executive officers, and they are reporting to the Minister of the Department of Trade, Industry and Competition (DTIC) on a quarterly basis.

<u>7.5.10 The key factors detracting from new vehicle sales in South Africa</u>

The respondents indicated the most important factors which are detracting from new vehicle sales in South Africa. The following factors are the most important:

- Affordability is a key issue in the South African economy. The middle class, who is the main consumers of new vehicles, is diminishing and the cost of vehicle ownership has increased significantly.
- A minimum economic growth of 3% is needed to restore business and consumer confidence, and it is critical for the improvement of new vehicle sales in South Africa.
- Price is a crucial issue because more than half of the vehicles sold in South Africa are imported and the price is subjected to exchange rate volatility.
- The high taxes on vehicles in South Africa are having a crippling effect on new vehicle sales and consumers are buying down or moving to the used vehicle market.

These four key factors are handicapping new vehicle sales in South Africa. This not only affects the direct stakeholders of the domestic automotive industry, but also negatively impacts all related industries benefiting from growth of the domestic automotive industry. The projected economic growth is poor, and sales are looking bleak. Government could consider various tax proposals to stimulate the new vehicle market and it is important that government investigates this matter urgently.

7.5.11 The key factors promoting new vehicle sales in South Africa

The respondents indicated the most important factors which promote new vehicle sales in South Africa. The following factors are the most important:

- Economic growth will create employment opportunities across the economy, improve affordability, and stimulate domestic new vehicle sales.
- Domestic and foreign investment is of paramount importance to grow the South African economy and to restore confidence in businesses and consumers. Investments in new automotive infrastructure is needed to ensure that South Africa keeps up with the latest in automotive technology.
- Price, as mentioned previously, is critical and subjected to exchange rate volatility which can be overcome by the local content requirements as emphasised in the SAAM 2021-2035 policy.

- In South Africa, new vehicle sales come down to affordability and consumers' disposable income levels have been severely impacted. Manufacturing more affordable vehicles, providing a range of incentives, and extending the repayment term will increase new vehicle sales.
- Reducing taxes on vehicles will have a positive effect on new vehicle sales.

These key factors overlap with the factors that detract from new vehicle sales in South Africa, thereby emphasising their importance as areas that must be focused on by government and the relevant stakeholders. For instance, 1% increase in Gross Domestic Product (GDP) represents a flat market in new vehicle sales, which implies that the GDP must grow more rapidly to increase new vehicle sales in South Africa (NAAMSA, 2016:4; AIEC, 2022:7).

Having provided the main conclusions of the survey, the focus now moves to the synchronisation of the stated research objectives with the conclusions of the study.

7.6 Synchronisation of research objectives with the conclusions of the study

The primary and secondary objectives of this research study are presented and synchronised with the results of the study, and the synchronisation is presented in table 7.1. The global automotive industry has undergone a tremendous transition because of the current technological explosion relating to new energy vehicles. The entire automotive landscape has changed, and the COVID-19 pandemic provided added pressure to create a dynamic automotive industry. Change is inevitable and South Africa must keep abreast and move with these transitions to establish the growth opportunities that are envisaged by the South African government.

Table 7.1: Research objectives synchronised with the main conclusions

Objectives	Main conclusions
Secondary objective: To determine the driving factors which promote new vehicle sales in South Africa.	In chapter 6, the main driving factors were identified as (see figure 6.12): • Economic growth. A close correlation exists between new vehicle sales and the GDP (AIEC, 2021:16). A minimum of 3% economic growth is needed to facilitate double digit growth in the South African automotive industry. Economic growth of 5% would translate into a 20% increase in new vehicle sales. • Domestic and foreign investments. Sustainable levels of investments, both foreign and domestic, are required in the country to create more job opportunities and to have a positive spin-off on the sales of new vehicles. • Price. In 2021, 60% of light vehicles sold in South Africa were imported and the costing is subject to exchange rate volatility (AIEC, 2022:25). Domestic new vehicles' prices have been increasing because of the exchange rate's weakness and the high taxes on new vehicle sales. South African manufactured vehicles which are exported could cost significantly less than what it would cost domestically. This indicates that the cost structure of new vehicle sales in South Africa is largely made up of taxes (18% on an entry level vehicle to 42% on a premium brand vehicle) rather than the raw cost of manufacturing the vehicle (Autotrader, 2017:1; Autolive February issue, 2019:1). • Affordability. Affordability is a key issue and South African consumers' disposable income levels are under immense pressure (AIEC, 2020:16: AIEC, 2021:17). The COVID-19 pandemic had a debilitating effect on the affordability of new

	vehicles and the disposable income of the middle-class consumer (Autolive June issue, 2020:17). • Associated costs. Associated costs are vehicle ownership costs, such as license fees, fuel levies, maintenance and service plans, tolls, insurance, interest, and indirect taxes (Automobil, 2016:10; AIEC, 2019:14). Reducing the cost of ownership will improve affordability and drive new vehicle sales. • Exchange rate weakness. A stable exchange rate will assist in providing price stability. Strengthening the exchange rate will reduce prices on imported components which will lower the cost of new vehicles because, as mentioned before, more than half of the vehicles sold in the domestic market are imported (AIEC, 2021:16; AIEC, 2022:16). • The above conclusions are supported by the hypothesis HO1: Pearson Chi-Square, where the results indicated no statistical significance ($p = 0.736$) between the type of automobile company and their perception on growth; Kruskal-Wallis, where the results indicated a statistical significant difference at the 10% level of significance between the three groups (group one significantly lower, group two on par, and group three significantly higher levels) regarding vehicle affordability ($p = 0.065$), the green environment ($p = 0.057$), and the digital environment ($p = 0.063$), and at the 5% level of significance regarding duty-free access on new vehicles ($p = 0.047$). Also see the moderator analysis in figures 6.13, 6.14, 6.17, and 6.20.
Secondary objective: To determine the constraint factors impacting new vehicle sales in South Africa.	In chapter 6, the constraint factors were identified as (see figure 6.11): • Affordability, as already discussed above. • Economic growth, as already mentioned above. • Price issues, as already explained above.

	• Taxes on new vehicles is a serious constraint. The various taxes on new vehicles are substantial (SARS, 2014; SARS, 2017; Barnes, Grant & Ndlovu, 2020:21). Using the formula in Appendix A, the ad valorem excise duty on locally manufactured vehicles is 3.64% on a value of R200 000, 5.61% on a value of R300 000, and 7.49% on a value of R400 000. The ad valorem excise duty on imported vehicles with a 25% import duty, is 10.71% on a value of R200 000, 16.59% on a value of R300 000, and 22.47% on a value of R400 000. Additional direct taxes associated with a new vehicle are Value Added Tax (VAT) at 15% which needs to be calculated at the recommended retail selling price, Carbon Dioxide (CO_2) tax, and tyre tax (see table 4.2). Add to this the indirect taxes associated with vehicle ownership, such as fuel levies, tolls, insurance, and service and maintenance costs to get a picture of the taxes' constraints on new vehicle sales. • The above conclusions are supported with the testing of hypothesis HO1 where the Pearson Chi-Square indicated no statistical significance ($p = 0.736$) between the type of company and their perception on growth. See also the moderator analysis in figures 6.13, 6.14, 6.17 and 6.20 in chapter 6.
Secondary objective: To investigate the global disruption in vehicle technology and fuel standards, and their impact on the consumption patterns of the new vehicle market in South Africa.	The main conclusions on the global disruption in vehicle technology and fuel standards are: • Technology resulting in increased fuel efficiency and eco-friendly alternative power sources is revolutionising the industry which could have a major impact on the South African vehicle manufacturers. • The global automotive industry's push towards a greener environment has accelerated the phasing out of Internal Combustion Engine (ICE) technology. South Africa's main

	export destination, the European Union (EU), has set 2025 as the deadline for diesel vehicles to be banned and is busy legislating the banning of new ICE vehicles by 2035 (Engineeringnews, 2018c; Manners-Bell, 2018:114). Currently, South Africa's manufacturing capacity is fully focused on selling ICE technology. • Euro 6 fuel quality is currently the benchmark set by the leading automotive markets and South Africa's use of Euro 2 fuel quality is detrimental to South African vehicle manufacturers (Manners-Bell, 2018:114). It means that South African consumers do not have access to the latest vehicle technology. • South Africa's hybrid petrol and diesel vehicle sales market share was low, constituting 678 units, while electric vehicle sales constituted 218 units in 2021 (AIEC, 2022:17). This small number of technologically advanced vehicles indicates how far behind South Africa is from the leading automotive markets. • South Africa's increasing reliance on the ever-growing fuel tax revenue per annum (currently R85 billion) is an obstacle preventing the rapid transition to electric vehicle technology (OUTA, 2021:1). • South Africa's electric vehicle charging infrastructure is lagging compared to the leading automotive countries and it is a major obstacle preventing the widespread adoption of new technology vehicles (DTIC, 2021:2). • Statistical support for the above conclusions can be found in question 10 of the principal component analysis in chapter 6, and the moderator analysis in figures 6.14, 6.18 and 6.19.
Secondary objective: To investigate the different options available to the South African vehicle	The main conclusions on how to grow the new vehicle market share are:

manufacturers to grow their new vehicle market share within the African region and in international markets.	• An African continent commitment is needed on the restriction of second hand or used vehicles (see table 6.11). • Favourable trade agreements, such as free duties on new vehicles or swift customs procedures, are needed to attract more vehicle manufacturers to Africa (AIEC, 2020:49) (see table 6.11). • The South African government should invest in electric vehicle infrastructure and charging facilities to promote domestic sales and achieve economies of scale (DTIC, 2021:2). • For the long-term supply to its main export market, the EU, South African vehicle manufacturers need to achieve economies of scale for zero emission vehicles and electric vehicles (AIEC, 2018:31; AIEC, 2022:32) (see figure 6.10). • Statistical support for the above conclusions can be found in the principal component analysis in question 17 of chapter 6, correlation results in table 6.25, and the moderator analysis in figures 6.17 and 6.19.
Secondary objective: To investigate the impact of the COVID-19 pandemic on South Africa's new vehicle sales and future growth strategies.	The main conclusions on the impact of the COVID-19 pandemic are: • South Africa's vehicle production declined by 29.22%, and total new vehicle sales declined by 29.14% in 2020 (AIEC, 2021:42). This can be ascribed to the economic downturn and the impact of the COVID-19 pandemic. • The average monthly employment by vehicle manufacturers declined by 1.07%, and by 4% in the automotive component sector in 2020 (AIEC, 2021:6). • South Africa's total vehicle exports declined by 29.91% in 2020 because of the worldwide impact of the COVID-19 pandemic (AIEC, 2021:6).

	• The South African middle class's disposable income is under heavy pressure resulting in a buying down trend in the market (AIEC, 2021:108). • The ratio of new vehicle versus used vehicle sales declined, indicating the South African consumer's economic downward buying spiral. The new vehicle ratio to used sales was 1:2.27 in 2020, which meant that for every new vehicle being financed, 2.27 used vehicles were financed (TransUnion, 2021:2). Prior to the COVID-19 pandemic, it was 1:2.06, a 10.07% increase from 2018 to 2020. • The online digital business component of marketing and selling grew exponentially with consumers spending more than 14.44 hours researching vehicles online (Schnehage, 2017:1). Currently, this makes up approximately 80% of the total vehicle purchasing process (Autotrader, 2020:46). • The virtual showroom took off and is becoming the preferred dealership model for the future (Autolive September issue, 2017:16). Virtual reality allows a customer to walk and look around a dealership and even test drive a vehicle (Autolive April issue, 2021:16). • Statistical support for the above conclusions can be found in the principal component analysis in questions 6 and 13 in chapter 6. See also the hypothesis HO1: Kruskal-Wallis test where the results indicated a statistically significant difference at the 10% level of significance between the three groups (group one significantly lower, group two on par, and group three significantly higher levels) regarding vehicle affordability ($p = 0.065$), the green environment ($p = 0.057$), and the digital environment ($p = 0.063$), and at the 5% level of significance regarding duty-free access on new vehicles ($p = 0.047$). See also the moderator analysis in figure 6.13.

Secondary objective: To determine the differences between foreign and locally owned companies; high and low growth expectancy groups; positive and negative growth outlook groups; and relative affordability groups regarding (see Appendix C for questionnaire): (i) the importance of growth drivers (question 6 of the questionnaire). (ii) the business impact of the various costs on the affordability of new vehicles (question 8 of the questionnaire). (iii) the business impact of the challenges impacting new vehicle sales' growth (question 9 of the questionnaire). (iv) the business impact of the different criteria impacting on new vehicle sales' growth (see these criteria in question 10 of the questionnaire). (v) the business impact of the coronavirus (COVID-19) affecting new vehicle sales' growth (question 12 of the questionnaire). (vi) the importance of the digital future criteria impacting new vehicle sales' growth (see these	The main conclusions on the differences of the various criteria between the groups are: There were 14 identified factors (see section 6.5 for these 14 factors) which led to the development of four research hypotheses that were tested. • H1: The results indicate that a statistically significant difference exists (p = 0.001), at the 1% level of significance, between the foreign and the domestic companies regarding their perceptions on the technological environment. The results also indicate that a statistically significant difference exists (p = 0.035), at the 5% level of significance, between the foreign companies and the domestic companies regarding their perceptions on the digital environment. Finally, the results indicate that a statistically significant difference exists (p = 0.072), at the 10% level of significance, between the foreign and the domestic companies regarding their perceptions on the COVID-19 challenges. Therefore, hypothesis 1 was supported with three (3) of the fourteen factors, namely technological and digital environment as well as regarding COVID-19 challenges. • H2: The results indicate that a statistically significant difference exists (p = 0.038 and p = 0.011), at the 5% level of significance, between the high growth expectation group and the low growth expectation group regarding their perceptions on COVID-19 challenges and the regulatory business environment. Therefore, hypothesis 2 was supported with two (2) of the fourteen factors, namely

criteria in question 13 of the questionnaire). (vii) the importance of the different criteria for South Africa's vehicle manufacturers when they are deciding to pursue the African markets (see these criteria in question 17 of the questionnaire).	COVID-19 challenges, and the regulatory business environment. • H3: The results indicate that a statistically significant difference exists (*p* = 0.022), at the 5% level of significance, between the positive outlook group and the negative outlook group regarding their perceptions on economic challenges. The positive outlook group believes that the South African economy will bounce back underpinned by government support and heightened exports to achieve the stated targets, thus have a lower mean value regarding economic challenges. Therefore, hypothesis 3 was supported with only one (1) of the fourteen factors, namely economic challenges. • H4: The results indicate a statistically significant difference, at the 10% level of significance, between the three groups regarding vehicle affordability (p = 0.065), the green environment (p = 0.057), and the digital environment (p = 0.063). Furthermore, there is a statistically significant difference, at the 5% level of significance, between the three groups regarding duty-free access on new vehicles (p = 0.047). None of the other factors showed any statistically significant differences between the three groups (all the p-values were above 0.1). Therefore, hypothesis 4 was supported with four (4) of the fourteen factors, namely vehicle affordability, the green environment, the digital environment, and duty-free access on new vehicles.
Secondary objective: • To determine the relationship between the expectation of growth	The main conclusions on the expectation of growth of new vehicle sales in South Africa are: • H5: The results indicate that there is no statistically significant relationship (p = 0.736) between the type of

of new vehicle sales in South Africa and: (i) company type. (ii) each of the challenges to new vehicle sales' growth.	company and their perceptions of growth. This, therefore, implies that the groups have the same perceptions of growth. • H6: The results indicate that statistically significant relationships exist at the 5% level of significance regarding the COVID-19 challenges ($p = 0.013$) and a regulatory business environment ($p = 0.011$). Therefore, hypothesis 6 was supported with two (2) of the challenges. Hypothesis 6 was not supported for the other twelve (12) challenges. These results confirmed that perceived business growth is limited due to the impact of COVID-19 which has had a debilitating impact on the South African automotive industry and the world economy. The results also indicated that business growth expectation is being hindered by regulatory business environment challenges which must become favourable for automotive OEMs' operations by having adequate protection and assistance from government.
Primary objective: To determine growth opportunities for the domestic new light vehicle market in South Africa.	The main conclusions on growth opportunities include: • The need to manufacture more affordable vehicles in South Africa to stimulate domestic new vehicle sales (AIEC, 2021:114) (see table 6.14 in chapter 6). • Expand the South African middle class by increasing economic activity, resulting in higher levels of disposable income to enhance new vehicle sales (AIEC, 2021:16) (see table 6.14 in chapter 6). • The market for used vehicles should be restricted. This must be implemented by government to ensure that vehicles older than fifteen years are scrapped to promote new vehicle sales and a greener environment (see table 6.15 in chapter 6). • On the other hand, South Africa has an ageing vehicle parc with more than 80% of vehicles older than five years and out

	of warranty (AIEC, 2022:16). Servicing these vehicles is a critical component towards the profitability of vehicle part manufacturers. • South Africa needs to invest in automotive research and development, engineering, testing facilities, and technology (see table 6.15 in chapter 6). Achieving unique African capabilities in automotive manufacturing will have a multitude of direct and spill-over benefits for the entire South African automotive industry. • Attracting new vehicle assembly opportunities with improved competitiveness, exports, and stable government policy are needed to ensure future growth. • Increased localisation of automotive components is needed to grow the vehicle market in South Africa and to insulate the industry against exchange rate fluctuations (AIEC, 2022:77). • Based on the broadening of the domestic secondary and tertiary vehicle component manufacturing, catalytic convertors and other automotive products can be exported in higher volumes. • South African raw materials must be beneficiated to the final stages to create more employment opportunities across all sectors, including the automotive industry (AIEC, 2021:114). • South Africa must invest in infrastructure development on all levels. Stability in power generation and road infrastructure is needed. Oil refineries need to be upgraded, and electric vehicle and charging infrastructure must be developed to facilitate further growth (AIEC, 2022:39). • The focus of South African vehicle manufacturers should shift to more environmentally friendly and fuel-efficient vehicles, including electric vehicles (AIEC, 2022:17).

