

**DETERMINANTS OF BANK PROFITABILITY: AN EMPIRICAL  
STUDY OF SOUTH AFRICAN BANKS**

**By**

**KIZA MICHEL KANA**

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**Supervisor: Prof Daniel Makina**

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# DECLARATION

Name: **KIZA MICHEL KANA**

Student number: **47-221-283**

Degree: **Masters**

## **DETERMINANTS OF BANK PROFITABILITY: AN EMPIRICAL STUDY OF SOUTH AFRICAN BANKS**

I declare that the above dissertation 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.

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**Signature**

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**Date**

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## **DEDICATION**

**This study is dedicated to my father, KIZA SHEBABO NESTOR, my mother, BEMBELEZA EVA, my sisters VUMILIA KIZA, DADA KIZA and SUBIRA KIZA, my uncles MANGAIKO ZAINDA, Dr KASHINDI MULOLWA, and late father MUKUBUKA NAKAHINI for their effort to prepare me toward my academic pursuits.**

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## **ABSTRACT**

The role that banks as key intermediaries play in the modern economy activities is unquestionable, it is admitted that banks remain one of the key financial intermediaries that provide a variety of services in the economy of every state. However, not all financial intermediaries have a significant impact on modern economies, only a stable and profitable banking sector can adequately play the role of financial intermediary in economy. The bank, as an intermediary in the modern economy must be profitable, and this profitability depends on a number of factors that are referred to in this study as determinants of bank profitability.

The effect of internal and external determinants of the bank profitability in South Africa is the main focus of this study. It utilized annual time series internal and external data for the period 2001 to 2013.

Quantitative approach methodology using secondary data and panel data technique to measure the impact of the determinants was used in the study. The sample consists of nine banks, followed for 12 years and sampled annually.

The results for bank-specific consist of four statistically significant variables such as bank size, non-interest income and non-interest expense and credit risk and four non-significant variables (equity capital, loan, saving deposit, fixe term deposit) also the industry-specific consist only one significant variable (market concentration) while macro-economic determinants consist of three non-significant variables (economic growth, inflation, and lending interest rate).

In conclusion, the empirical result shows that the bank specific factors are directly controlled by the Management thereby it has a positive correlation to the bank profitability while the industry specific (market concentration) also positively affects the bank profitability. However, the macroeconomic variables which are beyond the scope of management control were non-significant to profitability but show positive sign. Therefore, the variables which are significant affect positively the bank profitability, and the non-

significant variables affect the bank profitability negatively. The findings were consistent with mixed results found in prior literature.

***KEY WORDS:***

**Bank Profitability, South African banking sector, internal and external determinants on profitability, financial intermediary, performance, efficiency, market structure approach, regression analysis, panel data, business cycle.**

## ABBREVIATIONS

ATM(s)	Automatic Teller Machine(s)
BHCs	Bank Holding Companies
Cap	Equity Capital
CPI	Consumer Price Inflation
CR	Credit Risk
DEA	Data Envelopment Approach
GDPG	Economic growth
EU	European Union
FHCs	Financial Holding Companies
GDP	Gross Domestic Product
GDPG	Gross Domestic Product Growth
GLBA	Gramm-Leach-Bliley
GMM	Generalised Method of Moments
JBAR	Common acronym for the Johannesburg Inter-Bank Agreed Rate.
H-H Index	Herfindahl-Hirschman Index
INF	Inflation
IR	Interest Rate
ISD	Industry Specific Determinants
KOPBs	Kerala State of Old Private Sector Banks
L&A	Loans and Assets
INT	Lending interest rates
LFA	Loans Under Follow-up
LN	Bank Size
MENA	Middle-East & North Africa
NCD	Abbreviation for a negotiable certificate of deposit.
NIE	Non-Interest Expenditure
NII	Non-Interest Income

NIMs	Net Interest Margin(s)
OPB	Old Private Sector Bank
PL	Credit Risk
R&D	Research & Development
RI	Real Interest Rate
ROA	Return on Assets
ROAA	Return on Average Assets
ROAE	Return on Average Assets
ROC	Return on Capital
ROE	Return on Equity
R-WA	Risk-Weighted Assets
SEE	South Eastern European
S-C-P	Structure-Conduct-Performance
SGA	Sales General Administrative
S-P	Structure-Performance
TI	Total Income
UAE	United Arab Emirates
UK	United Kingdom
US	United States
USA	United States of America
WF	Working Fund

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# **CHAPTER 1**

## **INTRODUCTION AND BACKGROUND**

## 1.1 INTRODUCTION

Financial intermediaries play a pivotal role in the performance and operation of modern economic activities. Banks remain one of the key financial intermediaries in an economy, providing a variety of services. Therefore, the efficiency of financial intermediaries can have a significant impact on modern economies. A stable and profitable banking sector is able to resist negative shocks, and contributes to the stability of the financial system (Dietrich & Wanzenried, 2009:01). Consequently, identifying the key determinants of bank profitability has attracted the interest of academic researchers as well as bank managers. In addition, the study of bank performance becomes more important in view of financial development and economic crises, which can have a serious impact on the banking sector within a country.

According to Sufian and Habibullah (2009:208), the determinants of bank profitability can be divided into internal determinants (e.g. liquidity, capital adequacy and expense management), and external determinants (e.g. ownership and economic conditions). Javaid, Anwar and Gafoor (2011:61) asserted that although, in banking terms, determinants of profitability have been extensively researched, the definition of profitability differs among studies. Furthermore, they observed that in the past, researchers have attempted to investigate the determinants of profitability in the banking sector, but that some researchers only considered banking characteristics, whereas others also included the financial structure and macro-economic factors. According to Ali, Akhtar and Ahmed (2011:235), the significance of the profitability of banks can be observed at both the micro- and macro-levels of the economy. In this study, the focus will be on the determinants of bank profitability in South Africa, where there is a dearth of empirical evidence in this regard.

The determinants of bank profitability in recent studies typically measured profitability according to the Return on Assets (ROA) and/or Return on Equity (ROE) reported by a bank. The internal determinants originate from a bank-specific environment and are mainly influenced by a bank's management decisions and policy objectives, and could

therefore be referred to as micro-economic factors or bank-specific determinants of profitability. On the other hand, external determinants are variables reflecting the economic and legal environment that affects the operation and performance of banks in general. These internal and external factors contribute towards bank performance.

Against this backdrop, one can argue that research on determinants of bank profitability could play an essential role in identifying the factors that affect the profitability of banks. The findings of this study will benefit the fields of business management, bank management, financial markets and bank supervisors. Furthermore, it will shed light on how to incur minimal costs using best practices in terms of internal and external factors. In South Africa, such studies are limited in number, and most have not dealt specifically with the determinants of bank profitability (Meyer, 2002; Finlayson, 1997; Nokuthula, 2006; Oberholzer & Van der Westhuizen, 2004; Van Niekerk, 1990; KPMG, 1998; Natrass, 1989; O'Donnell & Westhuizen, 2002). Therefore, this study aims to fill this gap and add to the existing body of knowledge.

## **1.2 AN OVERVIEW OF NINE SOUTH AFRICAN COMMERCIAL BANKS**

This section examines the nine selected South African commercial banks. The following subheadings are used in order to obtain a good picture of the selected commercial banks: shareholder percentage, history of business, and nature of business.

### **1.2.1 ABSA BANK LTD**

#### *Shareholder Percentage*

According to Thomas (2012:65), the shares of ABSA Group Ltd are held as follows: Barclays Bank Plc- 55.5%; public investment corporation - 9.3%; Batho Bonke Capital (Ltd) - 3.9%.

### *History of business*

The Amalgamated Bank of South Africa (ABSA) was formed when Allied Bank, United Bank and Volkskas Bank merged in 1991. There was a subsequent merger with Bankorp (including Trust Bank and Bankfin) in 1992. The four commercial banks in the Absa Group, namely Allied Bank, Trust Bank, United Bank and Volkskas, traded under their original brand names for the first few years. Because the bank's customers and staff accepted the use of the ABSA brand, a decision was later taken to merge the four brands into one, namely the ABSA brand (Thomas, 2012:65).

### *Nature of Business*

Absa Bank Ltd is a banking group which offers a range of banking, wealth and wealth management products and services, primarily in South Africa. ABSA Bank Ltd's operations are conducted through 3 major business units: Retail Markets, Business Markets and Corporate, Investment Banking and Wealth (Thomas, 2012:65).

## 1.2.3 AFRICAN BANK LTD

### *Shareholder Percentage*

According to Thomas (2012:72), the shareholders of African Bank Investments Ltd are as follows: Government Employees Pension Fund- 12.4%; JP Morgan Asset Management – 10.2%; FIL Ltd – 5.2%; Directors – 5.0%; and Eyomhlaba Investment Holdings – 5.0%.

### *History of Business*

The African Bank of South Africa Ltd was established in July 1975. The name was changed to The African Bank Ltd in January 1978 and again in November 1999 to African Bank Ltd (Thomas, 2012:72).

### *Nature of Business*

African Bank Ltd is a registered bank and operates as a commercial retailer, also focusing on the field of small business development, advisory services and micro-lending. In the corporate division, money market and industrial leasing services are offered. The company has approximately 2.6 million customers and 643 branches. As at 31 December 2011, African Bank's total assets amounted to R50bn (Thomas, 2012:72).

### 1.2.3 CAPITEC BANK LTD

#### *Shareholder Percentage*

According to Thomas (2012:78), the shareholders in Capitec Bank Holdings Ltd are as follows: PSG Financial Services Ltd – 32.55%; Limietberg Baleggings (Pty) Ltd – 10.47%; Public Investment Corporation SOC Ltd – 7.73%; Coral Lagoon Investments 194 (Pty) Ltd – 4.75%; Thembeke Capital Ltd -3.50%; Ms NS Mjoli-Mncube – 0.11%; and Mr MC Mehl – 0.04%.

#### *History of Business*

Capitec Bank Ltd was established on 1 March 2001 through a restructuring process, in terms of which it capitalised and acquired the Business Bank Ltd as a subsidiary, in order to obtain bank license. The Business Bank was incorporated on 1 May 1980 as H & J Wire Industries Properties (Pty) Ltd. It was converted into a public company and its name changed to TBB Bank Ltd on 19 January 1999, and then to The Business Bank Ltd on 28 September 1999. The name of the company was changed to Capitec Bank Ltd in May 2001. Capitec Bank Ltd is a wholly-owned subsidiary of Capitec Bank Holdings Ltd. The latter company was listed on the JSE on 18 February 2002 (Thomas, 2012:78).

#### *Nature of Business*

Capitec Bank Ltd provides retail banking services in South Africa. The company offers daily savings accounts, fixed-term savings plans, personal and multi-loans, money management services, merchant terminals, salary transfers, workplace banking services, branch banking and internet banking services, ATM and point-of-sale transactions, mobile

banking, and debit cards. Capitec Bank has partnerships in 2 076 automated teller machines, 507 branches and approximately 3.7 million clients. As at 29 February 2012, the Capitec group's total assets amounted to 23.6bn (Thomas, 2012:78).

#### 1.2.4 FIRSTRAND BANK LTD

##### *Shareholder Percentage*

According to Thomas (2012:83), shares in FirstRand Ltd are held as follows: RMB Holdings Ltd – 33.89%; Public Investment Corporation Ltd – 12.03%; FRET Trust – 8.13%; and Remgro – 4%.

##### *History of Business*

First Rand Bank Ltd was registered in January 1929 and started operating immediately. The FirstRand group was established in 1998 as a result of the merging of the financial service interests of Anglo American Corporation of South Africa Ltd and R.M.B Holdings Ltd. The major companies involved at that time were the listed entities, namely First National Bank Holdings of Southern Africa Ltd and the Southern Life Association Ltd, Momentum Assurers Ltd, Discovery Health Ltd and Rand Merchant Bank Ltd, which was controlled by RMBH. FirstRand Bank Ltd became the major operating subsidiary under which various companies were divided, including First National Bank of Southern Africa Ltd, which was utilised for the incorporation of these divisions, with its name being changed to FirstRand Bank Ltd. FirstRand Bank launched its Shari'ah-compliant Islamic Finance service in 2005 (Thomas, 2012:83).

##### *Nature of Business*

FirstRand Bank Ltd is an integrated financial service group, providing a comprehensive range of products and services to the South African market, as well as niche products in certain international markets. FNB Islamic Finance offers Shari'ah-compliant products, including cheque accounts, debit cards, youth accounts and personal loans, home loans,

including fixed 20-year mortgage bonds, vehicle and asset finance up to six years, and commercial property loans. FNB offers Shari'ah-compliant vehicle finance through Wesbank. It also offers short-term insurance products to clients (Thomas, 2012:83).

#### 1.2.5 GBS MUTUAL BANK

##### *History of Business*

GBS Mutual Bank was established in 1877.

##### *Nature of Business*

The GBS Mutual Bank operates as a commercial bank, with a focus on asset based finance and investments. The bank offers savings accounts, transmission accounts, fixed period shares, permanent shares, subscription shares, short-term fixed deposits, long-term fixed deposits, mortgage bonds and loans. GBS Mutual Bank has approximately 12 000 clients, but does not have automated teller machines. As at 31 March 2012, GBS Mutual Bank's total assets amounted to R19.6m (Thomas, 2012:86).

#### 1.2.6 HBZ BANK LTD

##### *Shareholder Percentage*

Habib Bank AG (Zurich) holds one hundred percent of the shares.

##### *History of Business*

HBZ Bank Ltd was registered on 3 July 1995 by the Swiss-based banking group, Habib Bank AG (Thomas, 2012:93).

##### *Nature of Business*

HBZ Bank Ltd offers Shari'ah-compliant Islamic Banking products and services through its Islamic Banking branch. Products offered include savings, fixed deposit or current accounts, and access to business, equipment, vehicle and property financing. The Islamic Banking Division is not allowed to charge or pay interest on financing or deposits, or transact in investments or businesses involving alcohol, gambling or other activities which are not acceptable according to Islam. As at 31 December 2011, HBZ Bank Ltd's total assets amounted to R3.5bn (Thomas, 2012:93).

### 1.2.7 MERCANTILE BANK LTD

#### *Shareholder Percentage*

Mercantile Bank Holdings Ltd (Held by Caixa General de Depositos SA (Portugal) holds 91.75% of the bank's shares (Thomas, 2012:102).

#### *History of Business*

Mercantile Bank Ltd was established in 1987 and obtained a banking licence in 1989. Mercantile Bank Holdings Ltd was incorporated in January 1989 as the holding company of the bank, and changed its name to Mercantile Lisbon Bank Holdings Ltd (MLBH) in 1996. In 1995, the bank merged with the Bank of Lisbon International (BLI) (established in 1965) and Caixa General de Depositos S.A, a state-owned bank, which acquired a 27% interest in MLBH through its subsidiary Banco Nacional Ultramarino SA. In August 1998, Mercantile Lisbon Bank Holdings Ltd was listed on the JSE. Caixa Geral de Depositos S.A injected R120m capital into the bank in March 2002, thereby assuming control of Mercantile Lisbon Bank Holdings Ltd with a 64.8% interest. A recapitalisation of the group via a rights offer injected primary capital of R555m (September 2004), resulting in Caixa General de Depositos S. A's holdings increasing from 64.8% to 91.75% in 2005. The name of MLBH was changed to Mercantile Bank Holding Ltd (Thomas, 2012:102).

Mercantile Bank Ltd operates as a registered bank and provides a range of international and domestic banking services. It operates in selected business, commercial, corporate and alliance banking niches, in which it offers banking, financial and investment services (Thomas, 2012:102).

#### 1.2.8 NEDBANK LTD

##### *Shareholder Percentage*

Nedbank Group Ltd is held by Old Mutual Life Assurance Company (SA) Ltd and Associates (SA) – 51.86%; and Government Employees Pension Fund (SA) – 8.52% (Thomas, 2012:104).

##### *History of Business*

Nedcor Bank Ltd was established in Amsterdam on 6 April 1888 as Nederlandsche Bank en Credietvereening, and opened its first office in Pretoria on 1 August 1888.

##### *History of Business*

Nederlandsche Bank en Credietvereeninging changed its name to Nederlandsche Bank Voor Zuid-Africa, which was registered in 1951 as Netherlandes Bank of South Africa Ltd. By 1969, South African shareholding had increased to 100%, and in 1971, Netherlands Bank of South Africa Ltd had its name changed to Nedbank Ltd. In 1989, Nedbank subsequently underwent a name change to Nedcor Bank Ltd, making Nedbank a division of Nedcor Bank Ltd. However, in 2002, Nedcor Bank Ltd changed its name again to Nedbank Ltd, following the acquisition of BOE by Nedcor Ltd, which was effective as at 11 July 2002, and was delisted from the JSE. The legal entity was merged with the Nedcor

Group on 1 January 2003. The assets, liabilities and operations were transferred to Nedbank Ltd (a previously dormant entity) and People's Bank Ltd. In December 2003, restructuring within the group resulted in the technology and operations division being split into two divisions, namely the Group Operations Division and Group Business Innovations Technology Division (Thomas, 2012:106).

#### *Nature of Business*

Nedbank Ltd is a registered bank which, through its divisions and subsidiaries, offers a range of banking and financial services, including internet banking, cell phone banking and telephone banking. Go Banking facilities are offered through a debit card and funds can be accessed at Pick 'n Pay stores, Nedbank or through the Go Banking call centre (Thomas, 2012:123).

#### 1.2.9 STANDARD BANK OF SOUTH AFRICA LTD (THE)

##### *Shareholder Percentage*

Thomas (2012:121) states that the shareholders are as follows: Industrial and Commercial Bank of China – 20.1%; Public Investment Corporation Ltd – 13.4%; Tutuwa participants - 5.6% (Staff – 2.2%; Strategic partners – 2.3%; communities and regional business – 1.1%); Dodge & Cox – 3.0%; Old Mutual Group – 2.0%; Investment Solutions Ltd – 1.7%; Sanlam Group – 1.6%; Vanguard Corporation – 1.0%; Dimensional Emerging Markets Value Fund – 0.9%.

##### *History of Business*

The Standard Bank of South Africa Ltd (SBSA) was formed and registered in March 1962 as an African company, operating as a subsidiary of Standard Bank in London (subsequently becoming Standard Chartered Bank Pls). Standard Bank Group Ltd was incorporated into the holding company of SBSA. Standard Chartered Bank Plc sold its

39% stake in Standard Bank in 1987, transferring complete ownership of the holding company to South Africa (Thomas, 2012:122).

### *Nature of Business*

The Standard Bank of South Africa Ltd (SBSA) operates as a registered commercial bank. The company offers a full range of financial services, ranging from home loans to electronic banking, which operate through various divisions, such as the Card Division; community banking services; home loans and corporate services. Standard Bank, through its direct banking profile, includes internet access, as well as telephone and cell phone banking services, after registration. The company currently has 703 branches and loan centres and more than 9.8 million retail and business banking customers. As at 31 December 2011, the Standard Bank of South Africa's total assets amounted to R921.7bn (Thomas, 2012:122).

### **1.3 The Research Problem**

Bank profitability can be appraised at both the micro and macro levels of the economy. At the micro level, profit is the essential prerequisite for a competitive bank, and the cheapest source of funds. It is not merely a result, but also a necessity for successful banking in a period of growing competition in financial markets. Therefore, the basic aim of a bank's management is to make profit, as it is the essential requirement for conducting any business (Bobáková, 2003: 21). At the macro level, a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. The importance of bank profitability at both micro- and macro-levels has compelled researchers, academics, bank management and bank regulatory authorities to develop considerable interest in the factors that determine bank profitability (Athanasoglou, Brissimis & Delis, 2005:5).

Studies have been conducted on determinants of bank profitability, focusing on bank-specific and macro-economic indicators of profitability, within the United States of America (USA), Europe and Asia, as well as a few studies in African countries. However, authors such as Oberholzer and Westhuizen (2004); Kromhout (1988); Van der Westhuizen (1989); Van Niekerk (1990); and Van Gend (1994) focused on various performance measures in the South African banking sector, but none of them examined the determinants of bank profitability in any detail. Therefore, this study intends to examine the internal determinants (including size, capital adequacy, provisioning policy, expense management, deposits, liquidity, etc.) and external determinants (economic growth, inflation market and interest rate) with regard to profitability within banks. In addition, factors such as non-interest income (NII), non-interest expense (NIE), and industry-specific determinants (ISD) will be considered in this study. However, this type of study (including NII, NIE and ISD) has not yet been extensively conducted in the South African context. It is envisaged that research on the determinants of bank profitability in South Africa will make a significant contribution towards the existing literature on bank profitability.

#### **1.4 Objectives of the Study**

The main objective of the study is to examine the determinants of bank profitability in South Africa.

##### **1.4.1 Specific objectives of the study**

The specific objectives of the study are to:

- Examine the effect of bank-specific variables (such as equity capital, bank size (LN), loan, saving deposit, fixed term deposits, NII, NIE, and credit risk [CR]) on the profitability of South African banks,
- Analyse the effect of industry-specific variables (such as concentration) on the profitability of South African banks, and
- Analyse the effect of macro-economic variables (such as Gross Domestic Product (GDP) growth; inflation (INF); and interest rates (INT)) on the profitability of South African banks.

## **1.5 Significance of the Study**

The study of bank profitability becomes more important in view of the ongoing financial and economic crises, which have a fundamental impact on the banking industry in many countries around the world. Despite numerous international studies having been conducted on determinants of bank profitability, research of this nature in the South African context is very limited in terms of making a contribution. This study contributes to the literature on the determinants of bank profitability, by specifically focusing on the South African banking context. From a theoretical perspective, this study contributes to the expanding body of research conducted on determinants of bank profitability. From a practical viewpoint, the results of the study will give useful insights into the country's banking sector. Banks will be able to determine the importance of identified variables and use them as inputs in their policies. Thus, the soundness of financial systems, especially the banking system, is a key part of the organisation for strong macro-economic and monetary policy performance at the national level. Therefore, this study will contribute by highlighting new perspectives regarding how banks could become more competitive, by making a profit in order to sustain economic development within the country.

## **1.6 Scope of the Study**

The determinants of bank profitability discussed in this study are those which are currently used in conventional banking studies and literature. Therefore, the empirical part of the study was conducted by selecting a sample from South African banks. The sample which was purposely chosen comprises the four largest banks in the country, representing 85% of the banking market share. The data on each of the specified dependent and independent variables were obtained from the financial statements of the sample units.

The data which was collected in the study consists of an annual time-series from the balance sheets, as well as income and loss statements, of the listed banks during the period 2001-2013. The data sources include databases such as Bankscope (Bureau Van Dijk) (for bank-specific data), Business Monitor International (for macro-economic data),

and the South African Reserve Bank (list of South African banks according to the nature of their ownership).

There are 13 banks in South Africa that are listed in the Bureau Van Dijk database. The study is limited to the analysis of 9 of these banks, namely Absa Bank Ltd, FirstRand Bank Ltd, Nedbank Group Ltd, Standard Bank, Capitec, African Bank, GBS Mutual Bank, HBZ Bank Ltd, and Mercantile Bank Holdings Ltd. This was considered to be a sufficient sample for this study.

## **1.7 LIMITATIONS OF THE STUDY**

The results of this study are not without limitations. The data was affected by missing data for certain years. This issue was resolved by focusing on banks with complete data, and by imputing data for some of the variables.

## **1.8 CHAPTER OUTLINE**

### *Chapter 1: Introduction*

This chapter provides a background of the research problem and outlines the objectives of the study.

### *Chapter 2: Overview of the South African Banking Sector*

This chapter discusses the makeup of the South African banking sector.

### *Chapter 3: Literature Review*

This chapter reviews literature related to the issues of bank profitability and its determinants. It also discusses empirical studies that have been carried out and evaluates the results.

### *Chapter 4: Research Methodology*

This chapter describes the collection of data and the research techniques used for the study.

### *Chapter 5: Data Analysis and Discussion of Results*

The chapter presents data analysis and results and discusses the findings.

*Chapter 6: Conclusion and Recommendations*

This chapter evaluates the theory and practice as explained in the preceding chapters. It summarises the determinants of bank profitability in South Africa.

## **CHAPTER 2**

# **THEORY OF FINANCIAL INTERMEDIATION AND OVERVIEW OF THE SOUTH AFRICAN BANKING SECTOR**

## **2.1 INTRODUCTION**

This chapter presents the theory framework patterns on financial intermediary and overview of the South African banking sector on bank profitability. Firstly, a

comprehensive literature and theory analysis of financial intermediation will be used to conceptualise the two dimensions of the financial intermediation theory such as perceived risk and theory of perceived cost. Secondly, an overview on the South African Banking Sector is provided in order to understand the relationship between bank regulation and profitability in the South African context.

## **2.2 THE THEORETICAL FRAMEWORK**

### **2.2.1 FINANCIAL INTERMEDIARY THEORY**

Allen & Ndikumana (2000:134) argue that a financial system reduces liquidity risk and facilitates the management of risk by savers and investors. Financial systems collect and evaluate information more effectively and less expensively than individual investors because of the economies of scale enjoyed by financial intermediaries (Allen & Ndikumana 2000:135).

The payments system and intermediation are required for economic growth. Like any other for-profit corporation, the principal goal of financial intermediaries is to maximise shareholder wealth. Thus, decisions on lending, investing, borrowing, pricing, adding new services, dropping old services, and other activities depend on the impact on shareholder wealth (Gup & Kolari 2005:11).

According to Gup & Kolari (2005:9), deposit-type financial intermediaries are economic units whose principal function is obtaining funds from depositors and others, and then lending those funds to borrowers. Banks are one type of financial intermediaries.

