REAL EXCHANGE RATE MISALIGNMENTS AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICAN COUNTRIES

by

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DECLARATION

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I declare that "***REAL EXCHANGE RATE MISALIGNMENTS AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICAN COUNTRIES"*** 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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ABSTRACT

This study examined the effect of real exchange rate misalignments on economic growth in sub-Saharan Africa (SSA) by employing 15 countries. The sample is subdivided into 7 low-income countries and 8 middle-income countries. The dataset spans 41 years covering the period 1970-2010. The study examined this broad issue in piecewise fashion. In the first part, the study examined the validity of the Balassa-Samuelson Hypothesis (BSH) using a simplified regression model and within-effects estimations. The study found a negative and highly significant coefficient of the relative productivity term for the two subsamples (i.e. low-income SSA countries and middle-income SSA countries), in addition to the full sample. Thus, the study found a well-established BSH for the SSA countries considered.

Second, the study examined the impact of the real exchange rate undervaluation on economic growth using a standard regression model with key control variables. The study constructed an index of undervaluation, following Rodrik (2008). The study also constructed a Hodrick-Prescott based undervaluation index in order to evaluate the robustness of the main undervaluation index. Generally, the study found undervaluation to promote growth and overvaluation to reduce it. The study found the effect of undervaluation on economic growth to weaken as countries migrate from the low-income bracket to the middle-income bracket.

Moreover, the study examined whether the choice of the undervaluation measure mattered. The study found the choice of the undervaluation measure to matter. The Rodrik-type index appeared to overestimate the size of the impact of undervaluation on economic growth. Finally, the study examined whether the impact of undervaluation on growth was linear. The evidence showed that the impact of undervaluation on growth was linear, at least, for this study. The linear impact of real exchange rate movements on economic growth implied that undervaluation enhanced economic growth just as overvaluation hindered it.

KEY TERMS

Real Exchange Rates; Misalignments; Economic Growth; Undervaluation; Overvaluation; Low-income Countries; Middle-income Countries; sub-Saharan Africa

DEDICATION

This thesis is dedicated to my family and friends for their unending patience and love. It is also dedicated specifically to my granny, who has giving me endless protection and guidance.

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ACRONYMS

CFA	Communauté Financière Africaine
CMA	Common Monetary Area
ERP	Economic Recovery Programme
GDP	Gross Domestic Product
GMM	Generalised Method of Moments
HIPC	Heavily Indebted Poor Countries
NDP	National Development Plan
PPP	Purchasing Power Parity
RMA	Rand Monetary Area
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAP	Structural Adjustment Programme
SSA	Sub-Sahara(n) Africa
UNECA	United Nations Economic Commission for Africa
WDI	World Development Indicators

CHAPTER 1

INTRODUCTION

1.1 Background

The discussion of the real exchange rate has not featured in many growth models for a very long time; at least not in the first-generation growth models. This was mainly due to the fact that the first-generation growth models were formulated in a close-economy context, which did not provide space for the policy embodiment of the real exchange rate transmission (see Eichengreen, 2007). In the classic Solow (or Swan) model, for instance, the rates of return on capital (real interest rate) rather than the real exchange rate played a crucial role in directing capital investment across countries. Cross-country evidence suggests that if rates of return were so crucial in determining the direction of capital flow (as implied by the neoclassical growth models), and for that matter economic growth, developing countries should have seen huge capital flows from developed countries, barring capital-market imperfections, government tax policies and fear of expropriation, among others (see Romer, 2012). Yet this is not what is seen in reality.

In the modern economic theory, however, the real exchange rate has received the recognition that had eluded the variable for more than a century. The real exchange rate is now seen as a crucial determinant of economic growth, both within and across countries. Fundamentally, two lines of thought examine the real exchange rate as a determinant of economic growth. In this study, these are called the “competitive” school and the “volatility” school. These two schools provide interesting perspectives on the role of the real exchange rate in economic growth within and across countries.

On the one hand, the “competitive” school argues for the adoption of a competitive real exchange rate as a strategy for engineering economic growth. The central theory of this school is the export-led growth theory, where countries aim to keep prices of exports high enough to attract resources to the production of manufactures (see Eichengreen, 2007). Economic growth could be sustained using this strategy, provided that the income generated is channeled into saving for investment in the local economy. In this respect, a competitive real exchange rate (a moderately undervalued currency) acts as a “magic wand” for shifting resources from idle sectors of the domestic economy into the more productive export sector,

which is characterised by technological transfer (see Rodrik, 2008). And over time, through learning-by-doing, countries using this strategy are able to maintain their growth stimulus and thus expand into major economies. Proponents of this strategy often cite the success stories of the "Asian Tigers" and, much more recently, China, to buttress their stance (see Gala, 2007; Freund & Pierola, 2008). Arguably, this has been the most common tool employed by countries suffering from unemployment and balance-of-payment crises (see Rodrik, 2008).

On the other hand, the "volatility" school contends that the real exchange rate volatility undermines investment and trade, both of which are essential for economic growth. For economies to grow then, policies must be put in place to prevent excessive exchange rate volatilities. The fundamentals of financial fragilities and balance-sheet mismatch are necessary in explaining the ideas of the "volatility" school (see Eichengreen, 2007). Real exchange rate volatilities are often associated with floating exchange rate regimes, where countries allow their currencies to interact freely with other currencies (see Calvo & Reinhart, 2000). Real exchange rate volatility could cause severe financial distress and balance-sheet mismatch, especially in emerging economies where assets are denominated in local currencies and where liabilities are denominated in foreign currencies. This could lead to bankruptcy and severe financial crises, liquidity problems and wealth transfer, which inhibit economic growth. Calvo and Reinhart (2000) document evidence that shows most emerging countries were reluctant to float their currencies with the fear of volatility consequences; this phenomenon is now referred to as the "fear of floating" in the literature.

It must be added that real exchange rate volatilities could also be associated with fixed exchange rate regimes. Under the fixed exchange rate regime, for instance, if monetary policy is lax, real exchange rates could appreciate causing unsustainable current account deficits. This may force policy-makers to implement import and foreign currency controls, especially when external financing shrinks. These misalignments, according to Krueger (1983), would reduce trade openness, leading to a slowdown in economic growth.

From the foregoing discussion, it is clear that the real exchange rate is a crucial determinant of economic growth. Empirical evidence shows that most Eastern Asian countries, notably Japan, South Korea, Taiwan, Hong Kong, Singapore, and China, have used undervalued currencies to their advantage (see Dollar, 1992). Conversely, overvalued currencies have inhibited the growth of countries in Latin America and Africa. The World Bank documents

that persistently misaligned real exchange rates have caused severe drops in agricultural output in Africa (see World Bank, 1984). The present study pursues the line of reasoning of the "competitive" school mainly because their contentions enable the study to examine how overvaluation or undervaluation may affect economic growth which is the central theme of this study.

1.2 Statement of the Problem and Significance of the Study

The effect of real exchange rate misalignments on economic growth has been a never-ending debate in the literature. While some authors find overvaluation to be associated with lower economic growth (see Dollar, 1992; Razin & Collins, 1997; Acemoglu *et al*, 2002; and Fajnzylber *et al*, 2002), others find undervaluation to be associated with higher economic growth rates (see Gala, 2007; Gluzman *et al*, 2007; Rodrik, 2008; and Béreau *et al*, 2009). The policy implications of most of these studies are unclear for the most part, because they failed to point out whether the effect of real exchange rate misalignments on economic growth is linear or not. That is, for studies that found overvalued currencies adversely impact economic growth, no evidence was provided to show whether policies that lead to undervaluation would propel growth; the argument holds, conversely. Recent advances have been made to tackle the linearity issue, but the findings are conflicting. Aguirre and Calderon (2005) studied this issue, but the African countries covered were few (that is, only South Africa, Tunisia, Morocco, Egypt, Algeria, Côte d'Ivoire and Botswana were considered in that study); they found the impact of real exchange rate misalignments on economic growth to be nonlinear. That aside, Aghion *et al* (2009), Béreau *et al* (2009), and Rapetti *et al* (2011) also found the impact of real exchange rate misalignments on economic growth to be nonlinear. In stark contrast to these studies, Rodrik (2008), and Berg and Miao (2010) found the impact of real exchange rate misalignments on economic growth to be linear. Those were the few empirical studies on the linearity issue. The current study adds to these studies by examining the effect of real exchange rate misalignments on economic growth, and testing whether the effect is linear.

By examining the effect of real exchange rate misalignments on economic growth, and testing whether the effect is linear, the study enriches the literature in a number of ways. First, most previous studies were based on cross-country regressions, which may be less reliable. This study employs panel data models, which have the advantage of exploring cross-sectional and time series behaviours of the variables being examined. Second, the literature is

replete with evidence based mostly on non-African countries; the study fills this gap by employing selected countries of Sub-Saharan Africa (SSA). Finally, by establishing the linearity or otherwise of the effect of real exchange rate misalignments on economic growth, informed policies could be made for the countries involved; this is preferable to studies that established the *one-way* impact of real exchange rate misalignments on economic growth.

1.3 Research Objectives

This study seeks to examine the impact of real exchange rate misalignments on economic growth in selected countries of SSA. To be able to achieve this aim, the study will address the following:

a) Test the Balassa-Samuelson Hypothesis;
b) Examine the effect of undervaluation on economic growth in SSA countries;
c) Determine whether the effect of undervaluation on economic growth in SSA countries depends on the measure of undervaluation used;
d) Examine whether the effect of undervaluation on economic growth in SSA countries is linear.

1.4 Hypotheses of the Study

In line with the objectives of the study, the following hypotheses are tested:

a) Balassa-Samuelson Hypothesis holds in SSA countries;
b) Real undervaluation of the exchange rate enhances economic growth in SSA countries;
c) The effect of undervaluation on economic growth in SSA countries depends on the measure of undervaluation employed;
d) The effect of undervaluation on economic growth in SSA countries is linear.

1.5 Organisation of the Study

This study is organised in seven chapters. Chapter 1 introduces the study. It contains the background, the research problem and significance, the research objectives, the hypotheses of the study, and the organisation of the study. Chapter 2 discusses the nature of exchange rate policies, as well as the trends in real exchange rate and economic growth in selected low-income countries of SSA over the study period. Chapter 3 discusses the nature of exchange rate policies, as well as the trends in real exchange rate and economic growth in selected middle-income countries of SSA over the study period. Chapter 4 presents the Balassa-

Samuelson Hypothesis (BSH) and some empirical findings on the hypothesis. It analyses the theoretical relationships between the real exchange rate and economic growth. Then, it presents a comprehensive review of related empirical studies on the real exchange rate and economic growth nexus, and the possible research gaps left to be filled. Chapter 5 discusses the theoretical building blocks leading to the empirical specifications. Then, it presents the basic empirical model for verifying the Balassa-Samuelson Hypothesis. In addition, the chapter presents the nuances pertaining to the construction of the *undervaluation index.* It also presents the fully specified model that accounts for variable specification and omission bias, using both Rodrik and the Hodrick-Prescott based measures of *undervaluation*. Two additional models that enable the study to examine the linearity hypothesis are also presented in this chapter. In the final sections of this chapter, the estimation techniques and the data used in the study are discussed. Chapter 6 contains the results and findings stemming from applying the empirical models to the data. Chapter 7 is the final chapter and comprises the summary, the empirical findings, the policy recommendations, as well as the limitations of the study.

CHAPTER 2

REAL EXCHANGE RATE AND ECONOMIC GROWTH DYNAMICS IN SELECTED LOW-INCOME SUB-SAHARAN AFRICAN COUNTRIES

2.1 Introduction

In this chapter, the dynamics of real exchange rate and economic growth in seven selected low-income sub-Saharan African countries are discussed. These countries are: Congo DR, Ethiopia, Kenya, Malawi, Mali, Mozambique and Tanzania. Each of the sections except the last concentrates on each of the countries in the following manner. The main sections provide the historical perspective of the country under consideration. The three subsections under each main section discuss the exchange rate regimes and policies, the recent economic growth programmes and policies pursued by the countries, as well as the real exchange rate and the real GDP movements over the 1970-2010 period. The final section provides conclusions to the chapter.

2.2 Historical Perspective of the Democratic Republic of Congo

Democratic Republic of Congo, often known as Congo DR or DRC, remains one of the unstable countries in Africa after its independence from Belgium in 1960. Between 1965 and 1997, Congo DR was under the dictatorial rule of Mobutu Sese Seko; by this time, the country was called Zaire. After the overthrow of Mobutu, Laurent Kabila ascended to the thrown and renamed the country the Congo DR. The country has since remained as such. The current president is Joseph Kabila, the son of assassinated president, Laurent Kabila. Congo DR is said to have been the second most industrialised economy after South Africa prior to independence (Economist Intelligence Unit, 2008). But today, the country ranks among the least industrialised countries on the continent. The country was rocked by civil war between 1998 and 2003 (Coghlan *et al*, 2007). There are still traces of violence and conflict, especially, in the North and South Kivu provinces.

Arguably the largest country in Africa, it, however, has about only 3% arable land (Coghlan *et al*, 2007). Fortunately Congo DR is blessed with natural resources such as copper, zinc and diamonds. Economic activities are mostly concentrated in the informal sector. Persistent conflict and violence have resulted in an underdeveloped infrastructure. The statistical breakdown of the key demographic and socioeconomic indicators is presented in Table 2.1.

There is no formal insurance industry, leaving citizens at severe risk. Nonetheless, a regional deposit insurance fund was created in 1994 to be managed by the national banking association of Congo DR (see http://www.iadi.org/BankProfSelAfrCount2.doc.). The country has no stock market. Monetary policies are conducted by the central bank, Banque Centrale du Congo. The interest rates are set by the central bank.

Table 2.1: Key Demographic and Socioeconomic Indicators in Congo DR (2014)

Indicator	Estimate
Area of land	2,345,409 km sq.
Population	77,433,744
GDP (PPP)	$55 billion
GDP per capita (PPP)	$694
Economic growth rate (%)	6
Inflation rate (%)	12.2
Exchange rate (Congo franc per US dollar)	923.75
Unemployment rate (%)	8.9%
Human development index	0.304
Current account balance to GDP (%)	-3
External debt to GDP (%)	40
Share of industry in GDP (%)	27.6
Share of service in GDP (%)	35
Share of agriculture in GDP (%)	37.4
Number of licensed banks	18

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

2.2.1 Exchange Rate Regimes and Recent Policies in Congo DR

A few years after independence in 1960, DR Congo adopted a fixed exchange rate regime in which the Congolese franc was pegged to the US dollar. The currency was relatively stable with occasional fluctuations when government resorted to printing money. The Structural Adjustment Programme, which was introduced by the IMF and the World Bank into African countries, compelled countries involved to liberalise their exchange rate regimes. DR Congo was affected too. From 1980-1985 and 1990-1995, DRC adopted an interim exchange rate regime. However, in 2000 the country resorted to a floating regime.

The current regime is a managed or dirty float regime. The currency is allowed to move along with major currencies in periods of smooth economic climate. However, when the currency begins to experience severe depreciation or appreciation, the Central Bank steps in to peg it. Another distinguishing feature of the regime is a high level of dollarisation with a weak institutional framework to accommodate it. Most transactions are done in foreign currencies, especially in the US dollar.

Moving forward to the new regime, the Enhanced Interim Programme (EIP) paved the way for the initiation of flexible macroeconomic and financial policies leading to improved performance of the economy. The independence of the Central Bank of the DRC was restored in 2000. This led to a halt in the regular pattern of currency depreciation and hyperinflation. The inflation rate, which stood at 511% in 2000, fell drastically to 15% by 2002. With this drastic decline in the rate of inflation and the introduction of a floating exchange rate regime in May 2001, the currency became stable. Economic activity now reflects transactions in US dollars, which have to some extent instilled credibility into the financial system. Monetary policy has primarily focused on stabilising the national currency, resolving budget overruns, and restoring macroeconomic balance (IMF Country Report, 2010).

Starting in 2007, the country's currency has suffered frequent misalignments leading to uncertainties and loss of confidence in the economy. The Congolese franc depreciated 10.5% between January and February 2007. This was mainly due to the government's decision to print money (a sum of CDF 28 billion) in order to finance the widening government deficit. The main constraints of exchange rate policy management in Congo DR have been attributed to fiscal dominance, lack of capacity and credibility of the monetary authorities, institutional and administrative weaknesses, and the lack of well-functioning money and stock markets (OECD, 2008).

2.2.2 Recent Economic Growth Policies and Programmes in Congo DR

Right from independence, Congo DR was ravaged by political uncertainties, which inhibited its growth potential. The period between 1965 and 1997 was under extreme dictatorial rule. Prior to that, the period between 1960 and 1965 was characterised by a power struggle culminating in a shift in power from one political leader to the other. Thus, this era merits no discussion as far as this study is concern.

Programme Relais de Consolidation (PRC) was launched in 2006 to implement stabilisation reforms, but failed to achieve its objective due to excessive government spending (African Economic Outlook, 2008). This led to the delay in reaching the completion point of the HIPC initiative. An IMF Staff Monitored Programme (SMP) was set up to replace PRC (African Economic Outlook, 2008). The conditions of the SMP were that public finance would be stabilised while necessary spending went into poverty alleviation. Also, non-prior expenses were to be discouraged.