	• The potential of becoming a large-scale supplier of electric batteries, which are required for electric vehicles, must be investigated. This is suggested because raw material sources, such as lithium and manganese, are widely available in the country. This could create more employment opportunities and expand the export potential for South African vehicle component manufacturing. • The AfCFTA and Auto Pact will unlock new opportunities for regional integration which will enhance trade facilitation among African countries and streamline customs documentation and processes (AIEC, 2020:50; AIEC, 2022:46). • South Africa is geographically advantaged to increase exports into Africa while new markets must also be sought from other continents (AIEC, 2020:50; AIEC, 2022:46). • Statistical support for the above conclusions can be found in the descriptive statistics in table 6.24 and correlation results in table 6.25 in chapter 6. See also the hypothesis HO1: Pearson Chi-Square where the results indicated no statistical significance ($p = 0.736$) between the type of company and their perception on growth; Kruskal-Wallis where the results indicated a statistical significant difference at the 10% level of significance between the three groups (group one significantly lower, group two on par, and group three significantly higher levels) regarding affordability ($p = 0.065$), the green environment ($p = 0.057$), and the digital environment ($p = 0.063$), and at the 5% level of significance regarding duty-free access on new vehicles ($p = 0.047$). See also the moderator analysis in figures 6.13, 6.14, 6.15, 6.16, and 6.19.

Having summarised the main conclusions of the study and indicating how the research objectives were attained, the focus shifts to the recommendations of the study.

7.7 Main conclusions linked with the recommendations of the study

Table 7.2 shows a summarised version of the main conclusions linked with the recommendations of the study.

Table 7.2: Main conclusions linked with the recommendations of the study

Main conclusions	Recommendations
Almost two thirds (62.9%) of respondents are part of foreign owned companies. Foreign owned companies make a meaningful contribution to the South African economy by creating business and employment opportunities. See section 4.4, question 3 in section 6.2, and section 7.5.1 in this regard.	Most of the role players in the industry are foreign based. The South African government, being the primary role-player in this sector, plays a critical role by implementing policies, such as the SAAM 2021-2035, that will attract large sums of Foreign Direct Investment (FDI) to boost the domestic economy (AIEC, 2022:32). Government's commitment by providing long term policy certainty is needed to nurture foreign owned companies' contribution in South Africa. The SAAM 2021-2035 should assist in making the South African trading environment attractive for all investors, and it should include benefits, via incentives, for related sectors to increase FDI.
More than half (53.2%) of respondents expect the industry to grow moderately within the next two years. See section 4.3, question 4 in section 6.3, and section 7.5.2 in this regard.	The COVID-19 pandemic severely affected the South African economy (AIEC, 2021:5). Government, along with industry role-players, should pro-actively collaborate on resolving industry related concerns. The government should do its part to launch investment initiatives at a faster rate to instil confidence in the economy so that consumers can feel secure in their larger purchases.

The selling price of new vehicles in South Africa is higher than those of competitive countries with automobile manufacturing. One of the main reasons therefor is taxes which range from 18% on an entry level vehicle to 42% on the premium brands (Autotrader, 2017:1; Autolive February issue, 2019:1). See section 4.3, question 6 in section 6.3, and section 7.5.3 in this regard.	Government should investigate, or reconsider, the tax structures on new vehicles for both domestically manufactured vehicles and imported ones. A new vehicle's selling price includes all these secondary taxes. The most price sensitive new vehicle price range is currently from R214 200 to R303 283, where the price elasticity is -1.95, which means that a 1% price increase in this range results in a 1.95% decrease in demand (AIEC, 2021:16). The tax that government could reduce is the ad valorem excise duty on new vehicles because it is a fiscus neutral measure and has the least administrative burden. Reducing the ad valorem excise duty from 0.00003 to 0.000022 could increase new vehicle sales by 16 635 units at zero cost to the fiscus (see table 8 in Appendix A). The increased 16 635 vehicle sales would generate additional company income tax of R132 million after offsetting the reduction in excise duty. The CO_2 tax is a regressive tax which should be scrapped. By completely removing the CO_2 tax, new vehicle sales could increase by 11 756 units and add R1.1 billion to the fiscus when taking company income tax into account.
More than half (53.2%) of respondents indicated that South African consumers affordability levels are under strain in comparison to other developing countries. See question 7 in section 6.3, and section 7.5.4 in this regard.	South Africans' ability to afford new vehicles and their disposable income is under immense pressure (AIEC, 2020:16: AIEC, 2021:17). The South African government should ensure an environment which is conducive to containing price increases in the automotive industry, and they should ensure stability in the rand exchange rate. A low Consumer Price Index (CPI) could also assist with the affordability of a new vehicle.
There is consensus among all the respondents that economic growth, a	The following recommendations should address some of the most severe challenges:

volatile currency, and weak business confidence levels are the pre-dominant challenges which must be addressed immediately. See section 4.3, question 9 in section 6.3, and section 7.5.5 in this regard.	1. Government should reassess its range of taxes to aid the South African public. Government should be committed to making more positive economic reforms which international agencies require to boost investments and savings in the economy. Additional credit rating downgrades by the ratings agencies needs to be avoided. 2. Government can, via administrative price increases, contain inflation seeing that higher inflation increases the volatility of the rand. Foreign investment in South Africa is key to provide stability to the rand, as well as any South African bonds which are purchased in large quantities. Government should reduce its debt to restore investor confidence. Stabilising the rand is an urgent priority because it will provide certainty about the price of any automotive components or vehicles which are imported. Strengthening the rand will drop the price of these imports, resulting in price decreases which can be passed on to the consumer, thereby increasing new vehicle sales. 3. Government should focus on creating a business-friendly environment. Businesses create wealth and jobs, and consumers need jobs to be financially independent. The over-dependence on government welfare by a large part of the population needs to be addressed. People ought to be encouraged to start their own businesses, or to work in a business that is thriving which will restore both business and consumer confidence and will have a ripple effect on the South African economy.

There is consensus among all the respondents that electric vehicle, road, rail, and ports infrastructure need to be upgraded for the South African automotive industry to move forward and to grow to the levels intended and desired by government. See section 4.5, question 11 in section 6.3, and section 7.5.6 in this regard.	Infrastructure development should to be prioritised, and government needs to commit to growing the industry as intended in the automotive policy regime. If South Africa does not develop the inbound and outbound infrastructure within the country, escalating logistics costs would render South Africa internationally uncompetitive to attract future investments in new model generations, while pricing and affordability will be negatively affected due to exchange rate fluctuations. The following recommendations should be considered: 1. Government should implement a timeline for the complete rollout of EVs. Government should support the investment in the country to bring the automotive industry up to date regarding the required charging infrastructure and technology. Government needs to support the sale of EVs either through tax breaks or subsidies, and even incentivise the consumer to purchase an EV. To make the EVs more affordable, the ad valorem tax could be reduced, import tariffs on EVs could be reduced from 25% to lower rates, and government could recuperate the reduced tariff with licence fees and other taxes owing to a pent-up demand for EVs. By reducing import tariffs, price parity between ICE vehicles and EVs will be provided, and it will help with a smoother transition for the uptake of EVs. 2. Government should set a roadmap for road and rail infrastructure developments and to continuously monitor the achievement of these set targets. The planning phase of roads should include the construction of new roads, which will further open the development

	of new routes, and the continuous maintenance of the existing road infrastructure. 3. Ports infrastructure should be given immediate priority to increase efficiency, capacity, and speed with which the ports administrators handle imports and exports. Export is the backbone of the domestic automotive industry and of many other industries in South Africa. The focus needs to be on improving services and processes to make it easier to achieve the intended goals set out in the various government policies, such as the SAAM 2021-2035.
There is consensus among all the respondents that the COVID-19 pandemic had severely impacted new vehicle sales' growth in South Africa. The COVID-19 lockdown, disposable income deterioration, stock shortages, and Just-in-Time (JIT) supply requirements not being met, had the most severe effects on new vehicle sales' growth in South Africa. See section 4.6, question 12 in section 6.3, and section 7.5.7 in this regard.	The following recommendations should be considered by the South African government: 1. The COVID-19 pandemic has set the South African automotive industry back by approximately three years, and the recovery of the domestic market to the pre-COVID-19 level is expected to be protracted until 2023 (AIEC, 2021:43). Government should continue to emphasise the need to get vaccinated. In doing so, the economy can be fully opened, and people can get back to work. This will obviate public reliance on government social welfare seeing that people will have more disposable income. 2. As pointed out in the table, the CPI and interest rates should be kept in a manageable range because it contributes towards the affordability of a new vehicle. 3. Vehicle manufacturers should adjust their procurement strategies and JIT supply requirements. All industries should increase their holding and storage capacity to

	house critical stock and parts. Stock and parts shortages during the COVID-19 pandemic led to price increases and production delays which could be avoided with fast procurement and increased capacity.
More than two thirds (67.74%) of respondents indicated that the African continent would be a significant growth market for South Africa to increase new vehicle sales. See section 3.5, question 17 in section 6.3, and section 7.5.8 in this regard.	The African continent is very important for the future of vehicle manufacturers in South Africa (AIEC, 2022:53). As such, the following recommendations should be considered by the South African government: 1. South Africa should promote industrialisation on the African continent and needs to play a mentoring role to other African countries to formalise, develop, and grow all aspects of the relevant domestic automotive industries. South Africa can replicate its own automotive ecosystem in Africa via the Auto Pact to promote an investor-friendly, regulatory framework for vehicle manufacturers and assemblers, and automotive component suppliers. 2. South Africa's vehicle manufacturers and their African counterparts should pursue the made in Africa vision. This could be achieved by producing more of what Africa consumes, thereby establishing a generic African identity token on every vehicle manufactured in Africa. This action will stimulate the new vehicle market, as well as filter only African manufactured vehicles into the used vehicle segment in Africa. To promote intra-Africa trade, any vehicle without an African identity should attract a high import duty. 3. The higher African governance levels should collaborate to encourage the further development of

	manufacturing facilities. Cross border bureaucracy should be streamlined to eliminate trade restrictions and improve intra-Africa trade from the existing 15% to 35%.
The respondents were split regarding the target to manufacture 1.4 million vehicles by 2035, with 51.61% indicating possible achievement of the target and 48.39% indicating non-achievement of the target. Economic growth, export dependency, infrastructure development, government's commitment, and pricing and affordability are the most important factors. See sections 4.3 and 4.5, questions 19 and 20 in section 6.4, and section 7.5.9 in this regard.	Economic growth has already been discussed in this table. It is imperative that the measures and actions, discussed above, are considered and implemented as well as the following: 1. The government should make the South African environment conducive for all South Africans to live and work. The economy should be opened; entrepreneurship should be incentivised and encouraged; youth development, skills, and training should be prioritised; foreign investments should be secured; crime must be addressed to make South Africa safe; and government tenders could be rolled out faster to stimulate the economy. By implementing these economic reforms, foreign investments should start trickling in. 2. New markets ought to be continuously sought out because South Africa's over dependence on Europe as its main export destination needs to be reviewed. Export is the backbone of automotive manufacturing in South Africa; however, the European Union (EU) is moving away from ICE technology, thereby threatening the continued existence of the South African new vehicle market if the domestic automotive industry does not accelerate its transformation to New Energy Vehicles (NEVs).

The respondents indicated the most important factors which detract from new vehicle sales in South Africa. They are affordability, economic growth, price, and high taxes on vehicles. See section 4.3, question 21 in section 6.4, and section 7.5.10 in this regard.	The following recommendations should be considered by the South African government: 1. An opportunity to stimulate domestic new vehicle sales exists, at no cost to the fiscus, if government amends the way it treats VAT payment on leased vehicles. Instead of paying the full VAT upfront into the capital debt, the VAT could be paid proportionately to the period that the vehicle is leased. By restructuring this type of lease agreement, substantial savings on monthly instalments would be achieved improving vehicle affordability. Government would not lose the VAT income, it would merely be recovered over a longer time. 2. A first-time buyer incentive could be implemented to stimulate new vehicle sales. Government could aid first-time buyers who want to purchase a vehicle ranging from R200 000 to R350 000 because it is within this price category where the market is at its most sensitive. Government could offer an incentive of 20% upfront and recover the incentive over a five-year period through annual licence fees; various taxes; fees, such as fuel, tolls, insurance, maintenance, and servicing costs; and VAT. By increasing new vehicle sales, company income tax would also add substantial revenue to the fiscus. Table 9, in Appendix A, shows a calculation of the costs associated with owning a vehicle of R250 000, or R300 000, and then applying the 20% incentive to these costs. The consumer saves approximately R1 553.34/month on the R250 000 vehicle or R1 864.28/month on the R300 000 vehicle. With the

	20% incentive, new vehicle sales in this price range could increase by 20% which equates to the 5% of economic growth needed to grow the new vehicle market.
The respondents indicated the most important factors which promote new vehicle sales in South Africa, namely economic growth, domestic and foreign investments, price, affordability, and reducing taxes on vehicles. See section 4.3, question 22 in section 6.4, and section 7.5.11 in this regard.	To achieve higher levels of domestic and foreign investments, the following recommendations should be considered by the South African government to promote new vehicle sales: 1. Government should review its tax structure on personal income and company tax. South Africa's marginal rate of 45% on personal income is the second highest in Africa. This is compounded by an additional 15% VAT on after tax income. The fringe benefit tax could be reviewed to help employees with the affordability of a new vehicle, and it would aid the OEMs with increased corporate vehicle sales. South Africa's company tax rate is 28%, and 20% on dividends which is exorbitant and one of the highest in Africa. South Africa should become more attractive than competitor countries to boost both domestic and foreign investments in the country and in the automotive industry. 2. Government should use its existing resources to the best of its ability. If there is no infrastructure in required areas, government should attract potential investors with tax free incentives to invest in the country to develop this infrastructure. Local businesses should be stimulated with tax waivers, or incentives, to invest in expansion programmes in the country. South Africa's raw materials should be prioritised for beneficiation at special rates for companies investing in South Africa.

	This will unlock new business opportunities, create widespread employment for the local people, and positively impact the new vehicle market.

Table 7.2 presented the main conclusions linked with the recommendations of the study. The research questions, which were developed in chapter one, will be revisited and how it has been answered will be discussed next.

7.8 Answering the research questions

The research questions were developed in chapter 1 and highlighted in section 7.4. The main research question was to analyse growth opportunities for the domestic new light vehicle market in South Africa. The study answered this research question and presented a multitude of growth opportunities that the South African industry could benefit from. This study's supporting research questions were answered and the main conclusions of each research objective were presented in table 7.1. The research questions and the achievement of the research objectives guided the study to create and contribute to the creation of new knowledge. The study's contribution to knowledge will be discussed next.

7.9 Contribution to knowledge

The study contributed to the body of knowledge through primary and secondary data sources. The study's conclusions were compiled after gathering valuable information from the most important role-players in the South African automotive industry. Recommendations were made based on the survey's results, and by triangulation with industry experts, on how the South African government and the relevant stakeholders can pursue growth opportunities in the South African automotive industry. During the study, the global COVID-19 pandemic struck which opened unchartered areas in the global and South African automotive industries. The study incorporated the impact of the COVID-19 pandemic on the South African automotive industry and highlighted novel changes which impact the supply chain theory. New knowledge has been created about the South African automotive industry through the achievement of the research objectives. Objectives six and seven provided several conclusions which linked the results and conclusions. The study provided evidential proof on the importance of the domestic automotive industry to the South African economy. Certain limitations to the research were discovered while doing the study and they will be discussed next.

7.10 Limitations of the study

Several limitations to this study need to be taken into consideration when reading this thesis. They are discussed below:

- The results from this study are limited to the South African automotive industry with particular focus on growth opportunities for the domestic new light vehicle market in South Africa and cannot be extrapolated to other industries in the South African automotive industry in general.
- The survey was conducted through electronic means only because of the COVID-19 pandemic. There was no face-to-face contact where respondents could have answered questions in more detail or where more qualitative information could have been gathered. Thus, data collection was a restricted process that could have had an influenced on the quality of the respondents' answers whilst completing the questionnaire.
- The sample population consisted of 62 main role-players. Therefore, the possibility of bias and the small number of respondents are limitations of the study.
- The study focuses on growth opportunities for the domestic new light vehicle market in South Africa. SAAM 2021-2035, which is the growth and development framework for the future of new vehicles, only commenced in July 2021 and the effect thereof cannot be fully assessed at this early stage.

The limitations of the study were indicated above, and the areas for further research will be discussed next.

7.11 Areas for further research

The cost of vehicles in South Africa has steadily been increasing over recent years. In fact, vehicles that are exported can cost up to 50% less on the export markets than what they would cost on the domestic market (Pawnmycar, 2017:1). To ensure sufficient new vehicle sales' growth for the survival and sustainability of the domestic automotive industry in the long run, the following potential areas for research could be:

- An analysis of a first-time buyer incentive to stimulate new vehicle sales in the domestic market.
- An analysis of the removal, or reduction, of taxes and/or import duties on South Africa's new vehicle market and the potential benefit or loss thereof.

The SAAM 2021-2035 has only just been implemented and its impact on the various sectors of the automotive industry has yet to be determined. Owing to the synergies of the automotive sector with many related upstream sectors supplying raw materials, such as plastics, metals, rubber, chemicals, and leather, amongst others, the following potential areas for research could be:

- An analysis of the relevance and value of SAAM 2021-2035 regarding investment and manufacturing decisions in the automotive component sectors.
- An analysis of the impact of the transition from the APDP to the SAAM 2021-2035 on related economic sectors in the automotive industry in South Africa.
- An analysis of how regional integration in Africa could benefit the South African automotive industry under the SAAM 2021-2035.

The global automotive industry has heavily invested in new infrastructure, such as moving towards cleaner fuels and a greener environment. Many of the leading automotive countries of the world have set deadlines to when ICE technology would cease so that vehicles' carbon emissions can be reduced. Europe, being South Africa's main export destination for vehicles, has also set strict deadlines in this regard. Owing to the importance of the domestic automotive industry within the South African economy, the following potential areas for research could be:

- An analysis of South Africa's infrastructure to determine how it can be used to the country's maximum benefit, and to analyse in which infrastructure South Africa should invest to keep up with global markets.
- An analysis of the trade-off between the fuel revenue generated from ICE technology and the revenue that would be generated with South Africa's transition to electric vehicle technology.
- An analysis of the benefits to South Africa if it becomes the flagship country in Africa for manufacturing and selling EVs.