A high level of financial intermediation is performed by banks, and in particular, the transformations of deposits into loans which entail the monitoring of borrowers, and the qualitative transformation of capital, indicate that banks play an important role. More specifically, financial intermediaries emerge to lower the costs of researching potential investments, exerting corporate control, managing risk, mobilising savings, and conducting exchanges (Levine, Loayza & Beck 2000:36).

Commercial banks act as intermediaries between those who have money (that is, savers or depositors), and those who need money (that is, borrowers). As financial intermediaries, commercial banks enhance economic efficiency and economic growth by allocating capital to its best possible uses (Gup & Kolari 2005:10).

The function of the financial system is to pool savings. Financial intermediaries can thus help improve firm's productivity, by reducing the transaction costs associated with the mobilisation of savings from different economic agents. Reduction of information-costs makes financial intermediaries useful to improve the allocation of resources and also favour technological innovation (Meon & Well 2010:297).

According to the literature, profitable intermediation by banks depends solely upon intermediaries being able to reduce search and transaction costs for both lenders and borrowers of funds using economies of scale. In other words, the reduction in costs must be greater than the charge made by the intermediary as in the following equation (Howells & Bain 1998:17).

$$(y + C'_B + C'_L) < (C_B + C_L)$$

Where  $C_B$  = Costs to the borrower in the absence of an intermediary;

$C_L$  = Costs to the lender of funds in the absence of an intermediary;

$C'_B$  = Costs to the borrower when dealing via an intermediary,

$C'_L$  = Costs to the lender of funds when dealing via an intermediary;

$y$  = The intermediary's charge for supplying the services.

The meeting of the condition in the above equation is the bedrock of the livelihood of a commercial bank (Makina 2006). Also, it is noteworthy that the cost-reducing effect of intermediation which meets this condition is independent of the rate of interest (Howells & Bain 1998:17-18). Meon & Well (2010:297) indicated that financial intermediary development could improve productivity via this channel, as banks may reduce the costs of evaluating investment projects before lending decisions, and therefore would allow a better allocation of capital.

Andolfatto & Nosal (2009:290) established that even where money and intermediation are both essential, banking is not essential when monitoring cost is sufficiently small. However, a banking system is essential when monitoring costs are sufficiently large. In order to minimise these costs, banks securitise the safe portion of their loans in the form of pass-through certificates. This enables them to take part of the loan off their balance sheet and thus reduce their intermediary costs (Bolton & Freixas 2000:326). Higher cost of intermediation would decrease banks' profitability and prove to be detrimental to financial stability (Naceur & Kandil 2009:86).

Boot, Thakor & Udell (1987:468) suggested that a way to reduce debt-related costs without dissipating the associated tax shield is to utilise loan commitments. In fact, a loan commitment is a more powerful way of reducing moral hazard than partial self-financing with inside equity. Boyd & Smith (1997:344) asserted that expected repayments must at least cover the intermediary's cost of funds, inclusive of expected monitoring costs. Bhattacharya and Thakor (1993:8) believed that information asymmetries are the most basic form of transaction costs.

Borrower's use the services of intermediaries rather than issue private notes themselves because the issuing of notes involves an excessive number of transactions and excessive transactions costs (Bullard & Smith 2003:187). The costs to the borrower consist of two components:

- the rate paid on the notes issued (or on other forms of borrowing), and

- fees relating to the arrangement and operation of the facility (Central Bank of the Group of Ten Countries 1986:33).

According to Hubbard, Kuttner & Palia (2002:559), low-capital banks tend to charge higher loan rates than well-capitalised banks. This effect is primarily associated with firms for which information costs are likely to be important, and also when borrowing from weak banks.

Prior to banks granting loans, they must evaluate information about prospective borrowers to determine if they are creditworthy. Information is difficult and costly to obtain. Information about large firms that are publicly traded, such as Microsoft, is easier to obtain than information about small, privately held firms (Gup & Kolari 2005:246). Thus, banks cannot discriminate against borrowers on the basis of race, sex, age, and/or other factors. Borrowers must be judged on the basis of their creditworthiness. In addition, lenders must supply borrowers with accurate information about the cost of borrowing (Gup & Kolari 2005:31). Another factor is fixed costs for setting up markets which may result in multiple equilibria, one in which market finance predominates and another in which intermediated finance predominates (Allen & Gale 1999:87).

Financial transactions reallocate various categories of risk among lenders, borrowers and financial intermediaries such as market or price risk, credit risk market liquidity risk, settlement risk and country risk (Central Bank of the Group of Ten Countries 1986:199). However, if the banks taking on the higher degree of risk are profitable, it is the shareholders' gain (Gup & Kolari 2005:30).

According to Pelzer (2013:69), should a bank grant a credit, will the debtor/borrower be able to return the credit sum and the interest within the time frame agreed? The risk is the loss of the money involved, but may also result from a more positive outcome than estimated.

The financial intermediary engages in actions to reduce the chances of the idiosyncratic losses by eliminating risks that are superfluous to the financial transaction's purpose. Common risk avoidance actions are underwriting standards, due diligence procedures, and portfolio diversification (Allen & Santomero 1998:1479).

Although the precise way in which risk is managed may have changed, intermediaries have always been engaged in risk management, broadly defined. Allen & Santomero (2001:272) proposed that the theory of financial intermediation needs to have an understanding of the dynamic process of financial innovation to adequately address the transformation of the financial sector that is currently taking place globally.

Pasiouras, Garani & Zopounidis (2006:405) indicated that restriction on bank activities, risk-adjusted minimum capital requirements, direct intervention by managers, as well as improved accounting and auditing requirements; are devices that can be applied to control bank risk.

In both cases, there is much concern that the requirements do not take sufficient account of bank diversification or of the real riskiness of loans. It is suggested that regulators should use softer information about the quality of loans than the institutional nature of the borrowers (Dewatripont & Tirole 1993:12).

The characterisation of prepayment risk as a call option given to the borrower suggests still another alternative. Rather than give the option, the intermediary could charge the borrower for it, perhaps using some variant of the option pricing model to value the prepayment privilege. If this payment could assure adequate compensation for prepayment risk, the intermediary could then revert to the strategy of hedging the interest rate risk emanating from its short-funding posture by establishing its own short-hedge position in the futures market (Batlin 1983:183).

Short-term debt allows borrowers who expect their credit rating to improve to benefit from more favourable terms of lending. It also allows lenders to exercise more rapid control over borrowers who are in default. On the other hand, some of the gains of refinancing are the private control rights of the borrower. Lenders do not take account of these gains in their liquidation decisions and short-term debt can therefore lead to excessive liquidation. Long-term debt protects borrowers from this risk (Diamond 1993:3).

Besanko & Thakor (1993:4) considered a model of 'relationship banking' where there are repeated bilateral transactions between banks and borrowers. Banks that are in a relationship with their customers have informational advantages over other banks. Relationship banking provides banks with rents that encourage them to avoid risk taking. Increased competition reduces these rents and thereby encourages risk taking and failure. This leads to a reduction in the welfare of borrowers.

The implication is that a balance has to be struck between the benefits of lower prices that competition creates and the increased risk taking that decreased charter value of banks entails. However, customer relationships arise between banks and firms because in the process of lending, a bank learns more than others about its own customers. This information asymmetry allows lenders to capture some of the rents generated by their older customers. Competition thus drives banks to lend to new firms at interest rates which initially generate expected losses (Sharpe 1990:1069).

There are risks and distortions associated with bank competition that make the welfare effects of increased competition uncertain. It is quite conceivable that competition in banking needs to be moderated more than in other markets (Mayer & Vives 1995:11).

All financial systems are fundamentally affected by two important and pervasive phenomena. According to Hermalin, Rose, Garber, Crockett & Mullins (1999:363), borrowers and lenders are plagued by asymmetric information. Borrowers typically

have better information about repayment prospects than lenders, and they try to use this to their advantage. However, lenders are aware of this risk and act accordingly, limiting their exposure and charging a premium for bearing this risk. The second fundamental imperfection is that borrowers cannot credibly commit to making repayments that lenders can collect at low cost. In this view, Flamini, McDonald & Schumacher (2009) also identified a deficiency of information on borrowers as a source of credit that exposes banks to high credit risk.

Diamond (1993:71) marked the key assumption that at some date between the initial investment and the final realisation of returns, lenders receive additional information about the borrower types. On receipt of information, there is still time to shut the prospect down if this is deemed preferable. The starting point for the work is the observation that banks are information-gathering and information-processing institutions. When a bank grants a loan, it investigates the borrowing firm's assets and business plan. It later acquires information in the course of handling the firm's accounts and conducting routine banking transactions. It also observes the firm's repayment history. All of the information is proprietary and may be excluded from the public domain. When a bank fails, the information may be lost (Gale 1993:117).

However, Boot, Thakor, & Udell (1987:450) observed that neither risk aversion nor transaction costs provide a completely satisfactory answer to the puzzle of why bank loan commitments are so prevalent. They assume that risk aversion is limiting for two reasons: first, it seems to lead quite directly to loan commitment demand purely on the well-known grounds of risk sharing. In addition, it does not correspond well with reality where hedging/diversification opportunities for banks and borrowers could be better risk dissipation mechanisms than loan commitments. Therefore, in their opinion, transaction costs may well be the motivating factor for certain prearranged credit lines. However, transaction costs and risk aversion fail to explain the existence of a wide variety of loan commitment contracts.

Borrowers with good credit histories may be forced to seek new sources of finance without the benefit of the information that has been accumulated over the years (Gale 1993:117). In the case of asymmetric information, Boot *et al* (1987:453) assumed that, although a bank can observe whether or not a borrower's project was successful, it cannot observe the actual project pay-off. If the bank extends a loan at a given interest rate, then all it knows is that given the borrower's unobservable action choice in response to the offered loan contract, the return in the successful state exceeds the promised repayment.

The inequality of information between the bank and the borrower is called asymmetric information. Simply stated, asymmetric information means that the borrowers have more information about themselves than is available to the bank "lender" (Gup & Kolari 2005:247). Sharpe (1990:1084) demonstrated that the asymmetric evolution of borrower information in the bank loan-market yields ex-post monopoly power even though banks are ex-ante competitive. The degree to which banks and their customers use information gathered over time to efficiently adjust investment decisions depends in part upon the ability of banks to pre-commit against using their informational advantage to extract rents.

According to Rose & Hudgins (2013:10), asymmetries reduce the efficiency of markets, but provide a profitable role for intermediaries that have the expertise to evaluate potential investments. Asymmetric information also gives rise to a moral hazard problem after the loan is made. Moral hazard is the risk that the borrower, who has a loan, might use the funds to engage in higher-risk activities in expectation of earning higher returns. The higher-risk activities increase the probability of default on the loan (Gup & Kolari 2005:247).

Under asymmetric information, low-risk borrowers obtain more credit than under full information. These borrowers also obtain more credit and pay higher interest rates than higher-risk borrowers (Bensanko & Thakor 1987). Bester (1987:898) showed that no

borrower will be denied credit when a set of loan contracts can achieve perfect sorting of borrowers of different risks. Collateral requirements can be used as a signalling mechanism because only the low risk borrower is willing to accept contracts with a higher amount of collateral. Acharya (2009:249) stated that systemic-risk can also arise due to inter-bank contracts. This implies that regulating each bank's risk cannot fully capture the risks that could propagate through a nexus of contracts.

Fried & Howitt (1980:472) stated that credit rationing exists as part of an equilibrium risk-sharing arrangement between a bank and its customers. A borrower and lender can benefit not only from trading loan contracts now, but also from an "understanding" or "implicit contract" concerning the amounts they will be willing to trade, and at what prices, under various conditions in the future. By means of such arrangements, banks and their customers can share risk associated with an uncertain future. Yaron, Benjamin, & Charitonenko (1998:152) stated that lenders need a system which provides formal procedures for claims against property and enforcement of financial contracts.

The recent literature also points to another reason for the continuing existence of banks, and that is to restructure firms. Debt contracts are better suited than equity contracts to perform this function, and contracted lending through bank is better than dispersed lending through bond-markets (Mayer & Vives 1995:10). If the contracts are properly structured, outside lenders will retain control when they need it most. This implies that one can fine-tune the amount of control that lenders possess, using the added freedom of having two types of lenders, i.e., current and future (Diamond 1993:47).

Traditionally, banks have developed skills in differentiating between more and less risky projects in several ways, viz: demanding collateral; demanding information as a condition of the loan; developing a long-term association with successful clients in order to access inside information; and monitoring carefully the ex-post outcome of projects in which depositors' funds have been invested. There are high fixed costs incurred in these activities and despite the existence of various monitoring mechanisms, some

degree of information asymmetry remains, exposing the bank to bad-risk loans. It is this imperfect nature of the monitoring process that gives rise to the conventional bank-type loan that demands collateral upfront (Howells & Bain 1998:18).

However, banks earn profits for making loans and bearing default risk (Conard 2012:126). Most borrowers prefer to keep their financial records confidential. Lending institutions are able to attract borrowing customers because they pledge confidentiality. For example, a bank's depositors are not privileged to review the records of its borrowing customers. Depositors often have neither the time nor the skill to choose good loans over bad. They turn the monitoring process over to a financial intermediary. Thus a depository institution serves as an agent on behalf of its depositors, monitoring the financial condition of those customers who do receive loans to ensure that depositors will recover their funds. In return for monitoring activities, depositors pay a fee to the lender that is probably less than the cost they would incur if they monitored borrowers themselves (Rose & Hudgins 2013:10).

Borrowers/debtors signal their low-risk status to insurers by avoiding default in the credit market. The signals are credible because in equilibrium people who repay are more likely to be the low-risk type, and so receive better insurance terms. Facts indicate that people with high scores receive credit on cheaper terms, that scores decline with default, and that (given credit limits) creator-borrowing leads to lower scores (Chatterjee, Corbae, & Rios-Rull, 2008:176). In most cases, a credit scoring tool is used as a tool of the statistical models to determine the likelihood that a prospective borrower will default on a loan (Gup & Kolari 2005:250). The major advantages of credit scoring models are the reduced time and lower cost of processing loans. Another advantage is that the same measures are applied to all customers, thereby demonstrating a consistent credit policy (Gup & Kolari 2005:250). Nowadays, the use of technologies that involve the implementation of standard techniques in screening and monitoring at lower costs to potential investors/borrowers are common (Allen 1993).

Boot & Greenbaum (1993:5) maintained that regulation must be designed to encourage appropriate monitoring by financial intermediaries. They suggested that:

- (i) capital requirements may reduce monitoring by bank managers because of dilution of ownership,
- (ii) rents and reputations are substitute ways of encouraging monitoring, and
- (iii) incentives based on reputation are destroyed by risk-insensitive deposit insurance.

Bank capital serves as buffer against unanticipated losses that could result in insolvency. According to Angkinand (2009:243), regulation requiring banks to hold sufficient capital and bank supervisors to monitor banks' capital adequacy in order to control banks' risk taking, particularly in the presence of deposit insurance. Capital adequacy requirements and strong bank supervision therefore should limit banks' risky lending and the adverse impact of bank failures on the real economy. Similarly, the Basel Committee regulation (2004:24) stated that the total minimum capital requirements are meant to reduce credit, market and operation risks.

Furfine (2001:53) developed a dynamic model of a banking firm in an environment with risk-based and average capital requirements, regulatory monitoring and uncertain economic conditions. He suggested that regulatory standards and the way in which those standards are enforced, have significant impact on the portfolio allocation of the commercial bank.

In the same vein, Pasiouras, Tanna & Zopounidis (2009:295) argued that capital requirements could affect bank efficiency by influencing the quantity and quality of lending, the decision of banks in allocating their sources of funds (i.e. equity/deposits). In particular, economies of scale appear to be associated with information gathering in the form of the screening and monitoring of firms in the presence of diversification possibilities (Mayer & Vives 1995:10).

Traditionally, banking supervisors have used a number of monitoring tools/measures to assess liquidity risk in banks. One of the measures used is the average liquidity assets

held as a percentage of liquid assets held, remained above the liquidity asset requirement of not less than 5,0 percent of the banking sector's adjusted liability.

The direct measures of liquidity are not on the cash position and the troubles it may cause to financial managers, but it rather affects the company's profit in a more direct way (Elzelly 2004:50).

In order to mitigate the risk related to the intermediation between borrower and lender, Diamond (1984:393) argued that the possibility of diversification within the intermediary can make it feasible to hire an agent (the intermediary), and to monitor an agent (the borrower). He claimed that the diversification proves to be important even when everyone in the economy is risk-neutral.

### **2.3 THE SOUTH AFRICAN BANKING CONTEXT**

According to the South African Reserve Bank website, the first bank to be established in South Africa was the Lombaard Bank in Cape Town. It opened its doors for business on 23 April 1793. The earliest proposals for the establishment of a central bank in South Africa were made in 1879. The calls were repeated in the following few years, until a selection committee, consisting of the ten members of parliament was established on 31 March 1920 to observe the practicability of establishing a central bank. Following the recommendations of the committee, the South African Reserve Bank opened for business on 30 June 1921, thus, making it the oldest central bank in Africa. As the oldest central bank in Africa, the bank is today an internationally-respected central bank looking forward to its centenary celebrations on 30 June 2021 (Rossouw 2011: S18).

The central bank among other things, issues bank notes and coins, conducts monetary policies, provides credit to banks, manages South Africa's foreign exchange reserves, supervises and regulates the banking sector, and acts as a lender of last resort to the banking system (Kock & Smith 2005:4). The South African banking industry is managed by the South African Reserve Bank which has prudential and regulatory authority over

the banking sector and other financial institutions. According to the Bank Supervision Department of the South African Reserve Bank, there are 75 operating commercial banks of which 10 are locally controlled, 3 mutual banks, 6 foreign controlled banks, 42 foreign bank representatives, and 14 branches of foreign banks ([www.resbank.co.za](http://www.resbank.co.za)).

According to Apostolik, & Donohue & Went (2009), some central banks are also charged with maintaining certain foreign exchange rate levels. Central banks also arrange payments between banks and act as regulators and supervisors for banks within a country (Apostolik *et al* 2009:12).

The South African banking system is well developed and effectively regulated. Thomas (2012:1) insisted that the South African banking sector had proved to be well-positioned when compared to similar ones in the industrialised world, as shown by its resilience during the global economic recession that began in 2008.

The South African Reserve Bank implements the bank regulation in alignment with the Basel Committee on Banking Supervision (Basel Committee), international best practice and other domestic legislative developments as well as the Bank Amendment Act, 2013 (Act No. 22 of 2013). This Act provides the necessary legislative framework to implement further changes to the standards issued by the Basel Committee as part of the global regulatory reform project to address the weaknesses in the global banking sector highlighted during the global financial crisis (Financial stability review 2014:30 - see <http://www.resbank.co.za>). For instance, the Basel Committee (2006) also elaborates norms and rules that need to be observed in the process of lending, loan-loose capital requirement and credit risk.

However, evidence on the role of prudential regulation on bank efficiency is inconclusive. Although prudential regulation is primarily designed to strengthen systemic stability and improve the functioning of banking markets, one can argue that these regulatory policies can have adverse effects on financial intermediation. Economic theory suggests that

prudential regulatory tools can impact on the effectiveness of financial intermediation in a number of ways. For instance, stringent capital requirements can reduce bank's borrowing costs because high capitalisation can signal lower bankruptcy. On the other hand, the imposition of minimum capital requirements may impose additional costs on banks (Deng, Casu, & Ferrani 2014:100).

In order to ensure profitability and stability for new established banking, there is a need to follow the rules and regulations which have been developed by the Central Bank. On the other hand, excessive regulations may increase the cost of intermediation and reduce the profitability of the banking industry. As banks become more constrained, their ability to expand credit and contribute to the economic growth will be hampered during normal times (Naceur & Kandil 2009:71).

Rose & Hudgins (2013:27) claimed that the complex regulatory environment that governments around the world have created for financial service firms in an effort to safeguard the public's savings, bring stability to the financial system and hopefully, prevent abuse of financial service customers. Financial institutions must contend with some of the heaviest and most comprehensive rules applied to any industry.

According to the World Economic Forum Global Competitive Report 2013-2014, South Africa ranked first for the regulation of securities exchanges and first for strength of auditing and reporting standards. South African banks are the second soundest in the world and corporate boards are the second most efficacious. The financial services and protection of minority shareholders are third best in the world; and South Africa's ability to finance local equity is the fourth best internationally.

Since banks operate in a highly regulated industry, the banking and regulatory environment should be an important part of credit analysis. The capability of regulators to determine the soundness of the banks and their capacity and willingness to get involved

in settling problems for avoiding crises obviously affect the creditworthiness of the banks in the country (Pasiouras *et al* 2006:405).

According to McCarthy (1983:46), South Africa is acknowledged to have a very sophisticated financial structure for the country of its level of development. It must however be stressed that the financial system is primarily not geared to finance the development of the less sophisticated sector of the economy.

The financial sector in South Africa comprises commercial banks, development finance institutions, micro-finance, non-banking finance companies, stock exchange companies and insurance companies. In its development, the South African financial sector was subjected to occasional instability. Akinboade & Makina (2009:482) pointed out that South Africa experienced a banking crisis affecting small banks during the period between 1999 and 2002. However, certain regulatory actions were taken and normality returned to the banking sector. Many bankers then became more prudent and implemented actions such as down- or rightsizing of the business, curtailment and critical evaluation of cost structures, disposal of non-core and non-performing assets and investments, and the overhaul of risk management practice structures, among other things. Although, the South African banking sector experienced instability in the past, it remains healthy.

South Africa Info website (2013) indicated that the investment and merchant banking remain the most competitive front in the industry, while the country's "big five" banks - ABSA, FNB, Standard Bank, Nedbank and newcomer Capitec Bank dominate the retail market. Thomas (2012:25) states that Standard Bank is the largest bank in Africa by assets. The bank has also been ranked the most valuable banking brand on the continent for the second consecutive year. South African banks such as Standard Bank, FirstRand, ABSA Group, Investec and Nedbank, in that order, make up the top five banks on the African continent.

## **CHAPTER 3**

### **LITERATURE REVIEW**

### **3.1 INTRODUCTION**

Numerous determinants influence bank' profitability, recognizing the main concepts of the banking sector profitability and its determinants are essential in order to provide evidence to support the practical result by the theoretical and empirical review. Therefore, this chapter reviews literature which assisted the researcher in investigating the knowledge, awareness, and to contextualise the findings on diverse variables and their impact on profitability. Sub topics which build on this chapter are described here below. First, this chapter explains some theoretical frameworks approaches that are helpful in assessing the relationship between market structure approach, banking efficiency approach on bank profitability and empirical review discussed the relationship between bank-specific,

industry-specific and macroeconomic determinants on bank profitability. Finally, conclusion and knowledge gap was conducted.

## **3.2 THEORETICAL APPROACHES**

### **3.2.1 MARKET STRUCTURE APPROACH**

Investigating the manner in which banks make their market decisions in terms of profitability is one of the most important criteria in the banking sector. By increasing the concentration of market shares of merging firms (Berger 1995:2), it may suggest that the current wave of merger activity in the banking industry is motivated by the prospective benefits from greater market power.

The structure-performance relationship was investigated by using two different performance measures, i.e. price and profit, to provide evidence on whether consolidation benefits consumers as well as firms (Choi & Weiss 2005:636). These firms were then expected to develop and secure large market shares, thus ensuring high market concentration. Consequently, efficiency was assumed to be driving both profits and market structure (Rasiah 2010:83).

Molyneux & Forbes (1995:155) found that the degree of concentration in a market exerts a direct influence on the degree of competition amongst its firms. The more concentrated the market, the less the degree of competition. This hypothesis would be supported if the impact of market concentration on the performance of the firm was found to be significantly positive regardless of the degree of efficiency of the firm. Thus, firms in more concentrated markets would earn higher profits (for collusive or monopolistic reasons), than firms operating in less concentrated markets, irrespective of their efficiency. A positive relationship between firm profits and market structures was attributed to the gains made in the market share by more efficient firms. In turn, these gains led to increased market concentration (Molyneux & Forbes 1995:2).

Moudos (1998:195) assumed that the market showed a negative sign when in the largest markets there was more competition, easier market entry and awareness among customers of bank services. Where there was market growth, it was assumed to be a positive sign since expanding markets could generate higher profits. Market structure theory postulates that banks in a concentrated market can charge higher loan rates, pay lower deposit rates and lower collusion costs through their market power, thus generating more profits (Park & Weber 2006:1).

The efficiency structure theory states that firms which are more efficient will grow in size and market-share because they are able to charge lower prices than competitors while maintaining profitability. Higher profitability usually led to higher market concentration (Choi & Weiss 2005:641). Furthermore, Goldberg & Rai (1996:749) argued that the efficiency structure theory showed a positive relationship between profits and concentration.

Moreover, the banks, through processes of acquisitions, mergers and expansion, have attempted to enforce their area. This strategy was expected to exploit economies of scale and support the provision of new financial services such as asset management and bank insurance. Therefore, the expansion of the market share by private banks was a step towards the direction of intensifying competition.

Hannan (1991:76) focused on the relationship between bank profits and market concentration. In explaining this relationship, he discovered that the total bank profits were a separable function of a potentially large number of concentration measures that might differ across loan and deposit products as well as across the local markets in which the bank operated. In addition, this relationship allowed for the assumption of profit maximisation, separable costs, no cross-price effects among loan and deposit categories, and a security rate that does not vary with security holdings. In the South African banking sector, the market structure theory would allow the researcher to understand how the extension of the market (size and distribution of a bank) has affected deposits as well as

loans. One can argue that the expansion of the market by creating branches all over the country and facilities such as ATMs and Internet Banking may stimulate deposits which in return would encourage loans and have a positive impact on profitability.