Congo DR remains one of several SSA countries with minimal development of human resources. The government implemented free basic education in 2010 to improve human resources development. In 2011, the government of DRC announced its interest in adopting new prudent macroeconomic policies aimed at limiting the amount of credit that goes to the state, maintaining the value of the DRC currency, and accommodating inflationary pressures. The commitment to this cause led the DRC to reach the completion point of the Heavily Indebted Poor Countries (HIPC) initiative in 2010. The remaining debt owed to the IMF was cancelled, freeing the DRC from pressures of debt servicing.

In addition to participating in the HIPC initiative to ease the negative impact of debt burden on growth prospects of the economy, policy-makers in the DRC have introduced planning instruments and budgetary programming in the provinces with the objective of improving governance (African Economic Outlook, 2008). The country also put in place foundations to join the Organisation for Harmonisation of African Business Law (OHADA). Aside from implementing various initiatives to enhance governance, the DRC has abolished redundant taxes and illegal levies with the aim of boosting the business climate (African Economic Outlook, 2012).

Unemployment remains a crucial issue inhibiting the growth prospects of Congo DR. To respond to this issue, the government recently introduced a youth employment programme under the second Poverty Reduction Strategy Document (DSCRP 2) with the target of creating 900 000 jobs each year for the youth. Besides that, a steering group was created in 2011 to introduce a once-stop reform policy to simplify foreign trade operation, stimulate growth, and increase the rate of mobilisation of public revenues linked to foreign trade. Congo DR joined the Common Market for Eastern and Southern Africa (COMESA), and became a member of the COMESA's trade and development bank, ZEP, (preferential

exchange zone), and signed an agreement with the World Trade Organisation (WTO) on customs valuation processes.

The macroeconomic policies implemented in recent times, coupled with the structural reforms advanced in the past, are believed to have had a positive impact on growth via resource allocation. Another source of optimism is the fact that the mining, energy, agriculture, and forestry sectors remain largely underexploited. Sustainable exploitation of these sectors should spur rapid growth of the economy of the DRC.

2.2.3 Trends in Exchange Rate and Economic Growth in Congo DR

The fixed exchange rate regime from 1960 to 2000 adopted by Congo DR was marked by mixed economic performances, as Figure 2.1 shows. The figures quoted below are in the US dollars. Real GDP increased from 16 475.88 billion in 1970 to 20 475.01 billion in 1974. Real GDP then declined from 20 475.01 billion in 1974 to 16 516.44 billion in 1980. Following the monetary authority's decision to devalue the exchange rate in 1982 and 1984, real GDP responded, increasing from 16 991.40 billion in 1981 to 19 671.34 billion by 1988. From 1988 till 2001, real GDP was in free fall, declining by approximately 95.1%. In a desperate attempt to restore economic growth and remove distortions associated with the interim exchange rate regime, Congo DR soon abolished the pegged exchange rate in 2001. The interim pegged regime was replaced by a dirty or managed float regime. The real exchange rate depreciated substantially. Real GDP responded to the new exchange rate policy by increasing from 10 082.76 billion in 2001 to 16 644.71 billion in 2010 (percentage increment of approximately 39.42).

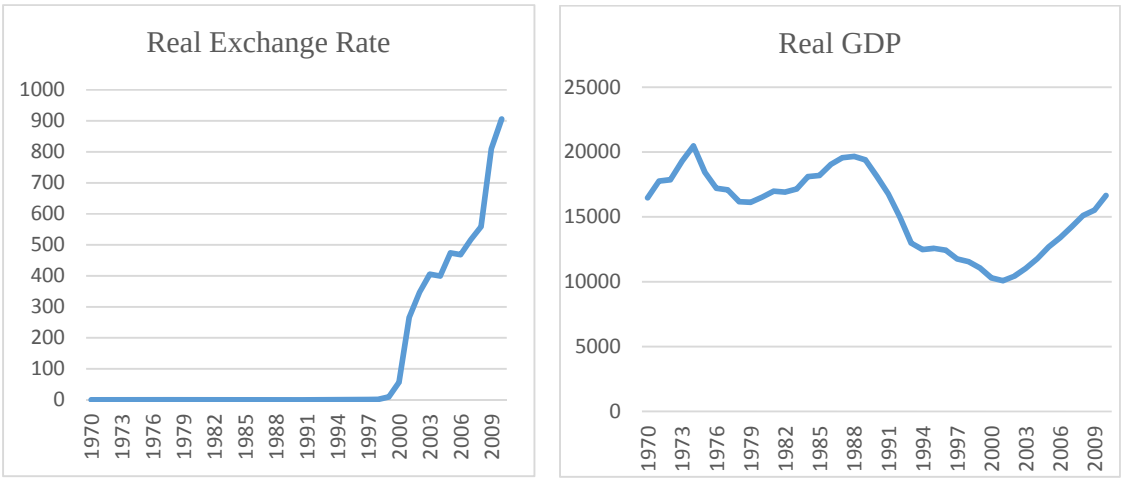

Figure 2.1: Trends in Exchange Rate and Economic Growth in DRC

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

2.3 Historical Perspective of the Republic of Malawi

Malawi is a landlocked country situated in the south-eastern part of the African continent. The country was originally known as Nyasaland. According to the World Bank and the IMF, Malawi is a relatively undeveloped, low-income country. The economy of Malawi is largely agricultural dependent, with most of its inhabitants living in rural areas (Kaluwa & Deraniyagala, 2011). Malawi is also said to depend heavily on external aid in order to finance its development programmes (Kaluwa & Deraniyagala, 2011). Transactions in Malawi are done mostly in the Malawian kwacha (the country's currency). A country marred by a high incidence of corruption, the government of Malawi faces major obstacles in improving education, developing the economy, providing accessible health care, protecting the environment, and becoming independent of external funds (Kaluwa & Deraniyagala, 2011).

After independence in 1964, Hastings Banda became the president and ruled under a one-party system until 1994. Nearly all of his policies were autocratic, yet this was the era in which Malawi made significant strides in agricultural and industrial development (IMF, 2003). In 1993, when Malawi adopted a multi-party system, Mutharika won the elections and, thus, took over from 1994. The incidence of misappropriation of funds and inappropriate policies were prevalent in the years that followed. Indeed, chronic corruption led to massive

withdrawal of aid from the IMF, the World Bank, and donor countries in 2000. The withdrawal of aid led to a decline in the government budget by 80% (IMF, 2003).

With the country facing challenges to meet the socioeconomic needs of its people, various economic programmes have been developed or implemented in Malawi since 2005. Some observers predict an improvement in the economic outlook of this country, with improvements in economic growth, education and health care seen in 2007 and 2008 (IMF, 2003). Certain demographic indicators, however, do not show many signs of economic improvement. The country has a low life expectancy, coupled with a high infant mortality rate. Besides, HIV/AIDS has ravaged the country in recent years leading to high losses in the labour force and increasing government expenditure (IMF, 2003).

Table 2.2: Key Demographic and Socioeconomic Indicators in Malawi (2014)

Indicator	Estimate
Area of land	118,484 km sq.
Population	16,407,000
GDP	$14.265 billion
GDP per capita	$857
Economic growth rate (%)	6.1
Inflation rate (%)	28.4
Exchange rate (Malawian kwachas per US dollar)	249.11
Unemployment rate (%)	3**
Human development index	0.493
Current account balance to GDP (%)	-15
External debt to GDP (%)	9.49
Share industry in GDP (%)	19.2
Share of service in GDP (%)	51.8
Share of agriculture in GDP (%)	29
Number of licensed banks	12

** This is the official figure provided by the Malawian government and is highly disputed.

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

In the last few years, Malawi has suffered growth setbacks. In 2009, the country lost much of its ability to cover its imports mostly due to the shortage of foreign exchange. Investment

responded by declining by 23% in 2009. Aside from that, IMF documents that a lot of investment barriers exist, which repress the economy. For instance, poor infrastructure for power, water, and telecommunications, as well as the high costs of service, are some of the barriers mentioned (IMF, 2003).

2.3.1 Exchange Rate Regimes and Policies in Malawi

The exchange rate policies in Malawi, just as in most countries in SSA, have been mixed. At some point, it operated the controlled or peg system (1984-1994), a managed float (1994-1995), a de facto peg (1995-1997), a crawling peg (1997-1998), a float (1998-2003), and a de facto adjustable peg (2003 to date). Malawi has moved back to a strictly controlled exchange rate regime with periodic rationing and continually low foreign exchange reserve coverage. In spite of this, its official exchange rate has been less overvalued (Maehle *et al*, 2013). Figure 2.2 shows the recent exchange regimes in Malawi.

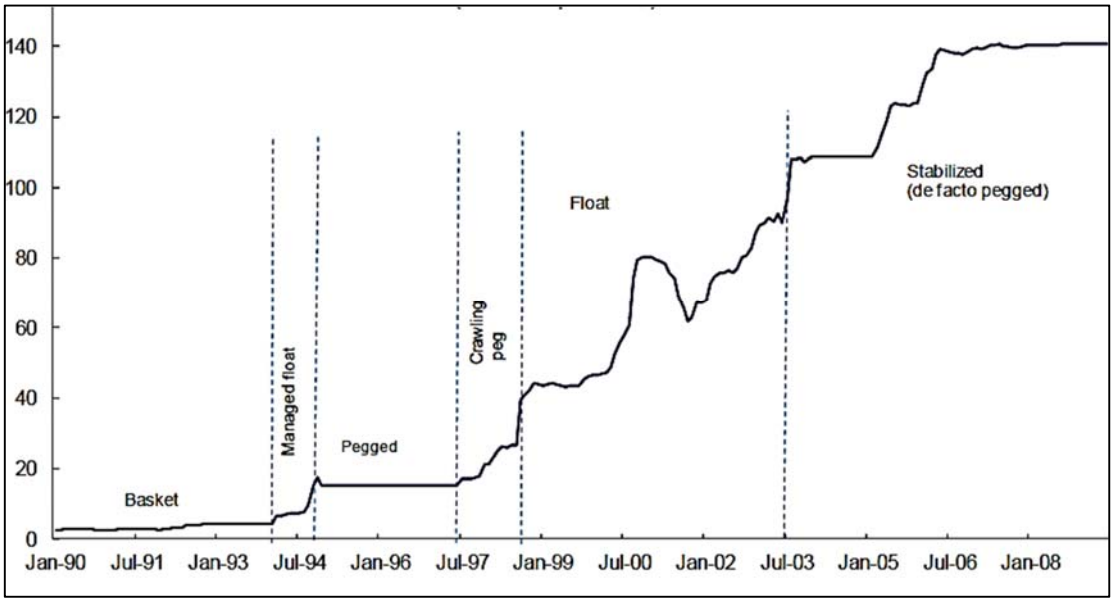

Figure 2.2: Exchange Rate Regime History of Malawi, 1990-2010

Source: Adapted from Maehle *et al* (2013).

It has been argued that the stop-and-go exchange rate policy that Malawi has been employing has not really provided a solution (Maehle *et al*, 2013). If anything, the policy has worsened the economic situation in the country. The exchange rate experienced high nominal depreciation from 1990 to 2012. In fact, the Malawian kwacha (MK) depreciated by 98%

between 1990 and 2010. At the same time, inflation rose steadily between 1990 and 2010; and consumer prices increased by almost 23% on average each year.

According to reports[1], monetary policies in Malawi could be categorised into three distinct regimes: i) an era of financial repression (1964-1986), ii) an era of financial reforms (1987-1994), and iii) an era of financial liberalisation (after 1994). These regimes have bearings on the behaviour of the exchange rate. Under the repressed system, the exchange rate was unduly pegged, while the exchange rate experienced nominal depreciation under the reformed and liberalised regimes.

In the first phase (1964-1986), the monetary authorities imposed direct controls on credit, while interest rates were also controlled. Sectorial credit allocation was implemented, allowing credits to flow to preferred sectors of the economy. The exchange rate was pegged alongside the imposition of price floors and ceilings. This led to a repressed economy whereby the real exchange rate was misaligned and prices distorted. The ultimate repercussion was an economy that was plunged into recession (see Reserve Bank of Malawi, 2003).

Facing a severe recession, the monetary authorities were persuaded by staff members of the IMF to undertake financial reforms from 1987 onwards. The first step was a partial deregulation of lending rates in July 1987. This was to be followed by a partial deregulation of deposit rates in April 1988 (see Simwaka, 2007). In addition, preferential lending was completely abolished by 1990. The exchange rate was allowed to float on February 1994. The establishment of a forex bureaux, and the trading of foreign exchange options and currency swaps accompanied this (Maehle *et al*, 2013).

2.3.2 Recent Economic Growth Policies and Programmes in Malawi

Various growth strategies, policies and programmes have been implemented by Malawian governments in the past. The Integrated Trade and Industry Policy was implemented in 1997 to galvanise growth in trade in six areas: i) review and improve trade policy, ii) provision of supportive trade infrastructure, iii) expand export markets and diversify products, iv) maintain and strengthen preferential non-reciprocal agreements, v) negotiate new preferential

[1] See Simwaka (2007), and Maehle *et al.* (2013) for further discussion.

agreements, and vi) creation of competitive domestic markets. Under the Integrated Trade and Industry Policy, transport and telecommunication infrastructures were to be developed and export credit financing mechanisms revamped. Malawi entered into such trade and growth agreements as the African Growth and Opportunity Act (AGOA) and the Everything But Arms (EBA) with the aim of expanding its export. As a member of COMESA and SADC, Malawi has also negotiated with member countries to trade and do business with them.

As a step towards achieving economic emancipation, Malawi, as have many other SSA countries, entered into an agreement with the IMF as a Heavily Indebted Poor Country (HIPC). Under the HIPC initiative, Malawi agreed to undertake certain reforms including cutting down excessive government spending and committing to transparent and accountable governance. Malawi reached the completion point of the HIPC initiative in 2006. Thus, the debt owed (estimated to be $646 million in net present value terms) to the IMF was cancelled. Consequently, the IMF released a fund of $411 million to the Malawian government to support its budget. These benefits were estimated to have the long-term impact of reducing debt service expenses to $5 million between the years 2006 and 2025; and increasing the average annual debt service savings from $39 million to $110 million over this period (see Kaluwa & Deraniyagala, 2011). The action undertaken by the IMF had an immediate impact as other donor institutions and countries reacted and cancelled Malawi's debts to them. Besides, Malawi signalled to prospective investors and donor institutions that it was committed to proper management of its economic affairs. As a result, the country's sovereign bond ratings quickly soared (Kaluwa and Deraniyagala, 2011).

Quite recently, Malawi received a one-year $77 million IMF Exogenous Shock Facility (ESF) to cushion the country against high world prices of crude oil and fertiliser (Malawi Government, 1998). The IMF cited the satisfactory review of Malawi's Poverty Reduction and Growth Facility (PRGF) as the reason to reward Malawi such a facility (IMF, 2003). The full amount of the facility was not paid out. Instead, Malawi received $52 million out of the total $77 million because of the country's inability to meet the targets. To continue to improve its economic performance, Malawi agreed to a new three-year medium-term macroeconomic programme with the IMF in February 2010. The key targets of the new programme included: a) restoring external equilibrium by liberalising the foreign exchange regime for current account transactions and by attaining foreign reserves to cover three

months of imports, b) maintain internal equilibrium by prudent fiscal and monetary policies that contain aggregate demand and inflation, c) sustaining poverty reduction by creating room in the budget for more pro-poor spending and by creating safety nets to protect the poor from exogenous shocks, d) building competitiveness by encouraging public financial management, tax administration and the efficiency of public enterprises (IMF, 2003).

Another significant growth initiative implemented by the Malawian government was the Malawi Growth and Development Strategy (MGDS). This strategy was a five-year growth strategy spanning the 2006-2011 period, which spelt out development priorities, and proposed outcomes and budgetary allocations (see Kaluwa & Deraniyagala, 2011). The ultimate goal of the MDGS was to transform the Malawian economy from a consuming and importing economy to a producing and exporting one. The policy orientation was designed to attaining the medium-term development goals of sustainable growth and development in infrastructure. The priority areas of the MDGS were agriculture and food security, irrigation and water development, transport infrastructure development, energy generation and supply, integrated rural development, and prevention and management of nutrition disorders, HIV and AIDS. The areas were chosen with the aim of achieving the Millennium Development Goals (MDGs).

2.3.3 Trends in Exchange Rate and Economic Growth in Malawi

From 1964 to 1986, Malawi maintained a fixed exchange rate regime (see Figure 2.3). Note that real GDP is in US dollars. Within this period, real GDP rose from 2 285.844 million in 1970 to 4 532.894 million in 1980, and dipped suddenly to 4 042.924 million in 1981. Even though the economy was repressed during this period, the growth in real gross domestic product was significant. From 1987 to 1994, Malawi resorted to financial reforms. Thus, lending and deposit rates were partially deregulated to ease pressures on exchange rates. The economy was partially stimulated with real GDP rising from 4 698.198 million in 1987 to 5 817.511 million in 1993. The exchange rate was finally liberalised in February 1994, allowing market forces to determine the rates. Real GDP consequently improved from 5 143.330 million in 1994 to 1 0917.499 million in 2010 (see Figure 2.3).