7.12 Conclusions to the study

This study aimed to determine the growth opportunities for the domestic new light vehicle market in South Africa. To achieve this goal, the study's primary objective and several secondary objectives were set. The literature chapters of the study covered aspects in the domestic automotive industry, the global automotive industry, and the various automotive policy regimes leading up to the current SAAM 2021-2035. These chapters provided the foundation for the information and theory that was used to develop the questionnaire so that the empirical survey could be conducted to gather the primary data.

It can be concluded that the study has achieved its aims and objectives in analysing and identifying the growth opportunities for the domestic new light vehicle market in South Africa. The conclusions of the study revealed that growth opportunities do exist, and that the government needs to take the initiative and lead the way in the pursuit of these growth opportunities. The conclusions make it clear that the domestic automotive industry is under immense pressure because of the COVID-19 pandemic which has caused a turbulent environment and a weaker economy. Strong economic growth, through stimulus mechanisms, is needed to put the largest manufacturing industry back onto a growth path and to provide positive benefits to all the stakeholders. The domestic automotive industry's future sustainability, as an export-oriented industry, depends on its accelerated transformation to new energy vehicles in view of the developments towards eco-friendly vehicle legislation in its major export markets.

The recommendations provided in this study will be beneficial to the South African automotive industry and to government in restoring this vital industry onto a growth path. A well-developed and inclusive automotive industry has developed through the various policy regimes, such as the Motor Industry Development Programme and the Automotive Production and Development Programme. The SAAM 2021-2035 has been developed with the objective of achieving quantum leaps in manufacturing and sales which will provide a multitude of direct and spill-over benefits to the entire South African economy. This study confirmed the important role that the domestic automotive industry plays within the economy and its vital contribution to the economy. On a broader scale, if the growth opportunities that do exist are pursued, the South African automotive industry will be at the forefront of automotive technology, manufacturing, and supplying markets for many years to come. South Africa, as the continent's automotive leader, can cement its dominance and increase its overall market share to 80% in Africa and to over 2% globally.

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Appendix A: Economic indicators

Table 1: Macroeconomic indicators for the South African automotive industry

	2017	2018	2019	2020
Vehicle Price Index (VPI)	4.93%	2.42%	2.70%	6.92%
VPI on used vehicles	3.60%	2.28%	1.42%	2.05%
Consumer Price Index (CPI)	5.35%	4.65%	4.05%	3.30%
Used to new vehicle ratio	2.42	2.06	2.07	2.27
Vehicle finance less than R200 000	43.25%	38.25%	37.50%	34.5%
Vehicle finance between R200 000 and R300 000	28%	26.75%	27.25%	28.25%
Vehicle finance more than R300 000	28.75%	35%	35%	37.25%

Sources: (TransUnion, 2017; TransUnion, 2018; TransUnion, 2019; TransUnion, 2020; TransUnion, 2021)

Table 2: Ad valorem excise duty on locally manufactured CBU

Locally manufactured CBU	
Recommended Retail Selling Price (RRSP) (excl. VAT)	R125 000
Less (100% - 20% APDP rebate)	80%
Recognised Value (RV)	R100 000
Formulae (RVx0.00003) - 0.75	0,0225
Value for ad valorem calculation	R88 565
Ad valorem excise duty	**R1 992,72**
Percentage of RRSP	1,59%

Source: (SARS, 2017)

Table 3: Ad valorem excise duty on locally manufactured CBU at 25% premium

Locally manufactured CBU at 25% premium	
RRSP (excl. VAT) - 25% price premium	R156 250
Less (100% - 20% APDP rebate)	80%
Recognised Value (RV)	R125 000
Formulae (RVx0.00003) - 0.75 (max of 25%)	0,0300
Value for ad valorem calculation	R 110 121
Ad valorem excise duty	**R3 303,64**
Percentage of RRSP	2,11%

Source: (SARS, 2017)

Table 4: Ad valorem excise duty on imported CBU - full 25% duty paid

C. Imported CBU - full 25% duty paid	
Imported vehicle (excl. VAT)	R100 000
Duty included @ 25%	R25 000
Imported value for ad valorem (+15%)	R115 000
Formulae (RVx0.00003) - 0.75 (max of 25%)	0,0345
Value for ad valorem calculation	R140 000
Ad valorem excise duty	**R4 830,00**
Percentage of CBU import value	4,83%

Source: (SARS, 2017)

Table 5: Ad valorem excise duty on imported vehicle – duty fully rebated

Imported vehicle - duty fully rebated	
Imported vehicle (excl. VAT)	R100 000
Duty discounted to 0%	R -
Imported value for ad valorem (+15%)	R115 000
Formulae (RVx0.00003) - 0.75 (max of 25%)	0,0270
Value for ad valorem calculation	R115 000
Ad valorem excise duty	**R3 105,00**
Percentage of CBU import value	3,11%

Source: (SARS, 2017)

Table 6: Carbon tax calculation (CO2 tax)

Vehicle type	Category	Emissions	Excess emissions	Environmental levy
Passenger car	120g/km	150g/km	30g/km	Excess emissions x duty rate (R90.00)
Calculation				30g/km x R90.00 per g/km.
Environmental levy payable				= R2 700.00

Source: (SARS, 2014)

Table 7: Interest rate calculation

Vehicle finance	Prime interest rate	10% (per annum)	Interest/12	Monthly interest payable
R200 000	10%	R20 000	R20 000/12	R1 666.67

Source: (Example constructed by researcher)

Table 8: Calculation on the ad valorem reduction from 0.00003 to 0.000022 and removal of the CO_2 tax

	Calculation on the ad valorem reduction from 0.00003 to 0.000022	Removing the CO_2 tax
Additional sales revenue	R5 440 311 649	R5 427 493 148
Additional vehicle demand (units)	16 635	11 756
Impact on the fiscus	R163 400	R905 504 487
VAT	R698 975 336	R812 903 938
Tyre levy revenue	R1 969 177	R1 485 618
Ad valorem revenue	-R1 007 228 603	R859 576 280
Import duties	R257 750 830	R253 661 880
CO_2 tax revenue	R48 696 660	-R1 024 123 230
Additional company income tax	R132 761 992	R154 506 624

Source: (SARS, 2014; SARS, 2017; Barnes, Grant & Ndlovu, 2020:21)

Table 9: Average monthly cost of owning a vehicle at R250 000 and R300 000

New vehicle purchase	Original price	20% incentive	Savings	Original price	20% incentive	Savings
Purchase price	250 000	200 000	R50 000	300 000	240 000	R60 000
Monthly costs						
Capital repayment - 7 years	R2 976,00	R2 381,00	R595,00	R3 571,42	R2 857,14	R714,00
Interest repayment @ 7% per annum	R1 458,33	R1 166,66	R291,67	R1 750,00	R1 400,00	R350,00
Average fuel cost in 2000 kms	R3 566,00	R3 566,00	-	R3 566,00	R3 566,00	-
Average monthly insurance @ 16%	R3 333,33	R2 666,66	R666,66	R4 000,00	R3 200,00	R800,00
Monthly running costs and maintenance	R620,00	R620,00	-	R620,00	R620,00	-
Average monthly costs	R11 953,66	R10 400,32	R1 553,34	R13 507,42	R11 643,14	R1 864,28

Source: (SARS, 2017; Autolive February issue, 2019; AIEC, 2021)

Appendix B: Covering letter

Title of study

Growth opportunities for the domestic new light vehicle market in South Africa

Dear Participant

The South African automotive industry has being significantly transformed over the past three decades since the implementation of the MIDP and APDP. There are now rapid advancements in technology which is causing a paradigm shift in the global automotive environment where it is becoming a case of the survival of the fittest. South Africa needs to raise its global ranking position for the industry to be sustainable in the long run and to contribute a myriad of benefits to the South African economy. As part of my research for a post graduate study at UNISA, your views and inputs on the growth opportunities for the domestic new light vehicle market in South Africa is highly sought after and much appreciated.

Thank you for your participation in this research study. In this rapidly changing business environment, where technology is playing an ever-increasing role in determining competitiveness, your inputs and views will play a critical role in determining growth opportunities for the domestic light vehicle market in South Africa so that the entire economy can benefit and prosper. All the information obtained will be treated in the strictest confidence and will only be published in aggregate format. Feedback on this research study will be made available on request to all participants once it is completed.

Yours faithfully

Faizal Khan

Supervisor details:

Prof Johan Strydom

Email: jwstrydom52@gmail.com

Appendix C: Empirical survey

Survey Questionnaire

Growth opportunities for the domestic new light vehicle market in South Africa

Respondent no:	

Dear Respondent

Thank you for your willingness to complete this survey on the growth opportunities for the domestic new light vehicle market in South Africa. The purpose of this survey is to gather your views and perceptions as an informed role-player in the industry on the business environment conditions of the global automotive industry and what growth opportunities exist for the domestic new light vehicle market in South Africa. This survey should not take longer than **15 to 20 minutes** to complete. This is an anonymous and strictly confidential survey. All participants will remain strictly anonymous, and the answers provided will be used for research purposes only.

Please answer all questions by placing a cross (X), a tick (✓) or a circle (O) in the block where necessary and elaborate where required. There are no right or wrong answers.

Section A: General information

1. Name of company where you work: ____________________________________

____

2. Which option best describes the status of the company you work for?

Status	**Mark with an X**
2.1 OEM	01
2.2 Vehicle importer/group	02
2.3 NADA	03
2.4 AAAM	04
2.5 NAAMSA	05

3. Please indicate if your company is a majority South African owned or majority foreign owned company (majority means 50.1% or more share of the company):

South African owned		Foreign owned	

Section B: Information on the South African automotive industry

4. What is your personal level of expectation regarding the South African automotive industry to improve new vehicle sales volumes within the next two years?

No expectation	Little expectation	Moderate expectation	High expectation	Very high expectation
1	2	3	4	5

5. Please explain your reason(s) for your choice in question 4.

____

____

Questions 6, 7 and 8 refer to the final customer who purchases the vehicle.

6. Please indicate both the level of importance and impact of each criterion regarding new vehicle sales growth in South Africa:

Criteria	**Importance**					**Impact**				
	No importance				Critical importance	No impact				Critical impact
6.1 Selling price of vehicles to the customer	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
6.2 Customer able to obtain finance or a loan	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
6.3 Customer opting for demo and used vehicle models over brand new vehicles	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
6.4 Customer demand for South African manufactured vehicles	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
6.5 Customer satisfaction levels with the different vehicle brands or models	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

7. Please indicate your opinion on new vehicles' affordability to the final customer in South Africa relative to other developing countries:

Significantly lower	Lower	On par	Moderately higher	Significantly higher
1	2	3	4	5

8. Please indicate the impact of the following costs on the affordability of new vehicles to the final customer in South Africa:

Criteria	**No impact**	**Little impact**	**Moderate impact**	**Large impact**	**Critical impact**
8.1 Inflation	1	2	3	4	5
8.2 Rand exchange rate	1	2	3	4	5
8.3 Financing costs	1	2	3	4	5
8.4 Fuel levies	1	2	3	4	5
8.5 Tyre levies	1	2	3	4	5
8.6 Insurance costs	1	2	3	4	5
8.7 Maintenance and service plans costs	1	2	3	4	5
8.8 Vehicle fiscal tax (CO_2, ad valorem)	1	2	3	4	5
8.9 Other (Please specify)	1	2	3	4	5

Please specify: ____

____

9. Please indicate the impact of the following challenges on new vehicle sales' growth in the South African automotive industry:

Criteria	**No impact**	**Little impact**	**Moderate impact**	**Large impact**	**Critical impact**
9.1 Political conditions	1	2	3	4	5
9.2 Stability of electricity supply	1	2	3	4	5
9.3 Rising costs of electricity	1	2	3	4	5
9.4 Port costs for importing and exporting	1	2	3	4	5
9.5 A volatile currency	1	2	3	4	5
9.6 Labour stability	1	2	3	4	5
9.7 Weak business confidence levels	1	2	3	4	5
9.8 Weak economic growth rate impacting disposable income levels	1	2	3	4	5
9.9 Other (Please specify)	1	2	3	4	5

Please specify: ____

10. Please indicate the perceived level of impact regarding the following criteria on new vehicle sales' growth in South Africa going forward:

Criteria	**No impact**	**Little impact**	**Moderate impact**	**Large impact**	**Critical impact**
10.1 The fourth industrial revolution	1	2	3	4	5
10.2 Introduction of clean automotive fuels (Euro 5 or 6)	1	2	3	4	5
10.3 Internal combustion engine technology	1	2	3	4	5
10.4 Hybrid engine technology	1	2	3	4	5
10.5 Electric vehicles	1	2	3	4	5
10.6 Autonomous driving vehicles	1	2	3	4	5
10.7 Trade wars	1	2	3	4	5
10.9 Alternate transport systems (Uber, Taxify, ride sharing, and others)	1	2	3	4	5
10.8 Government support (Financial and policy)	1	2	3	4	5

10.9 Other (Please specify)	1	2	3	4	5

Please specify: ____

____

____

11. Please indicate both the level of importance and impact of each infrastructural criterion to improve new vehicle sales' growth in South Africa:

Criteria	**Importance**					**Impact**				
	No importance importance			Critical		No impact			Critical impact	
11.1 Electric vehicle infrastructure	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
11.2 Road and rail infrastructure	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
11.3 Ports infrastructure	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

12. Please indicate the perceived impact of the coronavirus (COVID-19) regarding the following criteria affecting new vehicle sales' growth in South Africa going forward:

Criteria	**No impact**	**Little impact**	**Moderate impact**	**Large impact**	**Critical impact**
12.1 Coronavirus lockdown	1	2	3	4	5

12.2 Increased prices of vehicles	1	2	3	4	5
12.3 Decreased affordability by consumers	1	2	3	4	5
12.4 Stock shortages (components/parts)	1	2	3	4	5
12.5 Decreased cost competitiveness	1	2	3	4	5
12.6 Just-in-Time supply requirements not met	1	2	3	4	5
12.7 Altered marketing strategies	1	2	3	4	5
12.8 Other (Please specify)	1	2	3	4	5

Please specify: ____

____

____

13. Please indicate both the level of importance and impact of each digital future criterion on new vehicle sales' growth in South Africa going forward:

Criteria	**Importance**					**Impact**				
	No importance				Critical importance	No impact				Critical impact
13.1 Online consumer experience	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

13.2 Online vehicle purchasing	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
13.3 Online customer relationship management	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
13.4 The virtual showroom	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
13.5 Smart vehicles	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

Questions 14 to 17 require your views on the African continent as a potential growth market.

14. Do you perceive the African continent to be a significant growth market for South Africa to increase new vehicle sales in view of the African Continental Free Trade Area developments?

Yes		No	

If yes, answer questions 16 and 17 and then answer all questions in Section C.

If no, answer question 15 only (skip questions 16 and 17) and then answer all questions in Section C.

15. Please explain your answer for question 14.

____

____

____

____

16. Please indicate the perceived contribution of the African continent to the South African automotive industry in promoting new vehicle sales:

No contribution	Small contribution	Moderate contribution	High contribution	Critical contribution
1	2	3	4	5

17. Please indicate both the level of importance and impact of each criterion to South African vehicle manufacturers when deciding to pursue the African markets:

Criteria	**Importance**					**Impact**				
	No importance				Critical importance	No impact				Critical impact
17.1 Regulatory business environment	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
17.2 Duty-free access on new vehicles	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
17.3 Trade agreements	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
17.4 Ban the import of used vehicles	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

17.5 Stability in the economic environment	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
17.6 Clean fuels (Euro 5 or 6)	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
17.7 Customs matters and procedures	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

Section C: Government policy (The South African Automotive Masterplan 2021-2035)

Questions 18 to 22 require you to indicate your views and opinions on the South African Automotive Masterplan 2021-2035.

18. Please indicate the perceived contribution of the South African Automotive Masterplan 2021-2035 to the South African automotive industry:

No contribution	Small contribution	Moderate contribution	High contribution	Critical contribution
1	2	3	4	5

19. Do you perceive that the South African automotive industry will be able to achieve manufacturing volumes of 1.4 million units annually by 2035?

Yes		No	

20. Please explain your answer for question 19.

____

____

____

21. What do you regard as the most important factor(s) which detract from new vehicle sales in South Africa?

22. What do you regard as the most important measure(s) which will promote new vehicle sales in South Africa?

____

____

____

____

23. Contact details:

Name: ____

Contact number: ____

Email: ____

Thank you for your time and participation in this research study!!