A study by O'Donnell & Westhuizen (2002:238) which analysed ten branches of a major South African Bank revealed that many branches had been operating on a scale that was too small. The management's implication of a small branch to increase the scale of its operations, for example, increases the Rand-volume of its loans, is limited by the fact that the demographic and infrastructure characteristics of its client-area are largely outside its control. Lowering interest rates is one avenue by which a branch may increase the volume of its loans, but small branches within a tightly controlled corporate banking structure may not have the discretion over interest rates they would need to affect a significant increase in this measure of Bank Size.

Mamatzakis & Remoundos (2003:92) argued that the liberalisation of the banking system, the harmonisation of the legal system so as to meet the standards, and the radical technological changes such as the expansion of ATM-networks across the country, internet banking, etc., had markedly affected the structure of the banking market.

On the other hand, when concentration of the market is reduced, the size and distribution of banks become more dispersed and the banking sector profitability is expected to decline. In this instance, the relationship between market concentration and a bank's profitability is expected to be negative.

### **3.2.2 BANKING EFFICIENCY APPROACH**

The banking efficiency approach can be explained through bank-specific and macro-economic determinants. The issue of how efficiency in banking can be enhanced is important at the micro- (bank-specific) and macro-economic levels and efficiency has important policy-implications (Hussein 2003:2). According to Olson & Zoubi (2011:95), there is a relationship between cost efficiency and profitability.

There are two ways in which to estimate the profit efficiency. Hassan (2005:7) assessed the standard profit-function and the alternative profit-efficiency. The alternative profit-efficiency measures how close a bank is to generating maximum profit given its output-levels instead of output-prices. Whilst the standard function is specified in terms of input and output prices, the alternative profit function is specified in terms of input prices and output quantities.

Shareholders can achieve profits by maximising revenue and minimising costs. Also, depending on the market-power of the bank in the input and output markets respectively, it may be able to increase output prices or decrease input prices. It would be receiving a return on investment either through an increase in the bank's share price, or through dividends received (Bikker & Bos 2008:6).

O'Donnell & Westhuizen (2002:229) stated that the quality of outputs is assumed to be proportional to the total value of loans and deposits (one measure of LN).

Another proponent of this view is Farrell (1957:254) who described the efficiency of a firm as its success in producing as large as possible, an output from a given set of inputs. The specification of inputs and outputs of bank production is part of an ongoing debate. On one hand, the production-approach distinguishes labour and physical capital as inputs, and numbers of processed documents or transactions as outputs (Bikker & Bos 2008:14).

The three core banking functions are: collecting deposits, arranging payments, and making loans, and risk management (Apostolik, Donohue, & Went 2009:1).

Akhavain, Berger& Humphrey (1997:96) maintained that mergers and acquisitions could raise profits in any of three major ways:

- Firstly, they could improve cost efficiency, reducing costs per unit of output for a given set of output quantities and input prices.

- Secondly, mergers may increase profits through improvements in profit efficiency that involves superior combinations of inputs and outputs. Profit efficiency is a more inclusive concept than cost efficiency because it takes into account the cost and revenue effects of the choice of the output vector, which is taken as given in the measurement of cost efficiency.
- Thirdly, mergers may improve profits through the exercise of additional market power in setting prices. An increase in market concentration or market share may allow the consolidated firm to charge higher rates for the goods or services it provides, raising profits by extracting more surplus from consumers without any improvement in efficiency.

In the South African context, this theory has helped the researcher to investigate how the process of producing outputs from inputs can influence the explanatory variables that are controllable such as, bank-specific determinants and variables which are not controllable by the bank, and macro-economic determinants on bank efficiency which lead to profitability.

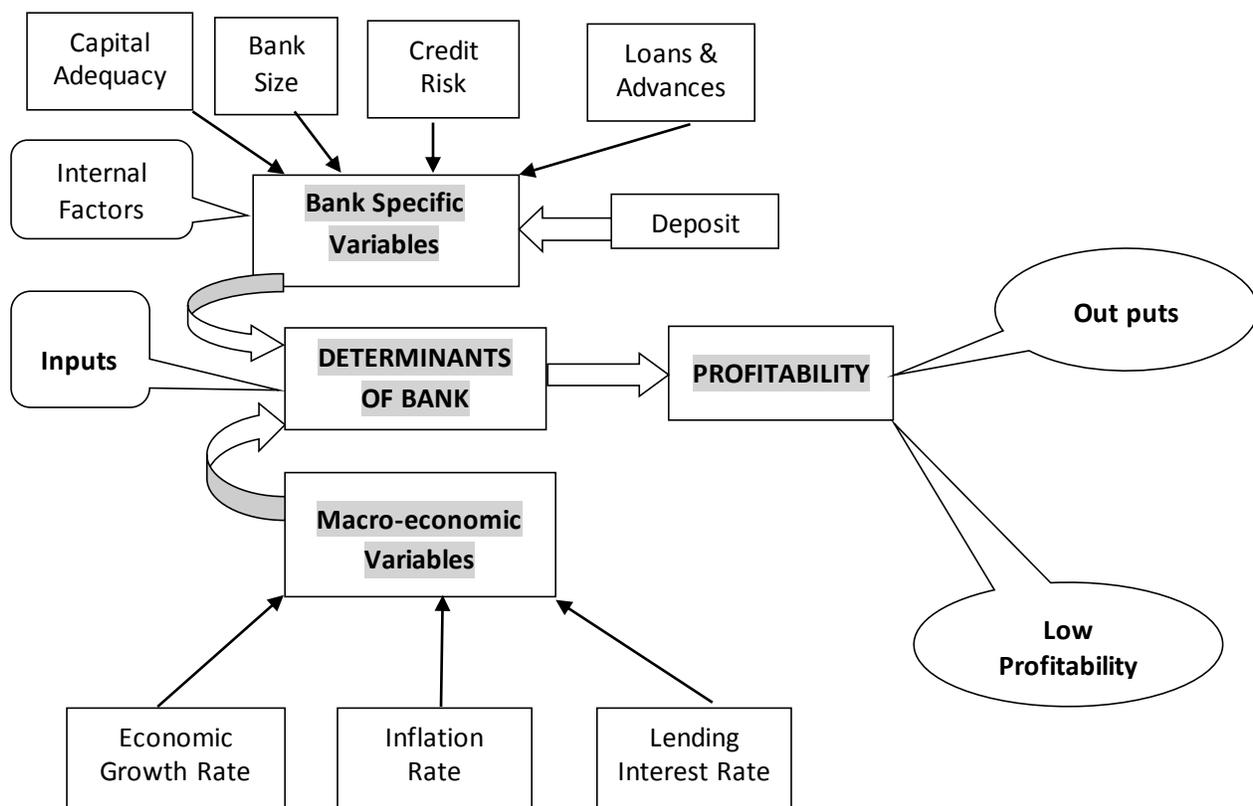
In the field of bank profitability, the general theories have not yet revealed a link between framework theories and the determinants of bank profitability. The study's conceptual framework of market structure and banking efficiency approaches was used in order to clarify how the relationship between bank-specific, industry-specific and macro-economic determinants affect the profitability of bank. The market structure approach will be used to analyse the MARCONS (industry-specific determinants), as well as to clarify its impact on bank profitability on South African Banks.

On the other hand, the banking efficiency approach will be used to analyse bank-specific (e.g. Equity Capital, Credit Risk, Loans and Assets and deposits); as well as macro-economic determinants (i.e. Economic Growth, Inflation, Interest Rate), towards its impact on bank profitability in South Africa. Banking efficiency also exploits the appropriate input and output variables to determine profitability. The process of producing outputs from

inputs can be influenced by environmental variables such as macro-economic determinants, which are frequently used and not controllable by banks. Bank-specific variables are controllable by the bank. The banking efficiency approach will be used to determine the relationship between bank profitability and both macro-economic and bank-specific variables. The review of existing literature and empirical research has been conducted by various scholars in the field of determinants of bank profitability. They concluded that bank-specifics, industry-specific and macro-economic determinants all have an impact on bank profitability.

This study examines factors that affect bank profitability in South Africa by using the following internal and external determinants.

**FIGURE 3.1:** Conceptual Banking Efficiency Model of Bank-Specific, Macro-economic Determinants in Relationship with Profitability.



**Source:** Mosood & Ashraf (2012:256)

Figure 3.1 explains the relationship between bank-specific, (Cap, PL, L&A); industry-specific, (MARCONS); as well as macro-economic determinants (EG, INF & INT), and profitability.

In the intermediary process, banks borrow and invest their clients' money to earn a return for their shareholders and also to meet the credit needs of the community (De Jager 2010:129).

Demirguc-Kunt & Huizinga (2000:3) stated that there are two measures of bank performance, i.e., bank profitability (measured as profits divided by assets), and bank interest margins (measured as net-interest income divided by assets). As an accounting identity, the bank interest margin equals (pre-tax) profits plus bank operating costs, and loan loss provisioning (and minus NII). Bank profitability and bank interest margins can be seen as indicators of the efficiency of the banking system.

Increasing interest rates or increasing collateral requirements, could increase the riskiness of a bank's loan portfolio, either by discouraging safer investors or by inducing borrowers to invest in riskier projects, and therefore, could decrease the bank's profits (Stiglitz & Weiss 1981:408).

According to Shleifer & Vishny (2009:307), banks use their scarce capital, to co-invest in newly securitised loans when asset prices are high, and to buy or hold on to distressed securities when asset prices are low. Expanding the balance sheet to securitise is very profitable in good times. However, banks borrow short-term and accept the risk of having to liquidate their portfolio-holdings at below fundamental values in bad times.

According to Rose & Hudgins (2013:05), the primary purpose of this ever-changing financial system is to encourage individuals and institutions to save and transfer the savings to those individuals and institutions planning to invest in new projects while needing credit to do so. This process of encouraging savings and transforming savings into investment spending causes the economy to grow, new jobs to be created and living standards to rise which also affects bank profitability.

### **3.3 DETERMINANTS OF BANK PROFITABILITY: AN EMPIRICAL REVIEW**

There are several studies on determinants of bank profitability in many countries. Most of the studies consider internal factors (bank-specific) and external factors (industry-specific) in a macro-economic environment. Bank profitability is usually expressed as a function of internal and external determinants. Additionally, the internal determinants could be termed micro- or bank-specific determinants of profitability. Furthermore, the external determinants are variables that are not related to bank management, but reflect the economic and legal environment that affect the operation and performance of financial institutions (Athanasoglou *et al.* 2008:122).

To corroborate this argument, Guru, Staunton & Shaflashanmugam (2002:3) argued that the determinants of bank profitability can be divided into two main categories, namely those that are management-controllable and those that are beyond the control of management. The factors which are management-controllable are classified as internal determinants and those beyond the control of management are referred to as external determinants. In the same manner, Ambar & Alper (2011:144) observed that bank specific determinants as internal factors are determined by the bank's management-decisions and policy-objectives, such as asset size, capital adequacy, asset-quality, deposit- and income-expenditure structure. The management-induced effects on profitability can be analysed by examining the balance-sheet and profit and loss accounts of these institutions. This view is supported by Athanasoglou *et al.* (2005:06) who claimed that the internal determinants originate from bank accounts (balance-sheets and/or profit and

loss accounts) and therefore could be termed micro- or bank-specific determinants of profitability.

In literature bank performance is typically measured by Return on Average Assets (ROAA), Return on Average Equity (ROAE), and/or Net Interest Margins (NIMs) and usually expressed as a function of internal and external determinants. In addition, internal determinants are factors that are mainly influenced by a bank's management decisions and policy objectives. Such profitability determinants are the level of liquidity, provisioning policy, capital adequacy, expenses of management and Bank Size. On the other hand, the external determinants, both industry and macro-economic related, are variables that reflect the economic and legal environments (Sufian& Habibullah 2009:210). Dietrich& Wanzenried (2009:4) pointed out that bank profitability is usually measured by ROAA and is expressed as a function of internal and external determinants. However, external variables include bank-specific variables that are also expected to affect the profitability of financial institutions.

Rasiah (2010:750) stated that the internal factors which tended to have a direct impact on bank revenue and costs are bank assets, liability portfolio management and overhead expenses.

The profitability of banks is determined by bank-specific, industry-specific and macro-economic factors (Curak, Poposki, & Pepur 2012:414). Francis (2013:143) stated that bank profitability can only be achieved if bank managers and policy makers continue to pay particular attention to bank-specific factors as well macro-economic determinants that have influence on their profitability

### **3.3.1 *Bank-specific Determinants***

In the South African Banking Sector, the bank-efficiency theory helps to clarify if bank specific variables have a relationship with profitability. In this context, each bank-specific

variable influences in a negative or positive way. At the same time, the nature of this relationship (each variable of bank-specific) can significantly affect bank profitability. This means that if the nature of the relation between each bank-specific variable is positive, the profitability is high, but if it's negative, the profitability is low.

Athanasoglou *et al.* (2005:06) suggested that all bank-specific determinants, excluding size, significantly affect bank profitability in line with prior expectations. Additionally, they also indicate that profitability is pro-cyclical and the effect of the business cycle being asymmetric. Of the same view, Ali *et al.* (2011:237) stated that the bank-specific indicators have more ability to influence the profitability of banks. The LN, operating efficiency, capital, PL, portfolio composition and asset management are all variables considered to be independent, and can influence profitability internally.

- ***Equity Capital (Cap)***

Capital adequacy is one of the determinants of bank profitability as indicated by different researchers.

According to Al-Jafari & Alchami (2014:28), capital size is calculated by dividing total equity by total assets. Well-capitalised banks have low insolvency cost and maximise profit on assets. Kosmidou, Tanna & Pasiouras (2005:2) investigated the impact of bank-specific characteristics, macro-economic conditions and financial market structure on United Kingdom (UK)-owned commercial bank profits, during the period 1995-2002. It was found that capital strength, represented by the equity to total assets ratio, is the main determinant of UK Bank profits providing support to the argument that well-capitalised banks face lower costs of external financing, which reduce their costs and enhance profits. Mendes & Abreu (2003:15) stated that less-leveraged banks have higher margins, which is consistent with theories stressing that better capitalised banks can charge more for loans and/or pay less on deposits insofar as they face lower bankruptcy risks.

Berger (1995:451) suggested that for banks in the United States (US) during the 1980s, there was a strong positive relationship between capital and earnings, and that for an

observably risky bank, such capital increases may result in reduced expected bankruptcy costs and lower interest expenses that may offset a significant part of any loss in earnings.

Banks with higher capital to asset ratios, are considered relatively safer compared to institutions with lower ratios. Dietrich & Wanzenried (2009:34) analysed the profitability of commercial banks in Switzerland during the 1999-2006 period. It was found that better capitalised banks seemed to be more profitable. This positive impact on bank profitability could be attributed to the fact that capital refers to the volume of the amount of own funds available to sustain a bank's activity and, therefore, bank capital acts as a safety net in the case of adverse developments.

Javaid, Anwar & Gafoor (2011:69) analysed the determinants of bank profitability in Pakistan during the 2004-2008 period. They observed that banks with more capital and total assets, were perceived to have more security, and that such an advantage could be translated into higher profitability.

Athanasoglou *et al.* (2005:25) examined the effect of bank-specific, industry-specific and macro-economic determinants of bank profitability using an empirical framework that incorporates the traditional Structure-Conduct-Performance (S-C-P) hypothesis to a panel of Greek banks during the period 1985-2001. They also found that capital is important in explaining bank profitability. Therefore, banking capital is important in explaining conventional bank profitability (Mokni & Rachdi 2013:324).

Aburime (2008:1) investigated company-level determinants of bank profitability using a panel data-set comprising 91 observations of 33 banks over the period 2000-2004. He found that capital, is a significant company-level determinant of bank profitability in Nigeria.

Dhouibi (2016:11) analysed the impact of bank transparency on the capital adequacy ratio in a developing country using a panel data-set that employs bank-level data from the

Tunisian banking sector covering the period 2000-2014 and estimated the model with Generalised Method of Moments (GMM). He stated that maintaining a high level of capital may reflect the effect of the profitability and efficiency of the banking operation, while a low level of capital may reflect the effect of negative results. Similarly, Nessibi (2016:39) examines how the banks' specific characteristics and macro-economic indicators affect the profitability in the Tunisian banking industry over the period 1990-2008. He also indicates that the more profitable banks are those with higher amounts of capital and low operating costs.

When the proper capital structure has been decided, there is a danger both in over-capitalisation and under-capitalisation. Therefore, Boskey (1959:22) explained this issue as follows:

*“The bank ought to have sufficient capital to enable it to make an impact on performance, and to earn enough for expenses, accumulate adequate reserves and for payment of a satisfactory dividend”.*

On the other hand, resources should not be so large that they greatly exceed what appears reasonably necessary for the fulfilment of bank purposes.

Atemakeng & Joseph (2000) examined empirically the Structure-Performance (S-P) hypothesis within the context of the Cameroonian commercial banking system over the period 1987-1999. Three accounting measures of a bank's performance were utilised: e.g. Return on Capital (ROC), ROA and ROE. The argument by KPMG (1998:53) focused on bank margins and their relationship to profitability of the four major banks in the South African market. The ROE was identified as being the significant performance measure and the profitability was reviewed on that basis.

In order to enhance profitability and stability of the financial system, the regulators have increased the focus on the capital adequacy of banking institutions. Such capital

increases may result in reduced expected bankruptcy costs, lower interest expenses, but also loss in earnings.

Bertrand (2000:19) examined the Swiss banks' capital and risk behaviour during the period 1989-1995 and found that Swiss banks close to the minimum regulatory capital requirements tend to increase their ratio of capital to Risk-Weighted Assets. This indicated that regulatory pressure, which is the expected penalty implied by a breach of the capital requirements, had the desired impact on the behaviour of banks. Moreover, regulatory pressure has a positive and significant impact on the ratio of capital to total assets, but no significant impact on the banks' risk-taking.

Capital requirements in the banking sector have a significant effect on the capital ratio decision and if the regulatory pressure did not encourage banks to increase their capital, it affected their selected risk levels. Prudential regulation intended to protect the banking system from these problems by encouraging banks to invest prudently in capital requirement.

Naceur & Kandil (2009:89) investigated the effects of capital regulations on the performance and stability of banks in Egypt. They suggested that a number of factors which contributed positively to bank-profitability in the post-regulation period are higher capital requirements, the reduction in implicit cost, and the increase in management efficiency.

Rasiah (2010:254) analysed the internal and the external determinants of profitability of commercial banks. The internal variables included management controllable factor such as liquidity, investment in securities, investment in subsidiaries, loans, non-performing loans, and overhead expenditure. Other determinants such as savings, current account deposits, fixed deposits, total capital and capital reserves and money supply also play a major role in influencing the profitability. In addition to the above, the external

determinants that are the factors which are beyond the control of management of these institutions.

Contrary to the aforementioned studies, other researchers found an inverse relationship between profitability and capital adequacy. The asset management and Economic Growth were found to be positively related to ROE, while operating efficiency was established to have a negative relationship with profitability. Ali *et al.* (2011:238) examined the profitability indicators of public and private commercial banks in Pakistan during the period 2006-2009. They suggested that bank profitability is negatively affected by capital when profitability was measured by ROA.

Hassan Al-Tamimi (2006:35) examined the determinants of the United Arab Emirates (UAE) commercial banks' performance and observed a negative relationship between capital and profitability. Similarly, Kundid (2012:53) stated that a higher level of the capital adequacy implies a lower profitability.

- **Bank Size (LN)**

LN is regarded as the natural logarithm of total assets (Al-Jafari & Alchami 2014:28). The relationship between the LN and profitability can be measured by economies of scale.

Sufian & Chong (2008:94) examined factors that influenced the profitability of financial institutions in a developing economy. They discovered that the LN is generally used to capture potential economies or diseconomies of scale in the banking sector.

When ROE is used as the dependent variable, LN usually demonstrates a significant relationship with profitability. Ambar & Alper (2011:149) examined the bank-specific and macro-economic determinants of bank profitability in Turkey from 2002 to 2010. They revealed that asset-size had a positive and significant effect on profitability. Similarly, Maredza (2014:1041) complemented his particular work by exploring the internal determinants of bank profitability, but with more focus on the impact of bank efficiency.

The author applied a two-step methodology framework to a panel of four small and four large banks for the period 2005-2011, and stated that LN was found to be an important driver of bank profitability in South Africa.

Milbourn *et al.* (1999:195) pointed to the vast empirical literature in banking to argue that increased size may offer strategic benefits (hence, increase shareholder wealth) in an environment with sufficient profitability in current operations and substantial uncertainty about future core competencies.

Hassan Al-Tamimi (2006:46) examined the determinants of the UAE commercial banks' performance. They discovered that the most significant determinants of the national banks' performance were LN and bank portfolio composition. In the same line of argument, Peiy & Werner (2005:03) analysed a panel of 288 German banks from 1998 to 2002 and found evidence to support the SCP Hypothesis and the scale-efficiency versions of the Efficient-Structure Hypothesis. They found that German Banks might improve their profitability by increasing their asset size by consolidation.

Sufian & Habibullah (2009:288) investigated the determinants of profitability in the Chinese banking sector during the period 2000-2005. They found that the Chinese banking sector had undergone significant financial reforms which had transformed the banking sector to a large extent. However, it is reasonable to assume that these developments posed great challenges to banks as the environment in which they operated changed rapidly, a fact that consequently had an impact on the determinants of profitability. Nevertheless, the overall results showed that all the determinants of bank profitability (bank specific, industry specific and macroeconomic determinants) had a statistically significant impact.

Kosmidou (2008:156) analysed how the bank's management-decisions, policy objectives and the overall banking environment affected the performance of banks in terms of their ROA during the period 1990-2002. An unbalanced pooled-time series data-set of 23

Greek commercial banks operating during the said period, provided the basis for the econometric analysis. The author found that the influence of size was positive in all cases but statistically significant only when the macro-economic and financial structure variables entered the models. Additionally, it seems that despite the improvements, Greek banks had to keep up their modernisation, as they would soon have to compete with other European Union (EU) banks of a significantly higher size.

Boyd & Runkle (1993:65) predicted that large banking firms will be less likely to fail than small ones. Spathis, Kosmidou & Doumpos (2002:528) investigated the factors of Greek banks from the financial statements that are related to their size, for the period 1990-1999. They found that large banks are more efficient than small ones. However, Vong & Chan (2008:108) in their study show that smaller banks achieve a higher return on assets than the larger ones.

Growing LN may have a positive effect up to a certain limit on profitability. Conversely, the effect of size could be negative due to bureaucratic and other reasons. Eichengreen & Gibson (2001:05) analysed the current state, past performance and future prospects of the Greek banking system. Their results indicated that profitability is a non-linear function of LN, such that smaller Greek banks will reap scale economies and raise profits if they grow larger, but that some of the larger banks had already exhausted their scale economies and would have to down-size in order to reduce costs.

Miller & Noulas (1997:505) examined large commercial banks during the latter part of the 1980s to determine what factors affected bank profitability using both cross-section and pooled-time series cross-section regressions. They found that large banks experienced poor performance (profitability) because of a declining quality of the loan portfolio.

Pasiouras & Kosmidou (2007:11) followed a two-stage procedure and examined the efficiency of the Greek co-operative banking sector for the first time. During the second stage, they used the Tobit-regression to determine the internal and external factors that

had an impact on banks' technical, allocation and cost efficiency. They found that larger banks were more technical and cost efficient. Banks with a broader ATM-network and with fewer branches appeared to be more technical and cost efficient.

However, some other researchers suggest the contrary. The LN plays an important role to maintain the position of the bank in the market to increase profitability. The relationship of LN can be found insignificant, but positive with profitability. Ali *et al.* (2011:238) found size to be insignificant, but negatively related to profitability/ROE.

When small-sized banks usually try to grow faster, even at the expense of their profitability especially when banks are newly established, they place greater emphasis on increasing their market share, rather than on improving profitability. Consequently, their effect on LN cannot have a significant impact on bank profitability (Athanasoglou *et al.* 2005:23).

Athanasoglou *et al* (2005:25) investigated the effect of bank-specific, industry-specific and macro-economic determinants on the profitability of Greek banks. They estimated that effect of size does not provide evidence of economies of scale in banking. Likewise, the ownership status of the banks is insignificant in explaining profitability, denoting that private banks do not in general make relatively higher profits, at least not during the period under consideration. In the South African context, the structure of the South African banking industry was characterized by monopolistic competition. This result may reflect domination by five large banks, which together account for over 85 per cent of total banking assets (Mlambo and Ncube 2011:4)

South Africa's largest banks developed more technical, allocation and cost efficient methods by opening branches and installing ATMs all over the country, inside and outside banks, in order to control a larger market share. ATMs were also installed in places away from banks.

African Bank and Capitec Bank collectively held the largest market-share in the low-income micro-financing landscape at R20 billion in 2010. In contrast, larger banks such

as the big four (Absa Bank, Standard Bank, Nedbank and FirstRand Bank) predominantly offered credit products designed for high-income earners. Nonetheless, they have established unsecured funding divisions designed for low-income earners (Thomas 2012:11). Banks have resorted to charging higher banking fees for in-branch services, which is one of the factors that compel consumers to use alternative banking means such as ATMs(Thomas 2012:31).