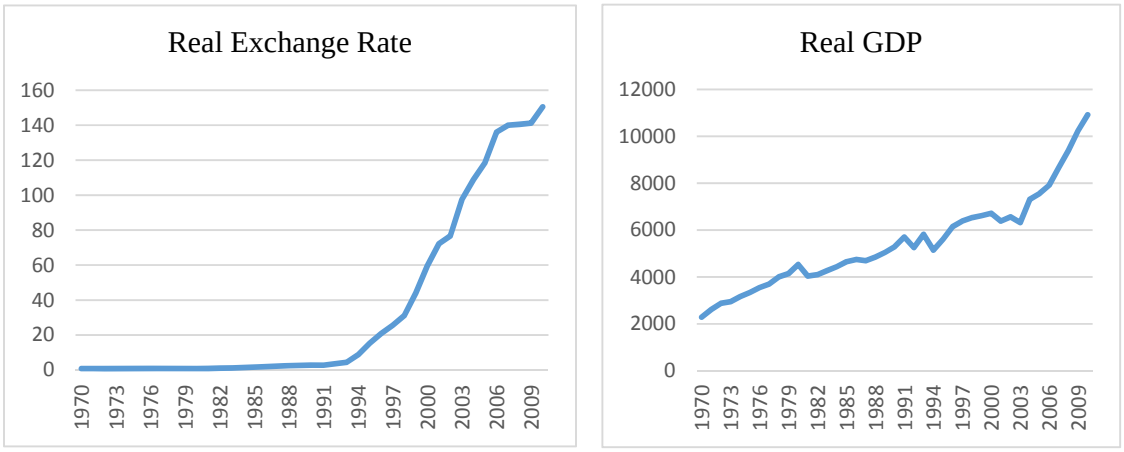

Figure 2.3: Trends in Exchange Rate and Economic Growth in Malawi

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013)

2.4 Historical Perspective of the Republic of Mozambique

The economy of Mozambique experienced turbulence in the past, especially in the mid-1980s. The civil war, which occurred around the 1980s, almost left the economy in shreds. Weak economic policies and heavy governmental intervention have not helped either. Right from independence in 1975, Mozambique's economy has been centrally planned with undue price controls and distortion. The government appointed administrators and regulators, and nationalised lands, organisations, institutions and banks, as well as all the properties abandoned by Portuguese settlers (Arndt, 1999). Mozambique operated a fixed exchange rate regime, in spite of the deteriorating economic conditions and increasing internal and external imbalances (Arndt, 1999).

The excessive government controls, which were often accompanied by inconsistent monetary and fiscal policies, and an unfortunate civil war in the 1980s, exacerbated the macroeconomic imbalances. For instance, real per capita income fell by 34% starting from 1981; inflation stood at 41% in 1986; price-controlled goods and services constituted 70% of GDP; industrial capacity utilisation was very low at between 20 and 30% (Arndt, 1999). Besides, fiscal deficit was huge, standing at 12% of GDP by 1986; the exchange rate was about 40 to 50 times higher in parallel markets than the official exchange rate; and reserve coverage was 0.4 months of imports (Fabrizio, 2001; Tarp *et al*, 2002).

Nevertheless, policy-makers have managed to reverse the economic deterioration in Mozambique. The economy is entirely different from the one in the past. From 1987 till today, the Mozambican economy has been recording, on average, GDP growth of 7.4% per year; per capita income has risen by 243% since 1987; at the same time, the country recorded a moderate rate of inflation. Behind this remarkable success story was the Economic Recovery Programme (ERP) designed and supported by the World Bank and the IMF. Table 2.3 shows some of the key demographic and socioeconomic indicators in Mozambique.

Table 2.3: Key Demographic and Socioeconomic Indicators in Mozambique (2014)

Indicator	Estimate
Area of land	801,590 sq. km
Population	23,929,708
GDP (PPP)	$26.257 billion
GDP per capita (PPP)	$1,169
Economic growth rate (%)	7
Inflation rate	4.3
Exchange rate (Mozambique metical per US dollar)	31.45
Unemployment rate	17
Human development index	45.7
Current account balance to GDP (%)	-43.4
External debt service to GDP (%)	48.9
Share of industry in GDP (%)	22.4
Share of service in GDP (%)	46.1
Share of agriculture in GDP (%)	31.5
Number of licensed banks	18

Source: Extracted from WDI (2014) and African Economic Outlook (2014).

2.4.1 Exchange Rate Regimes and Policies in Mozambique

After independence from Portugal in 1975, Mozambique has mostly operated a controlled economy. The exchange rate has been pegged over a considerable number of years. However, under pressure from severe hardships and economic instability, several reforms were introduced, including a gradual shift from a pegged exchange rate regime to a relatively market determined exchange regime (Fabrizio, 1998).

Starting in January 1987, the Mozambican currency, the metical, was devalued by 80.5% from Mt 39 per dollar to Mt 202 per dollar; the exchange rate peg was adjusted from a basket of six currencies to the dollar. Later that year, in July 1987, the metical was devalued by 50% from Mt 202 per dollar to Mt 404 per dollar. The devaluation at irregular intervals continued until April 1989 when a formal monthly devaluation was established (see Fabrizio, 2001). The authorities again changed the pegged exchange rate from a basket of six currencies to a dollar to a basket of 10 currencies in December 1989.

Again, in October 1990 the monetary authority of Mozambique introduced a market for foreign exchange, allowing commercial banks to transact with the public. The metical was devalued in mid-1991 following pressure to discourage imports; thus, foreign exchange transactions shifted closely to the official market (see Fabrizio, 2001). In April 1992, the official central bank rate and the market rate were unified. In addition, a special, more appreciated rate was introduced for tied aid.

Finally, the special appreciated rate was abolished in June 1993. The official exchange rate became fully market determined. In spite of this, there appeared a significant spread between the official and parallel rates, albeit transitory, in early 2000 – reaching a high of 10% in March 2000. This was partly due to severe floods that ravaged Mozambique at the beginning of that year. Official privatisation of the financial sector started after 1995, leading to the establishment of forex bureaus and the establishment of foreign banks. Steps were also taken to liberalise the current account (see Fabrizio, 1998).

Following these financial sector and exchange rate reforms, the economy of Mozambique responded positively and significantly (see Fabrizio, 2001). Economic growth reached a period high of 15% in 1987; and over the past 27 years, growth averaged 7% or more. Exports grew by 18% in 1987, remaining high over an extended period and averaging 12.4% between 1987 and 2010. Aid also increased over this period, speeding up imports of goods and services, and a significant rebuilding of international reserves (see Fabrizio, 2001; Tarp *et al*, 2002).

2.4.2 Recent Economic Growth Policies and Programmes in Mozambique

As documented earlier, the growth story of Mozambique following independence was nothing to write home about. Under the then strictly controlled system, the economy was

characterised by price distortion, misappropriation of funds, corruption, and persistent and irregular devaluation of the metical. To add a negative reverberating impact on the economy, a civil war broke out in the 1980s leading to severe loss of the active labour force, the destruction of infrastructure, and the disarray of institutions.

After the civil war, policy-makers in Mozambique began to gradually lay down programmes and strategies to arrest the economic deterioration. The main objective was to shift the economy from a controlled system to a market-based one. Supported by the IMF and the World Bank, the Economic Rehabilitation Programme (ERP) was launched in 1987. Under the ERP, Mozambique undertook reforms such as the unification of the exchange rate, a reformation of import tariff structure, liberalisation of external trade, privatisation of various public enterprises, elimination of price controls, financial sector reforms by partial privatisation and liberalisation of interest rates, and the establishment of an independent central bank (see MacMillan *et al*, 2003).

In addition to the ERP, the Structural Adjustment Programme (SAP) was also implemented to complement the economic transformation process embedded in the ERP. The implementation of the SAP led to a transition of the economy from a socialist regime to a capitalist regime, culminating in marked improvement in economic prospects such as employment, fall in inflation, stable exchange rates, and economic growth (see MacMillan *et al*, 2003). Later, in 2001, the government introduced the Poverty Reduction Strategy (PRSP), known in Mozambique as *Plano de Accao para a Reducao de Pobreza Absoluta*, or PARPA) leading to further structural changes in subsequent years (see MacMillan *et al*, 2003).

The most recent growth initiative was the Policy Support Instrument for Mozambique, a three-year programme designed by the government of Mozambique and supported by the IMF. The primary objectives of this instrument were to ensure economic stability, inflows of foreign direct investment (FDI), speed up economic growth, increase transparency and accountability, as well as alleviate poverty. In a recent evaluation of the policy, the IMF claimed that macroeconomic performance of Mozambique remains strong with real GDP growth for 2013 at 7.1% and inflation remaining moderate. The IMF also claimed that the PSI-supported programme was on track, and that all assessment criteria were met, but some structural reforms could not be achieved (IMF Press Release, 2014). According to officials of the IMF, the macroeconomic outlook of Mozambique remains favourable and growth was

expected to be maintained in the medium term by natural resource boom and infrastructural investment (IMF Press Release, 2014).

A programme to improve the performance of the agriculture sector, the National Agriculture Investment Plan (PNISA), has been implemented in Mozambique. The programme focuses on investment in hardware and technical assistance, and the expansion of cultivated areas. If successful, the PNISA was expected to expand agriculture production by 7% in 2014. The Sena rail line has also been upgraded, thereby boosting the transport of coal. Following this rehabilitation, coal production reached 7.5 million tonnes/year (Mt/y) in 2013, 4.8 Mt/y more than in 2012, barring heavy rains, which led to traffic.

The growth prospects of Mozambique could potentially be impeded by the deteriorating political situation. There have been increasing concerns over low-intensity confrontations between the government and the opposition. That aside, public financial management and economic governance has been on the decline in recent years, further casting doubt on the growth prospects of Mozambique. The Mozambican economy has been mostly capital-intensive, creating limited jobs, and, thus, has had little impact on poverty reduction.

2.4.3 Trends in Exchange Rate and Economic Growth in Mozambique

As Figure 2.4 shows, Mozambique maintained a fixed exchange rate regime over a fairly long period of time – well before independence in 1975 until 1993. The exchange rate was also devalued irregularly over this period. Real GDP (in US dollars) was moderate over the period with a relative increase from 3 151.014 million in 1970 to a regime peak of 4 496.182 million in 1982.

The controlled exchange rate regime was finally abolished in 1993, amid pressures from a decline in exports, balance of payment problems, a decline in aid inflows, and the rapid development of parallel markets. This allowed the market to determine the exchange rate. Once the floating exchange rate regime was adopted, the economy responded. The real exchange rate began to reflect the economic fundamentals leading to growth in exports, a decline in black market activities, an increase in aid inflows, and increases in real GDP from 4 747.756 million in 1993 to 17 455.298 million in 2010. In fact, the Mozambican real GDP has not dipped once under the flexible exchange rate regime, as Figure 2.4 shows.

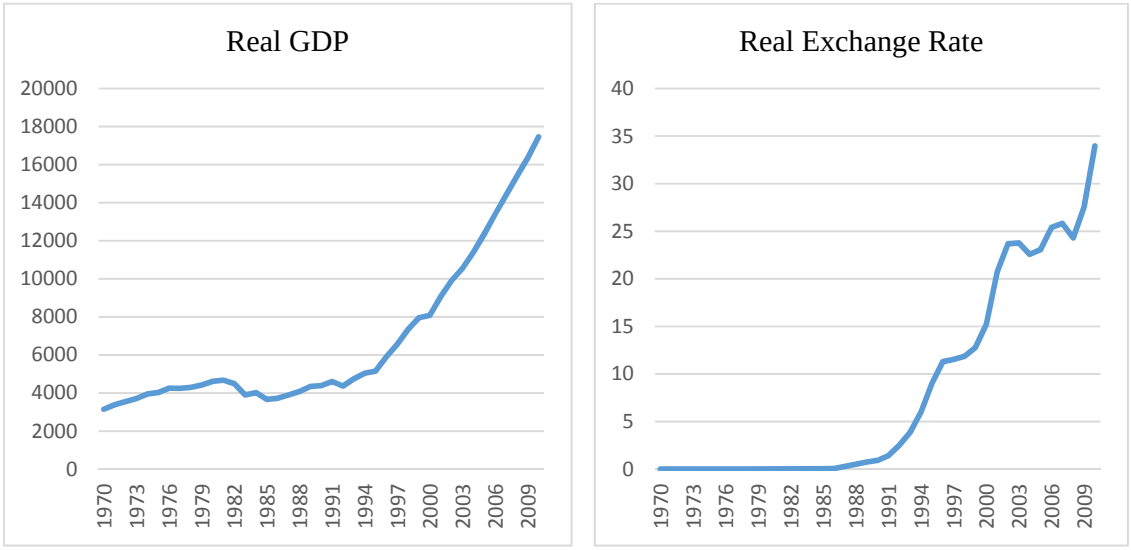

Figure 2.4: Trends in Exchange Rate and Economic Growth in Mozambique

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

2.5 Historical Perspective of the Republic of Tanzania

Tanzania, formally known as the Republic of Tanzania – an East African country – is bordered by Kenya, Zambia, Rwanda, Uganda, Burundi, Congo DR, Malawi and Mozambique. Divided into 30 administrative regions, the country formally became independent in 1961 under Nyerere as Tanganyika. In 1964, an agreement was reached between Tanganyika and Zanzibar; the two became a confederate forming the Republic of Tanzania (see Central Intelligence Agency, 2013a).

Mostly state-controlled from independence, the economy of Tanzania suffered long periods of stagnation around the late 1970s and mid-1980s. As a then socialist nation, Tanzania had an alliance with China, which financed Tanzania's 1 860km-long TAZARA Railway from Dar es Salaam to Zambia. Over the years, the agricultural sector has been the major contributor to GDP, accounting for more than 25% of GDP, contributing to 85% of exports, and 80% of employment. The country is extremely blessed with natural resources such as gold, diamonds, natural gas, coal, iron, platinum, chromium, tin, niobium and uranium, among others (see Central Intelligence Agency, 2013a).

Severe and prolonged drought hit the economy very hard at the turn of the 21st century. This, coupled with price distortion, corruption, inflexible institutions, and overvalued currency, led

to economic turbulence in the country from the late 1970s. Real economic growth was persistently negative, exports and imports were declining, and there were widespread shortages and high parallel market spreads, as well as high inflation (see Nord *et al*, 2009). The economic deterioration prompted the government of Tanzania to seek funding from the IMF in the mid-1980s. The Economic Recovery Programme, an IMF-sponsored programme, was implemented. This shifted the Tanzanian economy from a socialist regime to a more market-oriented one. The economy responded markedly, by recording an improved real growth, exports and imports, human capital development and institutional reforms, among others (see UNDP, 2012). Table 2.4 shows the key demographic and socioeconomic indicators of the Tanzanian economy in 2014.

Table 2.4: Key Demographic and Socioeconomic Indicators in Tanzania (2014)

Indicator	Estimate
Area of land	945,203 sq. km
Population	44,928,923
GDP (PPP)	$79.388 billion
GDP per capita (PPP)	$1,715
Economic growth rate (%)	7
Inflation rate (%)	7.9
Exchange rate (Tanzanian shilling per US dollar)	1657.50
Unemployment rate (%)	11.88
Human development index	0.476
Current account balance to GDP (%)	-13.7
External debt service to GDP (%)	11.48
Share industry in GDP (%)	24.2
Share of service in GDP (%)	48
Share of agriculture in GDP (%)	27.8
Number of licensed banks	34

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

2.5.1 Exchange Rate Regimes and Policies in Tanzania

Tanzania maintained a fixed exchange regime from independence in 1961 until well into the 1980s. This led to the development of a parallel market with premium. The premium rose from 40% in 1970 to about 250% in around 1985, and eventually surpassed 700% in March 1986 (see Nord *et al*, 2009). The official exchange rate of Tanzania was devalued several times in the 1980s. However, these devaluations could not impact on the parallel market due to persistent inflation (see Nord *et al*, 2009). The misaligned exchange rate persisted in the 1980s as government financed public losses and budget deficits by printing money. Inflation responded, rising by 30% during this period. Foreign currency also became very scarce. Moreover, increasing default on debt forced the authorities to resort to licensing and rationing. Exporters were compelled to give up their exchange earnings and were regularly under undue scrutiny and licensing procedures. Importers were also subjected to all kinds of regulations and licensing procedures, thereby exerting further pressure on the country's currency.

Amid economic hardships and severe price and exchange rate distortions, Tanzania designed and began to implement the Economic Recovery Programme (ERP) in 1986. The main aim of the ERP was to restore economic stability and reform the structural systems of the economy (see IMF, 1996). As part of the ERP, the shilling was largely devalued (see Edwards, 2012). The exchange rate regime was gradually shifted from a pegged system with a large parallel market premium to a more unified managed float between 1986 and 1993. Before that, a crawling peg was adopted in 1986 as part of the gradual shift process (see Nord *et al*, 2009). The nominal exchange rate was devalued by 60% between March and June of 1986, leading to a depreciation of the real effective exchange rate by 50% (see Edwards, 2012). Notable exchange rate adjustments were also undertaken under the ERP. The nominal exchange rate was devalued by 95% between March 1986 and mid-1995, leading to real effective exchange rate depreciation of around 87%. The parallel market premium was cut from 700% to about 30%.