Please email the completed survey back to faizalkhan02@outlook.com

Contact number: 083 2468 901

Appendix D: Interview schedule

Interview schedule			
Participant	Date of interview	Type of interview	Duration of interview
1. OEM	25 January 2021	Online questionnaire	10 minutes
2. OEM	28 January 2021	Online questionnaire	10 minutes
3. OEM	30 January 2021	Telephone	12 minutes
4. OEM	31 January 2021	Online questionnaire	10 minutes
5. OEM	02 February 2021	Online questionnaire	10 minutes
6. OEM	05 February 2021	Online questionnaire	10 minutes
7. OEM	05 February 2021	Telephone	15 minutes
8. Importer	28 January 2021	Online questionnaire	10 minutes
9. Importer	08 February 2021	Online questionnaire	10 minutes
10. Importer	10 February 2021	Online questionnaire	10 minutes
11. Importer	30 January 2021	Online questionnaire	10 minutes
12. Importer	31 January 2021	Online questionnaire	10 minutes
13. Importer	11 February 2021	Online questionnaire	10 minutes
14. Importer	11 February 2021	Telephone	12 minutes
15. Importer	29 January 2021	Telephone	18 minutes
16. Importer	29 January 2021	Telephone	17 minutes
17. Importer	30 January 2021	Online questionnaire	10 minutes
18. Importer	15 February 2021	Online questionnaire	10 minutes
19. Importer	15 February 2021	Online questionnaire	10 minutes
20. Importer	20 February 2021	Online questionnaire	10 minutes
21. Importer	20 February 2021	Telephone	15 minutes
22. Importer	21 January 2021	Telephone	15 minutes
23. Importer	22 February 2021	Online questionnaire	10 minutes
24. Importer	23 February 2021	Online questionnaire	10 minutes
25. Importer	23 February 2021	Online questionnaire	10 minutes
26. Importer	25 February 2021	Online questionnaire	10 minutes
27. Importer	28 February 2021	Online questionnaire	10 minutes
28. Importer	28 February 2021	Online questionnaire	10 minutes
29. NADA	15 February 2021	Telephone	15 minutes

30. NADA	15 February 2021	Telephone	18 minutes
31. NADA	22 February 2021	Telephone	20 minutes
32. NADA	22 February 2021	Telephone	20 minutes
33. NADA	24 January 2021	Telephone	30 minutes
34. NADA	26 February 2021	Telephone	25 minutes
35. NADA	03 March 2021	Telephone	15 minutes
36. NADA	03 March 2021	Telephone	18 minutes
37. NADA	04 March 2021	Online questionnaire	10 minutes
38. NADA	04 March 2021	Online questionnaire	10 minutes
39. NADA	05 March 2021	Online questionnaire	10 minutes
40. NADA	02 March 2021	Online questionnaire	10 minutes
41. NADA	03 March 2021	Online questionnaire	10 minutes
42. NADA	04 March 2021	Online questionnaire	10 minutes
43. NADA	08 March 2021	Online questionnaire	10 minutes
44. NADA	10 March 2021	Telephone	15 minutes
45. NADA	15 March 2021	Telephone	15 minutes
46. NADA	16 March 2021	Telephone	15 minutes
47. NADA	20 March 2021	Online questionnaire	10 minutes
48. NADA	20 March 2021	Online questionnaire	10 minutes
49. NADA	23 March 2021	Online questionnaire	10 minutes
50. NAAMSA	03 March 2021	Telephone	13 minutes
51. NAAMSA	10 March 2021	Telephone	12 minutes
52. NAAMSA	15 March 2021	Telephone	15 minutes
53. NAAMSA	18 March 2021	Telephone	15 minutes
54. NAAMSA	19 March 2021	Telephone	17 minutes
55. NAAMSA	22 March 2021	Telephone	18 minutes
56. NAAMSA	23 March 2021	Telephone	20 minutes
57. NAAMSA	25 March 2021	Telephone	12 minutes
58. NAAMSA	26 March 2021	Online questionnaire	10 minutes
59. NAAMSA	02 April 2021	Online questionnaire	10 minutes
60. NAAMSA	05 April 2021	Online questionnaire	10 minutes
61. NAAMSA	12 April 2021	Online questionnaire	10 minutes

62. AAAM	26 March 2021	Telephone	15 minutes

Appendix E: Inferential statistics

Factor Analysis

Notes

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	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES Q6.1.1 Q6.1.2 Q6.1.3 Q6.1.4 Q6.1.5 /MISSING LISTWISE /ANALYSIS Q6.1.1 Q6.1.2 Q6.1.3 Q6.1.4 Q6.1.5 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
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Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q6.1.1	4,27	0,705	62
Q6.1.2	4,39	0,610	62
Q6.1.3	3,32	0,805	62
Q6.1.4	2,32	1,052	62
Q6.1.5	3,87	0,877	62

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,627
Bartlett's Test of Sphericity	Approx. Chi-Square	26,845
	df	10
	Sig.	0,003

Communalities

	Initial	Extraction
Q6.1.1	1,000	0,673
Q6.1.2	1,000	0,687
Q6.1.3	1,000	0,438
Q6.1.4	1,000	0,652
Q6.1.5	1,000	0,455

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1,863	37,264	37,264	1,863	37,264	37,264	1,563	31,266	31,266
2	1,042	20,837	58,101	1,042	20,837	58,101	1,342	26,835	58,101
3	0,853	17,070	75,171						
4	0,683	13,655	88,826						
5	0,559	11,174	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
Q6.1.1	0,698	-0,431

Q6.1.2	0,566	0,605
Q6.1.3	0,578	-0,322
Q6.1.4	0,596	0,545
Q6.1.5	0,605	

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
Q6.1.1	0,816	
Q6.1.2		0,824
Q6.1.3	0,655	
Q6.1.4		0,794
Q6.1.5	0,662	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	0,797	0,604
2	-0,604	0,797

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

Notes

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	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
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Descriptive Statistics

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Q6.2.3	3,19	0,972	62
Q6.2.4	2,39	1,107	62
Q6.2.5	3,66	1,007	62

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,590
Bartlett's Test of Sphericity	Approx. Chi-Square	29,603
	df	10
	Sig.	0,001

Communalities

	Initial	Extraction
Q6.2.1	1,000	0,647
Q6.2.2	1,000	0,654
Q6.2.3	1,000	0,759
Q6.2.4	1,000	0,652

Q6.2.5	1,000	0,182

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues Total	Initial Eigenvalues % of Variance	Initial Eigenvalues Cumulative %	Extraction Sums of Squared Loadings Total	Extraction Sums of Squared Loadings % of Variance	Extraction Sums of Squared Loadings Cumulative %	Rotation Sums of Squared Loadings Total	Rotation Sums of Squared Loadings % of Variance	Rotation Sums of Squared Loadings Cumulative %
1	1,845	36,896	36,896	1,845	36,896	36,896	1,485	29,692	29,692
2	1,050	20,993	57,889	1,050	20,993	57,889	1,410	28,197	57,889
3	0,964	19,272	77,160						
4	0,625	12,500	89,660						
5	0,517	10,340	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component 1	Component 2
Q6.2.1	0,691	-0,412
Q6.2.2	0,547	0,596
Q6.2.3	0,677	-0,549
Q6.2.4	0,656	0,470
Q6.2.5	0,424	

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix[a]

	Component 1	Component 2
Q6.2.1	0,788	
Q6.2.2		0,809
Q6.2.3	0,870	
Q6.2.4		0,790
Q6.2.5		0,323

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	0,740	0,673
2	-0,673	0,740

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

Notes

Output Created		05-MAY-2021 14:34:53
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.

Syntax		FACTOR /VARIABLES Q8.1 Q8.2 Q8.3 Q8.4 Q8.5 Q8.6 Q8.7 Q8.8 /MISSING LISTWISE /ANALYSIS Q8.1 Q8.2 Q8.3 Q8.4 Q8.5 Q8.6 Q8.7 Q8.8 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,01
	Maximum Memory Required	9264 (9.047K) bytes

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q8.1	3,45	0,717	62
Q8.2	4,44	0,668	62
Q8.3	3,81	0,846	62
Q8.4	3,16	1,074	62
Q8.5	2,79	1,058	62
Q8.6	3,65	0,851	62
Q8.7	3,29	0,797	62
Q8.8	3,40	1,152	62

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,717
Bartlett's Test of Sphericity	Approx. Chi-Square	136,430
	df	28
	Sig.	0,000

Communalities

	Initial	Extraction
Q8.1	1,000	0,579
Q8.2	1,000	0,896
Q8.3	1,000	0,586
Q8.4	1,000	0,755
Q8.5	1,000	0,787
Q8.6	1,000	0,535
Q8.7	1,000	0,665
Q8.8	1,000	0,774

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,128	39,095	39,095	3,128	39,095	39,095	2,228	27,847	27,847
2	1,316	16,450	55,545	1,316	16,450	55,545	2,149	26,863	54,709
3	1,134	14,179	69,724	1,134	14,179	69,724	1,201	15,015	69,724
4	0,706	8,824	78,548						
5	0,618	7,726	86,274						
6	0,437	5,464	91,737						
7	0,398	4,972	96,709						
8	0,263	3,291	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component		
	1	2	3
Q8.1	0,692		
Q8.2			0,890
Q8.3	0,547	-0,516	
Q8.4	0,781		
Q8.5	0,754		-0,352
Q8.6	0,598	-0,404	
Q8.7	0,747		
Q8.8	0,441	0,748	

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Rotated Component Matrix[a]

	Component		
	1	2	3
Q8.1	0,656		
Q8.2			0,935
Q8.3	0,765		
Q8.4		0,809	
Q8.5		0,836	
Q8.6	0,720		
Q8.7	0,680	0,421	
Q8.8		0,731	0,454

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Component Transformation Matrix

Component	1	2	3
1	0,711	0,687	0,151
2	-0,689	0,638	0,343
3	0,139	-0,348	0,927

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

Notes

Output Created		05-MAY-2021 14:35:24
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62

Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES Q9.1 Q9.2 Q9.3 Q9.4 Q9.5 Q9.6 Q9.7 Q9.8 /MISSING LISTWISE /ANALYSIS Q9.1 Q9.2 Q9.3 Q9.4 Q9.5 Q9.6 Q9.7 Q9.8 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,01
	Maximum Memory Required	9264 (9.047K) bytes

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q9.1	3,77	0,965	62
Q9.2	3,47	0,953	62
Q9.3	3,47	0,936	62
Q9.4	3,71	1,014	62
Q9.5	4,42	0,691	62
Q9.6	3,82	0,897	62
Q9.7	4,08	0,795	62
Q9.8	4,37	0,683	62

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0,684

Bartlett's Test of Sphericity	Approx. Chi-Square	235,707
	df	28
	Sig.	0,000

Communalities

	Initial	Extraction
Q9.1	1,000	0,354
Q9.2	1,000	0,919
Q9.3	1,000	0,819
Q9.4	1,000	0,460
Q9.5	1,000	0,595
Q9.6	1,000	0,532
Q9.7	1,000	0,647
Q9.8	1,000	0,811

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,712	46,396	46,396	3,712	46,396	46,396	2,818	35,225	35,225
2	1,426	17,821	64,217	1,426	17,821	64,217	2,319	28,992	64,217
3	0,828	10,352	74,569						
4	0,685	8,566	83,135						
5	0,534	6,671	89,806						
6	0,434	5,422	95,228						
7	0,303	3,788	99,016						
8	0,079	0,984	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
Q9.1	0,585	
Q9.2	0,709	-0,646
Q9.3	0,786	-0,449
Q9.4	0,678	
Q9.5	0,748	

Q9.6	0,730	
Q9.7	0,621	0,512
Q9.8	0,560	0,705

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
Q9.1	0,524	
Q9.2	0,957	
Q9.3	0,894	
Q9.4	0,517	0,440
Q9.5	0,466	0,615
Q9.6	0,565	0,462
Q9.7		0,788
Q9.8		0,901

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	0,780	0,625
2	-0,625	0,780

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

Notes

Output Created		05-MAY-2021 14:36:08
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62

Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES Q10.1 Q10.2 Q10.3 Q10.4 Q10.5 Q10.6 Q10.7 Q10.8 Q10.9 /MISSING LISTWISE /ANALYSIS Q10.1 Q10.2 Q10.3 Q10.4 Q10.5 Q10.6 Q10.7 Q10.8 Q10.9 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,00
	Elapsed Time	00:00:00,00
	Maximum Memory Required	11368 (11.102K) bytes

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q10.1	3,06	0,921	62
Q10.2	3,27	0,890	62
Q10.3	3,27	0,853	62
Q10.4	2,68	0,785	62
Q10.5	2,71	0,965	62
Q10.6	1,92	0,685	62
Q10.7	2,69	1,095	62
Q10.8	2,82	0,859	62
Q10.9	4,02	0,983	62

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,704
Bartlett's Test of Sphericity	Approx. Chi-Square	112,717
	df	36

Sig.	0,000

Communalities

	Initial	Extraction
Q10.1	1,000	0,413
Q10.2	1,000	0,671
Q10.3	1,000	0,715
Q10.4	1,000	0,706
Q10.5	1,000	0,528
Q10.6	1,000	0,720
Q10.7	1,000	0,458
Q10.8	1,000	0,636
Q10.9	1,000	0,725

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,882	32,020	32,020	2,882	32,020	32,020	2,315	25,720	25,720
2	1,376	15,290	47,309	1,376	15,290	47,309	1,807	20,082	45,802
3	1,314	14,602	61,912	1,314	14,602	61,912	1,450	16,110	61,912
4	0,859	9,548	71,459						
5	0,720	8,002	79,461						
6	0,560	6,219	85,680						
7	0,508	5,639	91,319						
8	0,416	4,619	95,939						
9	0,366	4,061	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component		
	1	2	3
Q10.1	0,570		
Q10.2	0,686	-0,447	
Q10.3	0,621	-0,409	-0,403
Q10.4	0,668		0,465
Q10.5	0,643		
Q10.6		0,478	0,652

Q10.7	0,583		
Q10.8	0,519	0,598	
Q10.9	0,408	0,425	-0,615

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Rotated Component Matrix[a]

	Component		
	1	2	3
Q10.1	0,333	0,347	0,426
Q10.2	0,809		
Q10.3	0,689	0,324	-0,368
Q10.4	0,709		0,451
Q10.5	0,701		
Q10.6			0,847
Q10.7		0,607	
Q10.8		0,702	0,377
Q10.9		0,835	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Component Transformation Matrix

Component	1	2	3
1	0,790	0,548	0,275
2	-0,602	0,606	0,520
3	0,118	-0,577	0,808

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

Notes

Output Created		05-MAY-2021 14:37:36
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>

	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES Q13.1.1 Q13.1.2 Q13.1.3 Q13.1.4 Q13.1.5 /MISSING LISTWISE /ANALYSIS Q13.1.1 Q13.1.2 Q13.1.3 Q13.1.4 Q13.1.5 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,01
	Maximum Memory Required	4248 (4.148K) bytes

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q13.1.1	4,16	0,772	62
Q13.1.2	3,77	0,895	62
Q13.1.3	4,11	0,727	62
Q13.1.4	4,02	0,914	62
Q13.1.5	3,29	0,837	62

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,814
Bartlett's Test of Sphericity	Approx. Chi-Square	100,084

	df	10
	Sig.	0,000

Communalities

	Initial	Extraction
Q13.1.1	1,000	0,470
Q13.1.2	1,000	0,742
Q13.1.3	1,000	0,589
Q13.1.4	1,000	0,743
Q13.1.5	1,000	0,304

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,848	56,958	56,958	2,848	56,958	56,958
2	0,855	17,101	74,060			
3	0,564	11,278	85,338			
4	0,419	8,382	93,720			
5	0,314	6,280	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
Q13.1.1	0,686
Q13.1.2	0,861
Q13.1.3	0,767
Q13.1.4	0,862
Q13.1.5	0,551

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Rotated Component Matrix[a]

a. Only one component was extracted. The solution cannot be rotated.

Factor Analysis

Notes

Output Created		05-MAY-2021 14:38:23
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES Q17.1.1 Q17.1.2 Q17.1.3 Q17.1.4 Q17.1.5 Q17.1.6 Q17.1.7 /MISSING LISTWISE /ANALYSIS Q17.1.1 Q17.1.2 Q17.1.3 Q17.1.4 Q17.1.5 Q17.1.6 Q17.1.7 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,00

	Elapsed Time	00:00:00,00
	Maximum Memory Required	7376 (7.203K) bytes

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q17.1.1	4,40	0,583	43
Q17.1.2	4,19	0,732	43
Q17.1.3	4,09	0,718	43
Q17.1.4	4,33	1,085	43
Q17.1.5	4,23	0,611	43
Q17.1.6	3,42	0,932	43
Q17.1.7	4,00	0,655	43

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,561
Bartlett's Test of Sphericity	Approx. Chi-Square	51,191
	df	21
	Sig.	0,000

Communalities

	Initial	Extraction
Q17.1.1	1,000	0,530
Q17.1.2	1,000	0,720
Q17.1.3	1,000	0,769
Q17.1.4	1,000	0,534
Q17.1.5	1,000	0,576
Q17.1.6	1,000	0,862
Q17.1.7	1,000	0,640

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,251	32,151	32,151	2,251	32,151	32,151	2,097	29,963	29,963
2	1,371	19,580	51,731	1,371	19,580	51,731	1,408	20,119	50,082
3	1,010	14,423	66,155	1,010	14,423	66,155	1,125	16,073	66,155

4	0,846	12,082	78,237						
5	0,744	10,627	88,864						
6	0,514	7,337	96,201						
7	0,266	3,799	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component		
	1	2	3
Q17.1.1	0,434	-0,578	
Q17.1.2	0,846		
Q17.1.3	0,728		0,410
Q17.1.4	0,712		
Q17.1.5		0,678	
Q17.1.6	-0,372		0,851
Q17.1.7	0,354	0,694	

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Rotated Component Matrix[a]

	Component		
	1	2	3
Q17.1.1	0,517	-0,475	
Q17.1.2	0,802		
Q17.1.3	0,857		
Q17.1.4	0,648		
Q17.1.5		0,734	
Q17.1.6			0,923
Q17.1.7		0,730	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Component Transformation Matrix

Component	1	2	3
1	0,927	0,219	-0,304
2	-0,243	0,969	-0,042
3	0,285	0,113	0,952

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

Notes

Output Created		05-MAY-2021 14:38:50
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet2
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES Q17.2.1 Q17.2.2 Q17.2.3 Q17.2.4 Q17.2.5 Q17.2.6 Q17.2.7 /MISSING LISTWISE /ANALYSIS Q17.2.1 Q17.2.2 Q17.2.3 Q17.2.4 Q17.2.5 Q17.2.6 Q17.2.7 /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION /FORMAT BLANK(.32) /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
Resources	Processor Time	00:00:00,00
	Elapsed Time	00:00:00,01

Maximum Memory Required	7376 (7.203K) bytes

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Q17.2.1	4,35	0,686	43
Q17.2.2	4,16	0,814	43
Q17.2.3	3,98	0,831	43
Q17.2.4	4,19	1,052	43
Q17.2.5	4,21	0,675	43
Q17.2.6	3,33	0,944	43
Q17.2.7	3,95	0,754	43

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,590
Bartlett's Test of Sphericity	Approx. Chi-Square	97,594
	df	21
	Sig.	0,000

Communalities

	Initial	Extraction
Q17.2.1	1,000	0,558
Q17.2.2	1,000	0,627
Q17.2.3	1,000	0,724
Q17.2.4	1,000	0,594
Q17.2.5	1,000	0,540
Q17.2.6	1,000	0,722
Q17.2.7	1,000	0,638

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,062	43,738	43,738	3,062	43,738	43,738	3,024	43,207	43,207
2	1,342	19,165	62,904	1,342	19,165	62,904	1,379	19,697	62,904
3	0,799	11,411	74,315						
4	0,592	8,463	82,778						