- ***Credit Risk (CR)***

Several studies support credit risk to have a relationship with profitability. CR is measured as loan loss provisions divided by total loans (Al-Jafari & Alchami 2014:28). In the banking industry, CR-management plays an important role in terms of efficient banking. Manoj (2010:18) identified the determinants of profitability and operational efficiency of the Kerala State of Old Private Sector Banks (KOPBs) in India using an econometric methodology. He found that the Old Private Sector Bank (OPBs) in general and KOPBs in particular, enhanced operational efficiency and risk management capability, particularly CR-management. When a bank-borrower fails to meet the obligations of approved terms, there is always the possibility for the borrower to default from his/her commitments for one or the other reason resulting in crystallisation of CR to the bank. These losses could take the form of absolute default. In contrast, losses from changes in portfolio-value arise from actual or perceived deterioration in credit quality. Raghavan (2003:2) suggested that risk management could play an essential role by identifying, measuring and, more importantly, monitoring a bank's profile.

Naceur & Omran (2011) examined the influence of bank regulation, concentration and financial and institutional development on commercial bank margins and profitability across a broad selection of Middle-East and North-Africa (MENA) Loans and Assets Loans and Assets countries. They found that banks specialising in particular credit risk management had a positive impact on net interest and profitability of banks.

Sufian & Habibullah (2009:214) examined the performance of 37 Bangladeshi commercial banks during 1997-2004. The empirical findings of the study suggested that bank-specific characteristics in particular loan intensity, CR and cost, have positive and significant impact on bank performance, while non-interest income seems to have a negative relationship with bank profitability.

Flamini, McDonald & Schumacher (2009:1) examined a sample of 389 banks in 41 Sub-Saharan African Countries to study the determinants of bank profitability. They found that apart from credit risk, higher returns on assets are associated with larger LN, activity diversification and private ownership. Bank returns are affected by macro-economic variables suggesting that macro-economic policies that promote low inflation and stable output growth do boost credit expansion.

Alexiou & Sofoklis (2009:114) identified the key factors that influenced the profitability of Greek commercial banks during the period 2000-2007. It was found that bank profitability could be improved considerably if appropriate mechanisms to screen, monitor and forecast future levels of risk, were put in place.

In contrast, the major portion of a bank's operations is involved in borrowing and lending activities. As a result, banks suffer threats of high CR and they create loan loss provisions to mitigate the risk. Ali *et al.* (2011:235) studied Islamic banks' profitability in Pakistan by taking into consideration bank-specific and macro-economic factors. They observed that the high CR led to lower profitability measured by ROA. Additionally, the operating efficiency tended to exhibit the higher profitability-level as measured by ROE.

Ambar & Alper (2011:149) examined the determinants of bank profitability in Turkey. The panel-data method (fixed-effects model) was applied to data obtained from financial statements of 10 banks from 2002 to 2010. They found that ratios of loans/assets (L/A) and loans under follow-up (LFA) loans to have negative and significant impacts on ROA.

This indicated that credit portfolio volume and weak asset quality impact negatively on ROA.

Al-Jafari & Alchami (2014:41) investigated the determinants of bank profitability in Syrian banks. They used a sample of 17 banks during the years 2004 and 2011, and utilised the GMM-technique to test the hypotheses. They found negative and significant relationship between CR and bank profitability. This implied that higher CR, results in lower profits.

- **Deposits**

The findings of Guru *et al.* (2002:19) provided an insight into the characteristics and practices of successful commercial banks in terms of profitability. They found that deposits create free-funding from floats and contribute positively towards profitability.

Haron (2004:18) examined the effects of the factors that contribute towards the profitability of Islamic banks. He found that the more deposits are placed by depositors with the bank, the higher the income received by the bank, thus, influencing the profitability.

Deposits are the main source of bank-funding and are the lowest cost of funds. Ambar & Alper (2011:144) found that the more deposits are transformed into loans, the higher the interest margin and profit. Therefore, deposits have a positive impact on profitability of banks. In contrast, when there is higher cost of funding, it negatively affects bank profitability.

Kunt & Huizinga (1999:405) analysed how bank characteristics and the overall banking environment affect the manner in which banks function as reflected in interest margins and bank profitability. They found that banks who rely largely on deposits for their funding are also less profitable because deposits apparently entail high branching and other expenses. Deposits are a core of bank profitability; e.g. the higher the level of deposits,

the greater the effect it has on bank profitability. Kusi, Adu & Sai (2015:77) investigated bank profitability in Ghana using periods before, during and after the globe financial crises utilising the five-step Du-Pont model for the first time, during 2006-2012. They found that bank deposits and branch networking were not significant on bank profitability.

The findings of Guru *et al* (2002:19) found that commercial banks should not over-commit in loans, since the liquidity variable as proxied by the loans to deposit-ratio was generally found to have a negative impact on bank profitability. But when banks do not strive to attract more deposits as a source of funds, it can have a negative impact on bank profitability.

Davydenko (2011:25) examined the determinants of bank profitability in the Ukraine. The study investigated bank-specific, industry-specific and macro-economic indicators to the overall profitability in Ukrainian Banks. The study used a panel of individual banks' financial statements from 2005 to 2009. The author found that deposits have a negative impact on bank performance.

- ***Loans and Advances (L&A)***

The loans market, especially regarding credit to households and firms, is risky and has a greater expected return than other bank assets, thus, one will expect a positive relationship between loans and profitability.

When a bank suffers from a low quality of loans which is a core of banking activity, it is unable to extract considerable profits while the volume of deposit is growing. Chirwa (2003:571) investigated the relationship between market-structure and profitability of commercial banks in Malawi using a time series from 1970 to 1994. He found that variables which positively and significantly influence commercial bank profitability in the long-run and the short-run are the loan-assets ratio and the demand deposit-deposits ratio.

Bennaceur & Goaid (2008:127) found that bank loans have a positive and significant impact on the capacity to generate interest margins and profitability. When there is a higher level of deposits which are transformed into loans, higher profits are increased. Naceur (2003:1) found that loans have a positive and significant impact on profitability. However, some studies found a negative relationship between loans and profitability. Ambar & Alper (2011:148) showed that the impact of ratios of LA and loans under follow-up (LFA)/loans have a negative impact on profit.

In the case where banks are rapidly increasing their loan books have to pay a higher cost for their funding requirements; this could lead to a negative impact on profitability. Vong & Chan (2008:108) examined the impact of bank characteristics as well as macro-economic and financial structure variables on the performance of the Macao banking industry. They revealed that a higher loan-to-total assets ratio may not necessarily lead to a higher level of profits. Furthermore, a lower spread together with a higher loan-loss provision leads to lower profitability. Therefore, instead of loan size, it is the spread and quality of the loan that matter.

- ***Non-interest Income***

Non-interest income is a source of income other than earnings from loans. Non-interest income includes fees earned from offering unit trust services, service-charges on deposit accounts, standard fees and charges for other bank services. With increasing globalisation and financial liberalisation the banking business has been undergoing a gradual transformation away from the traditional business of financial intermediation and towards provision of other financial services including mutual fund, insurance, etc. Thus, non-interest income would represent a key source of bank revenue (profitability) in the future. By more aggressively selling services other than loans such as brokerage and trust services, bankers have found a promising channel for boosting the income statement by diversifying their income sources, and also for insulating their banks more adequately from fluctuations in interest rates and loans default risk (Rasiah 2010:77).

Smith, Staikouras & Wood (2003:5) examined the variability of interest and non-interest income, and their correlation for the banking systems of EU countries for the years 1994 to 1998. They found that the increased importance of non-interest income worked for most, but not for all categories. It is not, however, invariably more stable than interest income.

Elyasiani & Wang (2008:1) revealed that several factors on both the financial and production side of the banking activity can account for the recent growth of non-interest income.

- Firstly, technological advances and financial innovations such as securitisation have opened up new sources of non-interest income by allowing bank holding companies (BHCs) to offer a much wider set of products and services.
- Secondly, deregulatory moves in the financial services industry such as the Gramm-Leach-Bliley (GLBA) Act of 1999 have opened new frontiers for product diversification by allowing banks to enter into securities and insurance markets.
- Thirdly, the general trend towards deregulation has intensified competition in the markets for intermediation services. This has resulted in lower net interest margins and driven banks to seek alternative areas of activities in domestic and international spheres. The advents of risk-based capital and risk-based insurance premiums have further strengthened the attractiveness of these alternative outlets of activity.
- Fourthly, fee-based earnings are considered to be more stable than interest-income because they are less sensitive to economic and interest rate fluctuations, and have a low correlation with the latter allowing risk reduction through diversification. These factors have also encouraged banks to switch to fee-based activities. On the physical production side, at least theoretically, expansion of non-interest activities has the potential to create scope economies.

Huang & Chen (2006:359) investigated whether the reliance on different sources of non-interest incomes would affect bank efficiency. They employed the Data Envelopment Approach (DEA) to calculate the cost efficiency of Taiwan domestic commercial banks from 1992 to 2004. They observed that most banks regard non-interest incomes as one of the stable sources of bank revenues. Generally, the industry believes increasing the ratio of non-interest incomes to operating incomes can not only improve profitability but also reduce the risk to the bank.

Ramasastri & Gangadaran (2004:1311) attempted to compare the behaviour of interest and non-interest income of commercial banks in India for the period from 1997 to 2003. The paper further tried to examine whether non-interest income has helped in stabilising the total income of commercial banks in the country. They found that non-interest income helped to stabilise total operating income. However, in the case of nationalised banks and new private sector banks, it was noted that non-interest income has not helped in stabilising their income appreciably.

Williams & Prather (2010:240) considered the impact on bank risk of portfolio diversification between traditional margin income and fee-based income for banks operating in Australia. They found that income derived from traditional sources is less risky than income derived from non-interest based revenue. Overall, these results suggested that shareholders of banks will benefit when switching from increased bank exposure to non-interest income via diversification. However, shareholders should monitor bank exposure to non-interest income to ensure that they do not become over-exposed to the point where the volatility effect outweighs the diversification benefits.

Huang & Chen (2006:374) investigated whether the reliance on different sources of non-interest incomes would affect bank efficiency. They divided banks into three groups based on the percentage of the income sources, including the interest incomes and non-interest incomes. Their results implied that non-interest incomes operate more cost-efficiently. They also found that banks with more diversified income sources, i.e., the group of middle

percentage interest and non-interest incomes to operating incomes; are less cost-efficient. Furthermore, after testing the detailed items of non-interest incomes they found the influences of trading revenues and fee incomes are not significant within the three groups. However, the percentage of non-fee incomes to operating-incomes is the factor that affects bank efficiency.

Monshirian, Sahgal & Zhang (2011:17) investigated the relationship between non-interest income and systemic risk. They found that non-interest income can have contrasting effects on stability based on the competitive environment in the country. In some countries, non-interest income can significantly increase systematic risk. While in other countries, certain components of non-interest income can reduce systemic risk, thereby improving bank stability.

Stiroh & Rumble (2006:2158) examined whether the observed shift toward activities that generate fees, trading revenue and other non-interest income has improved the performance of US financial holding companies (FHCs) from 1997 to 2002. They found that diversification benefits between FHCs are more than offset by increased exposure to non-interest activities which are quite volatile but not more profitable than lending activities. Within FHCs, marginal increases in revenue diversification are not associated with performance, which may reflect either a change in managerial focus or simply the endogenous nature of the diversification decision. In contrast, marginal increases in non-interest income are still associated with declines in risk-adjusted profits, suggesting a very robust relationship.

Sufian & Habibullah (2009:214) found that that bank non-interest income exhibits a negative relationship when compared to bank profitability. Okeahalam (2001:2) suggested that in South Africa, interest-based income, and fee income spreads are competitively driven, and the level of competition in the corporate banking sector has contributed to the level of efficiency (profitability).

- ***Non-interest Expense***

Yildirim (2002:2294) found that non-interest expense includes fees and commissions-paid losses from foreign exchange and capital market transactions, personal expenses, taxes and duties, rental expenses, depreciation, and other expenses.

Hollis & Sweetman (2007:722) explored the relationship of 'capital' to non-interest expenses rather than to profits. They proposed a simple explanation for this relationship: higher 'capital' created depositor indifference, which in turn allowed clerks to 'skim' larger salaries.

Shu & Strassman (2005:783) tried to enhance their understanding of the Information Technology (IT) productivity paradox in the case of banking enterprises. Their result shows that IT is the only input variable that provides more dollar value than input cost on the margin when it is compared with interest expense, non-interest expense, staff cost, and operating expense.

Kantawala (2004:1663) attempted to analyse the risk of public sector banks in India, who controls the major chunk of the economic activities of the nation. He found that amongst the profitability ratios non-interest expense/Working Fund and non-interest expense/Total Income are found to have a significant effect. On the contrary, Claessens, Demirguc-Kunt & Huizinga (2001:808) provided a systematic study of how foreign bank presence has affected domestic banking markets in 80 countries. They used bank-level accounting data and macro-economic data for the 1988 to 1995 periods. They also found that increased presence of foreign banks is associated with reductions in profitability, lower non-interest income and overall expenses of domestic banks.

Millera & Noulas (1997:511) examined large commercial banks during the latter part of the 1980s to determine what factor affected bank profitability, using both cross-section and pooled-time series cross-section regressions. They discovered strong negative effects on bank profitability from non-interest expense to total expense.

According to Rasiah (2010:77), one of the major expenses incurred in generating revenue include interest paid out to depositors which is termed as interest expenses. Other expenses are non-interest expenses such as overhead expenses, operating expenses, salaries and wages paid to employees and miscellaneous expenses. The more expenses incurred by the bank, the less profit the bank will make.

In this study, the non-interest expense will allow the researcher to grasp the total factors which are included in the input of banks assets to determine bank profitability.

### **3.3.2 Industry-specific Determinants**

- **Market Concentration**

Smirlock (1985:75) stated that a bank's market share is defined as its total deposits divided by total bank deposits in the market. To measure market concentration, the three-bank deposit concentration ratio is used.

Athanasoglou *et al.* (2005:16) measured concentration using the '*Herfindahl-Hirschman (H-H Index)*' which was also used by the researcher in this study to measure market concentration. According to Kosmidou (2008:150), concentration is calculated as the total assets held by the five largest commercial banks in the country divided by the total assets of all the commercial banks in the country.

Bhattia & Hussian (2010) examined the relationship between market structure and performance in the banking sector using data from Pakistani commercial banks. They found that there is a positive relationship between profitability and concentration. The empirical findings suggested that market concentration determined profitability in Pakistani commercial banks. Furthermore, they also concluded that there was a negative relationship between competition and profitability.

Athanasoglou *et al.* (2006:21) examined the profitability behaviour of bank-specific, industry-related and macro-economic determinants, using a panel data-set of South Eastern European (SEE) countries over the period 1998-2002. They found that concentration positively affects banks profitability, but only when profitability is measured by ROA.

Short (1979:214) examined the relation between the profit rates of 60 banks and the concentration in the 'home' banking market of each. He found that greater market power lead to higher bank profit rates. However, the relatively small coefficients of the concentration variables indicate that relatively large changes in concentration are necessary to increase profit-rates by one percentage point.

On the contrary, Dietrich, & Wanzenried (2009:34) examined how bank-specific characteristics, macro-economic variables and industry-specific factors affected the profitability of 453 commercial banks in Switzerland over the period 1999 to 2006. They found that the market concentration rate had a significantly negative impact on bank profitability. By the same token, Roman & Danuletiu (2013:580) investigated the factors that had an influence upon the profitability of Romanian commercial banks, during 2003-2011. They found that banking concentration has an important impact on bank profitability.

When banks are in a concentrated market, they earn monopoly rents (which reflect in higher profitability) from collusion. This profitability comes from oligopolistic behaviour perpetrated by large banks in the market which would be taking the lion's share of monopoly rents.

Smirlock's (1985:80) findings did not support the notion that concentration in banking markets resulted in monopoly profits being earned, but suggested that the effect of concentration added nothing to the clarification of bank profitability rates.

Hassan Al-Tamimi, (2006:46) examined the determinants of the UAE commercial banks' performance. Their conclusions also indicated an insignificant impact of three factors, liquidity, portfolio composition, cost and concentration on banks' performances.

The banking sector in South Africa is also highly concentrated. In South Africa the top four banks handle approximately 89% of retail deposits. This is high by international standards. The four largest banks, as with the rest of the banking sector, continue to show reasonable returns. It is generally accepted that when there is a high concentration there is a likelihood of collusive oligopoly, that is, the possibility of firms co-operating to the disadvantage of the consumer (Okeahalam, 2001:16).

### **3.3.3 *Macro-economic Determinants***

These external determinants are indirect factors which may be uncontrollable but nevertheless influence the bank's profitability. Additionally, the commercial banks cannot control these indirect factors but can build flexibility into their operating plan to react to changes in the factors (Rasiah, 2010:80). The variables reflecting economic and legal environments that affect operations and performances of banks indicate that bank profitability is expected to be sensitive to macro-economic variables (Ambar & Alper, 2011:145). However, in the literature in terms of external determinants, three macro-economic variables are generally used, namely: annual real GDP growth rate, annual Inflation (INF) rate, and Real Interest (RI) rate.

A bank's efficiency and profitability measure is expected to be sensitive to macro-economic variables such as economic growth, inflation and lending interest rate. There is an asymmetric relationship between profitability and macro-economic determinants.

When the real GDP growth rate is high, sound management of banks affects development of the country. The inflation rate, if it is fully anticipated, it adjusts to lending interest rates. As a result, increased economic activity in the country affects bank profitability. In contrast, if the GDP growth rate of the country is weak, inflation is not anticipated and the high lending interest rate which is not adjusted promotes the deterioration of credit quality,

low demands of deposit and increases loan defaults which negatively affect bank profitability.

- ***Economic Growth***

GDP is among the most commonly used macro-economic indicators, as it is a measure of total economic activity within an economy. The Gross Domestic Product Growth (GDPG), calculated as the annual change in the GDP, is used as a measure of the macro-economic conditions. GDPG is expected to have an effect on numerous factors related to the supply and demand for loans and deposits (Kosmidou, 2008:152).

Sufian & Chong (2008:94) examined the factor that influences the profitability of financial institutions in a developing economy. They found that higher economic growth encourage banks to lend more and permits them to charge higher margins of interest and improve the quality of assets which affect bank profitability. They similarly, investigated the factors that have an influence upon the profitability of Romanian commercial banks during 2003-2011, and found that economic growth rate has an important impact on bank profitability.

Dietrich & Wanzenried (2009:34) found that GDPG variable is one of the most important factors which affected bank profitability. Ali *et al* (2011:238) showed that GDP has a positive effect on profitability as measured by ROA and ROE.

When real sector is growing, banks are usually collecting their loans successfully and extend new ones. Davydenko (2011:25) found that GDP has an expected positive effect on profitability because the banking sector is sensitive to the overall development of the economy.

According to Bashir (2003:42), economic growth can enhance a bank's profitability by increasing the demand for financial transactions, i.e., the household and business demand for loans. During periods of strong economic growth, the demand for loans tends to be higher. Furthermore, strong economic conditions are also characterised by higher demands for financial services thereby increasing the bank's cash flow, profits and non-

interest earnings. Fewer loans would be defaulted during strong economic conditions, thus, the GDPG variable is expected to have a positive impact on performance (profitability).

Albertazzi & Gambacorta (2009:407) found that GDP influences both net interest income (via lending activity), and loan loss provisions (via credit portfolio quality) which affect high bank profit.

In contrast, Ambar & Alper (2011:149) found that macro-economic factors (real GDPG growth rate and INF rate) did not have an important effect on bank profitability.

Hassan & Bashir (2003:18) found that higher growth rate of GDP seemed to have a strong positive impact on the performance measures. However, per capita GDP seemed to have limited effect on performance.

Ali *et al* (2011:238) found GDP had a positive effect on profitability as measured by ROA and ROE.

Naceur (2003:1) found that an economic growth rate had no impact on a bank's profitability. In contrast, Islam & Nishiyama (2016:77) found that economic growth rate negatively influenced bank profitability. Athanasoglou *et al.* (2006:23) found that with due respect to macro-economic variables, bank profits are not significantly affected by real per capita GDP fluctuations.

The researcher agrees with the findings of the research study conducted by Sufian & Chong (2008), Dietrich & Wanzenried (2009), Bashir (2003), because strong economic growth is characterised by higher demands for financial services thereby increasing the banks' cash flow which encourage them to lend more and allow them to charge higher margins of interest and improve the quality of assets which affect their profitability.

- ***Inflation (INF)***

The annual inflation rate is the growth of the money supply as measured by currency circulation (Kosmidou, 2008:150). Athanasoglou *et al* (2006:22) found that inflation has a strong effect on profitability.

When a bank's income increases more with INF than do bank costs, INF affects bank profitability. Kunt & Huizinga (1999:405) found that INF is associated with higher realised interest margins and higher profitability. When INF is fully anticipated and interest rates are adjusted accordingly, a positive impact on profitability will result.

Vong & Chan (2008:93) found that only the rate of inflation exhibits a significant relationship with the performance of banks (profitability) with regard to macro-economic variables. Islam & Nishiyama (2016:77) found that the rate of inflation positively affect bank profit.

Ali *et al.* (2011:237) also indicated that the Consumer Price Inflation (CPI) is statistically significant and associated with profitability (as measured by ROA). Similarly, Tan (2016:108) found that Chinese banks have higher profitability (ROA), NIM and Profit before Tax (PBT) in a higher inflationary environment.

Al-Jafari & Alchami (2014:41) found a positive and significant relationship between inflation rate and bank profitability.

If an inflation rate is anticipated, banks can adjust interest rate in order to increase revenues than costs. Guru *et al.* (1997:17) found that inflation has a positive impact on profitability. However, this may indicate that bank management may have anticipated the inflation rate. The positive relationship found between inflation and profitability in the Chinese banking sector reflects the fact that inflation in China can be fully anticipated and the interest rates are adjusted accordingly (Tan & Floros 2012:691).

On the contrary, if the inflation rate is not anticipated, banks cannot make proper adjustments of interest rates so that costs may increase faster than revenues.

Ambar & Alper (2011:149) found that the inflation rate has no important effect on bank profitability. In the same vein, Bashir (2003:42), stated that when inflation is anticipated, banks generate profits using high interest rates on loans in times of the higher inflation rate. Additionally, if it is unanticipated, banks would not adjust rates timely and overhead costs would rise faster than inflation resulting in decreased profitability.

In South Africa, the state of financial system development and reform process affects economic improvement which is sustained by prudent economic policies which decrease inflation. High commodity price index plays an important role for low costs and increases profitability in the banking sector in the country.

Kumbirai & Webb (2010:31) observe that improving macro-economic fundamentals results in low inflation, high commodity prices and increased investor confidence. In such favourable economic conditions, the banking sector plays an essential role in the economic growth of the country.

The researcher agrees with the findings of the study conducted by Vong & Chan (2008), Al-Jafari & Alchami (2014), Ali et al. (2011), because if an inflation rate is anticipated, banks can adjust interest rates in order to increase revenues than costs. This may indicate that bank management may have anticipated the inflation rate therefore, there is a positive relationship found between inflation and profitability.

- ***Real Interest (RI) Rate***

When RI rates are higher, return on equity of banks rise. Ambar & Alper (2011:149) found that, on macro-economic variables, only RI rate is found to be having a positive effect on profitability, as measured by ROE. Haron (2004:18) found that IR plays a major role in influencing the profitability. Vong & Chan (2008:104) found the RI rate to have a positive relationship with profitability.

Nessibi (2016:39) found that the real interest rate has a positive effect on bank profitability.

Kanwal & Nadeem (2013:191) explained that in the rule of borrowing short and lending long terms, banks may increase the lending-rate as compared to the deposit-rate and earn more profit over time. Interest-rate is positively related to bank profitability. When demand-deposits are frequently paid below zero or below the market interest rate, they can have an influence on bank profitability. Kunt & Huizinga (1999:405) established that high RI rates are associated with higher interest margins and affect bank profitability, especially in developing countries. However, Islam & Nishiyama (2016:77) found that interest rates negatively influence bank profitability.

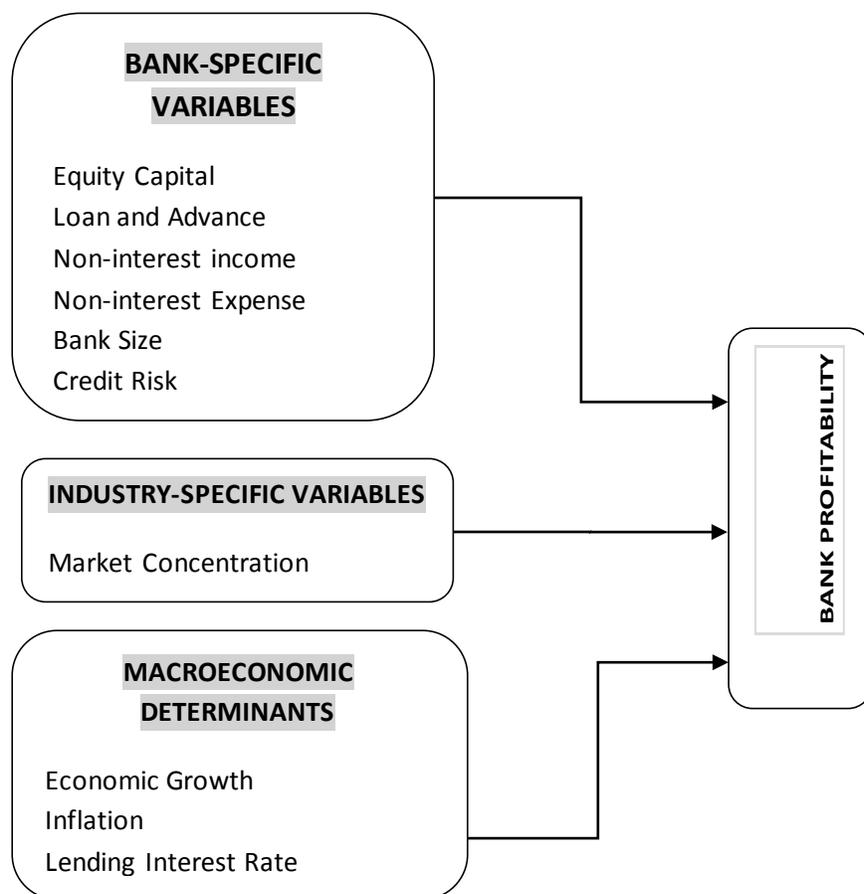
In South Africa, the central bank is tasked with determining the interest rates in order to facilitate the country's financial stability and sustainable economic growth (Thomas 2012:2). In this study, the researcher expected a positive relationship between interest rate and profitability. Most authors, who dedicated their studies on determinants bank profitability, emphasise that internal factors such as L&A, cap, LN, deposits and CR are considered key drivers of bank profitability. Conversely, another group of researchers believe that beyond internal factors of bank profitability, there are also unpredictable external factors (GDP, market concentration, inflation, and lending interest rate) which may affect bank profitability.