In 1992 the financial sector was liberalised, allowing for the establishment of forex bureaus and the creation of foreign deposit accounts in local banks (see IMF, 1994b; Nord *et al*, 2009). The forex bureaus were permitted to transact in foreign exchange at negotiated rates, meaning that the parallel market was, thus, legitimised. The foreign market responded favourably and sharply. The volume of transactions undertaken by forex bureaus increased

markedly within a fiscal year, rising from $100m in 1992 to around $400m in 1993, financing about 20% of commodity imports (see Nord *et al*, 2009; Edwards, 2012). Finally, the auction system was replaced by an interbank foreign exchange market in 1994. Exporters were allowed to retain most of their proceeds to finance their import needs from 1992. All restrictive requirements on exporters were abolished by 1994.

2.5.2 Recent Economic Growth Policies and Programmes in Tanzania

Throughout the 1960s and 1970s, the economy of Tanzania was mainly state-controlled and pursued a socialist agenda. The economy was generally not flexible, and was characterised by monopolistic and severely regulated institutions and production processes. These socialist mechanisms, coupled with a war against Uganda and external shocks around the 1970s, led to significant macroeconomic instability. Notably, GDP per capita fell remarkably, agricultural exports crashed, inflation clinched a period high, the economy stagnated, and the size of consumer goods dwindled during this period.

The mounting pressure of economic stagnation compelled the government of Tanzania to buy into the IMF-sponsored Economic Recovery Programme (ERP). The central theme of the ERP was to restore the economy and initiate structural reforms. The implementation of the ERP began to take shape in 1986. The first step was to realign prices by abolishing price ceilings and floors, and by devaluing the Tanzanian shilling (see Edwards, 2012). In addition, public enterprises were reorganised, and in some cases, privatised. Subsidies were removed, producer prices were increased in order to boost outputs, and import restrictions were abolished (see Mwase & Ndulu, 2008).

The beginning of the 1990s saw significant liberalisation of the Tanzania economy, with more concentration directed towards market-oriented reforms. By 1996, Tanzania began to implement more aggressive liberalisation policies leading to significant improvement in key economic indicators. For instance, annual real growth averaged around 5% from 1996 (2% more than the period 1990-1995), inflation fell to single digits by 1999, and even below 5% in 2002 (see Mwase & Ndulu, 2008). The moderate macroeconomic stability recorded as a result of the economic reforms stimulated the flow of official donor assistance into Tanzania, which helped cushion real economic growth.

Another significant step was the improvement in monetary management by the central bank (Bank of Tanzania). Cash was effectively managed by the Bank of Tanzania, preventing government withdrawals and consolidating the funds from donors. This was enough to eliminate the budget's domestic financing requirements, further easing inflationary pressures. The tax authority's decision to widen the tax base under a low tax rate regime led to huge fiscal consolidation from the tax revenue generated (see Mwase & Ndulu, 2008). For instance, revenue to GDP increased from 12.1% in 1999 to 13.6% in 2004.

The swift and often aggressive macroeconomic reforms implemented from 1986 enabled Tanzania to reach the decision point under the HIPC initiative in 2000, and the completion point in 2001. Thus, the IMF cancelled Tanzania's outstanding debts. Other donor countries and institutions followed suit by cancelling their debts with Tanzania. This relieved the government of the pressure of debt servicing, and instead allowed it to concentrate on improving the economy. The National Irrigation Master Plan was implemented in 2002 to irrigate 29.4 million hectares of arable lands in order to boost agricultural productivity.

2.5.3 Trends in Exchange Rate and Economic Growth in Tanzania

Tanzania operated a fixed exchange rate regime right from independence until 1986, when the Economic Recovery Programme (ERP) was implemented (see Figure 2.5). During this period, the economy of Tanzania experienced moderate growth. Real GDP (in US dollars) increased from 9 554.445 million in 1970 to 14 721.126 million in 2010. The moderate growth was due to a recurrent overvalued exchange rate, which led to export decline, and the accompanied and often irregular devaluations.

The economy of Tanzania shifted gradually from a pegged system to a more unified float from 1986 to 1993 – often characterised by devaluation. Real GDP increased faster during this period, going from 14 721.126 million in 1986 to 19 905.344 million in 1993 (see Figure 2.5). After 1993, the exchange rate was eventually liberalised, thereby allowing the exchange rate to float. It is obvious from Figure 2.5 that the floating regime had a tremendous impact on economic growth; real GDP increased remarkably from 20 509.138 million in 1994 to roughly 51 417.454 million in 2010 (an increment of about 60.11% in 16 years).

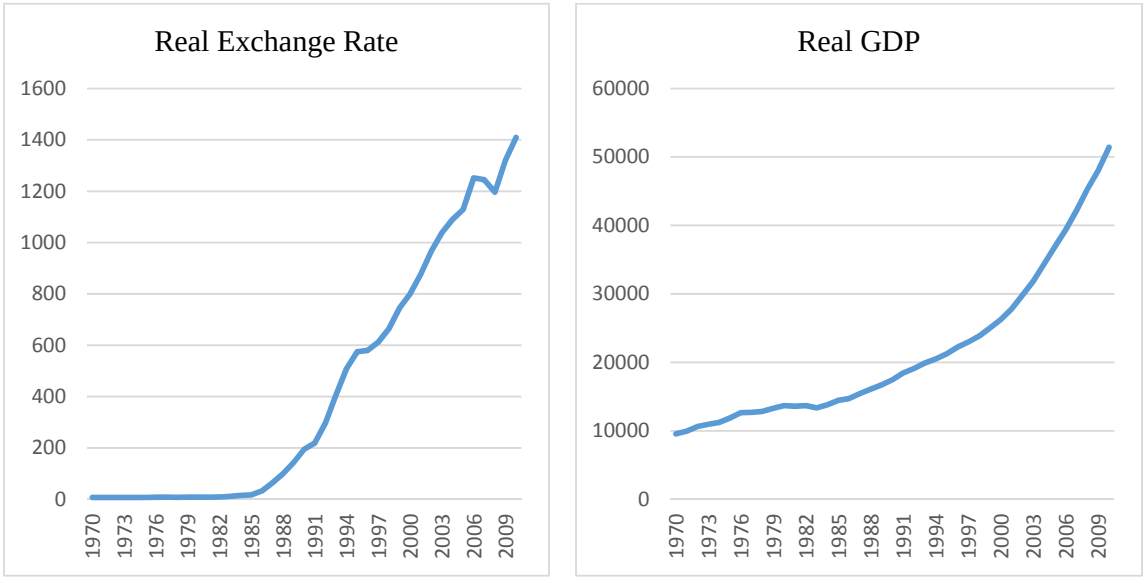

Figure 2.5: Trends in Exchange Rate and Economic Growth in Tanzania

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

2.6 Historical Perspective of the Republic of Kenya

The Republic of Kenya, popularly known as Kenya, is one of the East African countries. Bordered by the Indian Ocean, Tanzania, Uganda, South Sudan, Ethiopia and Somalia, Kenya covers 581,309 square kilometres of land, and has a population of approximately 44 million people (Central Intelligence Agency, 2012). The country was known as the East Africa Protectorate in 1895, and became the Kenya Colony in 1920 under British rule. At independence in December 1963, President Kenyatta and his government changed the name from Kenya Colony to the Republic of Kenya. In a referendum in August 2010, Kenya was divided into 47 semi-autonomous counties, controlled by elected governors (see Central Intelligence Agency, 2012).

Nairobi, the country's administrative capital, also doubles as the commercial capital. The agricultural sector is the main employer of Kenya's labour force (employing about 75% of total workforce), and exports mainly tea, coffee, and fresh flowers. The agricultural sector is said to be the least developed and the least efficient in the region. The sector was the main engine of economic growth until recently. The service sector has taken over as the driver of growth in Kenya. The country was devastated in mid-2011 when two series of missed rainy seasons culminated in the worst drought in East Africa in the past 60 years (Federal Research

Division, 2007). The most affected communities were those in the north-western part of the country, leading to a closedown of schools and farm activities. The Synthesis Report (2008) shows that, in spite of that, Kenya remains the largest and most advanced economy in east and central Africa. The wealth remains in the hands of a few people dwelling mainly in urban areas. Kenya is listed as a poor developing country with a human development index (HDI) of 0.519. Nearly 38% of its populace live in absolute poverty (Synthesis Report, 2008). The demographic and socioeconomic indicators are shown in Table 2.5.

The economy of Kenya has expanded in recent times. In particular, the tourism industry, higher education, and telecommunications (which now contribute 62% of GDP) have all recorded strong performances since 2007. The crucial tea sector has not suffered much from the drought in mid-2011. Evidence shows that the Kenyan economy has recorded at least 7% growth since 2007. Foreign debt also fell drastically, further gathering the growth momentum, albeit the electoral crisis in 2007 derailed the momentum substantially. The manufacturing industry remains the smallest sector in Kenya, contributing about 16% of GDP.

In addition, Kenya stands as the east and central African centre for financial services. The Nairobi Securities Exchange (NSE) ranks as the fourth largest on the continent, in terms of market capitalisation (Central Intelligence Agency, 2012). The financial system consists of 43 commercial banks, several non-bank financial institutions including mortgage companies, four savings and loans associations, and several forex bureaus (Central Intelligence Agency, 2012).

Table 2.5: Key Demographic and Socioeconomic Indicators in Kenya (2014)

Indicator	Estimate
Area of land	581,309 sq. km
Population	44,037,656
GDP (PPP)	$77.14 billion
GDP per capita (PPP)	$1,802
Economic growth rate (%)	4.9
Inflation rate (%)	5.7
Exchange rate (Kenyan shilling per US dollar)	87.55
Unemployment rate (%)	42
Human development index	0.52
Current account balance to GDP (%)	-8.8
External debt to GDP (%)	27.2
Share of industry in GDP (%)	17.39
Share of service in GDP (%)	52.73
Share of agriculture in GDP (%)	29.88
Number of licensed banks	43

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

2.6.1 Exchange Rate Regimes and Policies in Kenya

From independence in December 1963 till 1974, Kenya operated a fixed exchange rate regime with the Kenyan shilling pegged to the US dollar. Later within this period, the pegged exchange rate was modified into the special drawing rate, due to discrete devaluations. The exchange rate was frequently misaligned between 1974 and 1981. For instance, the exchange rate depreciated at some point by 14%, leading to a devaluation exercise in the 1981/82 period. As a measure to prevent future misalignments, the Kenyan government shifted from the fixed exchange rate regime to a crawling peg regime by 1982.

The aim for adopting a crawling regime was not met. The movement of the nominal exchange rate has not been stable as was expected by monetary authorities in Kenyan after 1982. Thus, the crawling peg exchange rate regime was abolished, with a dual exchange rate regime being adopted in 1990. As in previous regimes, the dual exchange rate regime also experienced overvalued exchange rates. The exchange rate was again devalued and the official exchange rate unified with the black market rate. By that time, in 1993, the exchange

rate was floated, allowing market forces to establish the rate. The main aim of the floating regime was to ease pressures on balance of payment, and to remove market distortions. Figure 2.6 shows the various exchange regimes of Kenya since independence.

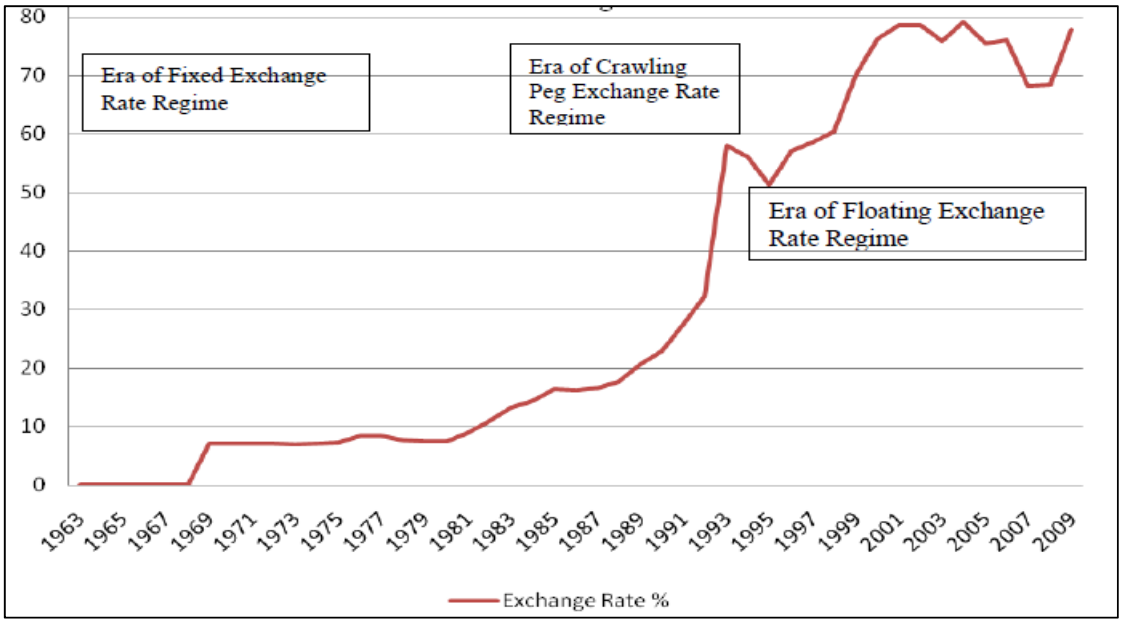

Figure 2.6: Exchange Rate Regime History of Kenya, 1963-2009

Source: Kenya National Bureau of Statistics (2010).

2.6.2 Recent Economic Growth Policies and Programmes in Kenya

Kenya has been battling with feeding the majority of its population. Persistent droughts over the years mean that the agricultural sector has not been able to minimise, on an annual basis, the food crisis in Kenya. Since independence, in 1963, the government of Kenya has implemented growth strategies and initiatives aimed at eliminating hunger, diseases, and illiteracy. The pioneering plan to enhance growth and achieve sustainable development in Kenya was the Sessional Paper No. 1, published in 1965. The paper outlined major strategies for achieving higher growth in Kenya including modernising the agricultural sector, revolutionising the manufacturing sector, and reforming institutions and systems to build a conducive investment climate.

Following the Sessional Paper No. 1, the Poverty Reduction Strategy Paper (PRSP) was soon formulated in 1999. The PRSP was a World Bank and IMF supported programme that was

designed to aid countries suffering from poverty and growth-related crises. The PRSP was formally launched in Kenya in 2001. In Kenya's case, the PRSP was a short-term policy initiative for attaining the long-term vision presented in the National Poverty Eradication Plan (NPEP) designed in 1999. The NPEP had a 15-year timeline to eliminate or reduce poverty, in line with the Millennium Development Goal (MDG) of halving poverty by 2015.

The PRSP and NPEP were ephemeral; the new government abandoned these strategies and initiated the Economic Recovery Strategy (ERS). The ERS was launched in 2003 with the aim of generating economic growth, which was stagnant at the time. The core of the ERS was to enhance growth, and create wealth and employment through which poverty and hunger could be eliminated. The ERS identified the agricultural sector as the key driver for achieving the economic recovery process. Thus, reformation and reconstruction of agricultural institutions, and investment in research into innovative production processes were fundamental to the growth strategy. The main policy dimensions outlined in ERS were the strengthening of institutions, rehabilitation and expansion of communication networks, stabilising the economy, and investment in human capital. The policy framework of the ERS folded in 2008.

The most recent strategy implemented is the Kenya Vision 2030 development strategy. The policy paper was developed in 2007, in order to consolidate the gains from the ERS. The strategy was formally launched in 2008. The ambitious strategy was implemented to transform Kenya into a globally competitive and industrialising country that was capable of providing its people a high quality life in a clean environment by 2030. The Vision 2030 had three main pillars: the economic pillar, aiming to sustain growth of 10% yearly to 2030; the social pillar, aiming to create a just, cohesive, and equitable social development; and the political pillar with an issue-based, people-cantered, result oriented and accountable democracy. The Vision 2030 was streamlined into three medium-term plans. The first five-year Medium-Term Plan (MTP I) spans 2008-2012, and consolidates the gains from the ERS. The MTP I has since been reviewed with satisfactory results reported. The second five-year Medium Term Plan (MTP II) spanning 2013-2017 was launched in October 2013, aiming at tightening the linkage between government priorities, planning and budgeting. The next Medium-Term Plan is yet to be launched.

2.6.3 Trends in Exchange Rate and Economic Growth in Kenya

Kenya maintained a fixed exchange rate regime from 1963 to 1974 with few devaluation exercises being undertaken within this period. Real GDP (in US dollars) increased moderately over this period. For instance, real GDP increased from 11 347.681 million in 1970 to 14 007.97 million in 1974. In 1974 a special drawing rate was instituted, replacing the pegged system. Between 1974 and 1981, the nominal exchange rate was frequently misaligned, prompting a devaluation exercise in 1981. However, real GDP continued to increase, from 13 955.831 million in 1975 to 20 363.116 million in 1982 (see Figure 2.7). The shift from fixed to crawling, dual, and finally to managed float seems not to have had any significant impact on real GDP as Figure 2.7 depicts.