5	0,570	8,137	90,915						
6	0,485	6,930	97,845						
7	0,151	2,155	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
Q17.2.1	0,738	
Q17.2.2	0,727	
Q17.2.3	0,783	0,335
Q17.2.4	0,760	
Q17.2.5	0,726	
Q17.2.6		0,823
Q17.2.7	0,476	-0,641

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
Q17.2.1	0,747	
Q17.2.2	0,674	0,416
Q17.2.3	0,823	
Q17.2.4	0,771	
Q17.2.5	0,701	
Q17.2.6	0,329	-0,783
Q17.2.7	0,377	0,704

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	0,989	0,147

2	0,147	-0,989

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Correlations

Notes

Output Created		31-MAY-2021 15:22:19
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet3
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.
Syntax		CORRELATIONS /VARIABLES=VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 /PRINT=TWOTAIL NOSIG FULL /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,02

Correlations

		VehAffordability	Veh_Demand	IntVehcost	GovTaxLevies	GovChallenges	EconomicChallenges	GreenEnvironment	PoliticalEnv	ManufacturingChallenges	CovidChallenges	Digitalenv	Q17f1
VehAffordability	Pearson Correlation	1	.272*	.367**	0,212	0,227	.375**	0,182	.290*	.284*	0,211	.475**	0,135
	Sig. (2-tailed)		0,032	0,003	0,097	0,077	0,003	0,157	0,022	0,026	0,100	0,000	0,389
	N	62	62	62	62	62	62	62	62	61	62	62	43
Veh_Demand	Pearson Correlation	.272*	1	.391**	0,099	0,083	0,185	0,227	0,193	.373**	-0,047	.340**	-0,034
	Sig. (2-tailed)	0,032		0,002	0,445	0,521	0,150	0,075	0,132	0,003	0,719	0,007	0,829
	N	62	62	62	62	62	62	62	62	61	62	62	43
IntVehcost	Pearson Correlation	.367**	.391**	1	.410**	0,180	.330**	.268*	-0,135	.407**	.290*	.320*	-0,148
	Sig. (2-tailed)	0,003	0,002		0,001	0,162	0,009	0,035	0,297	0,001	0,022	0,011	0,344
	N	62	62	62	62	62	62	62	62	61	62	62	43
GovTaxLevies	Pearson Correlation	0,212	0,099	.410**	1	0,157	.436**	0,121	-0,041	.342**	0,160	0,169	0,000
	Sig. (2-tailed)	0,097	0,445	0,001		0,224	0,000	0,350	0,749	0,007	0,214	0,190	1,000
	N	62	62	62	62	62	62	62	62	61	62	62	43
GovChallenges	Pearson Correlation	0,227	0,083	0,180	0,157	1	.561**	0,239	.273*	.424**	0,175	.345**	.348*

	Sig. (2-tailed)	0,077	0,521	0,162	0,224		0,000	0,062	0,032	0,001	0,173	0,006	0,022
	N	62	62	62	62	62	62	62	62	61	62	62	43
EconomicChallenges	Pearson Correlation	.375**	0,185	.330**	.436**	.561**	1	0,188	0,248	.436**	.427**	.426**	.363*
	Sig. (2-tailed)	0,003	0,150	0,009	0,000	0,000		0,144	0,052	0,000	0,001	0,001	0,017
	N	62	62	62	62	62	62	62	62	61	62	62	43
GreenEnvironment	Pearson Correlation	0,182	0,227	.268*	0,121	0,239	0,188	1	.310*	.290*	0,148	0,131	.309*
	Sig. (2-tailed)	0,157	0,075	0,035	0,350	0,062	0,144		0,014	0,023	0,251	0,311	0,044
	N	62	62	62	62	62	62	62	62	61	62	62	43
PoliticalEnv	Pearson Correlation	.290*	0,193	-0,135	-0,041	.273*	0,248	.310*	1	.436**	0,232	0,187	.386*
	Sig. (2-tailed)	0,022	0,132	0,297	0,749	0,032	0,052	0,014		0,000	0,069	0,147	0,011
	N	62	62	62	62	62	62	62	62	61	62	62	43
ManufacturingChallenges	Pearson Correlation	.284*	.373**	.407**	.342**	.424**	.436**	.290*	.436**	1	.344**	.301*	-0,022
	Sig. (2-tailed)	0,026	0,003	0,001	0,007	0,001	0,000	0,023	0,000		0,007	0,018	0,888
	N	61	61	61	61	61	61	61	61	61	61	61	42
CovidChallenges	Pearson Correlation	0,211	-0,047	.290*	0,160	0,175	.427**	0,148	0,232	.344**	1	.271*	0,298

	Sig. (2-tailed)	0,100	0,719	0,022	0,214	0,173	0,001	0,251	0,069	0,007		0,033	0,052
	N	62	62	62	62	62	62	62	62	61	62	62	43
Digitalenv	Pearson Correlation	.475**	.340**	.320*	0,169	.345**	.426**	0,131	0,187	.301*	.271*	1	0,228
	Sig. (2-tailed)	0,000	0,007	0,011	0,190	0,006	0,001	0,311	0,147	0,018	0,033		0,142
	N	62	62	62	62	62	62	62	62	61	62	62	43
Q17f1	Pearson Correlation	0,135	-0,034	-0,148	0,000	.348*	.363*	.309*	.386*	-0,022	0,298	0,228	1
	Sig. (2-tailed)	0,389	0,829	0,344	1,000	0,022	0,017	0,044	0,011	0,888	0,052	0,142	
	N	43	43	43	43	43	43	43	43	42	43	43	43

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

NPar Tests

Notes

Output Created		11-JUN-2021 08:27:15
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /K-W=VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv TechEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 Q17f2 BY q7adj(1 3) /MEDIAN=VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv TechEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 Q17f2 BY q7adj(1 3) /MISSING ANALYSIS.
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,03
	Number of Cases Allowed[a]	157286

a. Based on availability of workspace memory.

Kruskal-Wallis Test

Ranks

	q7adj	N	Mean Rank
VehAffordability	1.00	11	30,77
	2.00	18	23,25
	3.00	33	36,24
	Total	62	

Veh_Demand	1.00	11	29,23
	2.00	18	32,50
	3.00	33	31,71
	Total	62	
IntVehcost	1.00	11	23,50
	2.00	18	25,22
	3.00	33	37,59
	Total	62	
GovTaxLevies	1.00	11	35,82
	2.00	18	25,67
	3.00	33	33,24
	Total	62	
GovChallenges	1.00	11	29,64
	2.00	18	31,58
	3.00	33	32,08
	Total	62	
EconomicChallenges	1.00	11	35,91
	2.00	18	24,56
	3.00	33	33,82
	Total	62	
GreenEnvironment	1.00	11	36,36
	2.00	18	28,94
	3.00	33	31,27
	Total	62	
PoliticalEnv	1.00	11	36,27
	2.00	18	31,69
	3.00	33	29,80
	Total	62	
TechEnv	1.00	11	26,59
	2.00	18	30,00
	3.00	33	33,95
	Total	62	
ManufacturingChallenges	1.00	11	29,86
	2.00	18	28,31
	3.00	32	32,91
	Total	61	
CovidChallenges	1.00	11	30,68
	2.00	18	33,36

	3.00	33	30,76
	Total	62	
Digitalenv	1.00	11	28,36
	2.00	18	25,08
	3.00	33	36,05
	Total	62	
Q17f1	1.00	8	26,88
	2.00	10	28,00
	3.00	25	18,04
	Total	43	
Q17f2	1.00	8	25,56
	2.00	10	23,00
	3.00	25	20,46
	Total	43	

Test Statistics[a,b]

	VehAffordability	Veh_Demand	IntVehcost	GovTaxLevies	GovChallenges	EconomicChallenges	GreenEnvironment	PoliticalEnv	TechEnv	ManufacturingChallenges	CovidChallenges	Digitalenv	Q17f1	Q17f2
Kruskal-Wallis H	6,535	0,254	8,287	2,862	0,153	3,954	1,180	1,141	1,637	0,841	0,285	4,755	6,124	1,227
df	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	0,038	0,881	0,016	0,239	0,926	0,138	0,554	0,565	0,441	0,657	0,867	0,093	0,047	0,541

a. Kruskal Wallis Test

b. Grouping Variable: q7adj

Median Test

Frequencies

	q7adj		
	1.00	2.00	3.00

VehAffordability	> Median	3	0	9
	<= Median	8	18	24
Veh_Demand	> Median	4	8	15
	<= Median	7	10	18
IntVehcost	> Median	2	6	21
	<= Median	9	12	12
GovTaxLevies	> Median	7	5	14
	<= Median	4	13	19
GovChallenges	> Median	5	6	13
	<= Median	6	12	20
EconomicChallenges	> Median	7	5	17
	<= Median	4	13	16
GreenEnvironment	> Median	6	7	13
	<= Median	5	11	20
PoliticalEnv	> Median	5	5	10
	<= Median	6	13	23
TechEnv	> Median	3	5	14
	<= Median	8	13	19
ManufacturingChallenges	> Median	4	6	15
	<= Median	7	12	17
CovidChallenges	> Median	5	7	12
	<= Median	6	11	21
Digitalenv	> Median	4	6	20
	<= Median	7	12	13
Q17f1	> Median	4	7	7
	<= Median	4	3	18
Q17f2	> Median	4	4	7
	<= Median	4	6	18

Test Statistics[a]

	VehAffordability	Veh_Demand	IntVehcost	GovTaxLevies	GovChallenges	EconomicChallenges	GreenEnvironment	PoliticalEnv	TechEnv	ManufacturingChallenges	CovidChallenges	Digitalenv	Q17f1	Q17f2
N	62	62	62	62	62	62	62	62	62	61	62	62	43	43
Median	4,0000	3,0000	3,5000	3,0000	3,7500	4,0000	3,0000	3,5000	2,5000	3,7500	4,3333	3,8000	4,2500	4,0000

Chi-Square	6.087[b]	.286[c]	8.687[d]	3.612[e]	.437[f]	4.163[d]	.874[e]	1.009[g]	1.485[h]	.992[i]	.288[f]	4.243[j]	5.445[k]	1.442[l]
df	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	0,048	0,867	0,013	0,164	0,804	0,125	0,646	0,577	0,476	0,609	0,866	0,120	0,066	0,486

a. Grouping Variable: q7adj

b. 2 cells (33.3%) have expected frequencies less than 5. The minimum expected cell frequency is 2.1.

c. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 4.8.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 5.1.

e. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 4.6.

f. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 4.3.

g. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 3.5.

h. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 3.9.

i. 1 cells (16.7%) have expected frequencies less than 5. The minimum expected cell frequency is 4.5.

j. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 5.3.

k. 3 cells (50.0%) have expected frequencies less than 5. The minimum expected cell frequency is 3.3.

l. 2 cells (33.3%) have expected frequencies less than 5. The minimum expected cell frequency is 2.8.

Crosstabs

Notes

Output Created		11-JUN-2021 08:57:06
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.

	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=q4adj BY q2adj Q3 /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI /CELLS=COUNT ROW COLUMN /COUNT ROUND CELL /METHOD=EXACT TIMER(5).
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,17
	Dimensions Requested	2
	Cells Available	524245
	Time for Exact Statistics	0:00:00,03

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
q4adj * q2adj	62	100,0%	0	0,0%	62	100,0%
q4adj * Q3	62	100,0%	0	0,0%	62	100,0%

q4adj * q2adj

Crosstab

			q2adj			
			1.00	2.00	3.00	Total
q4adj	1.00	Count	14	11	17	42
		% within q4adj	33,3%	26,2%	40,5%	100,0%
		% within q2adj	58,3%	68,8%	77,3%	67,7%
	2.00	Count	10	5	5	20
		% within q4adj	50,0%	25,0%	25,0%	100,0%
		% within q2adj	41,7%	31,3%	22,7%	32,3%
Total		Count	24	16	22	62
		% within q4adj	38,7%	25,8%	35,5%	100,0%

	% within q2adj	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.894[a]	2	0,388	0,404		
Likelihood Ratio	1,913	2	0,384	0,405		
Fisher-Freeman-Halton Exact Test	1,869			0,404		
Linear-by-Linear Association	1.859[b]	1	0,173	0,211	0,114	0,050
N of Valid Cases	62					

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.16.

b. The standardized statistic is -1.363.

Symmetric Measures

		Value	Approximate Significance	Exact Significance
Nominal by Nominal	Phi	0,175	0,388	0,404
	Cramer's V	0,175	0,388	0,404
N of Valid Cases		62		

q4adj * Q3

Crosstab

			Q3		
			Foreign owned	South African owned	Total
q4adj	1.00	Count	29	13	42
		% within q4adj	69,0%	31,0%	100,0%
		% within Q3	74,4%	56,5%	67,7%
	2.00	Count	10	10	20
		% within q4adj	50,0%	50,0%	100,0%
		% within Q3	25,6%	43,5%	32,3%
Total		Count	39	23	62
		% within q4adj	62,9%	37,1%	100,0%
		% within Q3	100,0%	100,0%	100,0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.106[a]	1	0,147	0,169	0,121
Continuity Correction[b]	1,369	1	0,242		
Likelihood Ratio	2,076	1	0,150	0,169	0,121
Fisher's Exact Test				0,169	0,121
N of Valid Cases	62				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.42.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance	Exact Significance
Nominal by Nominal	Phi	0,184	0,147	0,169
	Cramer's V	0,184	0,147	0,169
N of Valid Cases		62		

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	8.607[a]	12	0,736	0,777
Likelihood Ratio	10,759	12	0,550	0,749
Fisher-Freeman-Halton Exact Test	8,114			0,795
N of Valid Cases	62			

a. 15 cells (75.0%) have expected count less than 5. The minimum expected count is .34.

Symmetric Measures

		Value	Approximate Significance	Exact Significance
Nominal by Nominal	Phi	0,373	0,736	0,777
	Cramer's V	0,215	0,736	0,777
N of Valid Cases		62		

T-Test

Notes

Output Created		11-JUN-2021 08:19:44
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST /TESTVAL=0 /MISSING=ANALYSIS /VARIABLES=diff6.1 diff6.2 diff6.3 diff6.4 diff6.5 /ES DISPLAY(TRUE) /CRITERIA=CI(.95).
Resources	Processor Time	00:00:00,00
	Elapsed Time	00:00:00,01

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
diff6.1	62	-0,0161	0,46136	0,05859
diff6.2	62	-0,1774	0,55881	0,07097
diff6.3	62	-0,1290	0,77848	0,09887
diff6.4	62	0,0645	0,76546	0,09721
diff6.5	62	-0,2097	0,65630	0,08335

One-Sample Test

Test Value = 0

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
diff6.1	-0,275	61	0,784	-0,01613	-0,1333	0,1010
diff6.2	-2,500	61	0,015	-0,17742	-0,3193	-0,0355
diff6.3	-1,305	61	0,197	-0,12903	-0,3267	0,0687
diff6.4	0,664	61	0,509	0,06452	-0,1299	0,2589
diff6.5	-2,516	61	0,015	-0,20968	-0,3763	-0,0430

One-Sample Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
diff6.1	Cohen's d	0,46136	-0,035	-0,284	0,214
	Hedges' correction	0,46713	-0,035	-0,280	0,212
diff6.2	Cohen's d	0,55881	-0,317	-0,571	-0,061
	Hedges' correction	0,56580	-0,314	-0,564	-0,060
diff6.3	Cohen's d	0,77848	-0,166	-0,416	0,086
	Hedges' correction	0,78822	-0,164	-0,411	0,085
diff6.4	Cohen's d	0,76546	0,084	-0,165	0,333
	Hedges' correction	0,77504	0,083	-0,163	0,329
diff6.5	Cohen's d	0,65630	-0,319	-0,574	-0,063
	Hedges' correction	0,66451	-0,316	-0,566	-0,062

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation.
Hedges' correction uses the sample standard deviation, plus a correction factor.

T-Test

Notes

Output Created		11-JUN-2021 08:17:52
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.