In addition, few studies focused on factors like Non-Interest Income (NII), Non-Interest Expense (NIE) in relation to bank profitability. However, this study will endeavour to Consider NII and NIE, among other determinants<sup>1</sup>

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<sup>1</sup> Determinants of bank profitability in this study are as follows: Equity Capital, Bank Size (LN), Loans and Advances (L&A), Deposits, Non-Interest Income, Non-Interest Expense, Credit Risk (CR), Market Concentration, Economic Growth, Lending Interest, Inflation (INF).

**FIGURE 3.2: Relationship between Bank-Specific, Industry-Specific, Macro-economic Determinants and Profitability**



**Source:** Model developed by author

### **Conclusion and Knowledge Gap**

In the field of bank profitability, the general theories have not yet revealed to link framework theories to the determinants of bank profitability. The study's conceptual framework of market structure and banking efficiency approaches was used in order to understand how the relationship between bank-specific, industry-specific, macro-economic determinants affect the profitability of bank. Market structure approach will be used to analyse the market concentration (industry specific determinants) as well as to understand its impact on bank profitability in South African banks.

In another hand, banking efficiency approach will used to analyse bank-specific (equity capital, credit risk, loan and advances, deposit) as well as macro-economic determinants (economic growth, inflation, lending interest rate), toward its impact on bank profitability in South Africa. Also banking efficiency used the appropriate input and output variables to determine profitability. The process of producing outputs from inputs can be influenced by environmental variable such as macro-economic determinants, which are frequently used as not controllable by the bank and bank-specific variables which are controllable by the bank. Banking efficiency approach will be used to determine the relationship between bank profitability and both macro-economic and bank-specific. Finally, market structure and banking efficiency approaches will be used in measuring the extension of bank profitability in the South African context.

The review of existing literature and an empirical research has been conducted by the various scholars in the field of determinants of bank profitability. They concluded that bank-specific, industry-specific and macro-economic determinants have an impact on bank profitability because the researchers have used either only internal or external variables, obviously that could not make possible the understanding of various challenges of some banks whose profitability is not significant.

In order to cover this gape, this study examines factors that affect bank profitability in South Africa by using the following internal and external determinants: equity capital, bank size, credit risk, loans and advance, deposit, market concentration, economic growth, inflation, lending interest rate including non-interest income, non-interest expense. Thus, an explicit analysis of the determinants of bank profitability in South Africa is indeed lacking. It is therefore hoped that this study will serve to expand the existing literature on banking and finance in South Africa, particularly in the context of the determinants of bank profitability.

In order to investigate the factors which affect the profitability of South African banks, the researcher conducting this study by using quantitative approach methods, by observing large numbers of observation and including sufficient number of variables, this makes

complete difference from the previous researchers, because they used mixed research approach with limit observation and number of variables.

## **CHAPTER 4**

### **RESEARCH METHODOLOGY**

## **4.1 INTRODUCTION**

This chapter presents the research design and methodology to be used in this study. In this chapter, the researcher describes the methodology that will be used in the empirical analysis to test different hypotheses. It will make use of a quantitative approach in order to achieve the objectives of the study. It also explores issues of research design; population size and sampling techniques. Lastly, data sources and estimation approaches model.

## **4.2 RESEARCH METHODOLOGY**

In this section, the researcher describes the methodology to be used in this study. According to Burns & Grove (2003:223), the research methodology comprises the entire strategy of the study, from the identification and assessment of the problem to the final phase of data analysis, conclusions and recommendations.

According to Stanczak (2007:10), methodology refers to the innovative ways in which researchers employ visual tools and techniques to gather data and generate reports. It also highlights issues and tools related to research design such as: population, sample and sampling techniques, data sources, estimation approaches and the model.

### **4.2.1 QUANTITATIVE APPROACH**

Quantitative research investigates the relationships between variables within a particular population using numerical data and statistical methods. In order to define the research objective, a quantitative research approach will be used. Quantitative research entails collecting numerical information. This information is entered into a statistical software, after which the results are analysed using statistical techniques, and a so-called

quantitative analysis. This analysis method is often used for surveys, secondary data and experiments (Verhoeven 2011:111). What makes this study quantitative is that instruments that produce numerical data are used, and the data is analysed using statistics (Remler & Van Ryzin 2011:58).

In addition, quantitative research involves measurements, usually of a number of variables, and sample. Therefore, for each variable we have scores for each member of the sample (Punch 2011:109).

The strengths and weaknesses of quantitative research are summarised in the table below:

**TABLE 4.1:** *The Strength and Weakness of Quantitative Research*

<b><i>Approach</i></b>	<b><i>Strength</i></b>	<b><i>Weakness</i></b>
<b>QUANTITATIVE</b>	The data can be aggregated, summarised, and subjected to statistical analyses. The findings of data from large representative samples may ultimately be generalised to similar populations.	This method depends on the availability of prior theories and hypotheses. Previously developed and validated measures are also required for the collection of quantitative data. The researchers with only numeric data may find it difficult to meaningfully communicate the research findings to a broad audience.

**Source:** Adapted by the author from Jacobs, Kawanaka & Stigler, 1999

In order to provide credible, accountable, and legitimate answers to the research objective in this study, the researcher will use the quantitative approach with the use of secondary data that is numerical in nature.

### **4.3 RESEARCH DESIGN**

Babbie (2007:112) states that research design involves a set of decisions regarding what topic is to be studied among what population with what research methods for what purpose. In addition, a research design is an exposition or plan of how the research plans to execute the research problem that has been formulated (Mouton, 1996:175).

Research design can be distinguished in the literature, roughly ordered from general to specific. According to Punch (2011:62), research design means all the issues involved in planning and executing a research project, from identifying the problem through to reporting and publishing the results. A research design has two main functions. The first relates to the identification and/or development of procedures and logistical arrangements required to undertake a study, and the second emphasises the importance of quality in these procedures to ensure their validity, objectivity and accuracy (Kumar, 2011:94).

#### **4.3.1 POPULATION AND POPULATION SIZE**

According to Gray (2009:148), a population can be defined as the total number of possible units or elements that are included in the study. In addition, if it is not possible to evaluate the entire population because of its large size or a lack of research resources, and then we might select a sample of elements to be investigated by the researcher.

The target population for a study is the group about whom the researcher would like to be able to speak in the reports and presentations that they develop from the findings. The population can be individuals, groups of individuals, or other units (Bickman & Rog 2009:94).

The population for this study will be drawn within the South African commercial banks. According to the Bankscope database, there are 17 commercial banks listed in South Africa. However, in this study we consider 9 banks because of availability of the data, i.e. Absa Bank, Standard Bank, FirstNational Bank, Nedbank, Capitec Bank, African Bank, Albaraka Bank Limited, GBS Mutual Bank, Grindrod Bank Limited, Habib Overseas Bank

Limited, HBZ Bank Limited, Mercantile Bank Holdings Limited, Sasfin Bank Limited and The South African Bank of Athens Limited.

#### **4.3.2 SAMPLE SIZE AND POPULATION SAMPLING TECHNIQUES**

A sample comprises elements or subsets of the population considered for actual inclusion in the study. It can also be viewed as a subset of measurements drawn from a population in which the researcher is interested (Unrau, Gabor & Grinnell 2007:279, cited by De Vos, Strydom, Fouche & Delport 2011:231). In this study, the population under investigation was identified from a list of banks as provided by the South African reserve bank. ([www.resbank.co.za](http://www.resbank.co.za))

According to Patel (2013:171), the fundamental objective of sampling is to give maximum information about the parent population with minimum effort. Thus, the theory of sampling mainly deals with the estimation of unknown parameters of the population by which we can determine the distribution of the population under research.

Sampling is the process of selecting a few (a sample) from a bigger group (the sampling population) to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation or outcome regarding the bigger group (Kumar 2011:193).

De Vos, Strydom, Fouche & Delport (2011:234) describe sampling as taking a portion of a population or universe and considering it a representative of that population or universe. Generalising the results of a sample based on working with such a sample means that it is assumed that any other portion of the same population would yield the same observations. Sampling is done to increase the feasibility, cost effectiveness, accuracy and manageability of the prospective survey.

Through sampling only an estimate is made about the actual situation prevalent in the total population from which the sample is drawn (Kumar 2011:193). Sampling to achieve representativeness is usually called probability sampling, and while different strategies have been designed to achieve it, the main one is some type of random selection (Punch 2011:102).

The basic objective of any sampling design is to minimise, within the limitation of cost, the gap between the values obtained from the sample and those prevalent in the study population (Kumar 2011:25). In random elections, each element in a population has an equal chance or equal probability of being chosen (Punch 2011:102).

In this study, the researcher suggested that the first probability sampling is based on randomisation, while the second non-probability sampling is done without randomisation (Strydom 2011:228).

The empirical study was conducted by taking sample among South African banks. The purposive sampling which is a non-probabilistic sampling was used to choose the sample of the study which comprises nine commercial banks.<sup>2</sup> It is worthy to note that among these nine selected banks four of them are labelled as four biggest banks as they represent over 86% of the banking market share in South Africa (Falkena, Davel, Hawkins, Llewellyn, Luus, Masilela, Parr, Pienaar & Shaw 2004:iii), and other commercial banks.

The banks sampled in this research are 9 South African commercial banks as cited above (see Section 4.3.1), after excluding other commercial banks because of missing values. The study considered data for a period of 12 years from 2001-2013.

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<sup>2</sup>List of sample of commercial banks to be considered in this study are Absa Bank Ltd, African Bank Limited, Capitec Bank Holdings Limited, FirstRand Bank Ltd, GBS Mutual Bank, HBZ Bank Limited, Mercantile Bank Holdings Limited, Nedbank Group Limited, and Standard Bank Group Limited.

**TABLE 4.2:** Banks' Sample of the Study

<b>No.</b>	<b>Name of Bank</b>	<b>Year Established</b>	<b>Branch No.</b>	<b>Total Assets-</b>	<b>Head Office</b>
1.	Absa Bank	1991	990	R 742bn	Johannesburg
2.	Standard Bank	1962	703	R 921.7bn	Johannesburg
3.	Nedbank	1888	452	R 648.1bn	Johannesburg
4.	First National Bank	1929	823	R 698bn	Johannesburg
5.	African Bank	1975	643	R 50bn	Midrand
6.	Capitec Bank	2001	507	R 23.6bn	Stellenbosch
7.	GBS Mutual Bank	1877	3	R 862.9m	Grahamstown
8.	HBZ Bank Limited	1995	5	R 3.5bn	Westville
9.	Mercantile Bank Holdings Limited	1987	n/a	R 6.2bn	Sandton

**Source:** Thomas (2012:65) and [www.bankscop.com](http://www.bankscop.com)

#### **4.3.3 DATA SOURCES**

The data used are annual time series from the balance sheets and income and loss statements of listed banks from 2001-2013. The study involved only listed banks because of availability of data. Our sample consists of an unbalanced and balanced dataset accomplishing 108 total observations. In other words, the 9 banks were followed for 12 years and sampled annually. All bank-specific and industry-specific data were sourced from Bank Scope database of the Bureau Van Dijk and unconsolidated data was selected but where these were not available, the researcher chose consolidated data instead. The variables that were not in ratios were converted to logarithms according to the literature review. Macroeconomic determinants data were collected from Business Monitor International.

#### **4.3.4 ESTIMATION APPROACHES AND MODEL**

According to Bickman & Rog (2009:302), analysis of numeric data may be in two broad forms. One is to summarise the data into meaningful forms/indicators that are easy to

understand, compare, and communicate. These indicators are called descriptive statistics. The second general category consists of techniques for estimating population parameters, testing hypotheses, or making predictions are called inferential statistics.

The study uses panel regression techniques to test the relationship between bank-specific, industry-specific and macro-economic determinants with regards to bank profitability. Panel data (also known as longitudinal cross-sectional time-series data) is a dataset in which the behaviour of entities is observed across time. These entities could be states, companies, individuals, countries, etc. (Reyna 2007:02).

Longitudinal studies can suffer from the conditioning effect. This describes a situation where, if the same respondents are contacted frequently, they begin to know what the researcher expects from them and thus, they may respond to questions without thinking, or they may lose interest in the enquiry and end up producing the same result. The main advantage of a longitudinal study is that it allows the researcher to measure the pattern of change and obtain factual information, requiring collection on a regular or continuing basis thus enhancing its accuracy(Kumar 2011:110).

An important benefit from pooling time-series data is ability to control for individual-specific effects possibly unobservable which may be correlated with other included variables in the specification of an economic relationship (Hausman & Taylor 1981:1377).

Therefore, panel data can capture and measure effects that are not detectable in time-series analysis, as well as provide a platform on which to test more complicated behavioural models (Hsiao 1986; and Klevmarken 1989 cited by Alexiou & Sofoklis (2009:107).

Panel regression techniques are used in this study to analyse the internal determinants as well as the external determinants. Firstly, it has the advantage of giving more informative data as it consists of time series information which captures dynamic adjustment. Secondly, this technique allows for the study of the impact of macro-

economic developments on profitability after controlling bank-specific characteristics, with less collinearity among variables, more degrees of freedom and greater efficiency (Vong & Chan 2009:104).

The consensus from the literature on bank profitability is that the appropriate functional form of analysis is the linear one (Vong & Chan 2009:105). According to Bourke (1989:73), the appropriate functional form for testing is a linear function. Thus, to examine the determinants of bank profitability in South Africa, the researcher used a linear model to analyse the time series data.

The dataset may be a short panel (few time periods and many individuals), a long panel (many time-periods and few individuals) or both. This distinction has consequences for both estimation and inference (Camero & Travedi 2009:230). In addition, a long panel data analysis was used in this study because of the number of the period of observation (12 years) was higher than the number of observed individuals (9 banks).

The theories pertain to the behaviour of the individual unit and panel data provides valuable information at the individual level. Descriptive statistics, auto-correlation, heteroscedasticity, multicollinearity in the data and correlation matrix of residuals was used in the analysis.

- ***Fixed Effects***

The idea behind the fixed effect model is that there is one real value for the treatment effect and that all the trials will estimate this one value. According to Bhargava & Franzini (1982:533), the fixed effects frameworks have been proposed in order to take account of the individual differences when estimating economic relationships from panel data.

Reyna (2007:9) stated that using the fixed-effect (FE) explores the predictor and outcome variables within an entity (country, person, company, etc). However, each entity has its own individual characteristics that may or may not influence the predictor variables. All

models were estimated using fixed-effect regression and the researcher eliminated the firm-level heterogeneity through the use of mean deviation data (Kosmindou, Tanna & Pasiouras 2004:14).

- ***Random Effects***

According to Reyna (2007:26), random effects assume that the entity's error term is not correlated with the predictors which allows for time-variables to play a role as explanatory variables.

Bhargava, Franzini and Narendranathan (1982:533) argued that several heterogeneous and the so-called "random effects" and the "fixed effects" frameworks have been proposed in order to take account of the individual differences when estimating economic relationships from panel data.

- ***Hausman Test***

According to Cameron & Trivedi (2005:271), the Hausman test is based on comparisons between two different estimators to consider a test for endogeneity of a regressor in a single equation. Two alternative estimators are the OLS and 2SLS estimators. The 2SLS estimator uses instruments to control for possible endogeneity of the regressor. If there is endogeneity the OLS is inconsistent, resulting in the two estimators having a different probability limit. If there is no endogeneity both estimators are consistent, so the two estimators will have the same probability limit.

In order to determine whether to use the fixed effects or random effects model, the Hausman test will be conducted using the following hypotheses test.

- (a) H<sub>0</sub>: Preferred model is random effect  
H<sub>1</sub>: Preferred model is fixed effect
- (b) H<sub>0</sub>: Unique errors are not related to regressors  
H<sub>1</sub>: Unique errors are related to regressors

The null hypothesis is rejected when the calculated P-value is smaller than the 5% level ( $P < 0.05$ ). The p-value represents the probability that if the null hypothesis is true the researcher will observe a statistic that deviates by chance from the parameter being tested by a greater degree than is observed (Hamburg & Young 1994:519 & 319).

This means, if p-value smaller than 0.05 we use the fixed effects model; if p-value is greater than 0.05 then we use Random effects model. The Wooldridge test was used for if the p-value was smaller than 0.05 there would be serial correlation.

The estimation of dynamic models from panel data, however, is much more complex than its counterpart in time series analysis, since a typical panel consists of only a few observations over time (Bhargava, Franzini & Narendranathan 1982:534).

The study used the model regression equation adopted from Athanasoglou, Brissimis & Delis (2005:12). The general model to be estimated is of the following linear form:

#### 4.3.4.1 Equation (1)

$$\pi_{it} = c + \sum_{k=1}^K \beta_k x_{it}^k + \varepsilon_{it} \quad (1)$$

$$\varepsilon_{it} = v_i + u_{it}$$

**Where:**  $\pi_{it}$  is the profitability of bank  $i$  at time  $t$ , with  $i = 1; \dots, N$ ;  $t = 1; \dots, T$ .  $c$  is a constant term,  $x_{it}$  s are  $K$  explanatory variables and  $\varepsilon_{it}$  is the disturbance with  $v_i$  the unobserved bank-specific effect and  $u_{it}$  the idiosyncratic error. This is a one-way error component regression model. Where  $v_i \sim IIN(0, \sigma_v^2)$  and independent of  $u_{it} \sim IIN(0, \sigma_u^2)$ .

#### 4.3.4.2 Equation (2)

The explanatory variables  $X_{it}$  separated into these three groups is:

$$\Pi_{it} = c + \sum_{j=1}^J \beta_0 X_{it}^j + \sum_{L=1}^L \beta_1 X_{it}^L + \sum_{m=1}^M \beta_m X_{it}^m + \varepsilon_{it}, \quad (2)$$

Where the  $X_{it}$ :  $c$  with superscripts  $j$ ,  $L$  and  $m$  denote bank-specific, industry-specific and macro-economic determinants respectively.

The equation that account for individual explanatory variables for ROA model which is specified for this particular study is given as follows.

#### 4.3.4.3 Equation (3)

ROA model: Return on assets as the dependent variable.

$$ROA_{it} = B_0 + B_1 CAP_{it} + B_2 SIZE_{it} + B_3 LOAN_{it} + B_4 SAVDEP_{it} + B_5 FIXTDEP_{it} + B_6 NII_{it} + B_7 NIE_{it} + B_8 CR_{it} + B_9 CONS_{it} + B_{10} GDP_{it} + B_{11} INF_{it} + B_{12} INT_{it} + e_{it}$$

Where  $i$  = Bank and  $t$  = time.

Where:  $\beta_1$ - $\beta_{12}$  is coefficients for the respective explanatory variables, from this  $\beta_1$ - $\beta_8$ , represent coefficient of bank specific determinants,  $\beta_9$ , represent coefficient of industry specific determinants,  $\beta_{10}$ - $\beta_{12}$ , represent coefficient of macroeconomic determinants.

The study used the Return on Assets Ratio (ROA) as measures of bank profitability.

## 4.4 VARIABLES DEFINITION AND MEASUREMENTS

### 4.4.1 DEPENDANT VARIABLE

- **Return on Asset (ROA)**

Vong & Chan (2008:101) argued that the performance of a bank is measured by its return on assets (ROA). The ROA, defined as net income divided by total assets, reflects how

good a bank's management is in using the bank's investment resources to generate profits. A number of authors have used ROA as a measure of bank profitability (Naceur 2003:06; Pasiouras & Kosmidou 2007:05; Kosmidou 2008:149; Javaid *et al.* 2011:66; Athanasoglou *et al.* 2006:21; Kosmidou 2006:14; Flamini *et al.* 2009). Banks with lower leverage (higher equity) will generally report higher ROA. This study used the ROA as the primary dependent variable.

#### **4.4.2 INDEPENDENT VARIABLES**

- ***Bank Specific Determinants***

*Equity Capital (CAP)*: Is measured by total equity over total assets and this shows capital adequacy and the general safety and soundness of the financial institution. The study employed this ratio to proxy the capital variable because ROA has been used as a measure of profitability. Therefore, the researcher expected position between equity capital and profitability.

*Bank Size Ratio (SIZER)*: One of the most important questions regarding bank profitability is whether or not bank size optimises profitability. Generally, the effect of size on profitability is expected to be positive to a certain extent. However, for banks that become extremely large, the effect of size could be negative due to bureaucracy and other reasons. Hence, the size-profitability relationship may be expected to be non-linear. The study also used the banks' logarithm of total assets and their square in order to capture the possible non-linear relationship and to remove the scale effect (Dietrich & Wanzenried 2009:12).

*Loans and Advances Ratio (LOANR)*: This is measured by total loans divided by total assets, and this ratio provides a measure of income source. Other things being constant, the more the deposits that are transformed into loans, the higher the level of profit. Hence, it is expected to have a positive relationship with bank performance.

*Deposits*: There are three main types of deposits received by commercial banks, namely: saving deposits, term deposits and demand deposits. However, only saving and term

deposits are interest-bearing deposits. Therefore, the impact of the interest expense on banks profitability are captured by the saving deposits to total assets ratio (SAVEDR) and term deposits to total assets ratio (FIXDR). Being the major and perhaps the cheapest source of funding for banks, it is generally believed that customer deposits impact banking performance positively as long as there is sufficient demand for loans.

The two types of deposits are captured as the following ratios:

$$\text{Saving Deposit (SAVEDR)} = \frac{\text{Saving Deposits}}{\text{Total Assets Ratio}}$$

$$\text{Term Deposits (FIXDR)} = \frac{\text{Term Deposits}}{\text{Total Assets Ratio}}$$

*Non-Interest Income Ratio (NIIR):* The importance of fee-based services of commercial banks and their product diversification is captured by non-interest income to total income ratio. Although fee-based services in general generate lesser income than loans, it is expected to add something on banks profit and have a positive relationship with profitability. However, when banks shift their attention from interest income services to non-interest income services, profitability may decline. Therefore, this ratio may have a negative effect on profitability.

*Non-Interest Expense Ratio (NIER):* In addition to interest expenses paid for saving and term deposits, commercial banks incur operating costs and depreciation expenses. To capture the impact of those non-interest expenses on banks profitability, the factor is measured by the ratio of non-interest expenses to total assets. It is expected to be negatively related with profitability, since improved management of these expenses will increase efficiency and thereafter raise profits.

*Credit Risk Ratio (CRR):* For this variable, the study utilises the loan-loss provisions to total loans ratio. In view of the fact that increased exposure to credit risk is normally

associated with decreased firm profitability and hence, it is expected to have a negative relationship with banks profitability.

- **Industry Specific Determinant**

*Market Concentration Ratio (CONSR):* This is the measure of the size and distribution of banks in a particular market or country. The market concentration is captured by the Herfindahl-Hirschman (H-H) index which is the sum of the square of market share of the sample banks included in this particular study. Market share of each bank is measured by the ratio of a bank's total assets to total asset of all banks.

In a highly concentrated market that lacks competition in the setting of the price of banking services, existing banks become more profitable. Thus, there will be a positive relationship between market concentration and profitability. On the other hand, when the concentration of the market is reduced and the size and distribution of banks become more dispersed, the banking sector profitability is expected to reduce. In this instance, the market concentration and banks profitability is expected to be negative.

- **Macro-economic Determinants**

*Economic Growth Ratio (GDPR):* This is measured by the real GDP growth rate and it is hypothesised to affect banking profitability positively. This is because the default risk is lower in upturns than in downturns of the economy. In addition, higher economic growth may lead to a greater demand for both interest bearing and non-interest bearing financial services, thereby improving the profitability of banks.

*Lending Interest Rate Ratio (INTR):* The real interest rate relationship produces profitability according to the lend-long and borrow-short argument (Vong & Chan 2009). On the other hand, increasing real debt and interest rates on borrowers leading to lower asset quality resulting in declining profitability Vong & Chan 2009.

*Inflation Ratio (INFR)*: High inflation rate is associated with higher costs as well as higher income. If a bank's income rises more rapidly than its costs, inflation is expected to exert a positive effect on profitability. On the other hand, a negative coefficient is expected when its costs increase faster than its income.

The table below describes the independent variables and their expected sign in the regression.

**TABLE 4.2:** Explanatory Variables and Expected Signs

Variables	Notation	Expected Effect
-----------	----------	-----------------

Determinants Independent Variables	Bank specific	Equity Capital	CAP	+
		Bank Size	SIZE	±
		Loans and Advances	LOANS	+
		Deposits :	SAVED	+
		FIXDEP+		
		Non-Interest Income	NII	±
		Non-Interest Expense	NIE	±
		Credit Risk	CR	-
	Industry Specific	Market Concentration	CONS	±
	Macro-economic	Economic Growth	GDP	+
	Lending Interest Rate	INT	±	
	Inflation	CPI	±	

Source: Athanasoglou *et al* (2005:32)

The study used a quantitative approach and a longitudinal study in collecting and analysing the data collected from 9 different banks in South Africa. The methodology applied and the research design was used will enable the researcher to determine the outcome of the research. An analysis of panel data was elected as the most appropriate to explain well the variables in equation.