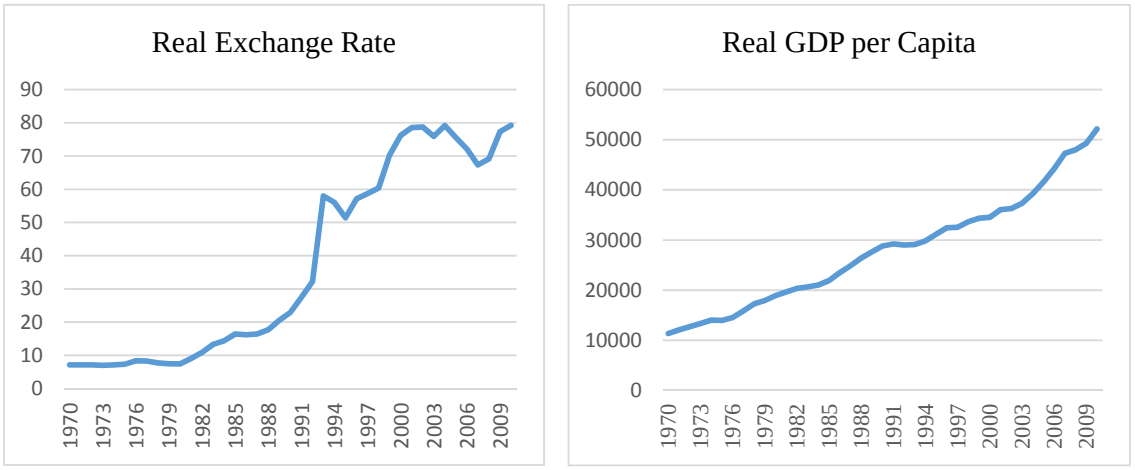

Figure 2.7: Trends in Exchange Rate and Economic Growth in Kenya

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

2.7 Historical Perspective of the Republic of Ethiopia

Ethiopia, known officially as the Federal Democratic Republic of Ethiopia, is a country located in the Horn of Africa. Ethiopia is bordered by Djibouti, Eritrea, Somalia, South Sudan, Sudan, and Kenya. Ethiopia is recognised as the most populous landlocked country in the world, and the second most populous in Africa (World Bank, 2013a). Ethiopia is well known to be one of the earliest monarchies in the world, and originally the birthplace of mankind. The country has never been colonised due to its successful military resistance during the 19th century Scramble for Africa (see The World Factbook, 2014).

Ethiopia remains one of the founding countries of the United Nations, the Non-aligned Movement, Group of 77, Group of 24, African Union, the Pan African Chamber of Commerce and Industry, the UNECA, African Aviation Training, the African Standby Force, and several other notable governmental and nongovernmental organisations.

The country endured a series of droughts, famines, and civil wars in the 1980s. This retarded the growth of the Ethiopian economy for a long time. According to the IMF, the Ethiopian economy was the fastest growing economy in the world from the early 2000s until 2009. The economic growth averaged at least 10% between 2004 and 2009 (IMF Country Report, 2012). Ethiopia was also recognised as the fastest growing non-oil-dependent African economy between 2007 and 2008. The growth rate has since dropped to 7% and has been estimated to grow at 6.5% in the future. This reflects the weaker external demand and a continually constrained environment for private sector activity (see IMF Country Report, 2012). The fast growth of the economy is being constrained by high inflation and a difficult balance of payments situation. Inflation increased to 40% in August 2011 due to a loose monetary policy, large civil service wage increases in early 2011, and high food prices (see IMF Country Report, 2012). However, with the implementation of tight monetary and fiscal policies, inflation dropped to 19% in 2012. Table 2.6 shows some of the key demographic and socioeconomic indicator in Ethiopia in 2014.

Table 2.6: Key Demographic and Socioeconomic Indicators in Ethiopia (2014)

Indicator	Estimate
Area of land	1,104,300 sq. km
Population	93,877,025
GDP (PPP)	$109 billion
GDP per capita (PPP)	$1,300
Economic growth rate (%)	9.7
Inflation rate (%)	7.4
Exchange rate (Ethiopian birr per US dollar)	19.63
Unemployment rate (%)	17.5
Human development index	0.396
Current account balance to GDP (%)	-5.4
External debt to GDP (%)	24.31
Share of industry in GDP (%)	13
Share of service in GDP (%)	45
Share of agriculture in GDP (%)	42
Number of licensed banks	19

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

2.7.1 Exchange Rate Regimes and Policies in Ethiopia

The economy of Ethiopia practiced two main exchange rate regimes in its history. Pre-1992 was under a fixed exchange rate regime, while post-1992 was characterised by a managed float regime. Under the article of agreement of the IMF, each member country's currency was assigned a central parity against the US dollar, allowing currencies to fluctuate by deviation of plus or minus 1% of the parity. Ethiopia, as a founding member, was bound by this agreement. Member countries were granted the authority to devalue or revalue their currencies in situations of misalignment.

In 1945, the Ethiopian birr was issued having a value of 5.52 (0.36 grams) of fine gold in line with the Bretton Woods Agreement. The currency was pegged at 2.48 birr to the US dollar in the same year. However, by 1964, the Ethiopian birr was overvalued and, thus, was devalued to 2.50 birr per US dollar. The Bretton Woods System collapsed in 1971, leading to the floating of the US dollar. The monetary authority of Ethiopia revalued the exchange rate by 8.75% to 2.30 birr per US dollar on 21 December 1971. The exchange rate was again

revalued to 2.07 birr per US dollar in February 1973 after the US devalued the dollar by 10%. From 1973 onwards, the fixed exchange rate regime was maintained till 1992.

In 1992, the monetary authority of Ethiopia undertook a devaluation exercise in an attempt to enhance export competitiveness, ensure efficient allocation of resources, and to remove parallel markets and illegal cross-border trading activities. The other aim of the devaluation exercise was to provide the avenue for liberalising the exchange rate. In May 1993, a fortnightly auction market was introduced. The auction market included the Dutch Auction System, which used the official exchange rate, and the Marginal Pricing Auction System, which employed the marginal exchange rate. However, these systems were unified in July 1995. By August 1996, the fortnightly auction market was abolished, paving the way for the adoption of the weekly auction market in order to contain the growing demand for foreign exchange. Forex bureaus were allowed to operate. The wholesale auction system replaced the retail auction system in September 1998. The interbank foreign market was also introduced, operating simultaneously with the weekly auction system till October 2001. Since then, the official exchange rate has been determined by the daily interbank foreign exchange market.

2.7.2 Recent Economic Growth Policies and Programmes in Ethiopia

In the 1980s, the Ethiopian economy was in severe crisis. The protracted civil war, recurring drought, corruption, and inflexible institutions coupled with a heavily controlled economy led to widespread economic underperformance, poverty, and shortages of essential commodities at the turn of 1990. The Ethiopian government soon bought into various World Bank and IMF sponsored initiatives, which were already popular in other sub-Saharan African countries. The ERPs and SAPs were the dominant programmes at the time. The SAP and ERP were aimed at reducing poverty and enhancing growth. The initiatives were also geared towards reforming and restructuring public institutions and enterprises. The core of the ERPs and SAPs were to facilitate the transformation of the economy from a state-controlled system to a market-oriented one, thereby providing an enabling environment for restoration of macroeconomic stability and a favourable business environment.

In 1993, the Ethiopian government implemented the Agricultural Development Led Industrialization Strategy (ADLI) to enhance the agriculture sector productivity. The main goals of the strategy were to reduce poverty, enhance industrial development, and ensure a dynamic and self-sustaining growth, especially in the countryside. In addition, the First and

Second Five-Year Development Programmes (FFYDP and SFYDP) were devised to improve state institutions and affairs.

Building from earlier policy initiatives, the Interim Poverty Reduction Strategy Paper (I-PRSP) was launched in 2000. Under the umbrella of the I-PRSP, the Sustainable Development and Poverty Reduction Programme (SDPRP) was developed and implemented in 2002. The three-year strategy lasted between 2002 and 2005. As in earlier strategies, the thrust of the SDPRP consisted of: overriding and intentional focus on agriculture (since the sector is the source of livelihood for 85% of the population where the bulk of the poor live); strengthening private sector growth and development, especially in industry, as a means of achieving off-farm employment and output growth (including investment in necessary infrastructure); rapid export growth through production of high value agricultural products and increased support to export oriented manufacturing sectors, particularly intensified processing of high quality skins/leather and textile garments; undertaking major investment in education and strengthening the ongoing effort on capacity building to overcome critical constraints to implementation of development programmes; deepening and strengthening the decentralisation process to shift decision-making closer to the grass roots population, to improve responsiveness and service delivery; improving governance to move forward in the transformation of society, improve empowerment of the poor and set a framework and provide an enabling environment for private sector growth and development; agricultural research, water harvesting and small scale irrigation; and focusing on increased water resource utilisation to ensure food security.

The second strategy implemented under I-PRSP was a Plan for Accelerated and Sustained Development to End Poverty (PASDEP). It gathered lessons from the SDPRP, and as such was more comprehensive than the SDPRP. The PASDEP was consequently considered to be a national development plan that deepened the fundamentals of the SDRP by revolutionising various sectors of the Ethiopian economy.

In an attempt to reinvigorate the economy as well as reduce the incidence of poverty in the rural communities, the government of Ethiopia initiated a five-year Growth and Transformation Plan (GTP) from 2010 through to 2015. The strategy takes up the gains from the previous Plan for Accelerated and Sustained Development to End Poverty (PASDEP). The programme emphasised the need to promote rapid and broad-based economic growth

through seven strategic objectives: sustaining equitable economic growth, maintaining growth focused on agriculture and rural areas, developing industry, expanding infrastructure, enhancing the expansion and quality of social development, building capacity and promoting good governance, and promoting empowerment of women and young people.

2.7.3 Trends in Exchange Rate and Economic Growth in Ethiopia

Figure 2.8 shows that exchange rate regimes in Ethiopia were of two phases: a fixed exchange rate characterising the pre-1992 period, and a managed float regime characterising the post-1992 period. Growth stagnated under the fixed exchange rate regime; real GDP (in US dollars) was 16 436.811 million in 1970, and 19 211.149 million in 1992 (a percentage change of 14.4 points, and 0.11 percentage on year-on-year basis). However, when the managed float regime was introduced post-1992, real GDP increased moderately between 1993 and 2003, reflecting the increase in real exchange rate. Beyond 2003, the increase in real GDP was tremendous (increasing from 32 263.994 million in 2003 to 68 669.848 million by the end of 2010. Clearly, as the real exchange rate was allowed to float, it gradually reflected the fundamentals of the economy. Hence, the exchange rate depreciated leading to increases in export and inflows of aids, and the ensuing real GDP growth (Figure 2.8).

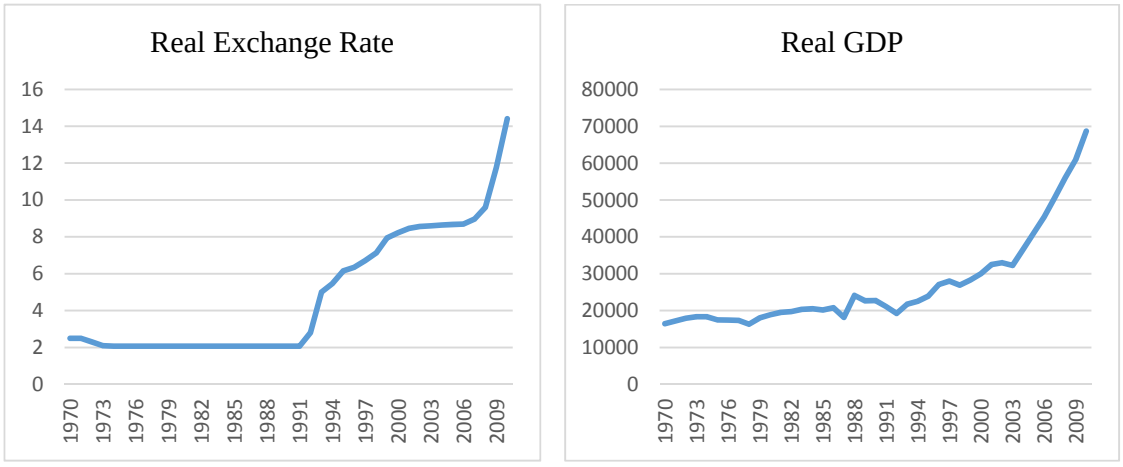

Figure 2.8: Trends in Exchange Rate and Economic Growth in Ethiopia

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

2.8 Historical Perspective of the Republic of Mali

The Republic of Mali, commonly known as Mali, is a landlocked SSA country located in West Africa. Bordered by Algeria, Niger, Burkina Faso, Ivory Coast, Guinea, Senegal and Mauritania, Mali covers a land size of just 1 240 000 sq. km with a total population of 14.5 million. Mali was originally under French rule as the Sudanese Republic, joined Senegal in 1959, and finally became independent in 1960 as the Mali Federation. When Senegal seceded, the Sudanese Republic became the independent Republic of Mali. For a very long period, Mali was under one-party rule until the 1991 coup brought in constitutional changes and a multi-party state. With a human development index (HDI) of 0.344, GDP per capita (PPP) of $1,100, Mali is one of the poorest countries in Africa. About half of Mali's population lives below the international poverty line of US$1.25 a day (Human Development Indicators, 2009). On average, a worker's annual salary is approximately US$1,500.

The control of financial activities in Mali is in the hands of the Central Bank of West African States. Mali maintains connections with the French government under the *Banque Centrale des Estats de l'Afrique de l'Ouest* (BCEAO) agreement signed in 1962. As a result, the country is part of the French Zone, and therefore uses the CFA franc as its legal tender. The agriculture sector remains the main contributor of GDP with cotton being the largest crop export. Other agricultural products include corn, rice, tobacco, vegetables, and tree crops. The mining sector of Mali is the other vital sector, being the third largest producer of gold in Africa. The country produces other minerals such as limestone, salt, kaolin, and phosphate. The agriculture sector employs 80% of the labour force, followed by the service sector, which employs 15%. Table 2.7 provides some demographic and socioeconomic indicators of the Malian economy in 2014.

Table 2.7: Key Demographic and Socioeconomic Indicators in Mali (2014)

Indicator	Estimate
Area of land	1,240,192 sq. km
Population	14,517,176
GDP (PPP)	$17.983 billion
GDP per capita (PPP)	$1,100
Economic growth rate (%)	5
Inflation rate (%)	5.3
Exchange rate (BEAC franc per US dollar)	479.50
Unemployment rate (%)	8.10
Human development index	0.344
Current account balance to GDP (%)	-9.8
External debt to GDP (%)	5.5
Share of industry in GDP (%)	23.4
Share of service in GDP (%)	39.7
Share of agriculture in GDP (%)	36.9
Number of licensed banks	12

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

2.8.1 Exchange Rate Regimes and Policies in Mali

Since independence, Mali has been a member of the CFA countries. The CFA franc has been pegged to the French franc. This exchange rate regime is, thus, classified as exchange rate arrangements with no separate legal tender, according to the IMF. This regime has suffered considerably in the past. Sub-Saharan countries outside the CFA zone experienced large real appreciations in the 1970s and early 1980s, estimated to be approximately 44% on average. Hence, most of the non-CFA African countries devalued their exchange rates during the 1980s, leading to the overvaluation of the real rate of the CFA franc to the French franc. Consequently, Mali and the CFA member countries undertook a “maxi-devaluation” exercise in 1994, moving the rate from 50 CFA franc /French franc to 100 CFA franc/French franc.

2.8.2 Recent Economic Growth Policies and Programmes in Mali

The first two of the series of programmes implemented to enhance economic growth in Mali were the IMF and World Bank sponsored Economic Recovery and Structural Adjustment

Programmes (ERP and SAP) implemented in (1988). Under these programmes, vigorous economic reforms were supposed to be undertaken in order to pave the way for economic growth. Mali successfully privatised 46 enterprises fully, and 12 partially; 20 enterprises were liquidated between 1988 and 1996. The economic reforms increased social and economic conditions, enabling Mali to become a member of the WTO in May 1995.

The Malian government received assistance from the International Development Association (IDA) in 1991, which aided the government to relax the enforcement of mining codes. This initiative boosted investment inflows into the mining industry. Mali also joined the Organisation for the Harmonisation of Business Law in Africa (OHADA). In addition, the Malian government privatised three major state companies in 2008: the railway company, Societé de Telecommunications du Mali (SOTELMA), and the Cotton Ginning Company (CMDT). These major economic overhauls led to US$3.4 billion GDP being recorded in 2002, which further increased to US$5.8 billion in 2005, amounting to approximately a 17.6% annual growth rate.

The government of Mali implemented the Growth and Poverty Reduction Strategy Support Programme (GPRSSP I) in 2002 with the aim of boosting growth, reducing poverty, and recapitalising the economy. The initiative spanned from 2002 to 2006. At the end of the programme, a follow up programme, GPRSSP II, was initiated in 2011 to consolidate the gains from GPRSSP I. The new programme, which spanned 2007 to 2011, had two strategic pillars: (a) boosting economic growth, improving food security, and raising the incomes of rural producers by increasing and diversifying food production; and (b) promoting the well-being of poor people by continuing reforms in the social sector. Finally, GPRSSP III, a continuation of GPRSSP II, was implemented in 2012. This programme is supposed to cover 2012 to 2017 focusing on: promoting accelerated, diversified, and sustainable growth oriented towards the development of employment and income-generating opportunities; reinforcing long-term development strategies, and equal access to qualify social services; and developing the capacity of institutions, and promoting good governance.