Syntax		T-TEST GROUPS=q4adj(1 2) /MISSING=ANALYSIS /VARIABLES=VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv TechEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 Q17f2 /ES DISPLAY(TRUE) /CRITERIA=CI(.95).
Resources	Processor Time	00:00:00,03
	Elapsed Time	00:00:00,02

Group Statistics

q4adj		N	Mean	Std. Deviation	Std. Error Mean
VehAffordability	1.00	42	3,8571	0,55163	0,08512
	2.00	20	3,7500	0,62008	0,13865
Veh_Demand	1.00	42	3,3452	0,70268	0,10843
	2.00	20	3,3750	0,68585	0,15336
IntVehcost	1.00	42	3,5893	0,52910	0,08164
	2.00	20	3,4625	0,72218	0,16148
GovTaxLevies	1.00	42	3,0476	0,85404	0,13178
	2.00	20	3,2667	0,98289	0,21978
GovChallenges	1.00	42	3,6310	0,76157	0,11751
	2.00	20	3,6375	0,69051	0,15440
EconomicChallenges	1.00	42	4,2083	0,54638	0,08431
	2.00	20	4,0125	0,69526	0,15547
GreenEnvironment	1.00	42	2,9619	0,60282	0,09302
	2.00	20	2,8500	0,68939	0,15415
PoliticalEnv	1.00	42	3,5000	0,70711	0,10911
	2.00	20	3,2500	0,88109	0,19702
TechEnv	1.00	42	2,4286	0,66783	0,10305

	2.00	20	2,6250	0,53496	0,11962
ManufacturingChallenges	1.00	41	3,6524	0,76624	0,11967
	2.00	20	3,7125	0,68477	0,15312
CovidChallenges	1.00	42	4,4603	0,44753	0,06906
	2.00	20	4,0833	0,70814	0,15834
Digitalenv	1.00	42	3,8524	0,66561	0,10271
	2.00	20	3,9100	0,53695	0,12007
Q17f1	1.00	30	4,3917	0,43886	0,08013
	2.00	13	3,9231	0,70256	0,19485
Q17f2	1.00	30	4,1500	0,45769	0,08356
	2.00	13	4,0385	0,59377	0,16468

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
VehAffordability	Equal variances assumed	0,557	0,458	0,687	60	0,495	0,10714	0,15600	-0,20490	0,41918
	Equal variances not assumed			0,659	33,795	0,515	0,10714	0,16270	-0,22357	0,43786
Veh_Demand	Equal variances assumed	0,038	0,847	-0,157	60	0,876	-0,02976	0,18947	-0,40875	0,34923
	Equal variances not assumed			-0,158	38,306	0,875	-0,02976	0,18782	-0,40988	0,35036
IntVehcost	Equal variances assumed	2,552	0,115	0,782	60	0,437	0,12679	0,16220	-0,19767	0,45124
	Equal variances			0,701	29,074	0,489	0,12679	0,18095	-0,24326	0,49683

	not assumed									
GovTaxLevies	Equal variances assumed	0,265	0,609	-0,899	60	0,372	-0,21905	0,24366	-0,70643	0,26834
	Equal variances not assumed			-0,855	33,133	0,399	-0,21905	0,25626	-0,74034	0,30224
GovChallenges	Equal variances assumed	0,043	0,837	-0,033	60	0,974	-0,00655	0,20099	-0,40859	0,39549
	Equal variances not assumed			-0,034	41,010	0,973	-0,00655	0,19404	-0,39841	0,38531
EconomicChallenges	Equal variances assumed	1,262	0,266	1,206	60	0,232	0,19583	0,16234	-0,12890	0,52057
	Equal variances not assumed			1,107	30,592	0,277	0,19583	0,17685	-0,16506	0,55672
GreenEnvironment	Equal variances assumed	0,402	0,529	0,652	60	0,517	0,11190	0,17157	-0,23129	0,45510
	Equal variances not assumed			0,622	33,308	0,538	0,11190	0,18004	-0,25427	0,47808
PoliticalEnv	Equal variances assumed	2,957	0,091	1,201	60	0,235	0,25000	0,20824	-0,16654	0,66654
	Equal variances not assumed			1,110	31,087	0,275	0,25000	0,22521	-0,20927	0,70927
TechEnv	Equal variances assumed	0,824	0,368	-1,150	60	0,255	-0,19643	0,17083	-0,53814	0,14528

	Equal variances not assumed			-1,244	45,939	0,220	-0,19643	0,15789	-0,51425	0,12139
ManufacturingChallenges	Equal variances assumed	0,021	0,885	-0,297	59	0,767	-0,06006	0,20210	-0,46446	0,34434
	Equal variances not assumed			-0,309	41,877	0,759	-0,06006	0,19433	-0,45228	0,33216
CovidChallenges	Equal variances assumed	8,843	0,004	2,552	60	0,013	0,37698	0,14772	0,08149	0,67248
	Equal variances not assumed			2,182	26,471	0,038	0,37698	0,17275	0,02220	0,73176
Digitalenv	Equal variances assumed	1,412	0,239	-0,338	60	0,737	-0,05762	0,17054	-0,39875	0,28351
	Equal variances not assumed			-0,365	45,652	0,717	-0,05762	0,15800	-0,37572	0,26049
Q17f1	Equal variances assumed	2,596	0,115	2,664	41	0,011	0,46859	0,17592	0,11331	0,82387
	Equal variances not assumed			2,224	16,209	0,041	0,46859	0,21069	0,02242	0,91475
Q17f2	Equal variances assumed	0,015	0,903	0,670	41	0,507	0,11154	0,16648	-0,22467	0,44774
	Equal variances not assumed			0,604	18,468	0,553	0,11154	0,18467	-0,27574	0,49881

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
VehAffordability	Cohen's d	0,57419	0,187	-0,348	0,719
	Hedges' correction	0,58150	0,184	-0,343	0,710
	Glass's delta	0,62008	0,173	-0,365	0,706
Veh_Demand	Cohen's d	0,69739	-0,043	-0,575	0,490
	Hedges' correction	0,70627	-0,042	-0,568	0,484
	Glass's delta	0,68585	-0,043	-0,575	0,490
IntVehcost	Cohen's d	0,59704	0,212	-0,322	0,745
	Hedges' correction	0,60463	0,210	-0,318	0,736
	Glass's delta	0,72218	0,176	-0,362	0,709
GovTaxLevies	Cohen's d	0,89685	-0,244	-0,777	0,291
	Hedges' correction	0,90826	-0,241	-0,768	0,287
	Glass's delta	0,98289	-0,223	-0,757	0,317
GovChallenges	Cohen's d	0,73981	-0,009	-0,541	0,524
	Hedges' correction	0,74922	-0,009	-0,534	0,517
	Glass's delta	0,69051	-0,009	-0,542	0,523
EconomicChallenges	Cohen's d	0,59755	0,328	-0,209	0,862
	Hedges' correction	0,60515	0,324	-0,207	0,851
	Glass's delta	0,69526	0,282	-0,262	0,818
GreenEnvironment	Cohen's d	0,63152	0,177	-0,357	0,710
	Hedges' correction	0,63955	0,175	-0,352	0,701
	Glass's delta	0,68939	0,162	-0,375	0,695
PoliticalEnv	Cohen's d	0,76649	0,326	-0,211	0,860

	Hedges' correction	0,77624	0,322	-0,208	0,850
	Glass's delta	0,88109	0,284	-0,260	0,820
TechEnv	Cohen's d	0,62880	-0,312	-0,846	0,224
	Hedges' correction	0,63680	-0,308	-0,836	0,221
	Glass's delta	0,53496	-0,367	-0,908	0,182
ManufacturingChallenges	Cohen's d	0,74098	-0,081	-0,615	0,454
	Hedges' correction	0,75057	-0,080	-0,608	0,448
	Glass's delta	0,68477	-0,088	-0,622	0,449
CovidChallenges	Cohen's d	0,54374	0,693	0,144	1,237
	Hedges' correction	0,55066	0,685	0,142	1,222
	Glass's delta	0,70814	0,532	-0,032	1,084
Digitalenv	Cohen's d	0,62773	-0,092	-0,624	0,441
	Hedges' correction	0,63572	-0,091	-0,616	0,436
	Glass's delta	0,53695	-0,107	-0,639	0,428
Q17f1	Cohen's d	0,52981	0,884	0,201	1,558
	Hedges' correction	0,53975	0,868	0,198	1,529
	Glass's delta	0,70256	0,667	-0,047	1,357
Q17f2	Cohen's d	0,50136	0,222	-0,431	0,874
	Hedges' correction	0,51077	0,218	-0,423	0,858
	Glass's delta	0,59377	0,188	-0,471	0,839

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

T-Test

Notes

Output Created		11-JUN-2021 08:44:10
Comments		
Input	Data	C:\Users\User\Documents\2021\Faizal 2021\faizal final coded data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST GROUPS=Q19('Yes' 'No') /MISSING=ANALYSIS /VARIABLES=VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv TechEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 Q17f2 /ES DISPLAY(TRUE) /CRITERIA=CI(.95).
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,02

Group Statistics

Q19		N	Mean	Std. Deviation	Std. Error Mean
VehAffordability	Yes	30	3,8778	0,51404	0,09385
	No	32	3,7708	0,62469	0,11043
Veh_Demand	Yes	30	3,4167	0,74375	0,13579
	No	32	3,2969	0,64582	0,11417
IntVehcost	Yes	30	3,5000	0,65653	0,11987
	No	32	3,5938	0,53788	0,09508
GovTaxLevies	Yes	30	2,9889	0,84637	0,15453
	No	32	3,2396	0,93607	0,16548
GovChallenges	Yes	30	3,5833	0,65434	0,11947
	No	32	3,6797	0,80881	0,14298

EconomicChallenges	Yes	30	3,9667	0,59355	0,10837
	No	32	4,3125	0,56440	0,09977
GreenEnvironment	Yes	30	2,9267	0,64216	0,11724
	No	32	2,9250	0,62579	0,11063
PoliticalEnv	Yes	30	3,5167	0,68837	0,12568
	No	32	3,3281	0,83868	0,14826
TechEnv	Yes	30	2,6000	0,54772	0,10000
	No	32	2,3906	0,69252	0,12242
ManufacturingChallenges	Yes	30	3,6250	0,60796	0,11100
	No	31	3,7177	0,84839	0,15237
CovidChallenges	Yes	30	4,3111	0,51739	0,09446
	No	32	4,3646	0,61847	0,10933
Digitalenv	Yes	30	3,8000	0,60344	0,11017
	No	32	3,9375	0,64345	0,11375
Q17f1	Yes	23	4,2283	0,46413	0,09678
	No	20	4,2750	0,67814	0,15164
Q17f2	Yes	23	4,1957	0,47047	0,09810
	No	20	4,0250	0,52503	0,11740

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
VehAffordability	Equal variances assumed	0,321	0,573	0,733	60	0,466	0,10694	0,14584	-0,18478	0,39867
	Equal variances not assumed			0,738	59,033	0,463	0,10694	0,14492	-0,18304	0,39693
Veh_Demand	Equal variances assumed	1,394	0,242	0,678	60	0,500	0,11979	0,17659	-0,23344	0,47303

	Equal variances not assumed			0,675	57,576	0,502	0,11979	0,17741	-0,23538	0,47496
IntVehcost	Equal variances assumed	0,020	0,887	-0,617	60	0,540	-0,09375	0,15202	-0,39783	0,21033
	Equal variances not assumed			-0,613	56,173	0,543	-0,09375	0,15300	-0,40022	0,21272
GovTaxLevies	Equal variances assumed	1,690	0,199	-1,104	60	0,274	-0,25069	0,22715	-0,70507	0,20368
	Equal variances not assumed			-1,107	59,926	0,273	-0,25069	0,22641	-0,70359	0,20220
GovChallenges	Equal variances assumed	0,929	0,339	-0,514	60	0,609	-0,09635	0,18760	-0,47161	0,27890
	Equal variances not assumed			-0,517	58,773	0,607	-0,09635	0,18632	-0,46921	0,27650
EconomicChallenges	Equal variances assumed	0,074	0,786	-2,352	60	0,022	-0,34583	0,14706	-0,64000	-0,05167
	Equal variances not assumed			-2,348	59,206	0,022	-0,34583	0,14730	-0,64056	-0,05110
GreenEnvironment	Equal variances assumed	0,038	0,845	0,010	60	0,992	0,00167	0,16106	-0,32050	0,32383
	Equal variances not assumed			0,010	59,503	0,992	0,00167	0,16119	-0,32082	0,32416
PoliticalEnv	Equal variances	0,278	0,600	0,964	60	0,339	0,18854	0,19561	-0,20273	0,57981

	assumed									
	Equal variances not assumed			0,970	58,996	0,336	0,18854	0,19436	-0,20037	0,57745
TechEnv	Equal variances assumed	1,702	0,197	1,315	60	0,194	0,20938	0,15927	-0,10922	0,52797
	Equal variances not assumed			1,325	58,384	0,190	0,20938	0,15807	-0,10700	0,52575
ManufacturingChallenges	Equal variances assumed	0,721	0,399	-0,489	59	0,626	-0,09274	0,18953	-0,47199	0,28650
	Equal variances not assumed			-0,492	54,431	0,625	-0,09274	0,18852	-0,47063	0,28514
CovidChallenges	Equal variances assumed	1,898	0,173	-0,368	60	0,714	-0,05347	0,14533	-0,34417	0,23722
	Equal variances not assumed			-0,370	59,258	0,713	-0,05347	0,14449	-0,34256	0,23562
Digitalenv	Equal variances assumed	1,712	0,196	-0,866	60	0,390	-0,13750	0,15869	-0,45492	0,17992
	Equal variances not assumed			-0,868	60,000	0,389	-0,13750	0,15836	-0,45426	0,17926
Q17f1	Equal variances assumed	2,456	0,125	-0,267	41	0,791	-0,04674	0,17529	-0,40074	0,30726
	Equal variances not assumed			-0,260	32,915	0,797	-0,04674	0,17989	-0,41276	0,31928

Q17f2	Equal variances assumed	0,001	0,973	1,124	41	0,267	0,17065	0,15180	-0,13592	0,47722
	Equal variances not assumed			1,115	38,560	0,272	0,17065	0,15299	-0,13892	0,48022

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
VehAffordability	Cohen's d	0,57388	0,186	-0,314	0,685
	Hedges' correction	0,58118	0,184	-0,310	0,676
	Glass's delta	0,62469	0,171	-0,330	0,670
Veh_Demand	Cohen's d	0,69488	0,172	-0,327	0,671
	Hedges' correction	0,70372	0,170	-0,323	0,662
	Glass's delta	0,64582	0,185	-0,316	0,684
IntVehcost	Cohen's d	0,59817	-0,157	-0,655	0,343
	Hedges' correction	0,60578	-0,155	-0,647	0,338
	Glass's delta	0,53788	-0,174	-0,673	0,327
GovTaxLevies	Cohen's d	0,89384	-0,280	-0,780	0,221
	Hedges' correction	0,90521	-0,277	-0,770	0,219
	Glass's delta	0,93607	-0,268	-0,768	0,237
GovChallenges	Cohen's d	0,73820	-0,131	-0,629	0,369
	Hedges' correction	0,74759	-0,129	-0,621	0,364
	Glass's delta	0,80881	-0,119	-0,617	0,381
EconomicChallenges	Cohen's d	0,57867	-0,598	-1,105	-0,086

	Hedges' correction	0,58603	-0,590	-1,091	-0,085
	Glass's delta	0,56440	-0,613	-1,129	-0,087
GreenEnvironment	Cohen's d	0,63375	0,003	-0,495	0,501
	Hedges' correction	0,64182	0,003	-0,489	0,494
	Glass's delta	0,62579	0,003	-0,495	0,501
PoliticalEnv	Cohen's d	0,76970	0,245	-0,256	0,744
	Hedges' correction	0,77949	0,242	-0,253	0,735
	Glass's delta	0,83868	0,225	-0,278	0,724
TechEnv	Cohen's d	0,62673	0,334	-0,169	0,834
	Hedges' correction	0,63470	0,330	-0,167	0,824
	Glass's delta	0,69252	0,302	-0,204	0,804
ManufacturingChallenges	Cohen's d	0,74004	-0,125	-0,627	0,378
	Hedges' correction	0,74961	-0,124	-0,619	0,373
	Glass's delta	0,84839	-0,109	-0,611	0,394
CovidChallenges	Cohen's d	0,57185	-0,094	-0,591	0,405
	Hedges' correction	0,57912	-0,092	-0,584	0,400
	Glass's delta	0,61847	-0,086	-0,584	0,413
Digitalenv	Cohen's d	0,62443	-0,220	-0,719	0,280
	Hedges' correction	0,63238	-0,217	-0,710	0,277
	Glass's delta	0,64345	-0,214	-0,713	0,289
Q17f1	Cohen's d	0,57332	-0,082	-0,681	0,518
	Hedges' correction	0,58408	-0,080	-0,668	0,509
	Glass's delta	0,67814	-0,069	-0,668	0,532

Q17f2	Cohen's d	0,49650	0,344	-0,262	0,945
	Hedges' correction	0,50582	0,337	-0,257	0,928
	Glass's delta	0,52503	0,325	-0,287	0,929

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

T-Test

Notes

Output Created		11-JUN-2021 08:07:33
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	Split File	<none>
	N of Rows in Working Data File	62
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST GROUPS=q3rec(1 2) /MISSING=ANALYSIS /VARIABLES=VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv TechEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 Q17f2 /ES DISPLAY(TRUE) /CRITERIA=CI(.95).
Resources	Processor Time	00:00:00,02
	Elapsed Time	00:00:00,02

Group Statistics

q3rec		N	Mean	Std. Deviation	Std. Error Mean
VehAffordability	1.00	39	3,7692	0,68464	0,10963
	2.00	23	3,9130	0,28810	0,06007

Veh_Demand	1.00	39	3,2436	0,69653	0,11153
	2.00	23	3,5435	0,65562	0,13671
IntVehcost	1.00	39	3,4679	0,60202	0,09640
	2.00	23	3,6848	0,57017	0,11889
GovTaxLevies	1.00	39	3,1453	0,89767	0,14374
	2.00	23	3,0725	0,90986	0,18972
GovChallenges	1.00	39	3,6410	0,68776	0,11013
	2.00	23	3,6196	0,82182	0,17136
EconomicChallenges	1.00	39	4,1603	0,63476	0,10164
	2.00	23	4,1196	0,54808	0,11428
GreenEnvironment	1.00	39	2,8872	0,64039	0,10254
	2.00	23	2,9913	0,61638	0,12852
PoliticalEnv	1.00	39	3,4615	0,78961	0,12644
	2.00	23	3,3478	0,74521	0,15539
TechEnv	1.00	39	2,2949	0,61471	0,09843
	2.00	23	2,8261	0,51365	0,10710
ManufacturingChallenges	1.00	38	3,7303	0,64562	0,10473
	2.00	23	3,5761	0,87072	0,18156
CovidChallenges	1.00	39	4,2393	0,56687	0,09077
	2.00	23	4,5072	0,54001	0,11260
Digitalenv	1.00	39	3,7436	0,60166	0,09634
	2.00	23	4,0870	0,61148	0,12750
Q17f1	1.00	28	4,2321	0,60449	0,11424
	2.00	15	4,2833	0,50768	0,13108
Q17f2	1.00	28	4,1071	0,49735	0,09399
	2.00	15	4,1333	0,51640	0,13333