## **CHAPTER 5**

### **DATA ANALYSIS AND DISCUSSION OF RESULTS**

## **5.1 INTRODUCTION**

This chapter analyses the determinants of bank profitability in South Africa using the balanced panel data, where all the variables are observed for each cross-section and each time-period. This study incorporated time series data for the period 2002-2013 and cross-section segments of nine South African commercial banks. Initially the chapter presents the relationship between determinants and bank profitability, the descriptive statistics of the selected variables, the correlation analysis determining how the variables are related and finally, the estimated models. The Hausman Test was used to determine whether to use the fixed effects (FE) model or the random effects (RE) model. In this case the FE model was most appropriate. The panel data was then diagnosed for the presence of auto-correlation and heteroscedasticity. The regression was used to quantify how many the explanatory variables impacted on ROA. The model was fitted to the data for each dependent variable using only continuous explanatory variables.

## **5.2 DESCRIPTIVE STATISTICS OF VARIABLES**

Table 5.1 below reports the mean, maximum, minimum, standard deviation, observation and coefficient variation of the data. Descriptive statistics are presented after preparing the data for analysis. A total of 108 observations were used in the analysis.

**TABLE 5.1:** Descriptive statistics of variables: 2001-2013

<i>Variables in Ratio</i>		<i>Mean</i>	<i>Max</i>	<i>Min</i>	<i>Standard Deviation</i>
<b>Dependent</b>	ROA	2.29	11.00	-9.00	3.13
<b>Independent</b>	CAP	14.79	89.00	5.00	14.21
	SIZE	21.50	98.00	3.00	16.33
	LOAN	62.96	84.00	26.00	15.40
	SAVED	29.89	93.00	-85.00	39.62
	FIXED	25.08	93.00	0.00	26.25
	NII	37.74	68.00	0.00	17.63
	NIE	7.51	64.00	2.00	11.47
	CR	5.59	30.00	0.00	7.23
	CONC	11.18	48.00	0.00	13.89
	GDP	3.40	5.60	-1.50	1.88
	INF	5.88	12.00	0.00	3.06
	INTR	5.54	11.10	2.80	2.28
<b>Source:</b> Computed from E-Views result					

As illustrated in Table 5.1, the main measure of bank profitability is ROA which indicates that South African commercial banks have an average positive ROA. With a total of 108 observations, the average ROA was found to be 2.29%. The standard deviation of return on asset was 3.13%.

Further to the dependent variables there are some statistics to mention such as minimums and maximums where the mean of the capital, the CAP was 14.79%.

In this industry, there is a high capital ratio with the maximum of 89% and a minimum of 5.00%. This high variation has taken place since regulatory and supervision of the South African Reserve Bank was higher.

Furthermore, in another descriptive statistics of LOANS, the average of mean was 62.96%. The maximum and the minimum average of loans are 84.00% and 26.00%, which explains that the most efficient and profitable bank has quite a substantial loan advantage than the least efficient and profitable bank.

With regard to SAVDEP, the mean was 29.89% and the maximum and the minimum 93.39% and -85.44% respectively. Descriptive statistics of FIXDEP indicated that mean was 25.08% and the maximum and the minimum are 89.90% and 0.00% respectively. The higher levels of deposits, the higher its effect on bank profitability (Kunt & Huizinga, 1999:405)

With regard to NII, the average of mean was 37.74% and the maximum and minimum were 68.00% and 0% respectively. From the descriptive statistics of NIE, the mean was 7.51% and the maximum and minimum 64% and 2% respectively.

The mean of CR was 5.59%. This means South African commercial banks have on average 5.59% non-performing loans from the total loans. The maximum and minimum were 30.00% and 0% respectively.

Descriptive statistics for the market concentration are captured by the H-H Index, which is the sum of the square of market share of the sample banks included in this particular study. The average was 11.18%, and the maximum and minimum 48% and 0% respectively.

From the descriptive statistics of GDP, the mean was 3.40%, and the maximum and minimum 5.60% and -1.50% respectively.

The average of INF was 5.88% and maximum and minimum 12.00% and 0% respectively. The average of INTR was 5.54% and the maximum and minimum 11.10% and 2.80% respectively.

### 5.3 CORRELATION ANALYSIS

In order to determine what type of relationship exists between dependent and independent variables; Pearson's correlation coefficient was used to determine the extent of the relationship between the variables. Pearson's coefficient of correlation measures the linear association between two variables on an interval or ratio scale (Davis, Pecar & Santana, 2014). According to Hair, Black, Babin & Anderson, (2014), the correlation coefficient indicates the strength of the association between two metric variable where a + or – indicates the direction of the relationship. The value ranges from -1 to 1.

As mentioned in the methodology, Cohen (1988) stated that if  $r = 0.10 - 0.29$  then there is a low effect (low correlation);  $r = 0.30 - 0.49$  has a medium effect (moderate correlation) and  $r = 0.50 - 0.99$  has a large effect (strong correlation). The results of the correlations of only the dependent variables and the explanatory variables are shown in Table 5.2. The full correlation analysis is shown in appendix II.

**TABLE 5.2:** Correlation analysis of ROA with the explanatory variables

<i>Variable</i>	<i>ROA</i>
Return on asset (ROA)	-
Equity capital (CAP)	.649

Bank size (LN)	.641
Loan (LOAN)	-.161
Saving deposits (SAVDEP)	-.346
Fixed term deposits (FIXTDEP)	-.121
Non-interest income (NII)	-.340
Non-interest expense (NIE)	.684
Credit risk (CR)	.430
Market concentration (MARCONS)	-.305
Economic growth (GDP)	.140
Inflation (INF)	.118
Lending interest rate (INTR)	.082

As depicted in the Table 5.2 the independent variables CAP has a strong significant positive relationship with ROA. CAP correlated at 0.649 with ROA. Thus, high values in equity capital are associated with high values in return on assets. Maintaining a high level of capital may reflect the effect of the profitability and efficiency of the banking operation, while a low level of capital may reflect the effect of negative results (Dhouibi, 2016:11).

LN (SIZE) has a strong positive relation when correlated with ROA, SIZE correlated at 0.641 with ROA. Thus, high values in LN are associated with high values in ROA. This result is in line with Athanasoglou *et al.* (2008:128) who argued that the effect of a growing size on profitability proved to be positive to a certain extent.

The NII variables are moderately negatively correlated to ROA. NII correlated at -0.340 with ROA. Thus, NII are associated with low values in ROA. NIE has a strong positive correlation with ROA, Non-Interest Expense correlated at 0.684 with ROA. This result is unexpected because ROA should have a negative correlation with NIE.

CR has a moderate positive statistically significant correlation with ROA and CR correlated at 0.430 with ROA. This is unexpected because CR should have negative correlation with ROA.

The variables MARCONS moderately negatively correlated to ROA. MARCONS correlated at -0.305 with ROA.

The correlation between explanatory variables was all below 0.7 except for a near correlation between CAP, LN and NIE. All the other remaining correlations were below 0.8. Collinearity problems exist if more than one predictor has a high variance proportion (loads highly) on a principal component having a high condition index. One should definitely be concerned when two or more loadings greater than 0.9 appear on a component with a high condition index (Kleinbaum *et al.* 2008:314).

#### 5.4 REGRESSION ANALYSIS.

For the purpose of identifying the important variables impacting the dependent variables such as ROA, the researcher has used regression analysis. Since this is panel data, the first test to be done was to determine whether the model was a FE or RE model using the Hausman Test.

##### 5.4.1 HAUSMAN TEST FOR MODEL 1

The Hausman test is where the null hypothesis is that the preferred model is RE vs. the alternative it is FE (Greene 2008). It basically tests whether the unique errors ( $\varepsilon_{it}$ ) are correlated with the regressors where the null hypothesis is that they are not (Torres-Reyna 2007). The results of the models are given in Table 5.3.

**TABLE 5.3:** Hausman Test for Model 1 – all continuous variables

<b>Test <math>H_0</math> : <math>\varepsilon_{it}</math> is not correlated with <math>X_i</math> (random-effects model is appropriate)</b>	
<b><math>H_1</math>: <math>\varepsilon_{it}</math> is correlated with <math>X_i</math> (fixed-effects model is appropriate)</b>	
<b><i>Test Summary</i></b>	<b><i>Model ROA</i></b>

<b>Chi-sq statistic (<math>\chi^2</math>)</b>	58.31
<b>Chi-sq. d.f</b>	12
<b>Prob (p-value)</b>	$p < 0.001$
<b>Decision</b>	Reject $H_0$

In this model the p-value was highly significant. Since the p-values were less than 0.01, the null hypothesis of RE was rejected and it was concluded that the FE model was appropriate.

#### **5.4.2 DIAGNOSTIC TESTS FOR MODEL 1**

In this case the data was tested for heteroscedasticity using WaldTests for groupwise heteroscedasticity and autocorrelation was tested using Wooldridge Test for autocorrelation in panel data.

##### **5.4.2.1 Testing for heteroscedasticity for Model 1**

The Wald Test for heteroscedasticity tests the null hypothesis that there is homoscedasticity (or constant variance). The results of the test are shown in Table 5.4 below.

**TABLE 5.4:** Wald Test for Model 1 – all continuous variables

<b>Test <math>H_0 : \sigma_i^2 = \sigma^2</math> for all i</b>	
<b>Test Summary</b>	<b>Model ROA</b>

<b>Chi-sq statistic (<math>\chi^2</math>)</b>	2603.88
<b>Chi-sq. d.f</b>	9
<b>Prob (p-value)</b>	$p < .001$
<b>Decision</b>	Reject $H_0$

Here the result indicated that p-value is less than 0.05. The null hypothesis was rejected for homoscedasticity and it was concluded that there is heteroscedasticity in the data.

#### 5.4.2.2 Testing for auto-correlation for Model 1

The Wooldridge Test for auto-correlation tests the null hypothesis that there is no serial auto-correlation. The results of the tests are shown in Table 5.5.

**TABLE 5.5:** Wooldridge Test for Model 1 – all continuous variables

<b>Test <math>H_0</math> : No first-order auto-correlation</b>	
<b><math>H_1</math>: There is first order auto-correlation</b>	
<b><i>Test Summary</i></b>	<b><i>Model ROA</i></b>
<b>F-statistic (<math>F</math>)</b>	134.980
<b>Fd.f</b>	(1, 8)
<b>Prob (p-value)</b>	$p < .001$
<b>Decision</b>	Reject $H_0$

All p-values are less than 0.001, that is, the tests are highly significant. We reject the null hypothesis and conclude that there is auto-correlation.

#### 5.4.2.3 Correlation matrix of residuals

According to Baltagi (2008), cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). The author further indicated that this is not much of a problem in micro panels (few years and large number of cases).

The correlation of residuals was tested using Breusch-Pagan LM Tests of independence. The null hypothesis across the residuals is not correlated. In this case the results for models 1a and 1b had p-values of .0036 and 62.903 respectively. Thus the null hypothesis of no correlation across entities was rejected in both models and it was concluded that there is correlation across entities. In this case, since the panel data is a micro-panel, this is not much of a problem.

#### **5.4.3 THE FITTED FIXED EFFECTS OF REGRESSION MODELS**

Since the data had heteroscedasticity and was auto-correlated, the robust standard error estimates for linear panel models were used for the data. In this case the FE model was fitted with robust standard errors.

##### **5.4.3.1 *The Model – ROA as the dependent variable***

##### **ROA model: Return on assets as the dependent variable**

Table 5.6 summarises the results for ROA model using all continuous variables.

**TABLE 5.6:** Regression results: ROA dependent variable with continuous explanatory variables

<i>Explanatory Variable</i>	<i>Coefficients</i>	<i>Robust std.err</i>	<i>T</i>	<i>P&gt; t </i>
CAP	-.0471262	.0367934	-1.28	0.236
SIZE	-.0920887	.0443813	-2.07	0.072*
LOAN	-.0164835	.0232587	-0.71	0.499
SAVDEP	-.0348332	.0236664	-1.47	0.179
FIXTDEP	-.004915	.0147237	-0.33	0.747
NII	-.0829263	.0314058	-2.64	0.030**
NIE	.1384860	.0554701	2.50	0.037**
CR	-.2089229	.0314109	-6.65	0.000***
MARCON	-.0940672	.0470388	-2.00	0.081*
GDP	.0236404	.1302868	1.08	0.312
INF	.1406936	.1302868	1.02	0.312
INTR	.1026707	.1137021	0.90	0.393
_cons	9.998959	2.58659	3.87	0.005**

\*\*\*, \*\*, \* shows respectively significance at 1%, 5% and 10%.

ROA indicates how effectively a bank is managing its assets to generate income.

The ROA is a multiple regression equation comprising of twelve explanatory variables of which eight are bank-specific, one industry-specific and three macro-economic variables.

From the regression results five are statistically significant, two at the 10% level of significance, two at the 5% level of significance, one at the 1% level of significant and four variables were not significant at all. The variables Bank NII, NIE and the variables Size and MARCON were found to be significant at the 10% level and 5% level of significant was a positive effect on bank profitability in ROA. CR was significant at the 1% level, having highest significant and positive effect on bank profitability measured with ROA.

An increase of 1 unit in NIE is associated with an increase of 0.138 in ROA, the result show that there is positive relationship between non-interest expense and profitability. This is unusual as there should be a negative relationship between profitability and non-interest expenses.

An increase of 1 unit in NII and LN is associated with a decrease of  $-.083$  and  $-.092$  in ROA respectively. Non-interest income and bank size have negative effect on ROA. According to Smith, Staikouras & Wood (2003:5) they found that the increased importance of non-interest income worked for most, but not for all categories of bank stabilised profits. Thus South African banks managers need to work hard to turn the level of non-interest income into positive.

An increase of 1 unit in CR is associated with decrease of  $-.208$  in ROA. The expected sign was negative, the result show negative sign, this means credit risk has negative relationship with ROA. In order to maintain the level of profitability, South African commercial banks need to improve considerably the mechanisms to screen, monitor and forecast future levels of risk management.

An increase of 1 unit in market concentration is associated a decrease of  $-.094$  in ROA. From this results show that Market Concentration has negative relationship with ROA but significant negative effect on bank profitability. From this result the researcher can conclude that market Concentration negatively affects profitability in the South African bank industry.

On the other hand, the variables Equity Capital, Loan, Saving Deposit, Fixed Term were found not significant without any effect on South African commercial banks.

The variables Equity Capital and Loan the expected sign was negative and hence negative effect on bank profitability. According to Ambar & Alper (2011:148) stated that loans under follow-up (LFA)/loans have a negative impact on profit.

Macroeconomic variables Economic Growth (GDP), Inflation (INF) and INTR, are significant but with positive impact on bank profitability.



## **CHAPTER 6**

### **CONCLUSION AND RECOMMENDATIONS**

#### **6.1 INTRODUCTION**

This chapter draws attention to the conclusions based on the previous chapters of the study which introduced the main issues related to bank profitability. The objective and hypothesis of the study, presented the theoretical framework and empirical literature review, outlined the research methodology and followed the analysis to describe the results. Ultimately, this chapter deals with the summary, recommendation and conclusion but further research opportunities will also be identified.

## **6.2 SUMMARY AND OVERVIEW OF THE RESEARCH**

### **6.2.1 Overview of the Research**

In Chapter 1 the researcher presented the introduction and background of the study with regard to the importance of bank profitability, research problems, objectives, significance and the limitation of the study.

Theoretical framework of financial intermediation theory was presented in Chapter 2 in terms of perceived costs and risk between lenders and borrowers. The chapter examines the factors which affect bank profitability by using the theory of financial intermediation. The chapter also highlights an overview of the South African banking sector in terms of bank regulation in the South African context.

Chapter 3 conceptualises the framework of market structure and banking efficiency. Approaches were used in order to understand how the relationship between bank-specific, industry-specific and macro-economic determinants affects the profitability of banks. The review of existing literature and an empirical research was conducted by various scholars in the field of determinants of bank profitability which covered bank-specific, industry-specific and macro-economic determinants on bank profitability.

In Chapter 4 reviews the research methodology and design used in the study. The quantitative approach was used and an analysis of panel-data was selected as the most appropriate to explain the variables in equation well.

### **6.2.2 The Research Summary**

The primary objective of this study was to examine the determinants of bank profitability in South Africa, with the secondary objectives which were to examine the effect of bank specific variable (such as equity capital, bank size (LN), loan, saving deposit, fixed term deposits, NII, NIE, credit risk [CR]); on the profitability of South African Banks; to analyse the effect of industry specific variables (such as concentration) on the profitability of South African Banks, and to analyse the effect of macro-economic variables (such as Gross Domestic Product (GDP) growth; inflation (INF); landing interest) on the profitability of South African Banks.

The primary and secondary objectives have been met. It was found that South African commercial banks are profitable, the variables of bank-specific and industry-specific were found significant on bank profitability, however, the variables for macro-economic variables was found insignificant but with positive effect.

### **6.2.3 Conclusion of the Study**

The determinant of bank profitability discussed in this study is that currently used in conventional banking studies and literature. Therefore, the empirical study has been conducted by taking samples among South African Banks. The sample purposely chosen comprises that of the four largest banks that represents 85% of the banking market share. The data on each of the specified dependent and independent variables were collected from the financial statements of the sample units. The data was an annual time-series from the balance sheets, and income and loss statements of listed banks during the period 2001-2013. The data sources include databases such as the Bankscope Bureau Van Dijk, (for bank specific data), Business Monitor International (for macro-economic

data), and the South African Reserve Bank (list of South African Banks by their nature of ownership).

With regards to the factors determining the bank profitability in South African commercial banks, this study identified some factors that are more influential than others in terms of bank profitability measuring with return on asset in South African banking market. As observed from table 5.6 regression results, the explanation power of the bank-specific and the external (both industry-specific and macroeconomic) determinants enter into the regression the explanatory power of the model Return on Asset. From this, the researcher can conclude that, the profitability of South African banks explained by both internal and external determinants. However, the empirical results showed that profitability is more explained by bank-specific and industry-specific variables such as Non-Interest Income, Non-Interest Expense, Bank Size, Credit risk and Market Concentration were found to be significant than the macroeconomic variables such as Economic Growth, Inflation and Lending Interest rate. Therefore, the variables which are significant affect positively the bank profitability, and the non- significant variables affect the bank profitability negatively.

### **6.3 RECOMMENDATIONS**

Based on the findings, the following recommendations are given for policy makers, bank managers, shareholders and directors.

Generally these empirical results provide evidence that, the profitability of South African banks are formed by bank-specific factors such as non-interest income, non-interest expense, bank size and credit risk (that are affected by bank-level management), industry specific (market concentration). Yet, macroeconomic variables that are not the direct result of a bank's managerial decision does not seem to significantly effect on bank profitability but with a positive sign. So, the banks' managers, policy makers, shareholders, and directors should be highly concerned with the management and maintenance of bank-specific and industry-specific variables which are significant and contribute significantly to the bank profitability. Concerning the variables which are not

significant, the stakeholders should make make some efforts in order to improve those variables to the end of making profit.

- To improve profitability of commercial banks, South African commercial banks stakeholders should give more attention to increase equity capital to meet capital requirement for the Basel Committee Regulations by reducing expenses and other doubling of capital costs.
- The South African stakeholders banks should better manage the impact of loans to generate interest margins and profitability by spreading and improving their inspection techniques to identify quality of loans to borrowers and reinforce the internal audit-system for the lending functions of banks, monitoring the process after the loan has been granted, to determine whether the borrower is complying with the terms of the loan-agreement. It will improve poor enforcement of creditor-rights and strengthen the legal environment of business to avoid bankruptcy of the bank and strengthen economics of the country.
- Concerning savings and fixed deposits which are the main sources of bank-funding and is at the lowest cost. Therefore, South African commercial banks stakeholders should give more attention to increasing the depositors, as the higher the level of deposits, the greater the effect it has on bank profitability.

#### **6.5.1 SCOPE FOR FURTHER RESEARCH**

Future researches could be conducted on issues such as the extent of the power of the supervisory agencies to take specific actions against bank management, directors, shareholders, and bank auditors and their effect on the profitability of South African commercial banks.

The specific regulations that may concern future research are related to restrictions on banks' activities and three pillar of Basel, namely capital requirements (Pillar 1), official supervisory power (Pillar 2), and market discipline (Pillar 3). According to Vivas &

Pasiouras (2010:1439) these regulatory conditions could affect bank efficiency (profitability).

The current study did not consider ROE as dependent variables; however, future research should include ROE as one of the dependent variables. Concerning independent variables, additional ones that can be considered include bank regulation and supervision variables (i.e. CAPRQ capital requirement [CAPRQ]; private monitoring [PRMON]; official disciplinary power [SPOWER]; and restrictions on bank activities [RESTR]).

## BIBLIOGRAPHY

Aburime, T.U. (2008). Determinant of bank profitability: Company-level evidence from Nigeria. Available at SSRN 1106825.

Abreu, M. and Mendes, V. (2005). Are banks sensitive to monetary and exchange rate policy? Available at SSRN 676411

Akhavein, J. Berger, A. & Humphrey, D.B. (1997). The effects of mergers on efficiency and prices: Evidence from a bank profit function. *Review of Industrial Organization*, 12(1):95-139.

Akinboade, O.A. & Makina, D. (2009). 'Bank lending and business cycles: South African evidence', *African Development Review*, 21(3): 476-498.

Albertazzi, U. & Gambacorta, L. (2009). 'Bank profitability and the business cycle', *Journal of Financial Stability*, (5): 393-409.

Alexiou, C. & Sofoklis, V. (2009). 'Determinants of bank profitability: evidence from the Greek banking sector', *Economic Annals*, (182): 93-118.

Ali, K., Akhtar, M.F. & Ahmed, H.Z. (2011). 'Bank-specific and macroeconomic indicators of profitability: empirical evidence from the Commercial Bank of Pakistan', *International Journal of Business and Social Science*, 2(6): 232-242.

Al-Jafari, M. K. & Alchami, M. (2014). 'Determinants of bank profitability: Evidence from Syria', *Journal of Applied Finance and Banking*, 4(1):17-45.

Allen, F. (1993). 'Stock markets and resource allocation'. In: Mayer, Colin and Vives, Xavier. *Capital markets and financial intermediation*, Cambridge: Cambridge University Press: 81-108.

Allen, F. & Gale, D. (1999). 'Diversity opinion and financing of new technologies', *Journal of Financial Intermediation*, 8(1): 68-89.

Allen, D.S.& Ndikumana, L. (2000). 'Financial Intermediation and Economic Growth in South Africa.' *Journal of African Economies*, 9(2):132-160. Accessed on 20 December 2014, <http://jae.oxfordjournals.org/content/9/2/132.full.pdf+html>.

Allen, F. & Santomero, A. M. (2001). 'What do financial intermediaries do?', *Journal of Banking & Finance*, (25): 271-294.

Allen, F. & Santomero, A. M. (1998). 'The theory of financial intermediation.' *Journal of Banking & Finance*, (21): 1461-1485.

Ambar, A. & Alper, D. (2011). Bank-specific and macroeconomic determinants of commercial bank profitability: empirical evidence from Turkey. *Business and Economics Research Journal*, 2(2): 139-152.

Andolfatto D. & Nosl, E. (2009). 'Money, intermediation, and banking.' *Journal of Monetary Economics*, 56: 289-294.

Angkinand, A.P. (2009). 'Banking regulation and the output cost of banking crises'. *Journal of International Financial Markets, Institutions and Money*, 19(2): 240-257.

Apostolik, R. Donohue, C. & Went, P. (2009). *Foundations of banking risk. An overview of banking, banking risks, and risk banking regulation*. Hoboken, New Jersey: John Wiley & Son.

Ariccia, G.D. & Marquez, R. (2004). 'Information and bank credit allocation. *Journal of Financial Economics*' (72): 185-214.

Atemakeng, T. and Joseph, N. (2000). Market Structure and Profitability Performance in Banking Industry of CFA Countries: The Case of Commercial Banks Profitability in Cameroon. (Viewed 12 June 2014.)

Athanasoglou, P.P. Brissimis, S.N. & Delis, M.D. (2008). 'Bank-specific, industry-specific determinants of bank profitability.' *Journal of International Financial Markets, Institutions & Money*, 18(2), 121-136.

Athanasoglou, P. Delis, M. & Staikouras, C. (2006). '*Determinants of Bank Profitability in South Eastern European region*,' Bank of Greece Working Paper, No. 47.

Athanasoglou, P.P., Brissimis, N.S, & Delis, D.M. (2005). 'Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability', Bank of Greece Working Paper, No. 25, 5-37

Babbie, E. R., (2007). *The practice of social research*. (11<sup>th</sup>ed). Belmont, CA: Thomson Wadsworth.

Badi H. Baltagi, B. H. (2009). *Econometric Analysis of Panel Data*. Chichester: John Wiley & Sons

Bashir, A.H.M. (2003). 'Determinants of profitability in Islamic Banks: Some evidence from the Middle East.' *Islamic Economic Studies*, 11(1): 32-57.

Basel Committee on Banking Supervision, (2006). 'International convergence of capital measurement and capital standards'. *A revised framework comprehensive version*. June 2006: 1-347. (See: <http://www.resbank.co.za>).

Basel Committee on Banking Supervision, (2004). 'International convergence of capital measurement and capital standards'. *A revised framework*. June 2004: 1-228 (See: <http://www.resbank.co.za>).