2.8.3 Trends in Exchange Rate and Economic Growth in Mali

In Figure 2.9, the real exchange rate of Mali has declined from 276.4 in 1970 to 211.3 in 1980, representing a real appreciation of 30.81%. Within this period, even though real GDP (in US dollars) had increased, the increment was moderate. The exchange rate depreciated

from 271.7 in 1981 to 449.3 in 1985. Again, real GDP did not reflect the behaviour of the exchange rate till this point. However, the exchange rate became overvalued from 1986 to 1993, following the widespread devaluation exercises that were carried out in non-CFA African countries in the early 1980s. To correct the overvalued exchange rate, Mali and member countries of the CFA agreed and devalued the CFA franc. After the devaluation process was carried out, Mali's exchange rate depreciated from 555.2 in 1994 to 733.04 in 2001. Real GDP began to respond to this depreciation by increasing from 6 107.16 million in 1994 to 8 680.22 million in 2001. From 2002 till 2009, the exchange rate appreciated, but this appreciation does not seem to have influenced real GDP growth as Figure 2.9 shows.

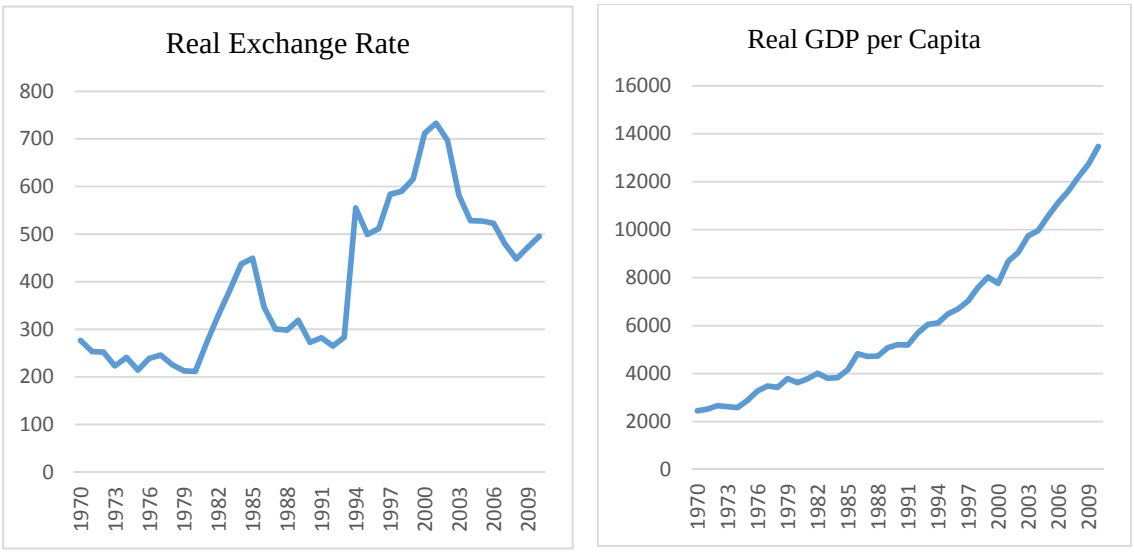

Figure 2.9: Trends in Exchange Rate and Economic Growth in Mali

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

2.9 Conclusions

The chapter provided a country-based literature on seven selected low-income countries in SSA. In particular, the chapter discussed the dynamics of real exchange rate and economic growth in these countries, by focusing on the exchange rate regimes and policies as well as the various growth programmes and policies undertaken by these countries. The exchange rate regimes and policies pursued by these countries were remarkably similar. The countries pursued a fixed exchange rate regime from independence and later, in the 1980s, devalued their exchange rates under pressure from economic deterioration. By the late 1990s and the early 2000s, these countries pursued free float or dirty float regimes (with the exception of

Mali, which is in a currency union). In addition, the growth strategies and programmes pursued by these countries are similar or the same, ignoring the names given to the strategies and programmes. It can be concluded that these countries are, in their current states and probably not by chance, but on the basis that their economic fundamentals and policy initiative, similar.

CHAPTER 3

REAL EXCHANGE RATE AND ECONOMIC GROWTH DYNAMICS IN SELECTED MIDDLE-INCOME SUB-SAHARAN AFRICAN COUNTRIES

3.1 Introduction

In this chapter, the dynamics of real exchange rate and economic growth in eight selected middle-income sub-Saharan African countries are discussed. These countries are: Botswana, Ghana, Lesotho, Mauritius, Namibia, Nigeria, South Africa and Zambia. As in Chapter 2, each of the sections except the last concentrates on each of the countries in the following manner. The main sections provide the historical perspective of the country under consideration. The three subsections under each main section discuss the exchange rate regimes and policies, the recent economic growth programmes and policies pursued by the countries, as well as the real exchange rate and the real GDP movements over the 1970-2010 period. The final section provides conclusions to the chapter.

3.2 Historical Perspective of Ghana

The Republic of Ghana, originally known as the Gold Coast, became an independent state in 1957. The country is located along the Atlantic Ocean and bordered by Togo, Burkina Faso, and Ivory Coast. Ghana has been rated as the 5th most stable; 17th best governed and 13th highest in human capital development on the African continent in 2010 (see Nesbitt, 2012). The economy of Ghana has also been rated as the 6th largest by purchasing power parity and nominal GDP on the African continent in 2012. In addition, the country ranks as one of the fastest growing economies in the world; the 10th highest per capita GDP in Africa, and the highest per capita GDP in West Africa in 2013 (see WDI, 2014). Ghana is very dominant in West African politics (Kacowicz, 1998). The country is a member of both the Economic Community of West African States (ECOWAS) and the Group of 24 (see Bureau of African Affairs, 2014).

Ghana is rich in natural resources such as gold, diamonds and bauxite. The economy of Ghana is best described as a mixed emerging one with real GDP growth of 8.7% in 2012 (Ghana Statistical Service, 2012). The economy is tied to the Yuan Renminbi with massive gold reserves. Monetary operations, including exchange rate management, in Ghana is under the influence of the Bank of Ghana – the central bank of Ghana. The Ghana Stock Exchange

(GSE), the official stock exchange of the country, is reported to be the 5th largest on the African continent with a market capitalisation of GH¢57.2 billion, and also the second best performing stock exchange in SSA in 2013 (see African Business, 2011). The country remains the second largest producer of cocoa in the world. As of 2014, the country has been classified as a lower to middle-income country. Services account for 50% of GDP, manufacturing 24.1%, extractive industries 5%, and taxes 20.9% (African Business, 2011). The demographic and socioeconomic indicators in Ghana as at 2014 are shown in Table 3.1.

Table 3.1: Key Demographic and Socioeconomic Indicators in Ghana (2014)

Indicator	Estimate
Area of land	238,535 km^2
Population	24.2 million
GDP (PPP)	$103 billion
GDP per capita (PPP)	$3,974
Economic growth rate (%)	7.13
Inflation rate (%)	11.61
Exchange rate (Ghana cedi per US dollar)	3.54
Unemployment rate (%)	3.6
Human development index	0.573
Current account balance to GDP (%)	-11.45
External debt to GDP (%)	32.25
Share of industry in GDP (%)	28.57
Share of service in GDP (%)	49.47
Share of agriculture in GDP (%)	21.96
Number of licensed banks	28

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.2.1 Exchange Rate Regimes and Recent Policies in Ghana

The exchange rate policies in Ghana after independence have largely been influenced by political regimes (see Bhattarai & Armah, 2005). From 1957 to 1982, Ghana pursued a fixed exchange regime, which was in line with the Bretton Woods system. Under the fixed exchange regime, the cedi was pegged against major convertible currencies such the US dollar and the British pound. The exchange rate was maintained by decrees and

administrative controls, such as import licences, in order to contain excess demand for foreign currency.

The deteriorating economic performance under this regime, largely led by an overvalued cedi, excessive import of finished goods, and concurrent balance of payment crisis motivated the Bank of Ghana to undertake a series of devaluation exercises between 1983 and 1986. It must be emphasised that the series of devaluation exercises were conditions stated in the policy recommendations of the Economic Recovery Programme (ERP). The cedi was devalued from 2.75 cedis per US dollar in 1983 to 90 cedis per US dollar by the third quarter of 1986. Under the ERP, the exchange rate policy was featured by a scheme of bonuses on exchange receipts and surcharges on payment (see Bhattarai & Armah, 2005). In addition, a dual system was adopted initially under the ERP; specific payments and receipts were based on two exchange rates: 23.38 cedis per US dollar, and 30.00 cedis per US dollar. This dual system was unified to 30.00 cedis per US dollar in October 1983.

Between 1983 and 1984, a quarterly adjustment of exchange rate – a real exchange rate rule cost in the purchasing power parity (PPP) framework – was introduced such that the exchange rate was adjusted quarterly to factor in inflation rates of major trading partners. Following distortions in the exchange rate, a periodic devaluation exercise was adopted in December 1984, replacing the quarterly adjustment system. The authorities replaced the periodic devaluation exercise with an auction market in September 1986, due to its lack of success (see Sowa & Acquaye, 1998; Bhattarai & Armah, 2005). The auction system was expected to achieve trade liberalisation, and speed up the rate of exchange rate adjustment. The auction system was dualistic in nature: (i) a fixed exchange with the cedi pegged to the dollar at 90.00 cedis per dollar for earnings from cocoa exports and oil-related products, and (ii) a flexible rate determined by the market with auctions, which was conducted weekly by the Bank of Ghana (see Oduro & Harrigan, 2000). The system was, however, unified in February 1987. By this time, the economy of Ghana had gradually moved away from what was a fixed exchange regime to a managed float regime.

Following the unification of the dual exchange rates under the auction system, the Dual Retail Auction (DRA) was adopted. This system was based on a marginal pricing mechanism; thus, the bidder paid a marginal price. This was to be later replaced by the Dutch Auction System (DAS) under which successful bidders paid a bid price (see Sowa &

Acquaye, 1998; Bhattarai & Armah, 2005). In 1988, forex bureaux were legally permitted to operate, following the Bank of Ghana's attempt to unify the black market and the legal exchange market (Bank of Ghana). The successful legalisation of forex bureaux to operate alongside the auction system created a dual spot exchange rate in Ghana (see Sowa & Acquaye, 1998; Bhattarai & Armah, 2005). In addition to these developments, the Wholesale Auction System (WAS) was introduced in March 1990, replacing the weekly retail auction system. A composite exchange system, the interbank and a wholesale system, was utilised under the WAS. Licenced forex bureaux and authorised banks were permitted to purchase foreign currency from the Bank of Ghana for retail. The WAS would later make way for the Interbank Market System in April 2002. Till today, banks and forex bureaux operate in the foreign market in Ghana. Since Ghana shifted to a managed float regime in 1986, it has maintained this regime.

There have been recent interventions in the Ghanaian foreign exchange market by the Bank of Ghana, amid drastic depreciation of the cedi against major currencies such as the Euro, the US dollar, and the British pound. The current bank-related interventions include the following: (i) commercial banks and other financial houses have been banned from issuing cheques and cheque books on foreign accounts and foreign currency accounts, (ii) banks are not allowed to grant a foreign currency-denominated loan of a foreign currency-linked facility to a client who does not earn foreign currency, (iii) offshore foreign deals by resident companies including exporters are not allowed, (iv) over-the-counter cash withdrawals from foreign exchange and foreign currency accounts not exceeding US$10,000 or its equivalent are only allowed for traveling outside Ghana per person per travel, and (v) all undrawn foreign currency-denominated facilities would now be converted into the local currency-denominated facilities (see Bank of Ghana). Besides, forex bureaux are also affected by the current interventions. The following interventions are being implemented: (i) forex bureaux operators are not allowed to buy or sell more than US$10,000 or its equivalent per transaction, (ii) forex bureaux are required to adopt the certified software approved by the Bank of Ghana, and (iii) forex bureaux are also required to issue only electronic receipts for all transactions.

3.2.2 Recent Economic Growth Policies and Programmes in Ghana

At independence in 1957, the economy of Ghana was in great shape. Income per capita was reported to be among the highest in sub-Saharan Africa. Exchange reserves were substantial;

government was lively; and the civil service was very competent (see Pickett & Shaeeldin, 1990). On average, the economy grew by 2% to 3% annually; gross investment was 20% of GDP, and was largely funded by domestic savings (Pickett & Shaeeldin, 1990).

However, the economy of Ghana began to decline in the mid- and late-1960s; while the population was rapidly increasing. This was mainly attributed to the staggering increase in the capital stock in the first half of the decade.[2] The economy plummeted rapidly in the late 1970s and the early 1980s. For instance, real GDP per capita declined on average by 2% between 1960 and 1982; foreign exchange contracted; agricultural production declined at an annual rate of 6%; and industrial output declined at a rate of 7% annually (see Pickett & Shaeeldin, 1990).

In terms of its economic prospects, Ghana was deemed superior to South Korea at independence; but by 1982, the average income in South Korea was six times higher than that in Ghana. Indeed, the period between 1970 and 1980 is now known in the literature as the lost decade, following persistent balance of payment deficits, dwindling consumption per head, and the imposition of strict controls in the markets, unnecessary printing of money, and frequent change in government through *coups d'états* (see Aryeetey *et al*, 2000). The worst period in this decade was the drifting of both skilled and unskilled labour out of the country in search of new and greener pastures elsewhere.

Evidently, economic restoration and structural adjustment frameworks were urgently needed to rescue the grim economic situation in Ghana by 1983. Consequently, in April 1983, the government of Ghana, acting under the funding and tutelage of the IMF and the World Bank, launched two key policy frameworks to reverse the deteriorating economic conditions in the country. The first policy framework, the Economic Recovery Programme (ERP) spanned the period of 1984-1986. The aim of the ERP was to restore and stabilise the economic system of Ghana, mainly by bringing down inflation, which was over 100%, reducing extensive government involvement and promoting effective financial management. Through the ERP, the government of Ghana resorted to market-oriented strategies, leading to a reduction in macroeconomic imbalances and improved financial sector performance. The exchange rate, which was previously distorted, was liberalised; and inflation was reduced from 113% in

[2] See Pickett and Shaeeldin (1990) for further discussion.

1983 to approximately 10% by 1991. The annual real GDP growth increased to 5% on average. In addition, the balance of payment moved from a deficit to a surplus, for the first time in over a decade. Nevertheless, private investment and further growth were limited, due to the particular structural reforms in the agricultural, parastatal, and financial sectors (see Pickett & Shaeeldin, 1990).

The Structural Adjustment Programme (SAP), which was in place between 1986 and 1989, was launched in 1986, to complement the ERP. The main objectives were to achieve fiscal stability and a positive balance of payments, restructure and diversify the production base of the economy, trim down unproductive investments, and to moderate the growth of inflation in Ghana. The key policy reforms under the Structural Adjustment Programme included, among others, the restoration of cocoa production and marketing, exchange rate and trade reforms, divestiture and liquidation of dormant and unprofitable state corporations, tax reforms, and the restructuring of state institutions and legal frameworks, to attract foreign direct investment (see Aryeetey *et al*, 2000).

The ERP and the SAP were associated with austerity measures. A number of workers were laid off; and subsidies on basic commodities were removed, thereby leading to short-term economic hardships. In an attempt to put the so-called "human face" on the economic reforms and adjustments, the Programme of Action to Mitigate the Social Cost of Adjustments (PAMSCAD) was introduced in 1987 by the government of Ghana under an IMF/World Bank-sponsored initiative (see Sowa, 2002). The PAMSCAD was specifically directed towards alleviating the adverse social impact of the ERP and the SAP. The programme received about USD$85.7 million to fund 23 projects, from its donors (see Aryeetey & Goldstein, 2000). The PAMSCAD required a close collaboration between the IMF/World Bank, district governments, and especially from communities. Some of the projects undertaken under the PAMSCAD were employment initiatives, education, assistance for retrenched civil servants, and income-generating projects (Aryeetey & Goldstein, 2000). In fact, this *ad hoc* programme was implemented to ensure that the growth momentum gathered under the SAP and the ERP would not dissipate.

In 1988, the Financial Sector Adjustment Programme (FINSAP) was launched to specifically focus on restructuring the financial sector, which was extremely prone to high default rates and non-performing bank assets, and to high inflationary rates, which wiped out the capital

base and depositors' confidence (see Sowa, 2002). This programme was funded by the World Bank, Japan, and Switzerland. The tenets of the FINSAP included, among other policies, institutional restructuring (especially, of financially distressed banks), enhancement of the legal and regulatory frameworks for bank operations, promoting non-financial institutions, the liberalisation of exchange rates, the establishment of forex bureaux, the establishment of the Ghana Stock Exchange, as well as the liberalisation of interest rates (see Sowa, 2002; Bawumia, 2010). The FINSAP was to be carried out in three phases: FINSAP I covered 1988-1991; FINSAP II covered 1992-1995; and FINSAP III 1995 to date.