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper

VehAffordability	Equal variances assumed	6,340	0,014	-0,956	60	0,343	-0,14381	0,15041	-0,44468	0,15705
	Equal variances not assumed			-1,150	55,589	0,255	-0,14381	0,12501	-0,39428	0,10666
Veh_Demand	Equal variances assumed	0,207	0,651	-1,673	60	0,100	-0,29989	0,17925	-0,65845	0,05867
	Equal variances not assumed			-1,700	48,575	0,096	-0,29989	0,17643	-0,65452	0,05475
IntVehcost	Equal variances assumed	0,272	0,604	-1,397	60	0,168	-0,21683	0,15526	-0,52740	0,09373
	Equal variances not assumed			-1,417	48,341	0,163	-0,21683	0,15306	-0,52453	0,09086
GovTaxLevies	Equal variances assumed	0,000	0,988	0,307	60	0,760	0,07284	0,23718	-0,40160	0,54727
	Equal variances not assumed			0,306	45,775	0,761	0,07284	0,23802	-0,40634	0,55202
GovChallenges	Equal variances assumed	0,386	0,537	0,110	60	0,913	0,02146	0,19448	-0,36756	0,41048
	Equal variances not assumed			0,105	39,978	0,917	0,02146	0,20370	-0,39024	0,43316
EconomicChallenges	Equal variances assumed	0,898	0,347	0,256	60	0,799	0,04069	0,15891	-0,27717	0,35855
	Equal variances not			0,266	51,804	0,791	0,04069	0,15294	-0,26624	0,34762

	assumed									
GreenEnvironment	Equal variances assumed	0,586	0,447	-0,627	60	0,533	-0,10412	0,16607	-0,43632	0,22807
	Equal variances not assumed			-0,633	47,727	0,530	-0,10412	0,16442	-0,43476	0,22651
PoliticalEnv	Equal variances assumed	0,126	0,724	0,559	60	0,578	0,11371	0,20339	-0,29313	0,52055
	Equal variances not assumed			0,568	48,474	0,573	0,11371	0,20033	-0,28897	0,51640
TechEnv	Equal variances assumed	0,538	0,466	-3,486	60	0,001	-0,53122	0,15241	-0,83607	-0,22636
	Equal variances not assumed			-3,652	52,978	0,001	-0,53122	0,14546	-0,82298	-0,23945
ManufacturingChallenges	Equal variances assumed	1,096	0,300	0,791	59	0,432	0,15418	0,19487	-0,23576	0,54411
	Equal variances not assumed			0,736	36,664	0,467	0,15418	0,20960	-0,27065	0,57900
CovidChallenges	Equal variances assumed	0,102	0,751	-1,829	60	0,072	-0,26793	0,14648	-0,56094	0,02508
	Equal variances not assumed			-1,853	48,120	0,070	-0,26793	0,14463	-0,55871	0,02285
Digitalenv	Equal variances assumed	0,284	0,596	-2,158	60	0,035	-0,34337	0,15913	-0,66168	-0,02506

	Equal variances not assumed			-2,149	45,674	0,037	-0,34337	0,15981	-0,66511	-0,02162
Q17f1	Equal variances assumed	0,709	0,405	-0,279	41	0,782	-0,05119	0,18343	-0,42164	0,31926
	Equal variances not assumed			-0,294	33,363	0,770	-0,05119	0,17388	-0,40480	0,30242
Q17f2	Equal variances assumed	0,010	0,922	-0,162	41	0,872	-0,02619	0,16124	-0,35183	0,29945
	Equal variances not assumed			-0,161	27,810	0,874	-0,02619	0,16313	-0,36045	0,30807

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
VehAffordability	Cohen's d	0,57210	-0,251	-0,768	0,267
	Hedges' correction	0,57938	-0,248	-0,758	0,264
	Glass's delta	0,28810	-0,499	-1,030	0,042
Veh_Demand	Cohen's d	0,68182	-0,440	-0,959	0,083
	Hedges' correction	0,69049	-0,434	-0,947	0,082
	Glass's delta	0,65562	-0,457	-0,985	0,080
IntVehcost	Cohen's d	0,59055	-0,367	-0,885	0,154
	Hedges' correction	0,59806	-0,363	-0,874	0,152
	Glass's delta	0,57017	-0,380	-0,903	0,151
GovTaxLevies	Cohen's d	0,90216	0,081	-0,435	0,596
	Hedges'	0,91364	0,080	-0,430	0,588

	Hedges' correction				
	Glass's delta	0,90986	0,080	-0,437	0,595
GovChallenges	Cohen's d	0,73974	0,029	-0,486	0,544
	Hedges' correction	0,74915	0,029	-0,480	0,537
	Glass's delta	0,82182	0,026	-0,490	0,541
EconomicChallenges	Cohen's d	0,60442	0,067	-0,448	0,582
	Hedges' correction	0,61211	0,066	-0,443	0,575
	Glass's delta	0,54808	0,074	-0,442	0,589
GreenEnvironment	Cohen's d	0,63169	-0,165	-0,680	0,352
	Hedges' correction	0,63972	-0,163	-0,672	0,348
	Glass's delta	0,61638	-0,169	-0,685	0,351
PoliticalEnv	Cohen's d	0,77362	0,147	-0,370	0,662
	Hedges' correction	0,78347	0,145	-0,365	0,654
	Glass's delta	0,74521	0,153	-0,366	0,668
TechEnv	Cohen's d	0,57970	-0,916	-1,454	-0,372
	Hedges' correction	0,58708	-0,905	-1,435	-0,368
	Glass's delta	0,51365	-1,034	-1,624	-0,427
ManufacturingChallenges	Cohen's d	0,73763	0,209	-0,311	0,727
	Hedges' correction	0,74718	0,206	-0,307	0,718
	Glass's delta	0,87072	0,177	-0,345	0,695
CovidChallenges	Cohen's d	0,55717	-0,481	-1,001	0,043
	Hedges' correction	0,56426	-0,475	-0,989	0,043
	Glass's delta	0,54001	-0,496	-1,026	0,045

Digitalenv	Cohen's d	0,60528	-0,567	-1,090	-0,040
	Hedges' correction	0,61298	-0,560	-1,076	-0,039
	Glass's delta	0,61148	-0,562	-1,097	-0,015
Q17f1	Cohen's d	0,57327	-0,089	-0,716	0,539
	Hedges' correction	0,58403	-0,088	-0,703	0,529
	Glass's delta	0,50768	-0,101	-0,727	0,529
Q17f2	Cohen's d	0,50393	-0,052	-0,679	0,576
	Hedges' correction	0,51339	-0,051	-0,666	0,565
	Glass's delta	0,51640	-0,051	-0,677	0,578

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Nonparametric Tests

Notes

Output Created		28-JUN-2021 14:36:52
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Syntax		NPTESTS /INDEPENDENT TEST (VehAffordability Veh_Demand IntVehcost GovTaxLevies GovChallenges EconomicChallenges GreenEnvironment PoliticalEnv TechEnv ManufacturingChallenges CovidChallenges Digitalenv Q17f1 Q17f2) GROUP (Q2FIN) KRUSKAL_WALLIS(COMPARE=PAI RWISE) MEDIAN(TESTVALUE=SAMPLE COMPARE=PAIRWISE) /MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE /CRITERIA ALPHA=0.05 CILEVEL=95.
Resources	Processor Time	00:00:05,17
	Elapsed Time	00:00:05,35

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The medians of VehAffordability are the same across categories of Q2FIN.	Independent-Samples Median Test	0,023	Reject the null hypothesis.
2	The distribution of VehAffordability is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,065	Retain the null hypothesis.
3	The medians of Veh_Demand are the same across categories of Q2FIN.	Independent-Samples Median Test	0,933	Retain the null hypothesis.
4	The distribution of Veh_Demand is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,825	Retain the null hypothesis.
5	The medians of IntVehcost are the same across categories of Q2FIN.	Independent-Samples Median Test	0,531	Retain the null hypothesis.

6	The distribution of IntVehcost is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,973	Retain the null hypothesis.
7	The medians of GovTaxLevies are the same across categories of Q2FIN.	Independent-Samples Median Test	0,925	Retain the null hypothesis.
8	The distribution of GovTaxLevies is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,878	Retain the null hypothesis.
9	The medians of GovChallenges are the same across categories of Q2FIN.	Independent-Samples Median Test	0,299	Retain the null hypothesis.
10	The distribution of GovChallenges is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,709	Retain the null hypothesis.
11	The medians of EconomicChallenges are the same across categories of Q2FIN.	Independent-Samples Median Test	0,752	Retain the null hypothesis.
12	The distribution of EconomicChallenges is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,700	Retain the null hypothesis.
13	The medians of GreenEnvironment are the same across categories of Q2FIN.	Independent-Samples Median Test	0,220	Retain the null hypothesis.
14	The distribution of GreenEnvironment is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,057	Retain the null hypothesis.
15	The medians of PoliticalEnv are the same across categories of Q2FIN.	Independent-Samples Median Test	0,362	Retain the null hypothesis.
16	The distribution of PoliticalEnv is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,706	Retain the null hypothesis.
17	The medians of TechEnv are the same across categories of Q2FIN.	Independent-Samples Median Test	0,165	Retain the null hypothesis.
18	The distribution of TechEnv is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,128	Retain the null hypothesis.

19	The medians of ManufacturingChallenges are the same across categories of Q2FIN.	Independent-Samples Median Test	0,301	Retain the null hypothesis.
20	The distribution of ManufacturingChallenges is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,698	Retain the null hypothesis.
21	The medians of CovidChallenges are the same across categories of Q2FIN.	Independent-Samples Median Test	0,179	Retain the null hypothesis.
22	The distribution of CovidChallenges is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,210	Retain the null hypothesis.
23	The medians of Digitalenv are the same across categories of Q2FIN.	Independent-Samples Median Test	0,255	Retain the null hypothesis.
24	The distribution of Digitalenv is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,063	Retain the null hypothesis.
25	The medians of Q17f1 are the same across categories of Q2FIN.	Independent-Samples Median Test	0,524	Retain the null hypothesis.
26	The distribution of Q17f1 is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,570	Retain the null hypothesis.
27	The medians of Q17f2 are the same across categories of Q2FIN.	Independent-Samples Median Test	0,009	Reject the null hypothesis.
28	The distribution of Q17f2 is the same across categories of Q2FIN.	Independent-Samples Kruskal-Wallis Test	0,047	Reject the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Moderator Analysis

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4054	,1644	,2872	3,8033	3,0000	58,0000	,0147
	Coeff	Se	T	P	LLCI	ULCI
constant	1,7843	1,2955	1,3773	,1737	-,8089	4,3775
GovChall	,6203	,5287	1,1731	,2456	-,4382	1,6787
TechEnv	,3620	,3603	1,0047	,3192	-,3592	1,0832
Int_1	-,0903	,1456	-,6203	,5375	-,3818	,2011

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4074	,1660	,2867	3,8485	3,0000	58,0000	,0140
	Coeff	Se	T	P	LLCI	ULCI
constant	3,0799	,9651	3,1911	,0233	1,1479	5,0118
TechEnv	,1411	,3747	,3767	,7078	-,6089	,8912
GovTaxLev	-,0122	,3004	-,0405	,9678	-,6135	,5892
Int_1	,0550	,1159	,4747	,6368	-,1770	,2871

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4865	,2367	,2624	5,9948	3,0000	58,0000	,0012
	Coeff	Se	T	P	LLCI	ULCI
constant	2,4448	1,8169	1,3456	,1837	-1,1922	6,0818
TechEnv	,0108	,7354	,0146	,9884	-1,4612	1,4827
Economic	,1671	,4268	,3915	,6969	-,6873	1,0215
Int_1	,0634	,1712	,3706	,7123	-,2792	,4061

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4106	,1686	,2858	3,9210	3,0000	58,0000	,0129
	Coeff	Se	T	P	LLCI	ULCI
constant	3,0450	1,1242	2,7087	,0089	,7948	5,2953
TechEnv	,0926	,4467	,2074	,8364	-,8015	,9868
Political	,0339	,3177	,1066	,9155	-,6022	,6699
Int_1	,0498	,1221	,4083	,6845	-,1945	,2942

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4424	,1957	,2809	4,6224	3,0000	58,0000	,0058
	Coeff	Se	T	P	LLCI	ULCI
constant	1,4216	1,3488	1,0540	,2963	1,2793	4,1225
TechEnv	,7105	,5160	1,3769	,1739	-,3228	1,7438
Manufactur	,4289	,3560	1,2047	,2333	-,2840	1,1418
Int_1	-,1033	,1326	-,7789	,4393	-,3688	,1622

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4033	,1626	,2878	3,7553	3,0000	58,0000	,0156
	Coeff	Se	T	P	LLCI	ULCI
constant	,4710	2,3825	,1977	,8440	-4,2982	5,2402
TechEnv	1,0291	,9180	1,1210	,2669	-,8085	2,8666
CovidChall	,5936	,5399	1,0994	,2761	-,4872	1,6744
Int_1	-,1648	,2064	-,7983	,4279	-,5780	,2484

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4855	,2357	,2627	5,9613	3,0000	58,0000	,0013
	Coeff	Se	T	P	LLCI	ULCI
constant	,8212	1,8483	,4443	,6585	-2,8786	4,5210
DigitalEnv	,7078	,4539	1,5593	,1244	-,2008	1,6165
GovChall	,4035	,5273	,7652	,4472	-,6520	1,4591
Int_1	-,0847	,1263	-,6707	,5051	-,3376	,1681

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,5118	,2619	,2537	6,8604	3,0000	58,0000	,0005
	Coeff	Se	T	P	LLCI	ULCI
constant	1,8816	2,9472	,6384	,5257	-4,0179	7,7812
DigitalEnv	,2849	,7672	,3714	,7117	-1,2508	1,8207
Economic	,1374	,7258	,1892	,8506	-1,3155	1,5902
Int_1	,0166	,1852	,0895	,9290	-,3542	,3874

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,5183	,2686	,2554	6,9790	3,0000	58,0000	,0004
	Coeff	Se	T	P	LLCI	ULCI
constant	-,6397	2,0237	-,3161	,7531	-4,6922	3,4127
DigitalEnv	,9963	,4895	2,0352	,0465	,0160	1,9766
Manufactur	,7944	,5404	1,4699	,1471	-1,2878	1,8766
Int_1	,1613	,1276	-1,2636	,2115	-,4169	,0943

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4970	,2470	,2588	6,3429	3,0000	58,0000	,0009
	Coeff	Se	T	P	LLCI	ULCI
constant	-1,7266	3,4179	-,5052	,6154	-8,5683	5,1151
DigitalEnv	1,3256	,8697	1,5242	,1329	-,4153	3,0664
CovidChall	,9124	,7877	1,1583	,2515	-,6644	2,4893
Int_1	-,2096	,1983	-1,0571	,2948	-,6066	,1873

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,5666	,3210	,2334	9,1402	3,0000	58,0000	,0000
	Coeff	Se	T	P	LLCI	ULCI
constant	-1,7539	1,6919	-1,0366	,3042	-5,1407	1,6329
DigitalEnv	1,2561	,4124	3,0458	,0035	-,4306	2,0817
CovidChall	1,2245	,5059	2,4203	,0187	-,2118	2,2372
Int_1	-,2606	,1217	-2,1419	,0364	-,5042	-,0171

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,5008	,2508	,2576	6,4704	3,0000	58,0000	,0007
	Coeff	Se	T	P	LLCI	ULCI
constant	3,1167	1,6919	1,5980	,0560	-,0821	6,3156
DigitalEnv	,1177	,4039	3,0458	,7718	-,6908	,9262
GovTaxLev	-,2687	,4732	2,4203	,5723	-1,2159	,6785
Int_1	,0895	,1176	-2,1419	,4498	-,1459	,3248

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,3252	,1058	,3074	2,2867	3,0000	58,0000	,0881
	Coeff	Se	T	P	LLCI	ULCI
constant	,1285	1,8464	,0696	,9447	-3,5675	3,8246
GreenEnv	1,1338	,6613	1,7143	,0918	-,1901	2,4576
GovChall	,9173	,5034	1,8222	,0736	-,0904	1,9250
Int_1	-,2753	,1773	-1,5523	,1260	-,6302	,0797

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,4581	,2099	,2716	5,1359	3,0000	58,0000	,0032
	Coeff	Se	T	P	LLCI	ULCI
constant	-2,4629	2,3125	1,0651	,2913	-7,0920	2,1661
GreenEnv	1,7204	,8019	2,1454	,0361	-,1152	3,3255
Economic	1,3791	,5250	2,6271	,0110	-,3283	2,4300
Int_1	-,3660	,1800	-2,0331	,0466	-,7264	-,0057

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,3085	,0951	,3160	1,9979	3,0000	58,0000	,1245
	Coeff	Se	T	P	LLCI	ULCI
constant	2,2998	1,9932	1,1539	,2534	-1,6914	6,2911
GreenEnv	,2842	,7172	,3962	,6934	-1,1521	1,7204
Manufactur	,3121	,4893	,6378	,5262	-,6677	1,2918
Int_1	-,0423	,1731	-,2441	,8081	-,3889	,3044

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,3296	,1086	,3064	2,3556	3,0000	58,0000	,0812
	Coeff	Se	T	P	LLCI	ULCI
constant	-2,5409	3,1972	-,7947	,4300	-8,9408	3,8589
GreenEnv	1,8354	1,0433	1,7592	,0838	-,2530	3,9238
CovidChall	,3296	,7088	1,8755	,0658	-,0895	2,7481
Int_1	-,3745	,2291	-1,6348	,1075	-,8332	,0841

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,3405	,1159	,3039	2,5357	3,0000	58,0000	,0655
	Coeff	Se	T	P	LLCI	ULCI
constant	4,6275	1,4821	3,1222	,0028	1,6607	7,5944
GreenEnv	-,5279	,5242	-1,0070	,3181	-1,5772	,5214
Political	-,2937	,4114	-,7139	,4781	-1,1172	,5298
Int_1	,1718	,1414	1,2148	,2294	-,1113	,4548

Model summary – Vehicle affordability						
R	R-sq	MSE	F	Df1	Df2	p
,2970	,0882	,3134	1,8707	3,0000	58,0000	,1446
	Coeff	Se	T	P	LLCI	ULCI
constant	1,8133	1,1832	1,5326	,1308	-,5551	4,1816
GreenEnv	,5582	,4001	1,3953	,1683	-,2426	1,3590
GovTaxLev	,4851	,3443	1,4091	,1642	-,2040	1,1743
Int_1	-,1237	,1145	-1,0806	,2843	-,3528	,1054

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4225	,1785	,3060	4,2017	3,0000	58,0000	,0093
	Coeff	Se	T	P	LLCI	ULCI
constant	,2387	1,3371	1,1785	,8589	-2,4378	2,9153
TechEnv	1,2047	,5457	2,2075	,0313	,1123	2,2971
GovChall	,7159	,3719	1,9252	,0591	-,0285	1,4602
Int_1	-,2518	,1503	-1,6756	,0992	-,5526	,0490