Batlin, C.A. (1983). 'Interest rate risk, prepayment risk, and the futures market hedging strategies of financial intermediaries.' *The journal of futures markets*, 3(2): 177-184.

Bennaceur, S. & Goaid, M. (2008). The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *Frontiers in finance and economics*. 5(1): 106-130.

Berger, A. N. (1995). 'The relationship between capital and earnings in banking'. *Journal of Money, Credit and Banking*, 27(2): 432-456.

Berger, A.N. & Hannan, T.H. (1997). 'Using efficiency measures to distinguish among alternative explanations of the structure-performance relationship in banking'. *Management Finance*, 23(1): 6-31.

Berger, A. N. & Humphrey, D. B. (1994). 'Bank scale economies, mergers, concentration, and efficiency: *The U.S experience*. Berger, A.N., 1995. The relationship between capital and earnings in banking.' *Journal of Money, Credit and Banking*, 27(2): 432-456.

Rehr, K. and Sengupta, R. (2016). 'Has the relationship between bank size and profitability changed?' *Economic Review-Federal*, issue Q 2: 49-72. Available at: <http://EconPapers.repec.org/RePEc:fip:fedker:00040>

Bertrand, R. (2000). 'Capital requirements and bank behaviour: empirical evidence for Switzerland', *Journal of banking and Finance*, 25(4): 789-805. Working papers/wp-0005 Available at: <http://EconPapers.repec.org/RePEc:eee:jbfina:v:25:y:2001:i:4:p:789-805> (Accessed on 24/09/2014)

Besanko, D. & Thakor, A. (1993). 'Relationship banking, deposit insurance and bank portfolio choice'. In: Mayer C. & Vives X. (Eds). *Capital markets and financial intermediation*. Cambridge, UK: University Press.

Besanko, D. & Thakor, A. V. (1987). 'Competitive equilibrium in the credit market under asymmetric information,' *Journal of Economic Theory*, 42(1): 167-182.

Bester, H. (1987). 'The role of collateral in credit markets with imperfect information'. *European Economic Review*, 31 (4): 887-899.

Belsley, A.D. (1991), *Conditioning Diagnostics: Collinearity and Weak Data in Regression*, John Wiley & Sons.

Bhargava, A. Franzini, L. & Narendranathan, W. (1982). 'Serial Correlation and the Fixed Effects model'. *The Review of Economic Studies*, 49(4):533-549.

Bhattacharya, S., & Thakor, A.V. (1993). Contemporary banking theory. *Journal of Financial Intermediation*, 3(1), 2-50.

Bhatti, G. A. & Hussain, H. (2010). 'Evidence on Structure Conduct Performance Hypothesis in Pakistani Commercial Banks. *International Journal of Business and Management*, 5(9): 174.

Bickman, L. & Rog, D. J. (2009). *Applied social research methods*. (2<sup>nd</sup>ed), Los Angeles: The Sage.

Bikker J.& Bos J.W. (2008). *Bank performance: A theoretical and empirical framework for the analysis of profitability, competition and efficiency*, London: Routledge International Studies in money and Banking.

Bobáková, I.V. (2003). 'Raising the Profitability of Commercial Banks'. BIATEC, XI:21-25. Available at: [http://www.nbs.sk/BIATEC/BIA04\\_03/21\\_25.PDF](http://www.nbs.sk/BIATEC/BIA04_03/21_25.PDF). Accessed:8 April 2005

Bolton, P. & Freixas, X. (2000). 'Equity, bonds, and bank debt: Capital structure and financial market equilibrium under asymmetric information'. *Journal of Political Economy*, 108(2): 324-351.

Boot, A.A. & Greenbaum, S.I. (1993). '*Bank regulation, reputation and rents: theory and policy implications*'. Capital Market and Financial Intermediation. (p.262).Cambridge, UK: University Press.

Boot, A. Thakor, A.V. & Udell, G. F. (1987). 'Competition, risk neutrality and loan commitments'. *Journal of banking and finance*, 11(3): 449-471.

Boskey, S. (1959). Problems and practices of development banks. *International Bank for Reconstruction and Development. Baltimore, MD: John Hopkins*.

Bourke, P. (1989). 'Concentration and other determinants of bank profitability in Europe, North America and Australia'. *Journal of Banking and Finance*, 13(1): 65-79.

Boyd J.H.& Runkle D. E. (1993). 'Size performance of banking firms'. *Journal of Monetary Economics*, 31(1): 47-64.

Boyd, J.H. & Smith, B.D. (1997). 'Capital market imperfections, international credit markets, and non-convergence'. *Journal of Economic Theory*, 73(2): 335-364.

Brooks, C. (2002). *Introductory Econometrics for Finance*: New York, Cambridge University Press.

Bullard, J. & Smith, B.D. (2003). 'Intermediaries and payment instruments'. *Journal of Economic Theory*, 109(2): 172-197.

Burns, N. & Grove, S. (2003). *Understanding nursing research*. (3<sup>rd</sup> ed). Philadelphia: WB: Saunders.

Choi, B.P. & Weiss, M.A. (2005). 'An empirical investigation of market structure, efficiency and performance in property-liability insurance'. *Journal of risk and insurance*, 72(4): 635-673.

Byeonyongog, P.C. & Weiss, M.A. (2005). 'An empirical investigation of market structure, efficiency, and performance in property-liability insurance'. *The journal of risk and insurance*, 72(4): 635-673.

Camero, A.C. & Trivedip, P.K. (2009). *Microeconometrics using stata*, (Vol.5). College station. TX: Texas: Stata Press.

Casu, B. Girardone, C. & Molyneux, P. (2015). *Introduction to banking*, Second Edition, United Kingdom, Pearson Education Limited.

Carlstrom, C.T. & Fuerst, T.S. (1997). 'Agency costs, net worth, and business fluctuations: A computable general equilibrium analysis'. *The American Economic Review*, 87(5):893-910.

Central Banks of the Group of Ten Country. (1986). '*Bank for international settlements: Recent innovations in international banking*'. Unpublished Report.

Chatterjee, S. Corbae, D. & Rios-Rull, J. V. (2008). 'A finite-life private-information theory of unsecured consumer debt'. *Journal of Economic Theory*, 142(1):149-177.

Chirwa, E. W. (2003). 'Determinants of Commercial Banks' Profitability in Malawi: A Co-integration Approach'. *Applied Financial Economics*, 13(8): 565-571.

Claessens, S. Demirguc-kunt, A. & Huizinga, H. (2001). 'How does foreign entry affect domestic banking markets?' *Journal of Banking & Finance*, 25(5): 891-911.

Conard, E. (2012). *Unintended consequences: why everything you've been told about the economy is wrong*. New York: Portfolio / Penguin.

Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*, 2<sup>nd</sup> ed., New Jersey: Lawrence Erlbaum Associates, ISBN 0-8058-0283-5.

Curak M. Poposki, K. & Pepur, S. (2012.) 'Profitability determinants of the Macedonian baking sector in changing environment'. *Procedia-Social and Behavioural Sciences*, (44): 406-416.

Davydenko, A., (2010). 'Determinants of bank profitability in Ukraine' *Undergraduate economic review*, 7(1): 2-32.

Davis, G. Pecar, B and Santana, L. (2014). *Business Statistics using Excel: A first course for South African Students*, Oxford University Press Southern Africa (Pty) Ltd, ISBN: 97801990440902

De Jager J. (2010). 'Much Ado about Nothing?' *Legal Principles on Money, Banks and their Clients after Joint Stock Company Varvarinskoye v ABSA Bank Ltd. S. Afr. Mercantile L.J*, 22(1):127-140.

Demirguc-Kunt, A. & Huizinga, H. (2003). 'Market discipline and deposit insurance'. *Journal of Monetary Economics*, forthcoming.

Demirguc-kunt, A. & Huizinga, H. (2000). 'Financial structure and bank profitability'. *World Bank Policy Research Working Paper*, (Vol. 2430).

Deng, B. Casu, B. & Ferrani, A. (2014). *The impact of deregulation and re-regulation on bank efficiency: Evidence from Asian* in Lindblom T. Sjogren, S.& Willeson, M. (2014). *Governance, regulation and bank stability*, First Ed. UK: Palgrave Macmillan Studies in Banking and Financial Institutions.

De Vos, A.S. Strydom, H. Fouche, C.B. & Delport, C.S.L. (2011). *Research at Grass roots: A primer for the social sciences and human professions*. 4<sup>th</sup> Edition. Hatfield, (Pretoria): Van Shaik Publisher.

Dewatripont, M. & Tirole, J. (1993). 'Efficient governance structure: Implications for banking regulation'. *Capital markets and financial intermediation*, (pp:12-35).

DeYoung, R. & Rice, T. (2004). 'How do banks make money?' The fallacies of fee income'. *Economic Perspectives-Federal Reserve Bank of Chicago*, 28(4): 34.

Dhouibi, R. (2016). 'Bank transparency and capital adequacy ratio: Empirical evidence from Tunisia'. *International Journal of Economics, finance and management*, 5(1): 9-20.

Diamond, D.W. (1993). *Bank loan maturity and priority when borrower can refinance*. Capital Markets and Financial Intermediation. (pp. 45-68). Cambridge, UK: University Press.

Diamond, D.W. (1991). 'Monitoring and reputation: The choice between bank loans and directly placed debt'. *Journal of Political economy*, 99(4): 689-721.

Diamond, D.W. (1984). 'Financial intermediation and delegated monitoring'. *The Review of Economic Studies*, 51(3): 393-414.

Dietrich, A. & Wanzenried, G. (2009). 'What determines the profitability of commercial banks? New evidence from Switzerland'. In *12<sup>th</sup> Conference of the Swiss Society for Financial Market Researches, Geneva*. February. Discussion Paper.

Eichengreen, B. & Gibson H.D. (2001). Greek banking at the dawn of the new millennium, *International Macro-economic, Centre for Economic Policy Research*. Available at <http://www.cepr.org>. Retrieved on 28/08/2014.

Elyasiani, E. and Wang, Y. (2008). 'Non-interest income diversification and information asymmetry of bank holding companies'. *Unpublished manuscript, FMA*: [http://www.fma.org/Texas/Papers/BHC\\_Diversification\\_Asymmetric.pdf](http://www.fma.org/Texas/Papers/BHC_Diversification_Asymmetric.pdf). (Retrieved on 20/08/2014).

Elzelly, A.M. (2004). 'Liquidity-profitability trade off: An empirical investigation in an emerging market'. *International Journal of Commerce and Management*, 14(2): 48-61.

Falkena, H. Davel, G. Hawkins, P. Liewellyn, D. Luus, C. Masilela, E. Parr, G. Pienaar, J. & Show, H. (2004): 'Competition in South African banking'. *Task Group Report for the National Treasury and the South African Reserve Bank*.

Farell, M.J. (1957). 'The measurement of productive efficiency'. *Journal of Royal Statistical Society, Series A (General)*, 120(3): 253-290.

Jimenez, G. Lopez, J.A.& Saurina, J. (2013). 'How does competition affect bank risk taking?' *Journal of financial stability*, 9(2013):185-195.

Finlayson, A.M. (1997). 'The link between strong brands and profitability in retail banks. Business administration'. *Unpublished MBA-Dissertation, University of the Witwatersrand*.

Flamini, V. Schumacher, L. & McDonald, C. (2009). The determinants of commercial bank profitability in Sub-Saharan Africa. *International Monetary Fund (IMF). Working paper, WP 09/15*.

Financial Stability Review, (2014) 'South African Reserve Bank', (pp.1-42). (See: <http://www.resbank.co.za>.)

*Frontier Market Intelligence* (2012).

Francis, M.E. (2013). 'Determinants of commercial bank profitability in Sub-Saharan Africa. *International Journal of Economics and Finance*, 5, (9): 134-147.

Fried, J. & Howitt, P. (1980). 'Credit rationing and implicit contract theory'. *Journal of Money, Credit and Banking*, 12(3): 471-487.

Furfine, C. (2001). 'Bank portfolio allocation: The impact of capital requirement, regulatory, and economic conditions'. *Journal of Financial Services Research*, 20(1): 33-56.

Gale, D. (1993). *Informational capacity and financial collapse*. In Mayer C., & Vives X. (Eds). *Capital markets and financial intermediation*, Cambridge, UK.: University Press.

Goldberg L.G. & Rai, A. (1996). 'The structure-performance relationship for European banking'. *Journal of banking and Finance*, (20): 745-771.

Gray, D. E. (2009). *Doing Research in the Real World*. Second edition. London: Sage.

Greene, W.H. (2008). 'The econometric approach to efficiency analysis'. *The measurement of productive efficiency and productivity growth*, pp. 92-250.

Grinnell, R.M. & Unrau, Y. A. (2008). *Social work research and evaluation: Foundations of evidence-based practise*. New York: Oxford University press.

Guru B.K. Staunton, J. & Shalashanmugam, B. (2002). 'Determinants of commercial bank profitability in Malaysian'. *Journal of Money, Credit, and Banking*,(17): 69-82.

Gup, B.E. & Kolari, J. W. (2005). *Commercial banking: The Management of Risk*, 3<sup>rd</sup> Edition, Australia: John Wiley and Sons Ltd.

Hallmann, T.F. Murdock, K.C. & Stiglitz, J.E. (2000). 'Liberalisation, moral hazard in banking, and prudential regulation: Are capital requirements enough?' *The American Economic Review*, 90(1): 147-165. (<http://dx.DOI.org/10.4102/ac.v13i1.203>)

Hannan, T.H. (1991). 'Foundations of the structure-conduct-performance paradigm in banking'. *Journal of Money, Credit and Banking*, 23(1): 68-84.

Hair, J.F. Back, W.C. Babin, B.J. & Anderson, R. E. (2014). *Exploratory factor analysis. Multivariate data analysis*, 7<sup>th</sup> Pearson new international ed. Harlow: Pearson.

Haron, S. (2004). 'Determinants of Islamic bank profitability'. *The Global Journal of Finance and Economics*, 1(1): 11-33.

Hassan M. K. (2005,). The cost, profit and X-Efficiency of Islamic banks. *Economic research forum*, 12<sup>th</sup> Annual Conference paper December 19<sup>th</sup>-21<sup>st</sup>. Grand Hyatt Cairo, Egypt.

Hassan M.K. & Bashir, A.H.M. (2003). 'Determinants of Islamic banking profitability'. In 10<sup>th</sup> ERF annual conference, Morocco (pp 16-18).

Hassan Al-Tamimi, H. A. (2006). 'The determinants of the UAE commercial banks' performance: a comparison of the national and foreign banks'. *Journal of Transnational Management*, 10(4):35-47.

Hassan Al-Tamimi, H.A. (2008). 'Implementing Basel II: an investigation of the UAE bank's Basel II preparations'. *Journal of financial Regulation and Compliance*, 16(2):173-187.

Hausman, J.A. & Taylor, W.E. (1981). 'Panel Data and Unobservable Individual Effects'. *Econometrica*, 49(6): 1377-1398.

Hermalin, B. Rose, A.K. Garber, P.M. Crockett, A., & Mullins Jr, D.W.,(1999). 'Risks to lenders and borrowers in international capital markets'. In *International Capital Flows* (pp. 363-420). *University of Chicago Press*.

Hollis A. & Sweetman A. (2007). 'The role of local depositors in controlling expenses in small-scale financial intermediation': *Empirical Analyses*. [\*Economica\*](#), 74(296): 713-735.

Holly, A. (1982). 'A remark on Hausman's specification test. *Econometrica*.' *Journal of the Econometrics Society*, 50(3): 749-759.

Howells, P. and Bain, K. (1998): *The Economics of Money, Banking and Finance*. Addison WesleyLon-Qman 1998.

Hsiao, C. (1985). 'Benefits and Limitations of Panel Data', *Economic Reviews*, 4(1): 121-174

<http://dx.doi.org/10.4102/ac.v13i1.203>

[http://www.jsdafrica.com/Jsda/Summer\\_2006/PDF/ARC\\_MarketStructureProfitabilityPerformace.pdf](http://www.jsdafrica.com/Jsda/Summer_2006/PDF/ARC_MarketStructureProfitabilityPerformace.pdf) [http://www.nbs.sk/BIATEC/BIA04\\_03/21\\_25.PDF](http://www.nbs.sk/BIATEC/BIA04_03/21_25.PDF)

Huang, L.W. & Chen, Y.K. (2006). 'Does bank performance benefit from non-traditional activities? A case of non-interest income in Taiwan commercial banks, *Asian Journal of Management and Humanity Sciences*, 1(3): 359-378.

Hubbard, G.R. Kuttner, K.N. & Palia, D.N. (2002). 'Are there bank effects in borrowers' costs of funds? Evidence from a matched sample of borrowers and banks'. *The Journal of Business*, 75(4): 559-581.

Hussein K. A. (2003). 'Operational efficiency in Islamic banking the Sudanese experience'. The Sudanese experience. Islamic Research & Institute (IRTI), No.1 working papers.

Hassan Al-Tamimi, H.A. (2008). 'Implementing Basel II: an investigation of the UAE bank's Basel II preparations'. *Journal of financial Regulation and Compliance*, 16(2):173-187.

Islam, M.S. & Nishiyama, S.I. (2016). 'The determinants of bank profitability: Dynamic Panel Evidence from South Asian Countries'. *Journal of Applied Finance & Banking*, 6(3): 77-97.

Jacobs J.K. Kawanaka K. & Stigler, W.J. (1999). 'Integrating qualitative and quantitative approaches to the analysis of video data on classroom teaching'. *International Journal of Education Research*, (31): 717-724.

Javaid, S. Anwar, J. Zaman, K. & Gafoor, A. (2011). 'Determinants of bank profitability in Pakistan: Internal Factor Analyses'. *Mediterranean Journal of Social Sciences*, 2(1): 2039-2117.

Kanas, A. Vosiliou, D. & Eriotis, N. (2012). 'Revisiting bank profitability: A semi-parametric approach'. *Journal of international financial markets, institutions and money*, 22(4): 990-1005.

Kantawala A. S. (2004). 'A propos the soundness of public sector banks, finance India'. *Banking Information Source*, 18(4): 1651-1671.

Kanwal, S. & Nadeem, M. (2013). 'The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan'. *European Journal of Business and Social Sciences*, 2(9): 186-201.

Kleinbaum, G. D. Kupper, L.L. Nizam, A. and Muller, E.K. (2008). *Applied Regression Analysis and Other Multivariable Methods*, Fourth Ed. CANADA: International Student Edition.

Klevmarken, N.A. (1989). 'Panel Studies: What can We Learn from Them?'. *European Economic Review*, (33): 523-529.

Kleynhans, E.P.J. & Meintjes, R. (2013). 'Political independence of the South African Reserve Bank: Managing interest rates'. *Acta Commercii*, 13(1): 10-pages.

Kock M.A. & Smith, H. (2005). 'Institutional sector classification guide for South Africa. *South African Reserve Bank*, 1-49. (<https://www.resbank.co.za/Publications/OtherPublications/Documents/Classification%20Guide.pdf>).

Kosmidou, K. (2008). 'The determinants of banks' profits in Greece during the period of EU financial integration'. *Managerial Finance*, 34(3): 146-159.

Kosmidou K. Tanna S. Pasiouras, F. (2005). 'Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. In Money Macro and Finance (MMF)'. *Research Group Conference*, (45):1-27.

KPMG, (1998). Bank margins and related profitability in South Africa. 33335, November 1998.

Kromhout, E. (1988). A computerized application of profit planning and control in a banking environment. *Unpublished MBA Dissertation*. University of Pretoria.

Kumar, R., (2011), *Research Methodology: a step-by guide for beginners*. (3<sup>rd</sup> ed.)  
Chennai (India): The Sage

Kusi, B.A. Adu, K.A. & Sai, R. (2015). 'Evaluating bank profitability in Ghana: A five step Du-Pond model approach'. *International Journal of Finance & Banking Studies*, 4(3): 69-82.

Kundid, A. (2012). 'How much is the choice of capital structure important for bank profitability in Croatia?' *Zegreb International Review of Economics & Business*, 15(3): 53-68.

Kumbirai, M. & Webb, R. (2010). 'A financial ratio analysis of commercial bank performance in South Africa'. *African Review of Economics and Finance* 2(1): 30-53

Kumbhakar, S.C. & Lovell, C.A.K. (2003). *Stochastic frontier analysis*. New York, USA.: Cambridge University Press.

Kunt, A.D. & Huizinga, H. (1999). 'Determinants of commercial bank interest margins and profitability: Some International evidence'. *The World Bank Economic Review*, 13,(20): 379-408.

Levine, R. Loayza, N. & Beck, T. (2000). 'Financial Intermediation and Growth: Causality and causes'. *Journal of Monetary Economics*, 46(1):31-77 <http://www.sciencedirect.com/science/article/pii/S0304393200000179#> (Accessed on internet 20/12/2014).

Ligeti, S. (1985). 'Development banks in the developing countries'. *Savings and development*, IX(3): 297-321.

Lindblom, T. Sjoren, S. & Willeson, M. (2014). *Challenges for banks and a new regulatory framework* in Lindblom, T. Sjoren, S. & Willeson, M. 2014. *Governance, regulation and bank stability*. 1<sup>st</sup> ed. UK: Palgrave MacMillan Studies in Banking and Financial Institutions.

Luo, X. (2003). 'Evaluating the profitability and marketability efficiency of large banks: An application of data envelopment analysis'. *Journal of Business Research*, 56(8): 627-635.

Makina, D. (2006). Risk-sharing, partnerships between banks, development agencies and NGOs can facilitate access to finance for SMMEs, *Africa growth Agenda*, September-November 2006.

Maredza, A. (2014). 'Internal determinants of bank profitability in South Africa: Does bank efficiency matter?' *International Business & Economics Research Journal*, 13(3):1033-1046.

Mamatzakis, E. & Remoundos, P. (2003). 'Determinants of Greek commercial banks' profitability, 1989-2000'. *Spoudai*, 53(1): 85-94.

Manoj, P.K. (2010). 'Determinants of Profitability and Efficiency of Old Private Sector Banks in India with focus on banks in Kerala State: An Econometric Study'. *International Research Journal of Finance and Economics*.(47): 7-20.

Masood, O. & Ashraff, M. (2012). 'Bank-specific and macroeconomic profitability determinants of Islamic Banks: The case of different countries'. *Qualitative Research in Financial Markets*, 4(2/3): 255-268.

May, T. (2001). *Social research: Issues, Methods and process*. (3<sup>rd</sup>ed.) Open University Press, Berkshire.

Mayer C., & Vives X., (1995). *Capital markets and financial intermediation*, UK: Cambridge University Press.

Mendes, V. & Abreu, M. (2003). 'Do macro-financial variables matter for European bank interest margins and profitability?' *European Integration and Banking Efficiency*. 2<sup>nd</sup> CIEF workshop, October, Lisbon, 30-31.

Mensi, S. & Zouari, A. (2010). 'Efficient structure versus market power: Theories and empirical evidence'. *International journal of economics and finance*, 2(4): 151-166.

Meon, P.G. & Well, L. (2010). 'Does financial intermediation matter for macroeconomic performance?' *Economic Modelling*, 27(1): 296-303.

Meyer, S.C.R. (2002). *The profit zone: ABSA, STANBIC, NEDCOR and FirstRand: an analysis of the profit strategies of four South Africa banks*. Unpublished MBA dissertation, Stellenbosch University.

Meyer, C. & Vives, X. (1993). *Capital markets and financial intermediation*, UK: Cambridge University Press.

Milbourn, T.T. Boot, A.W. & Thakor, A.V. (1999). 'Megamergers and expanded scope: Theories of bank size and activity diversity', *Journal of Banking and Finance*, 23(2):195-214.

Mlambo, K. & Ncube, M. (2011). 'Completion and efficiency in the banking sector in South Africa', *African Development Review*, 23(1):4-15.

Miller, S.M. & Noulas, A.G (1997). 'Portfolio mix and large-bank profitability in the USA'. *Applied Economics*, 29 (4): 505-512.

Mokni, R.B.S. & Rachdi, H. (2013). 'Assessing the bank profitability in the MENA region: A comparative analysis between conventional and Islamic bank'. *International Journal of Islamic and Middle Eastern Finance and Management*, 7(3): 305-332.

Molyneux, P. & Forbes, W. (1995). 'Market structure and performance in European banking'. *Applied Economics*, 27(2): 155-159.

Monette, D.R. Sullivan, T.J. & De Jong, C.R. (2005). *Applied social research: a tool for the human services*. (6<sup>th</sup>ed). Australia: Thomson Brooks/Cole.

Monshirian, F. Sahgal, S. & Zhang, B. (2011). Non-Interest income and Systemic Risk: The role of Concentration. In global systemic risk conference. *In Global Systemic Risk Conference*.

Moudos, J. (1998). 'Market structure and performance in Spanish Banking using a direct measure of efficiency'. *Applied Financial Economics*, 8(2): 191-200.

Mouton, J. (1996). *Understanding social research*. (1<sup>st</sup>ed). Pretoria, South Africa: Van Schaik.

Naceur S.B. (2003). *The determinants of the Tunisian banking industry profitability: Panel evidence*. universite libre de Tunis Working papers.

Naceur, S.B. & Kandil, M. (2009). 'The impact of capital requirements on banks' cost of intermediation and performance: *The case of Egypt*'. *Journal of Economics and Business*, 61(1): 70-89.

Naidoo, K. (2006). *Curriculum, Context and Identity: An Investigation of the Curriculum Practices of Grade 9 teachers in three contrasting socio-economic school contexts*. University of KwaZulu-Natal, Pietermaritzburg.

Nattrass, N. (1989). *Post-war profitability in South Africa: "A critique of regulation analysis in South Africa"*. Transformation 9.