Under the FINSAP, important banking laws and statutes were revised or repealed. For example, the Banking Law (PNDC Law 225), and the Bank of Ghana Law (PNDC Law 291) were revised, vesting sole banking sector supervisory powers in the Bank of Ghana. A follow-up programme to the FINSAP, the Financial Sector Strategic Plan (FINSSIP), was launched in 2001 to consolidate the gains chalked up under the FINSAP. The FINSSIP, which spanned 2001-2008, implemented several key reforms and Acts. Some of these included the Payment System Act of 2003), the Foreign Exchange Act of 2006, and the Credit Reporting Act of 2008, among others (see Bawumia, 2010).

The government of Ghana presented the Co-ordinated Programme of Economic and Social Development Policies to parliament. The programme's theme was dubbed "the Ghana Vision 2020". The programme aimed to transform Ghana from a lower-income country into a middle-income country by 2020. As part of the Vision 2020 agenda, the First Medium-Term Development Plan (FMTDP) was launched in 1997 (see Aryeetey *et al*, 2000). This programme, spanning 1997-2000, aimed at developing human capital, achieving steady economic growth, developing the rural and the urban areas, building the basic infrastructure, and creating a sustainable environment.

In addition, following an annual meeting in September 1999, the IMF announced its vision to incorporate poverty reduction and growth promotion strategies into the programmes being pursued by poor member countries of the Fund. Thus, the Poverty Reduction and Growth Facility (PRGF) was created to supplant the Enhanced Structural Adjustment Facility (ESAF). The PRGF mainly targeted economic growth and poverty reduction (see Aryeetey *et al*, 2000; Sowa, 2002; IMF, 2006). Consequently, the government of Ghana prepared and launched the Ghana Poverty Reduction Strategy (GPRS I) in 2002 with the aims of boosting

productivity and employment, developing the human resource base, providing basic services, and providing basic assistance to the poor and vulnerable.

The programme lasted between 2003 and 2005. The programme came to fruition largely because Ghana decided to access the financial assistance under the Heavily Indebted Poor Countries (HIPC) debt-relief initiative in 2002. The GPRS I was relatively successful, since relative macroeconomic stability was achieved. The Growth and Poverty Reduction Strategy (GPRS II) was launched in 2006 to consolidate the gains recorded under the GPRS I. The focus of the GPRS II was to promote rapid growth as the means of reducing poverty. This was considered necessary, so that Ghana could become a middle-income economy within the targeted period. The GPRS II lasted between 2006 and 2009. The priority areas of the GPRS II were macroeconomic stability, human-resource development, good and accountable governance, private sector competitiveness, and civic responsibility (see IMF, 2006).

Even though considerable macroeconomic stability and economic growth, as well as poverty reduction, were attained under the GPRS I and GPRS II, there were still lingering problems, such as a large balance of payment deficits, and fiscal deficits. These were mainly attributed to crude oil price shocks and food price shocks, as well as fiscal over-runs (see IMF, 2012). In addition, there was a notable decline in remittances and private external financing, due to the high adverse impact of the global financial crisis (see IMF, 2012). Thus, a successor programme, the Ghana Shared Growth and Development Agenda (GSGDA), was launched in 2010. The GSGDA spanned 2010-2013, with the key objective of creating the bedrock for transforming the Ghanaian economy structurally by 2020, through radical industrialisation. The focus of the GSGDA was on manufacturing, based on modernised agriculture, and the effective use of Ghana's natural resources. The GSGDA covered seven thematic areas, namely: ensuring and sustaining macroeconomic stability; enhancing the competitiveness of the private sector; oil and gas development; infrastructure and human settlements development; accelerating agricultural modernisation and resource management; human development, employment and productivity; and transparent and accountable governance (IMF, 2012).

Finally, the government of Ghana implemented the now infamous Savannah Accelerated Development Programme (SADA) in 2010, with the goal of doubling the *per capita* incomes of people living in the northern part of Ghana, as well as reducing the incidence of poverty in

these areas by 20% within 20 years (SADA, 2010). The key areas this programme addressed included: poverty reduction; climate adaptation, by minimising the frequent occurrence of floods and droughts; and the development of human capital, economic infrastructure, and an investment and private sector base, in order to manage the socioeconomic and ecological transformation of northern Ghana. The SADA programme, which is expected to last from 2010 to 2030, remains one of the most maligned macroeconomic programmes in the country's history. The programme has been fraught with allegations of corruption and financial malfeasance (see IDEG, 2010).

3.2.3 Trends in Exchange Rate and Economic Growth in Ghana

The exchange rate trend in Ghana (in this case, defined as Ghana cedi[3] per US dollar) increased gradually but smoothly between 1970 and 1979. During this period, real GDP (in US dollars) movement was irregular. For example, the real GDP increase from $14 533.90 million in 1970 to $15 347.69 in 1971, then declined to $14 962.73 in 1972. Following the liberation exercises from 1983, the exchange rate depreciated faster. The real GDP responded, increasing a year-on-year basis from 1983 to 2010. Over this period, the exchange rate depreciated by 26 013.595% and the real GDP increased by 37.38%. Figure 3.1 depicts the trends of the exchange rate and the real GDP in Ghana during the period 1970-2010.

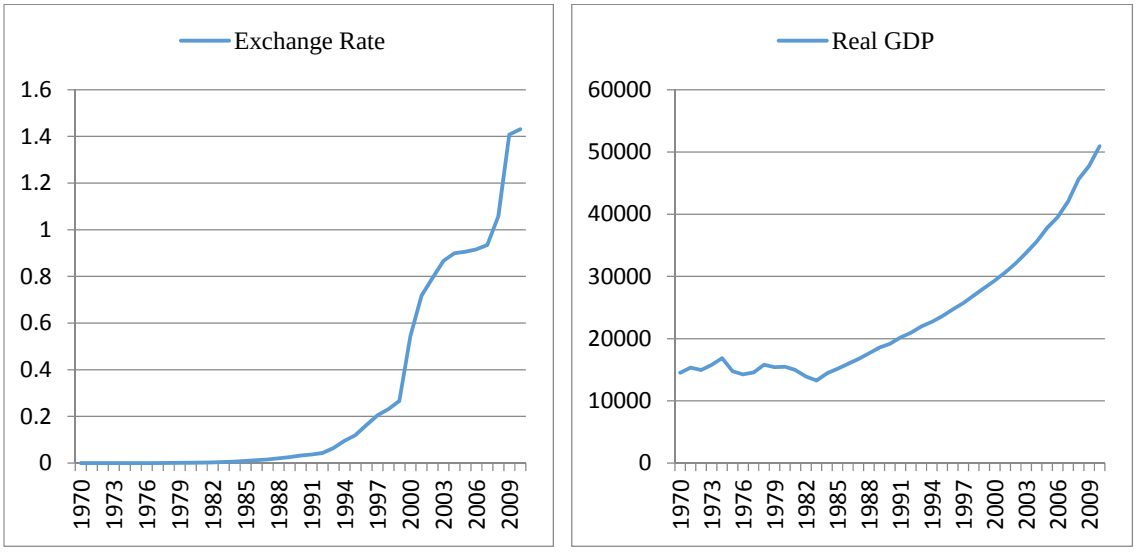

Figure 3.1: Trends in Exchange Rate and Economic Growth in Ghana

[3] Ghana cedi is the name given to the Ghanaian currency after the original currency, the cedi, was redenominated on July 3rd, 2007. Therefore, the interpretation of the exchange rate should reflect the new currency.

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.3 Historical Perspective of Nigeria

Known as the Federal Republic of Nigeria, the country is made up of 36 states and a Federal Capital Territory, Abuja. Geographically, Nigeria is located in West Africa, being bordered by the Gulf of Guinea, the Atlantic Ocean, Benin, Chad, and Cameroon. With a total land mass of 923 768 km^2 and a population of approximately 174 million people, Nigeria ranks as the most populous country in Africa and the seventh-most populous in the world (see Library of Congress, 2008). The country became independent in 1960 and has since gone through democracy and military dictatorships. Nigeria became relatively stable after her transition to democracy in 1999, with occasional setbacks from insurgent activities (see Adam, 2011).

The World Bank ranked the Nigerian economy in 2014 as the largest in Africa and the 26th-largest in the world in terms of GDP, which is in excess of US$500 billion (see Magnowski, 2014). The economy of Nigeria has also been projected to become a top 20 economy in the world by 2050 (see Gopaldas, 2012). The rapid growth of the economy of Nigeria has been widely attributed to her vast oil reserves. According to the World Bank classification, Nigeria is a mixed emerging market economy with a lower-middle-income status (see World Bank, 2013b). Nigeria has a fast developing financial market, with a relatively liquid stock market (i.e. Nigeria Stock Exchange) ranked the second largest in Africa and 30^{th} largest in the world in terms of capitalisation. The oil sector is the main sector, accounting for about 40% of GDP, followed by the agriculture sector, the service sector, and the manufacturing sector (see World Bank, 2011a). Nigeria is a member of major regional and economic groupings including the Organisation of Petroleum Exporting Countries (OPEC), the African Union (AU), the Economic Community of West African States (ECOWAS), and the Mexico, Indonesia, Nigeria, and Turkey (MINT) group. Table 3.2 shows some of the key demographic and socioeconomic indicators in Nigeria during 2014.

Table 3.2: Key Demographic and Socioeconomic Indicators in Nigeria (2014)

Indicator	Estimate
Area of land	923,768 km^2
Population	174,507,539
GDP (PPP)	$522 billion
GDP per capita (PPP)	$2,760
Economic growth rate (%)	7.31
Inflation rate (%)	8.48
Exchange rate (Nigerian naira per US dollar)	163.25
Unemployment rate (%)	7.5
Human development index	0.504
Current account balance to GDP (%)	4.43
External debt to GDP (%)	4.21
Share of industry in GDP (%)	25.64
Share of service in GDP (%)	52.39
Share of agriculture in GDP (%)	21.97
Number of licensed banks	25

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.3.1 Exchange Rate Regimes and Recent Policies in Nigeria

The Nigerian financial system was largely repressed prior to the implementation of the Structural Adjustment Programme (SAP) in 1986, due to the imposition of interest rate ceilings, and sectorial credit allocation (see Okonjo-Iweala & Osafo-Kwaako, 2007). Nigeria pursued a fixed exchange rate regime in the 1960s with heavy exchange controls. This regime caused the naira, Nigeria's currency, to overvalue resulting in major economic distortions. For instance, the imports of finished goods and services soared, causing an unfavourable impact on domestic production of goods and services, balance of payment, and the level of foreign reserves (see Sanusi, 2004). The black market exchange rate and economic activities developed rapidly under the fixed exchange rate regime (see Sanusi, 2004; Okonjo-Iweala & Osafo-Kwaako, 2007).

The Central Bank of Nigeria (CBN) shifted from the fixed exchange rate regime it mainly operated in 1960s to a pegged arrangement between the 1970s and the mid-1980s, in an attempt to arrest the deteriorating economic conditions. The problems experienced under the

fixed exchange rate regime still persisted, leaving authorities with no option but to seek the intervention of the World Bank and the IMF. Consequently, the SAP was implemented in 1986, and one of its policies was the adoption of a more flexible exchange rate regime. Thus, the CBN shifted from operating the pegged arrangement to a more flexible exchange rate regime in 1986. Nigeria has since remained under this exchange rate regime. A distinctive attribute of the current regime, as noted by Sanusi (2004), is that the regime is managed float with a strong commitment to protecting any particular parity.

Since independence, the Federal Constitution of Nigeria has charged the CBN to be the autonomous regulator of the naira. Thus, the CBN regularly ensures that the external value of the naira remains favourable. Various policy initiatives have been adopted to enhance the external strength of the naira in the past. For example, the Autonomous Foreign Exchange Market (AFEM) was introduced in 1995 to ensure a smooth and effective trade of the naira and other major currencies in the Nigerian foreign exchange market (see Sanusi, 2004). However, the AFEM failed to live up to expectations, prompting the adoption of the two-way quote system, the Inter-Bank Foreign Exchange Market (IFEM), in October 1999. The IFEM was implemented to diversify the supply of foreign exchange in the economy by stimulating the funding of the inter-bank operations from privately-earned foreign exchange. In addition, the IFEM was to assist the naira in achieving a realistic exchange rate. Similar to the AFEM, the IFEM was grossly limited by supply-side rigidities, recurrent expansionary fiscal operations of the governments, and persistent excess liquidity in the financial system (see Sanusi, 2004).

The apparent limitations of the IFEM motivated the CBN to introduce the wholesale Dutch Auction System (DAS) in July 2002. The two-way auction system, the DAS, was designed to allow the CBN and authorised dealers to participate in the foreign exchange market. The DAS also enabled the CBN to set the price of the exchange that buyers were willing to buy, the marginal rate; this price represented the ruling rate of the auction (see Sanusi, 2004). The DAS was aimed at achieving two main goals: (i) to establish a realistic exchange rate for the naira, and (ii) to arrest the dwindling foreign reserves. These objectives are claimed to have been achieved. Sanusi (2004) for instance, argued that the DAS has been able to narrow the arbitrage premium from double digits to a single digit, enhanced the stability of the naira against the US dollar, reduced capital flight, and curbed rent-seeking among market

operators. Okonjo-Iweala and Osafo-Kwaako (2007) also noted that the DAS facilitated the convergence of foreign markets and eliminated the existing black premium.

3.3.2 Recent Economic Growth Policies and Programmes in Nigeria

The government of Nigeria began implementing a series of reforms and development plans right after independence in 1960, with the aim of transforming the Nigerian economy from one that was agricultural dependent to an industry-oriented economy. The first of such reforms and development plans was the National Development Plan (NDP), which was prepared between 1960 and 1962. The NDP was developed into four generational series: the First National Development Plan (1962-1968); the Second National Development Plan (1970-1974); the Third National Development Plan (1975-1980); and the Fourth National Development Plan (1981-1985).

The First National Development Plan (FNDP) was launched in 1962. The FNDP, which spanned the period 1962-1968, was aimed at mobilising the national economic resources for effective national investment purposes. Specifically, the FNDP aimed to maintain an average economic growth rate of 4% per year. The mechanism for achieving this objective was to invest approximately 15% of Nigeria's GDP each year in the most productive sectors of the economy, whether private or public (see Federal Government of Nigeria, 1962). The priority areas of the FNDP included: transport, mining and quarrying, start-up and growth of industries, and the creation of industrial structures with linkages to the remaining sectors. The FNDP employed a mainly import-substitution industrialisation strategy (see Chete *et al*, 2014). At the end of the FNDP in 1968, many regarded it as a failed policy, as it was heavily dependent on foreign technology and expertise (Chete *et al*, 2014).

On the basis that the FNDP had failed, the government designed and launched a new plan, the Second National Development Plan (SNDP), in 1970. The SNDP was implemented with the aims of maximising the development and earning power of human resources, creating employment, and expanding the distribution of essential goods and services to all parts of Nigeria. The key target of the SNDP was to upgrade local production and industrial capacity (see Federal Government of Nigeria, 1970). The SNDP, which was implemented between 1970 and 1974, was mainly backed by the 1972 Act on the indigenisation of enterprises, which would later be replaced by the Nigerian Enterprises Promotion Act of 1977 (Federal Government of Nigeria, 1970). This plan, as in the case of the FNDP, could not realise its

intended objectives, mainly because of the shallow nature of Nigeria's technological capacity. Therefore, the economy could not be transformed beyond its elementary phase. In addition, it has been realised that all the projects established under the plan have either been shut down, or operate below capacity today (see Chete *et al*, 2014).

In 1975, the Nigerian government launched the Third National Development Plan (TNDP), which covered the period 1975-1980. The core objectives of the TNDP were taken from the SNDP policy paper. These core objectives were to establish Nigeria firmly as: (i) a united, strong, and self-reliant nation; (ii) a great and dynamic economy; (iii) a just and egalitarian society; (iv) a land of bright and full opportunities for all citizens; and (v) a free and democratic society (Federal Government of Nigeria, 1975). The TNDP was meant to transfer ownership and control of the industry to the citizens, and to enhance the proliferation of enterprise ownership among the citizens. A key industrial Act backing the TNDP was the Nigerian Enterprises Promotion Act of 1977 (see Chete *et al*, 2014). The main setback of the TNDP was that it largely focused on public investment in heavy industries, which did not suit the economic structure of the Nigerian economy during that time. Furthermore, many of the objectives stated in the plan were vague (Chete *et al*, 2014).

Consequently, the government of Nigeria prepared and launched the Fourth National Development Plan in 1981. The plan spanned the 1981-1985 period, with the aim of motivating foreign investors to drift from the less-sophisticated sectors of the economy to the more capital and resource-intensive sectors, which demand huge investments (see Edward, 1988). The policy was unsuccessful, primarily due to the frequent changes in government between 1983 and 1985 (see Edward, 1988). Besides this, the private firms invested in the light technology consumer industries, which depended largely on imported machinery and raw materials, leading to a depreciation of the naira, declining foreign-exchange earnings, balance of payment deficits, and increasing unemployment in the country (see Chete *et al*, 2014). It became obvious that the development plans were just a waste of scarce resources and time. Hence, the idea of development planning began to fade in Nigeria after 1985.