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4574	,2092	,2946	5,1145	3,0000	58,0000	,0033
	Coeff	Se	T	P	LLCI	ULCI
constant	2,9419	1,9251	1,5281	,1319	-,9117	6,7955
TechEnv	-,2569	,7791	-,3298	,7428	-1,8166	1,3027
Economic	-,0217	,4522	-,0479	,9620	-,9269	,8836
Int_1	,1288	,1814	,7101	,4805	-,2343	,4919

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4885	,2387	,2874	5,9563	3,0000	58,0000	,0013
	Coeff	Se	T	P	LLCI	ULCI
constant	,8555	1,3642	,6271	,5331	-1,8763	3,5874
TechEnv	,6542	,5219	1,2535	,2151	-,3909	1,6994
Manufactur	,5514	,3601	1,5311	,1313	-,1698	1,2725
Int_1	-,1042	,1341	-,7768	,4405	-,3727	,1644

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4379	,1917	,3011	4,5857	3,0000	58,0000	,0060
	Coeff	Se	T	P	LLCI	ULCI
constant	-,2399	2,4367	-,0985	,9219	-5,1176	4,6378
TechEnv	1,0427	,9389	1,1106	,2713	-,8366	2,9221
CovidChall	,6960	,5522	1,2603	,2126	-,4094	1,8014
Int_1	-,1686	,2111	-,7986	,4278	-,5912	,2540

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4208	,1771	,3065	4,1595	3,0000	58,0000	,0098
	Coeff	Se	T	P	LLCI	ULCI
constant	3,7993	1,1643	3,2632	,0018	1,4687	6,1299
TechEnv	,1517	,4626	,3278	,7442	-,7744	1,0777
Political	-,3505	,3291	-1,0652	,2912	-1,0093	,3082
Int_1	,0659	,1264	,5213	,6041	-,1872	,3190

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,5251	,2757	,2698	7,3590	3,0000	58,0000	,0003
	Coeff	Se	T	P	LLCI	ULCI
constant	1,7004	,9363	1,8161	,0745	-,1738	3,5746
TechEnv	,4131	,3635	1,1364	,2604	-,3145	1,1407
GovTaxLev	,3467	,2914	1,1896	,2390	-,2367	,9301
Int_1	-,0337	,1125	-,2995	,7656	-,2588	,1914

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,3286	,1080	,3323	2,3398	3,0000	58,0000	,0827
	Coeff	Se	T	P	LLCI	ULCI
constant	2,4249	2,0786	1,1666	,2481	-1,7359	6,5856
DigitalEnv	,2326	,5105	,4557	,6503	-,7893	1,2545
GovChall	,0086	,5930	,0146	,9884	-1,1784	1,1957
Int_1	,0135	,1421	,0949	,9248	-,2709	,2978

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4018	,1615	,3123	3,7229	3,0000	58,0000	,0162
	Coeff	Se	T	P	LLCI	ULCI
constant	4,8407	3,2701	1,4803	,1442	-1,7051	11,3865
DigitalEnv	-,5947	,8513	-,6986	,4876	-2,2987	1,1093
Economic	-,5236	,8053	-,6502	,5181	-2,1356	1,0884
Int_1	,1936	,2055	,9550	,3435	-,2151	,6077

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,5047	,2547	,2813	6,4930	3,0000	57,0000	,0007
	Coeff	Se	T	P	LLCI	ULCI
constant	-2,1603	2,1239	-1,0171	,3134	-6,4133	2,0928
DigitalEnv	1,1491	,5138	2,2366	,0292	,1203	2,1779
Manufactur	1,3296	,5672	2,3441	,0226	,1938	2,4653
Int_1	-,2520	,1340	-1,8815	,0650	-,5203	,0162

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,3860	,1490	,3170	3,3846	3,0000	58,0000	,0240
	Coeff	Se	T	P	LLCI	ULCI
constant	2,9151	3,7825	,7707	,4440	-4,6565	10,4868
DigitalEnv	-,0917	,9324	-,0953	,9244	-2,0182	1,8349
CovidChall	-,0768	,8718	-,0881	,9301	-1,8219	1,6683
Int_1	,0782	,2195	,3564	,7228	-,3611	,5176

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,3797	,1441	,3188	3,2559	3,0000	58,0000	,0279
	Coeff	Se	T	P	LLCI	ULCI
constant	1,9427	1,9774	,9825	,3299	-2,0155	5,9010
DigitalEnv	,5412	,4820	1,1229	,2661	-,4236	1,5061
Political	,0939	,5913	,1588	,8744	-1,0897	1,2775
Int_1	,0608	,1422	-,4277	,6704	-,3455	,2239

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4842	,2345	,2852	5,9213	3,0000	58,0000	,0014
	Coeff	Se	T	P	LLCI	ULCI
constant	2,4702	1,6815	1,4691	,1472	-,8957	5,8362
DigitalEnv	,0855	,4250	,2013	,8412	-,7652	,9363
GovTaxLev	,0502	,4979	,1008	,9201	-,9465	1,0469
Int_1	,0486	,1237	,3925	,6962	-,1991	,2962

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,3016	,0910	,3386	1,9349	3,0000	58,0000	,1340
	Coeff	Se	T	P	LLCI	ULCI
constant	1,4857	1,9379	,7666	,4464	-2,3935	5,3649
GreenEnv	,6035	,6941	,8694	,3882	-,7860	1,9929
GovChall	,3854	,5283	,7294	,4687	-,6722	1,4430
Int_1	-,1027	,1861	-,5519	,5831	-,4753	,2698

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,3985	,1588	,3134	3,6491	3,0000	58,0000	,0176
	Coeff	Se	T	P	LLCI	ULCI
constant	,2557	2,4839	,1030	,9184	-4,7164	5,2279
GreenEnv	,7339	,8613	,8521	,3977	-,9902	2,4581
Economic	,6306	,5639	1,1184	,2680	-,4981	1,7594
Int_1	-,1204	,1934	-,6227	,5359	-,5075	,2667

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4427	,1960	,3035	4,6322	3,0000	57,0000	,0057
	Coeff	Se	T	P	LLCI	ULCI
constant	,5982	1,9533	,3063	,7605	-3,3131	4,5096
GreenEnv	,6711	,7029	,9548	,3437	-,7364	2,0786
Manufactur	,6468	,4795	1,3490	,1827	-,3133	1,6070
Int_1	-,1275	,1697	-,7517	,4553	-,4673	,2122

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4619	,2133	,2930	5,2428	3,0000	58,0000	,0029
	Coeff	Se	T	P	LLCI	ULCI
constant	-5,5780	3,1266	-1,7840	,0796	-11,8366	,6806
GreenEnv	2,6367	1,0203	2,5843	,0123	,5944	4,6790
CovidChall	1,8951	,6931	2,7341	,0083	,5076	3,2826
Int_1	-,5343	,2240	-2,3848	,0204	-,9828	-,0858

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,4439	,1971	,2991	4,7447	3,0000	58,0000	,0050
	Coeff	Se	T	P	LLCI	ULCI
constant	6,4773	1,4704	4,4051	,0000	3,5340	9,4207
GreenEnv	-,8363	,5201	-1,6082	,1123	-1,8733	,2047
Political	-1,0952	,4081	-2,6835	,0095	-1,9122	-,2783
Int_1	,3214	,1403	2,2912	,0256	,0406	,6022

Model summary – Internal vehicle cost						
R	R-sq	MSE	F	Df1	Df2	p
,5246	,2752	,2700	7,3419	3,0000	58,0000	,0003
	Coeff	Se	T	P	LLCI	ULCI
constant	-,1032	1,0981	-,0940	,9254	-2,3013	2,0948
GreenEnv	,9826	,3173	2,6463	,0105	,2393	1,7258
GovTaxLev	,9289	,3195	2,9069	,0052	,2892	1,5685
Int_1	-,2306	,1062	-2,1713	,0340	-,4433	-,0180

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	p
,4033	,1626	,4215	3,7551	3,0000	58,0000	,0156
	Coeff	Se	T	P	LLCI	ULCI
constant	2,3459	1,5693	1,4949	,1404	-,7953	5,4871
TechEnv	,3507	,6405	,5475	,5861	-,9314	1,6328
GovChall	-,0228	,4364	-,0522	,9585	-,8964	,8508
Int_1	,0239	,1764	,1356	,8926	-,3291	,3770

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	p
,4234	,1792	,4131	4,2220	3,0000	58,0000	,0091
	Coeff	Se	T	P	LLCI	ULCI
constant	1,6909	2,2798	,7417	,4613	-2,8728	6,2545
TechEnv	,4065	,9227	,4405	,6612	-1,4405	2,2535
Economic	,1483	,5356	,2770	,7828	-,9237	1,2204
Int_1	,0035	,2148	,0163	,9871	-,4265	,4335

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4991	,2491	,3829	6,3037	3,0000	57,0000	,0009
	Coeff	Se	T	P	LLCI	ULCI
constant	,4195	1,5748	,2664	,7909	-2,7339	3,5729
TechEnv	,7537	,6025	1,2511	,2160	-,4527	1,9602
Manufactur	,5337	,4157	1,2840	,2043	-,2986	1,3661
Int_1	,0980	,1548	-,6331	,5292	-,4080	,2120

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4799	,2303	,3874	5,7863	3,0000	58,0000	,0016
	Coeff	Se	T	P	LLCI	ULCI
constant	-3,0095	2,7640	-1,0888	,2807	-8,5423	2,5233
TechEnv	2,7113	1,0650	2,5459	,0136	,5796	4,8431
CovidChall	1,1895	,6264	1,8989	,0626	-,0644	2,4433
Int_1	-,5117	,2395	-2,1366	,0369	-,9911	-,0323

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4129	,1705	,4175	3,9732	3,0000	58,0000	,0121
	Coeff	Se	T	P	LLCI	ULCI
constant	2,3672	1,3588	1,7421	,0868	-,3527	5,0871
TechEnv	,2770	,5399	,5130	,6099	-,8038	1,3577
Political	-,0102	,3841	-,0267	,9788	-,7790	,7586
Int_1	,0385	,1475	,2607	,7953	-,2569	,3338

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4415	,1950	,4052	4,6819	3,0000	58,0000	,0054
	Coeff	Se	T	P	LLCI	ULCI
constant	,5774	1,1474	,5032	,6167	-1,7194	2,8743
TechEnv	1,0351	,4455	2,3236	,0237	-,1434	1,9268
GovTaxLev	,5475	,3572	1,5327	,1308	-,1675	1,2624
Int_1	-,1936	,1378	-1,4046	,1655	-,4694	,0823

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,3580	,1281	,4388	2,8416	3,0000	58,0000	,0456
	Coeff	Se	T	P	LLCI	ULCI
constant	3,9745	2,3887	1,6639	,1015	-,8070	8,7561
DigitalEnv	-,1004	,5867	-,1711	,8648	-1,2747	1,0740
GovChall	-,6172	,6815	-,9056	,3689	-1,9814	,7470
Int_1	,1414	,1633	,8664	,3899	-,1854	,4682

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,3497	,1223	,4418	2,6944	3,0000	58,0000	,0543
	Coeff	Se	T	P	LLCI	ULCI
constant	3,9079	3,8890	1,0049	,3191	-3,8767	11,6926
DigitalEnv	-,2099	1,0124	-,2073	,8365	-2,2364	1,8166
Economic	-,4758	,9577	-,4968	,6212	-2,3928	1,4413
Int_1	,1377	,2444	,5635	,5753	-,3516	,6270

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4440	,1971	,4094	4,6655	3,0000	58,0000	,0055
	Coeff	Se	T	P	LLCI	ULCI
constant	1,8989	2,5622	,7411	,4617	-3,2318	7,0297
DigitalEnv	,1204	,6198	,1942	,8467	-1,1207	1,3615
Manufactur	,1074	,6842	,1570	,8758	-1,2627	1,4776
Int_1	,0419	,1616	,2592	,7964	-,2817	,3655

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,3999	,1599	,4228	3,6809	3,0000	58,0000	,0170
	Coeff	Se	T	P	LLCI	ULCI
constant	-2,9906	4,3685	-,6846	,4963	-11,7353	5,7540
DigitalEnv	1,8314	1,1116	1,6476	,1048	-,3937	4,0564
CovidChall	1,0892	1,0069	1,0818	,2838	-,9262	3,1047
Int_1	-,3238	,2535	-1,2776	,2065	-,8312	,1835

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4076	,1662	,4197	3,8525	3,0000	58,0000	,0139
	Coeff	Se	T	P	LLCI	ULCI
constant	4,9141	2,2688	2,1659	,0344	,3725	9,4557
DigitalEnv	-,4646	,5530	-,8401	,4043	-1,5716	,6424
Political	-,8955	,6784	-1,3199	,1920	-2,2535	,4625
Int_1	,2478	,1632	1,5183	,1344	-,0789	,5744

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,3576	,1279	,4390	2,8355	3,0000	58,0000	,0459
	Coeff	Se	T	P	LLCI	ULCI
constant	,1379	2,0862	,0661	,9475	-4,0382	4,3140
DigitalEnv	,7967	,5273	1,5109	,1362	-,2588	1,8523
GovTaxLev	,5453	,6178	,8828	,3810	-,6912	1,7819
Int_1	-,1289	,1535	-,8398	,4045	-,4361	,1783

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,2320	,0538	,4762	1,0997	3,0000	58,0000	,3566
	Coeff	Se	T	P	LLCI	ULCI
constant	1,9313	2,2983	,8403	,4042	-2,6692	6,5319
GreenEnv	,4637	,8232	,5633	,5754	-1,1841	2,1115
GovChall	,1966	,6266	,3138	,7548	-1,0576	1,4509
Int_1	-,0603	,2207	-,2732	,7856	-,5021	,3815

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,2713	,0736	,4663	1,5366	3,0000	58,0000	,2147
	Coeff	Se	T	P	LLCI	ULCI
constant	2,7188	3,0300	,8973	,3733	-3,3465	8,7840
GreenEnv	-,0313	1,0507	-,0297	,9764	-2,1344	2,0719
Economic	,0081	,6879	,0118	,9907	-1,3688	1,3850
Int_1	,0569	,2359	,2412	,8103	-,4153	,5291

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,4106	,1686	,4240	3,8519	3,0000	58,0000	,0140
	Coeff	Se	T	P	LLCI	ULCI
constant	4,1267	2,3087	1,7874	,0792	-,4965	8,7499
GreenEnv	-,7157	,8308	-,8615	,3926	-2,3794	,9479
Manufactur	-,2560	,5668	-,4517	,6532	-1,3909	,8789
Int_1	,2085	,2005	1,0397	,3028	-,1931	,6101

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,2562	,0657	,4703	1,3585	3,0000	58,0000	,2645
	Coeff	Se	T	P	LLCI	ULCI
constant	,3934	3,9609	,0993	,9212	-7,5353	8,3221
GreenEnv	1,1304	1,2925	,8746	,3854	-1,4569	3,7177
CovidChall	,4828	,8781	,5498	,5846	-1,2750	2,2405
Int_1	-,1915	,2838	-,6746	,5026	-,7596	,3767

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,2633	,0693	,4684	1,4401	3,0000	58,0000	,2404
	Coeff	Se	T	P	LLCI	ULCI
constant	2,7602	1,8402	1,5000	,1390	-,9234	6,4437
GreenEnv	,0536	,6508	,0823	,9347	-1,2493	1,3564
Manufactur	,0044	,5108	,0086	,9932	-1,0180	1,0268
Int_1	,0417	,1756	,2373	,8133	-,3098	,3931

Model summary – Vehicle demand						
R	R-sq	MSE	F	Df1	Df2	P
,2534	,0642	,4710	1,3267	3,0000	58,0000	,2745
	Coeff	Se	T	P	LLCI	ULCI
constant	1,5563	1,4504	1,0730	,2877	-1,3471	4,4597
GreenEnv	,5574	,4904	-1,1366	,2604	-,4243	1,5392
Manufactur	,3325	,4221	,7879	,4340	-,5123	1,1774
Int_1	-,0946	,1403	-,6742	,5028	-,3754	,1863

UNISA RESEARCH ETHICS REVIEW COMMITTEE

29 October 2020

ERC Reference #: 2020_CEMS_BM_105
Name: Mr Faizal Khan
Student #: 41025636
Staff # N/A

Dear Mr Faizal Khan

Decision: Ethics approval from 29 October 2020 to 28 October 2025

Researcher(s): Mr Faizal Khan
E-mail address: Faizalkhan02@outlook.com
Telephone #: 083 2468 901

Supervisor(s): Prof JW Strydom
E-mail: Jwstrydom52@gmail.com
Tel: 082 449 7506

Co-supervisor: Dr N Lamprecht
E-mail address: norman@naamsa.co.za
Telephone #: Tel: 082 829 1692

Working title of research:

Growth opportunities for the domestic new light vehicle market in South Africa

Qualification: PhD degree

Thank you for the application for research ethics clearance by the UNISA Research Ethics Review Committee for the above-mentioned research. Ethics approval is granted for 5 years.

*The **low risk application** was reviewed by a Sub-committee of URERC on 28 October 2020 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment. The decision will be tabled at the next Committee meeting on 11 November 2020 that this application was approved on 28 October 2020.*

The proposed research may now commence with the provisions that:

Linda van den Berg
Professional Language Practitioner
PO Box 3092
Lichtenburg
2740

Cell: +27 (64) 901-9304

Email: lindaberg.lvdb@gmail.com

Dear Mr Khan

This letter is to record that I have completed a language and technical edit of your thesis entitled: **"Growth opportunities for the domestic new light vehicle market in South Africa."**

The edit that I carried out included the following:

- Spelling
- Grammar
- Vocabulary
- Punctuation
- Pronoun matches
- Preposition matches
- Word usage
- Sentence structure
- Correct abbreviations and acronyms (matching your supplied list)
- Formatting
- Captions and labels for figures and tables
- Checking most in-text references
- Bibliography
- Appendices' text
- Technical specifications (as provided by you)

The edit that I carried out excluded the following:

- Content
- Correctness or truth of information (unless obvious)
- Correctness/spelling of specific technical terms and words (unless obvious)
- Correctness/spelling of unfamiliar names and proper nouns (unless obvious)
- Correctness of formulae or symbols, or illustrations.

Yours sincerely

Lvdberg

Linda van den Berg

10 February 2023