Neuman, W.L. (1997). *Social researcher methods: qualitative and quantitative approaches*. (5<sup>th</sup>ed). Boston: Allyn & Bacon.

Nessibi, O. (2016). 'The determinants of bank profitability: The case of Tunisia'. *Journal of Finance & Banking Studies*, 5(1): 39-50.

Nokuthula, S. (2006). Cost and profit efficiency of South African Banks. Unpublished Doctoral Dissertation, Johannesburg: University of the Witwatersrand.

O'Donnell, C.J. & Westhuizen, G. (2002). 'Regional comparisons of banking performance in South Africa'. *The South African Journal of Economics*, 70(3): 224-240.

Oberholzer, M. & Westhuizen Van der Westhuizen, G. (2004). 'An empirical study on measuring efficiency and profitability of bank regions'. *Meditari accountancy research*, 12(1): 165-178.

Okeahalam C. (2001). *Structure and conduct in the commercial banking sector of South Africa, Trade and Industrial Policy Strategies*. Paper presented at TIPS 2001 Annual Forum.'

Olson, D. & Zoubi, T.A. (2011). 'Efficiency and bank profitability in MENA Countries'. *Emerging Markets Review*, 12(2): 94-110.

Park, K.A. & Weber, W. (2006). Profitability of Korean banks: Test of market structure versus efficient structure. *Journal of Economic and Business*, 58(3): 222-239.

Pasiouras, F., Garani, C. & Zopounidis, C. (2006). 'The impact of bank regulations, supervision, market structure, and bank characteristics on individual bank ratings: A cross-country analysis'. *Review of Quantitative Finance and Accounting*, 27(4): 403-438.

Pasiouras, F. & Kosmodou, K. (2007). 'Factors influencing the profitability of domestic and foreign commercial banks in the European Union'. *Research in international business and finance*, 21(2): 222-237.

Pasiouras, F., Tanna S., & Zopounidis, C., (2009). The impact of banking regulations on banks' cost and profit efficiency: Cross-country evidence. *International Review of Financial Analysis*, 18(5), 294-302.

Patel, D.P., (2013). *Research Methods in the Social Sciences*, First Published, INDIA: Shree Niwas Publications.

Peiyi, Y. & Werner, N. (2005). *Market Structure, Scale Efficiency and Risk as Determinant of German Banking Profitability*, Faculty of Economics and Business, Department of Banking. Germany: University of Tübingen.

Pelzer, P. (2013). *Risk, risk management and regulation in the banking industry: The risk to come*. Abingdon, Oxon; New York: Routledge, 2013.

Poposka, K. & Trpkoski, M. (2013). 'Secondary model for bank profitability management test on the case of Macedonian banking sector, Research' *Journal of Finance and Accounting*, 4(6):216-225.

Punch, K. (2011). *Introduction to social research: quantitative and qualitative approaches*. (2<sup>nd</sup>ed). London, UK: Sage.

Raghavan, R.S. (2003). 'Risk management in banks'. *Chartered Accountant New-Delhi*, 5/(8): 841-851.

Ramasastri, A.S. Samuel, A. & Gangadaran, S. (2004). 'Income stability of scheduled commercial banks: Interest vis-a-vis Non-Interest Income'. *Economic and Political Weekly*, 1311-1319.

Rasiah, D. (2010). Review of Literature and Theories on Determinants of Commercial Bank Profitability'. *Journal of Performance Management*, 23(1): 23-50

Rasiah, D. (2010). 'Theoretical Framework of Profitability as Applied to Commercial Banks in Malaysia'. *European Journal of Economics, Finance and Administrative Science*, 19(19): 75-97

Reeve, R.A. & Walberg, J.J. (1997). *Secondary data analysis*, in J. P. Keeves (ed.), *Educational Research, Methodology, and Measurement: An International Handbook*. (2<sup>nd</sup>ed), New York: Pergamon Press.

Remler, D.K. & Van Ryzin, G.G. (2011). *Research Methods in Practice: Strategies for Description and Causation*, Thousand Oaks, California: Sage.

Reyna, O.T. (2007) *Panel Data Analysis Fixed and Random Effects using Stata* (v.45).  
Data & Statistical services, Princeton University.  
<http://www.princeton.edu/~otorres/Panel101.pdf>.

Rime, B. (2001). 'Capital requirements and bank behaviour: Empirical evidence for Switzerland'. *Journal of Banking and Finance*, 25(40): 789-805.

Roman, A. & Danuletiu, A.E. (2013). 'An empirical analysis of the determinants of bank profitability in Romania'. *Annales University, Apulensis Series Oeconomica*, 15(2):580-593.

Roman, A. & Danuletiu, A.E. (2013). 'An empirical analysis of the determinants of bank profitability in Romania'. *Annales Universitatis Apulensis: Series Oeconomica*, 15(2): 580-593.

Rose, P.S. & Hudgins, S.C. (2012). *Banking management and financial services*. Bank management and financial services, Ninth Edition, Boston: McGraw-Hill International Edition.

Rose, P.S. & Hudgins, S.C., (2013). *Banking management and financial services*. Bank management and financial services, Ninth Edition, Boston: McGraw-Hill International Edition.

Rose, P. S., & Hudgins, S.C., (2010). *Bank management and financial services*. (8<sup>th</sup>ed), Boston: McGraw-Hill International Edition.

Rossouw, J. (2011). 'A selective reflection on the institutional development of the South African Reserve Bank since 1921'. *Economic History of Developing Regions*, 26(Sup1): S3-S20.

Saunders, A. & Cornett, M.M. (2011). *Financial institution management: A risk management approach*. (7<sup>th</sup>ed). New York: McGraw-Hill international edition.

Sharpe, S.A. (1990). 'Asymmetric information, bank lending, and implicit contracts: a stylized model of customer relationships'. *The journal of finance*, 45(4): 1069-1087.

Shleifer, A. & Vishny, R.W. (2010). 'Unstable banking'. *Journal of Financial Economics*, 97(3):306-318.

Short, B.K. (1979). 'The relation between commercial bank profit rates and banking concentration in Canada, Western Europe, and Japan'. *Journal of banking and finance*, 3(3): 209-219.

Shu, W. & Strassmann, P.A. (2005). 'Does information technology provide banks with profit?' *Information & Management*, 42(5): 781-787.

Smith R. Staikouras C. & Wood, G., (2003). *Non-interest income and total income stability, Bank of England*, Working paper no 198.

Spathis, C. Kosmidou, K. & Doumpos, M. (2002). 'Assessing profitability factors in the Greek banking system: a multi-criteria methodology'. *International transactions in operational research*, 9(5): 517-530.

Stallings, B. & Peres, W. (2010). *Growth, employment, and equity: The impact of the economic reforms in Latin American and the Caribbean: Brooking Institution Press*.

Stanczak, G.C. (2007). *Visual research methods: Image, society, and representation*, Los Angeles: .TheSage.

Stiglitz, J.E. & Weiss, A. (1981). 'Credit rationing in markets with imperfect information'. *The American Economic Review*, 71(3): 393-410.

Stiroh, K.J. & Rumble, A. (2006). 'The dark side of diversification: The case of US financial holding companies'. *Journal of banking & finance*, 30(8): 213-2161.

Strydom, H. (2011). Sampling *in the quantitative paradigm*. In De Vos, A. S., Strydom, H., Fouche, C. B., & Delport, C. S. L. (Eds). (4<sup>th</sup> ed). *Research at grass roots: for the social sciences and human service professions*. Pretoria, South Africa: Van Schaik Publisher.

Sufian F. & Chong, R.R. (2008). 'Determinants of bank profitability in a developing economy. Empirical evidence from the Philippines. *Asian Academy of Management Journal of Accounting and finance*, 4(2): 91-112.

Sufian, F. & Habibullah, M. S. (2009). 'The Impact of Asian Financial Crisis On Bank Performance: Empirical Evidence From Thailand and Malaysia'. *Savings and Development*. 153-181.

Sufian, F. & Habibullah, M.S. (2009). 'Bank specific and macroeconomic determinants of bank profitability': *Empirical Evidence from the China banking sector. Frontiers of Economics in China*, 4(2): 274-291.

Sufian, F. & Habibullah, M. S. (2009). 'Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh'. *Journal of Business economics and management*, 10(3): 207-217.

Sunderland, D. & Uzoigwe, G. (2011). *Economic Development of Africa, 1880-1939*. Vol. 4. London, UK: Pickering & Charto.

Supervisory review process., (2004:167). Available on <http://www.resbank.co.za>.(Retrieved on 28 August 2014.)

South African banking sector overview (2013)  
<https://www.brandsouthafrica.com/investments-immigration/business/economy/sectors/financial>

South African Reserve Bank Website: <http://www.resbank.co.za> (Accessed 25 January 2014)

South Africa Info Website., (2013). <http://www.SouthAfrica.Info> (Accessed 25 January 2014).

Tan, Y. (2016). 'The impacts of risk and competition on bank profitability in China'. *Journal of International Financial Markets, Institutions & Money*, (40):85-110.

Tan, Y. & Floros, C. (2012). 'Bank profitability and inflation: the case of China'. *Journal of Economic Studies*, 39(6): 675-696.

Thomas, A. (2012). '*The Banking Sector*' (report). Retrieved from *Who Owns Whom* (database), Unisa Library.(Accessed 10 December 2014). Available at: <http://0-www.whoownswhom.co.za.oasis.unisa.ac.za>. Access is password controlled.

Unrau, Y.A. Gabor, P.A. & Grinnell, R.M. (2007). *Evaluation in social work: the art and science of practice*. 4<sup>th</sup> Ed., New York: Oxford University Press.

Van der Westhuizen, P. (1989). *An evaluation of relationship banking and transactional banking for the improvement of the profitability of the corporate banking sector in South Africa*.MBA Dissertation.University of Pretoria.

Van Gend, G. (1994). *The course of the profit rate curve across the conjuncture cycle and its significance for the funding of banks*.MCom. University of Port Elizabeth.

Van Niekerk, H. (1990). *An investigation of the banking sector in South Africa with special reference to relative profitability and its impact on capital requirements*.MBA Dissertation.Stellenbosch University.

Vento, G.A. & Ganga, P.L. (2014). *Corporate governance of banks and financial crises: Can the Post-Crisis Rules Make Banks Safer?* In Lindblom, T. Sjogren, S. & Willeson, M. (2014).*Governance, regulation and bank stability*. (1<sup>st</sup> ed), UK: Palgrave MacMillan. Studies in Banking and Financial Institutions

Verhoeven, N. (2011). *Doing Research: The How's and Why's of Applied Research*,(3<sup>rd</sup>ed): Eleven LYCEUM, *International publishing*.

Vivas, A.L. & Pasiouras, F. (2010). 'The impact of non-tradition activities on the estimation of bank efficiency: International evidence'. *Journal of Banking and Finance*, 34(7): 1436-1449.

Vong, A. P.I. & Chan, H.S. (2009). 'Determinants of Bank Profitability in Macao'. *Macau Monetary Research Bulletin*, 12(6), 93-113.

Williams, B. & Prather, I. (2010). 'Bank risk and return: the impact of bank non-interest income', *International journal of managerial finance. Emerald Group Publishing Limited*, 6(3): 220-244.

www.frontiermarket.com (Accessed 25 January 2014).

www.resbank.co.za (Accessed 25 January 2014).

www.SouthAfrica.Info (Accessed 25 January 2014).  
<https://www.brandsouthafrica.com/investments-immigration/business/economy/sectors/financial>

World economic forum's global competitiveness report., (2012-2013)  
<http://www.frontiermarket.com> (Accessed January 2014).

Wooldridge, J.W. (2009). *Introductory Econometrics*. (4<sup>th</sup>ed). Canada: South-Western Cengage learning.

Yaron, J. Benjamin, M. & Charitonenko, S. (1998). 'Promoting efficient rural financial intermediation'. *The world Bank Observer*, 13(2): 147-70.

Yildirim, C. (2002). 'Evolution of banking efficiency within an unstable macroeconomic environment: The case of Turkish commercial banks'. *Applied Economics*, 34(18): 2289-2301.

Yu, P. & Neus, W. (2005). *Market Structure, Scale Efficiency and risk as determinant of German banking profitability*, Faculty of Economics and Business, Department of Banking, University of Tübingen, Germany.

## APPENDICEX

Table 1.

List of registered banks and Representative offices

CATEGORY	COMMERCIAL BANKS
Mutual Banks	Finbond Mutual Bank; GBS Mutual Bank; VBS Mutual Bank
Locally Controlled Banks	African Bank Limited; Bidvest Bank Limited;  Capitec Bank Limited; First Rand Bank Limited; Grindrod Bank Limited; Investec Bank Limited; Nedbank Limited;

	Sasfin Bank Limited; The Standard Bank of South Africa Limited; Ubank Limited.
Foreign Controlled Banks	Absa Bank Limited; Albaraka Bank Limited; Habib Overseas Bank Limited; HBZ Bank Limited; Mercantile Bank Limited; The South Africa Bank of Athens Limited.
Foreign Bank Representatives	AfrAsia Bank Limited; African Banking Corporation of Botswana Limited ( Trading as Bank ABC Botswana); Banco Angolano de Investimentos; Banco BPI, SA; Banco Espirito Santo e Comercial de Lisboa; Banco Internacional de Credito; Banco Internacional de Credito; Banco Santander Totta S.A; Banif-Banco Internacional do Funchal, SA; Bank Leumi Le- Israel BM; Bank of America, National Association; Bank of Cyprus Group; CommerZbank AG Johannesburg; Credit Suisse AG; Ecobank; Export-Import Bank of India; Fairbairn Private bank ( Isle of Man) Limited; Fairbairn Private Bank (jersey) Limited; First Bank of Nigeria; First City Monument Bank Plc; Hellenic Bank Public Company Limited; Icici Bank Limited; Industrial and Commercial Bank of China African Representative Office; Kfw Ipex-Bank GmbH; Lloyds TsB Offshore limited; Millennium BCP; National Bank of Egypt; NATIXIS Southern Africa Representative office; Royal Bank of Scotland International Limited; Societe Generale Representative office for Southern Africa; Sumitomo Mitsui Banking Corporation; The Bank of New York Mellon; The Bank of Tokyo-Mitsubishi UFJ. LTD; The Mauritius Commercial Bank Limited; The Rep. Off. For Southern and Eastern Africa of the export-import Bank of China; The Royal

	Bank of Scotland N.V; The Royal Bank of Scotland Plc; UBS AG; Unicredit Bank A.G; Union bank of Nigeria Plc; Vnesheconombank; Wells Fargo Bank, National Association; Zenith Bank Plc.
Foreign Bank Branches	Bank of Baroda; Bank of China Limited Johannesburg Branch (trading as Bank of China Johannesburg branch); Bank of India; Bank of Taiwan South Africa Branch; BNP Paribas SA; Canara Bank; China Construction Bank Corporation-Johannesburg Branch; Citibank N.A; Deutsche Bank AG; HSBC bank Plc-Johannesburg Branch; JP Morgan Chase Bank, N.A. (Johannesburg Branch); Societe Generale; Standard Chartered Bank-Johannesburg Branch; State Bank of India.

Source: The South African Reserve Bank

Table 2

Correlation analysis of ROA with the explanatory variables.

	Return on asset	Equity capital	Bank size	Loan	Saving deposits	Fixed term deposits	Non-interest income	Non-interest expense	Credit risk	Market concentration	Economic growth	Inflation	Lending interest rate
Return on asset Pearson Correlation	1	.649**	.641**	-.161	-.346*	-.121	-.340*	.684**	.430**	-.305*	.140	.118	.082
Equity capital Pearson Correlation	.649**	1	.926**	-.298*	-.553**	-.068	-.508**	.897**	.555**	-.443*	.074	-.035	.160
Bank size Pearson Correlation	.641**	.926**	1	-.365*	-.468*	-.126	-.425*	.911**	.606**	-.381**	.032	-.085	.125
Loan Pearson Correlation	-.161	-.298*	-.365*	1	-.043	.262*	-.179	-.417*	-.096	-.244	-.021	.104	-.139
Saving deposits Pearson Correlation	-.346*	-.553**	-.468*	-.043	1	-.606**	.693	-.452*	-.288*	.701**	-.093	.041	-.157
Fixed term deposits Pearson Correlation	-.121	-.068	-.126	.262*	-.606**	1	-.482*	-.120	-.212	-.535**	-.050	.008	-.035
Sig. (2-tailed)	.213	.485	.195	.006	.000	.000	.000	.215	.028	.000	.611	.931	.716

Non-interest income Pearson Correlation	-.340	-.508**	-.425**	-.179	.693**	-.482**	1	-.392*	-.275*	.683**	-.108	-.008	-.135
Sig. (2-tailed)	.000	.000	.000	.063	.000	.000		.000	.004	.000	.266	.938	.162
Non-interest expense Pearson Correlation	.684**	.897**	.911**	-.417*	-.452*	-.120	-.392*	1	.525**	-.300*	.112	-.044	.203*
Sig. (2-tailed)	.000	.000	.000	.000	.000	.215	.000		.000	.002	.250	.649	.035
Credit risk Pearson Correlation	.430**	.555**	.606**	-.096	-.288*	-.212	-.275*	.525**	1	-.373*	.059	-.024	.159
Sig. (2-tailed)	.000	.000	.000	.321	.002	.028	.004	.000		.000	.545	.807	.100
Market concentration Pearson Correlation	-.305*	-.443**	-.381*	-.244	.701**	-.535**	.683**	-.300*	-.373*	1	.010	.000	-.001
Sig. (2-tailed)	.001	.000	.000	.011	.000	.000	.000	.002	.000		.916	.997	.990
Economic growth Pearson Correlation	.140	.074	.032	-.021	-.093	-.050	-.108	.112	.059	.010	1	.095	.329**
Sig. (2-tailed)	.148	.449	.743	.831	.336	.611	.266	.250	.545	.916	.108	.329	.001
Inflation Pearson Correlation	.118	-.035	-.085	.104	.041	.008	-.008	-.044	-.024	.000	.095	1	-.549**
Sig. (2-tailed)	.224	.723	.383	.285	.677	.931	.938	.649	.807	.997	.329	.000	.000
Lending interest rate Pearson Correlation	.082	.160	.125	-.139	-.157	-.035	-.135	.203*	.159	-.001	.329**	-.549**	1
Sig. (2-tailed)	.398	.098	.199	.151	.104	.716	.162	.035	.100	.990	.001	.000	.108

\*\* .Correlation is significant at the 0.01 level (2-tailed).

\* .Correlation is significant at the 0.05 level (2-tailed).

Notes: \*, \*\*, and \*\*\* Means significant at 10%, 5% and 1% respectively.

Table 3:  
Correlation matrix of residuals:

	__e1	__e2	__e3	__e4	__e5	__e6	__e7	__e8	__e9
__e1	1.0000								
__e2	-0.1373	1.0000							
__e3	-0.0732	0.1468	1.0000						
__e4	0.4352	0.1425	-0.0068	1.0000					
__e5	0.1295	-0.3790	-0.3528	-0.1492	1.0000				
__e6	0.4577	-0.1343	-0.4658	0.0977	0.5369	1.0000			
__e7	-0.3697	-0.0787	-0.2557	-0.1624	-0.2876	-0.3527	1.0000		
__e8	0.6824	-0.3037	0.3317	0.5840	0.1618	0.1902	-0.5595	1.0000	
__e9	0.5393	-0.1912	0.4394	0.2796	0.4423	0.3846	-0.7232	0.8349	1.0000

Breusch-Pagan LM test of independence:  $\chi^2(36) = 63.522$ , Pr = 0.0031

Based on 11 complete observations over panel units

Table 4  
Fixed Effect Regression

3 . xtreg ROAA CAP SIZE LOAN DepSV DepFX NIN NIE CR Conc GDPgr Infl IRate, fe

ROAA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
CAP	-.0471262	.0519979	-0.91	0.367	-.1504776 .0562253
SIZE	-.0920887	.0484432	-1.90	0.061	-.1883749 .0041975
LOAN	-.0164835	.024211	-0.68	0.498	-.0646055 .0316386
DepSV	-.0348332	.0176361	-1.98	0.051	-.0698868 .0002204
DepFX	-.004915	.0222847	-0.22	0.826	-.0492082 .0393782
NIN	-.0829263	.0313223	-2.65	0.010	-.1451827 -.0206699
NIE	.1384861	.0561007	2.47	0.016	.0269799 .2499923

CR	-.2089229	.0597719	-3.50	0.001	-.327726	-.0901198	
Conc	-.0940672	.0748036	-1.26	0.212	-.2427475	.0546131	
GDPgr	.0236404	.1174405	0.20	0.841	-.2097854	.2570662	
Infl	.1406936	.0851292	1.65	0.102	-.0285099	.3098972	
Irate	.1026707	.1255209	0.82	0.416	-.1468156	.352157	
_cons	9.998959	3.60828	2.77	0.007	2.827112	17.17081	
sigma_u	3.9131833						
sigma_e	1.9726694						
Rho	.79736837	(fraction of variance due to				u_i)	

F test that all u\_i=0: F(8, 87) = 4.99 Prob > F = 0.0000

Table 5

### Random Effect F

5 . xtreg ROAA CAP SIZE LOAN DepSV DepFX NIN NIE CR Conc GDPgr Infl IRate, re

ROAA	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
CAP	-.0073857	.0508701	-0.15	0.885	-.1070892	.0923178
SIZE	.0082508	.0462126	0.18	0.858	-.0823242	.0988258
LOAN	.0195601	.0181353	1.08	0.281	-.0159844	.0551047
DepSV	-.0057131	.0112975	-0.51	0.613	-.0278558	.0164295
DepFX	-.0246567	.0158594	-1.55	0.120	-.0557405	.0064271
NIN	-.0059409	.0204221	-0.29	0.771	-.0459674	.0340856

NIE	.166251	.0542884	3.06	0.002	.0598477	.2726543
CR	-.0070175	.0441419	-0.16	0.874	-.0935341	.0794991
Conc	-.0316523	.0282699	-1.12	0.263	-.0870604	.0237557
GDPgr	.0595098	.1343266	0.44	0.658	-.2037655	.3227851
Infl	.153185	.0966452	1.59	0.113	-.0362362	.3426062
IRate	.0294344	.1410667	0.21	0.835	-.2470511	.30592
_cons	-.1208586	2.543987	-0.05	0.962	-5.106982	4.865264
sigma_u	0					
sigma_e	1.9726694					
rho	0 (fraction of variance due to u_i)					

Table 6

### Hausman Test

. hausman fixed random

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
CAP	-.0471262	-.0073857	-.0397405	.0107712
LNSIZE	-.0920887	.0082508	-.1003395	.0145308
LOAN	-.0164835	.0195601	-.0360436	.0160401
DEP_SAV	-.0348332	-.0057131	-.0291201	.0135425

DEP_FIX	-.004915	-.0246567	.0197417	.0156553
NII	-.0829263	-.0059409	-.0769854	.0237492
NIE	.1384861	.166251	-.0277649	.0141442
CR	-.2089229	-.0070175	-.2019054	.040301
MARCON	-.0940672	-.0316523	-.0624149	.069256
GDP_GR	.0236404	.0595098	-.0358694	.
INF	.1406936	.153185	-.0124914	.
INTR	.1026707	.0294344	.0732362	.

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2( 12) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 58.31  
 Prob>chi2 = 0.0000  
 (V\_b-V\_B is not positive definite)

Table 7

The results for ROA model using all continuous variables.

xtreg ROAA CAP SIZE LOAN DepSV DepFX NIN NIE CR Conc GDPgr Infl IRate,fe vce(robust)

ROAA	Robust					
	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
CAP	-.0471262	.0367934	-1.28	0.236	-.131972	.0377196
SIZE	-.0920887	.0443813	-2.07	0.072	-.1944321	.0102547
LOAN	-.0164835	.0232587	-0.71	0.499	-.070118	.0371511
DepSV	-.0348332	.0236664	-1.47	0.179	-.0894081	.0197417

DepFX	<b>-.004915</b>	<b>.0147237</b>	<b>-0.33</b>	<b>0.747</b>	<b>-.038868</b>	<b>.029038</b>
NIN	<b>-.0829263</b>	<b>.0314058</b>	<b>-2.64</b>	<b>0.030</b>	<b>-.1553482</b>	<b>-.0105044</b>
NIE	<b>.1384861</b>	<b>.0554701</b>	<b>2.50</b>	<b>0.037</b>	<b>.0105717</b>	<b>.2664005</b>
CR	<b>-.2089229</b>	<b>.0314109</b>	<b>-6.65</b>	<b>0.000</b>	<b>-.2813565</b>	<b>-.1364893</b>
Conc	<b>-.0940672</b>	<b>.0470388</b>	<b>-2.00</b>	<b>0.081</b>	<b>-.202539</b>	<b>.0144046</b>
GDPgr	<b>.0236404</b>	<b>.0637934</b>	<b>0.37</b>	<b>0.721</b>	<b>-.1234674</b>	<b>.1707482</b>
Infl	<b>.1406936</b>	<b>.1302868</b>	<b>1.08</b>	<b>0.312</b>	<b>-.1597482</b>	<b>.4411354</b>
IRate	<b>.1026707</b>	<b>.1137021</b>	<b>0.90</b>	<b>0.393</b>	<b>-.1595268</b>	<b>.3648681</b>
_cons	<b>9.998959</b>	<b>2.58659</b>	<b>3.87</b>	<b>0.005</b>	<b>4.034271</b>	<b>15.96365</b>
sigma_u	<b>3.9131833</b>					
sigma_e	<b>1.9726694</b>					
rho	<b>.79736837</b> (fraction of variance due to u_i)					

Thank you in advance