In the latter part of the development planning era, world oil prices collapsed and petroleum output declined markedly. Nigeria, in particular, was at the harsh end of this economic malaise, as the country's OPEC quota declined rapidly in the early 1980s. The macroeconomic environment of Nigeria around that period was very unstable. It was

frequently characterised by excessive government spending on less productive sectors of the economy. The agricultural sector was seriously neglected. This, in addition to the inward-looking nature of government policies, exposed the Nigerian economy in the late 1980s to unfavourable external shocks. The declining oil revenue and the poor fiscal discipline created a balance-of-payment crisis, the debt crisis, high rate of unemployment, depleted foreign reserves, and stagflation (see NCEMA, 2013). The dire economic situation at the time prompted the government to introduce the Economic Stabilization Act of April 1982, which prevented non-governmental institutions from interfering in critical economic activities (NCEMA, 2013). The Act embodied strict austerity policies aimed at re-allocating expenditure to essential sectors, as well as to restoring fiscal and external balance. Some of the notable measures included exchange restrictions, increments in tariffs and import duties, an import-deposit scheme, and ceilings on the central bank's foreign exchange disbursements. In addition, the government introduced restrictive fiscal policies, such as increments in utility tariffs and prices on petroleum products, a freeze on public sector wages, and a freeze on capital expenditure, among others (see NCEMA, 2013).

The Economic Stabilization Act of April 1982 was overly restrictive, especially for a country that was already battling with an economic crisis. In 1986, the government of Nigeria succumbed to the IMF/World Bank-sponsored policy framework, the Structural Adjustment Programme (SAP), which was already making waves in most developing countries in crisis. This ultimately marked the final departure from the development planning policies largely employed in the past. The SAP outlined the following objectives: (i) the restructuring and diversification of the productive base of the Nigerian economy, in order to reduce the excessive dependence on the oil sector; (ii) privatising and liquidating unproductive state-owned enterprises; (iii) promoting the use of domestic technology and raw materials; (iv) restoring the balance of payments; and (v) achieving non-inflationary growth of the economy (see Okogu, 1992; Chete *et al*, 2014).

The SAP was intended to last for two years, but the government extended it to over a decade (1986-2000). Several key policies were initiated under the SAP, including the National Science and Technology Policy (SandT) of 1986, the Urban Mass Transit Programme of 1988, the Directorate of Food, Road and Rural Infrastructure (DFRRI) in 1986, a deflationary budget package in 1988, the National Directorate of Employment (NDE) of 1986, the SAP relief package of 1989, the Industrial Policy of 1989, the People's and Community Banks'

Policy of 1990, the Trade and Financial Liberalization Policy, and the National Economic Reconstruction Fund (NERFUND), among others (see Okogu, 1992; NCEMA, 2013; and Chete *et al*, 2014).

In addition, the financial sector was liberalised, import restrictions were abolished, and the fixed exchange rate was abandoned under the SAP. Nevertheless, the performance of the SAP remains a skeptical issue in the country-based literature.[4] Critiques point out that the SAP was not successful due to factors such as: (i) poor governance; (ii) market distortion, resulting from frequent interference by government; (iii) the non-inclusive nature of the programme's design, implementation and execution; (iv) the existence of weak institutions; and (v) political instability during the period (see NCEMA, 2013). Thus, at the end of the SAP, the incidence of poverty was still high, basic social services were scarce, unemployment was high, and economic growth was stagnant.

In 2003, the government of Nigeria embarked on an ambitious comprehensive growth and poverty reduction strategy: the National Economic Empowerment and Development Strategy (NEEDS), which, according to the government, was necessary to counter the development challenges of Nigeria (see NPC, 2004). The goals of the NEEDS were to: (i) create wealth; (ii) generate employment; (iii) reduce poverty; and (iv) to promote value re-orientation. The NEEDS was complemented by the State Economic Empowerment and Development Strategies (SEEDS), which were designed by the 36 states of Nigeria and the Federal Capital Territory (see Okonjo-Iweala & Osafo-Kwaako, 2007). The NEEDS focused on three thematic areas, namely: empowering people; promoting private enterprise; and changing the way the government works (NPC, 2004). The NEEDS, which ended in 2007, underscored the significance of science, technology, and innovation (STI) as the keys for unlocking economic development in Nigeria (Chete *et al*, 2014).

In order to consolidate the gains made under the NEEDS programme, the government of Nigeria designed a follow-up programme, the Nigeria Vision 2020, in 2009. The programme was officially implemented in 2010; and it was expected to end in 2013. The aim of the Nigeria Vision 2020 was to transform Nigeria into a top-20 economy in the world by 2020 (NPC, 2009). The Nigeria Vision 2020 was to provide a bridge between the objectives of the

[4] See an extensive review of Nigeria's reforms in Okonjo-Iweala (2012).

NEEDS programme, and the Seven-point Agenda. Two main objectives were outlined in the policy paper: (i) to stimulate the economic growth onto a sustained path of rapid socioeconomic development; and (ii) to put Nigeria among the top-20 largest economies in the world by 2020, specifically with a GDP of not less than $900 billion and a per capita income of not less than $4 000 per year (see NPC, 2009).

The Nigeria Vision 2020 placed science, technology, and innovation (STI) at the heart of the policy framework. Specific challenges in areas such as biotechnology, nanotechnology, institutional linkages, capacity building, renewable energy, venture capital, space research, small- and medium-scale industry-targeted research, knowledge-intensive new and advanced materials, STI information management, information and communication technology, intellectual property rights, traditional medicine, and indigenous knowledge were targeted, to be addressed by the Nigeria Vision 2020 (see Chete *et al*, 2014).

3.3.3 Trends in Exchange Rate and Economic Growth in Nigeria

From 1970 to 1985, the exchange rate was pegged with occasional devaluation and revaluation. Thus, the growth impact of the exchange rate was not clear. The real GDP started to reflect the impact of the exchange rate after 1986 when the exchange rate was liberalised. From 1986 to 2009, the naira per US dollar depreciated significantly. The rate was 1.755 in 1986, but by 2009, the rate was 86.451104 – a depreciation of about 4 827.669% during that period! The real GDP was stimulated by this depreciation, increasing from $93 823.995 million in 1986 to $130 022.008 million in 2000. This was a rather gradual increment. From 2001 to 2010, the year-on-year increment in real GDP was very pronounced and indeed reflected the considerable impact of depreciation of the exchange rate. Figure 3.2 shows the trends of the exchange rate and real GDP in Nigeria during the period 1970-2010.

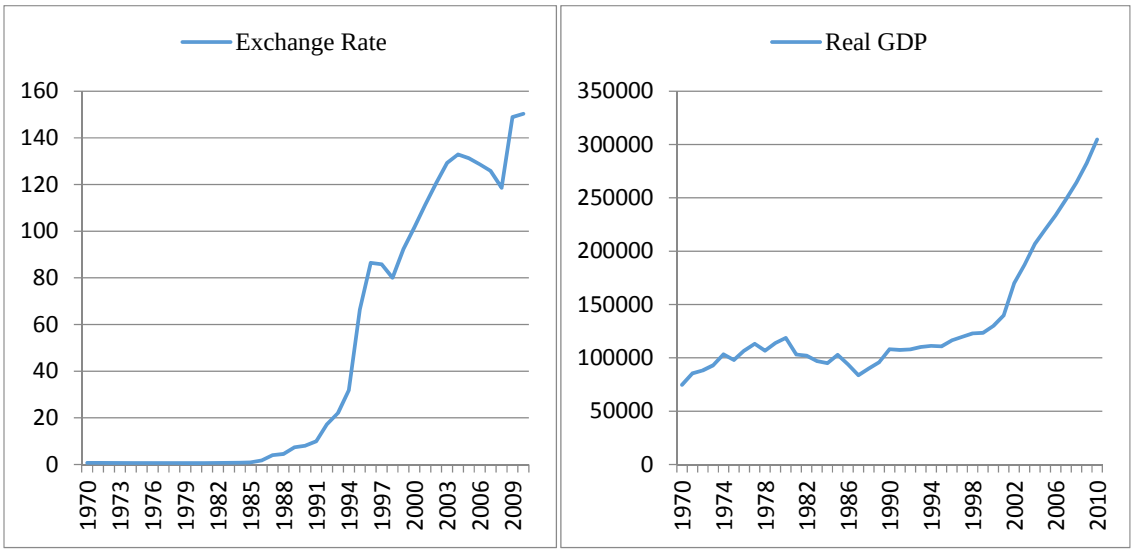

Figure 3.2: Trends in Exchange Rate and Economic Growth in Nigeria

Source: Constructed Penn World Tables, version 8.0, compiled by from Feenstra *et al* (2013).

3.4 Historical Perspective of Zambia

The Republic of Zambia is a landlocked country that is located in southern Africa. The country is bordered by Tanzania, Democratic Republic of Congo, Malawi, Zimbabwe, Angola, Botswana, and Namibia. Zambia has a total landmass of 752 618 km^2 and a population slightly over 13 million people, the majority of whom are concentrated in Lusaka, the capital, and the Copperbelt Province (see Central Statistical Service, 2010; UNSD, 2013). Out of the total population of Zambia, about 44% dwell in Lusaka and the Copperbelt Province alone (Central Statistical Service, 2010). Zambia became independent in 1964 and was under a one-party system until 1991. From 1991 onwards, Zambia adopted a multi-party system and series of decentralisation and socioeconomic policy initiatives, in addition to fighting poverty and corruption.

In 2010, the World Bank designated Zambia as one of the fastest growing economies in the world. Yet, the country still faces a high incidence of poverty and unemployment. With an income per capita of US$1 721, Zambia remains one of the poorest countries in the world (see WEO, 2013). The country is also said to have medium human capital development with a human development index (HDI) of 0.561 and ranks 141st in the world (see Human Development Report, 2014). In addition, the investment prospects of Zambia do not look

bright either. The country ranked as the 127th safest countries to invest in the world in 2011, according to Euromoney Country Risk Guide (2011). The agriculture sector remains the most dominant in terms of employment (employing about 80% of the total labour force), followed by the mining sector, the services sector, and the manufacturing sector. Although the agriculture sector employs the majority of the people, only 20% of the vast arable land is cultivated. Table 3.3 shows some of the key socioeconomic and demographic indicators in Zambia during 2014.

Table 3.3: Key Demographic and Socioeconomic Indicators in Zambia (2014)

Indicator	Estimate
Area of land	752,618 km^2
Population	13,092,666
GDP (PPP)	$24.36 billion
GDP per capita (PPP)	$1721
Economic growth rate (%)	6.35
Inflation rate (%)	6.97
Exchange rate (Zambian kwacha per US dollar)	5194.81
Unemployment rate (%)	13.1
Human development index	0.561
Current account balance to GDP (%)	-0.005
External debt to GDP (%)	27.56
Share of industry in GDP (%)	37.25
Share of service in GDP (%)	45.07
Share of agriculture in GDP (%)	17.68
Number of licensed banks	19

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.4.1 Exchange Rate Regimes and Recent Policies in Zambia

The exchange policies of Zambia have been very erratic. Basically, Zambia operated a fixed exchange rate regime in two periods: (i) between 1964 and 1982, and (ii) between 1987 and 1991. A crawling rate regime was adopted between 1983 and 1986. From 1992 to date, Zambia has been under a flexible regime. The exchange rate regime choice has been purely motivated by political factors.

The fixed exchange rates adopted between 1964 and 1982 and between 1987 and 1991 were maintained largely by decrees and administrative controls, such as import licences. For instance, decrees ensured occasional adjustments of the exchange rate, which was in stark contrast to conventional market interventions being employed in other countries (see Mkenda, 2001). The Zambian pound was created shortly after independence in 1964. This new currency was immediately pegged to the British pound. Debates over the colonial implications for adopting the Zambian pound as legal tender led to the renaming of the currency to the Zambian kwacha in 1968. The kwacha was soon pegged to the British pound at a rate of 1.7 kwacha per pound in the same year. In December 1971, authorities decided to link the kwacha to the US dollar (see Mkenda, 2001; Mungule, 2004).

The first significant intervention in the Zambian foreign exchange market was a revaluation of the kwacha by 11.1% in February 1973 (i.e. from 0.714 kwacha per dollar in 1971 to 0.643 kwacha per dollar in 1973). The new rate was maintained for about three years. The authorities undertook the first devaluation exercise in July 1976, by devaluing the kwacha by 20% against the US dollar. After the devaluation exercise, the kwacha was then officially linked to the Special Drawing Rights (SDR)[5] at SDR 1.0848, amid a crisis in the external balance, deteriorating terms of trade and oil price hikes (see Mungule, 2004). The first devaluation exercise seems to have been inadequate, so a series of devaluation exercises ensued during this crisis period. The kwacha was devalued by 10% in March 1978 to SDR 0.9763. It was again devalued by 20% in January 1983 to SDR 0.7819. In July of the same year, the kwacha was delinked from the SDR, and pegged to a weighted average basket of currencies of five major trading partners. At this point, the rate was allowed to adjust at 1% monthly (see Mungule, 2004).

Under the fixed exchange rate regime, however, the economic conditions of Zambia shifted from bad to worse. The external position rapidly declined, following a free-fall of copper revenues and increasing external debts (see Mkenda, 2001). The viable option was to float the kwacha. Thus, in October 1985, the kwacha was officially floated against currencies of major

[5] *"The SDR is an international reserve asset, created by the IMF in 1969 to supplement its member countries' official reserves. Its value is based on a basket of four key international currencies, and SDRs can be exchanged for freely usable currencies. With a general SDR allocation that took effect on August 28 and a special allocation on September 9, 2009, the amount of SDRs increased from SDR 21.4 billion to around SDR 204 billion (equivalent to about $316 billion, converted using the rate of March 12, 2014)" – International Monetary Fund*

trading partners (see Mwenda, 1996; Mkenda, 2001; Mungule, 2004). After the adoption of a more flexible exchange rate regime, the Dutch Auction System (DAS) was introduced with the objective of unifying the black market with the official exchange market, improving the allocation of foreign exchange, and allowing market forces to determine the external value of the kwacha (see Mkenda, 2001).

In January 1987, however, the DAS was replaced with a peg system with the kwacha pegged at 9.00 per US dollar. Following another desperate move by authorities, the peg system was replaced with a two-tier system after just three months of its existence (see Mungule, 2004). This dual system operated such that a specified rate was applied to official transactions, and a float rate was applied to all other transactions. Nonetheless, just as happened to all the previous exchange policies, the two-tier system was soon abolished. The float rate under the two-tier system is reported to have experienced drastic depreciation. This, alongside the rise in inflation, which was mainly associated with exchange rate pass-through, convinced authorities to abandon the two-tier system in May 1987. Following the abolishment of the two-tier system, another fixed exchange rate regime was adopted. The exchange rate system at this point was regulated by the Foreign Exchange Management Committee (FEMAC). The rate was fixed at 9.00 kwacha per dollar. The rate was later devalued by 20% in November 1988 and relinked to the SDR. The kwacha was again devalued by 49% in July 1989. After the devaluation exercise, the exchange rate was allowed to crawl monthly. In December 1989, the exchange rate was devalued by 50% (see Mwenda, 1996).

The FEMAC gradually shifted Zambia from the fixed exchange rate regime by introducing a dual exchange rate regime in 1990. The dual system consisted of an official retail window for importers, an open general license system (OGL), and an open window with a lower rate. But the official retail window for importers and the OGL were unified under the economic liberalisation policies in 1991 (see Mwenda, 1996). The unified OGL list was widened such that forex bureaux were permitted to trade, non-traditional exporters were permitted to retain 100% of their foreign earnings, and the Zambia Consolidated Copper Mines (ZCCM) was allowed to sell its foreign earnings at the market rate (see Mwenda, 1996). The official exchange rate was devalued by 30%, and the rate was allowed by FEMAC to crawl monthly at 8%. Commercial banks were given major controls over the exchange rate by 1993. After a few months of deliberations, the dealing system was implemented in December 1993. In addition, the Exchange Control Act of 1965 was formally repealed in January 1994. Import

restrictions were, thus, removed, permitting importers to fully convert the kwacha. For the first time, the public was allowed to hold foreign currency accounts in domestic banks. Furthermore, the current and capital accounts were fully liberalised. Additional reforms followed. In April 1995, commercial banks were allowed to trade daily with the central banks instead of weekly. The retention scheme, which prevented ZCCM from trading directly in the foreign market, was also abolished in 1996 (see Mkenda, 2001; Mungule, 2004).

A sharp depreciation of the kwacha in 2001 prompted authorities to announce new restrictive measures to stabilise the exchange rate. The dealing system, which was abandoned in 1996, was reintroduced in January 2001. Legislation was passed by the parliament of Zambia prohibiting the use of foreign currency in the country. In the wake of the severe volatility of the exchange rate and a sprout of multiple rates in the foreign market, the authorities launched the interbank foreign exchange market in July 2003 (Mungule, 2004). In a recent move to strengthen the kwacha, the legislation introduced in 2002 banning the use of foreign currency within Zambia was revoked. Clearly, the exchange rate regime of Zambia has been relatively flexible in the 2000s.

3.4.2 Recent Economic Growth Policies and Programmes in Zambia

At independence in 1964, Zambia's economy was performing well, largely due to the well-developed nature of the country's copper mines, coupled with stable and favourable external market conditions. Zambia pursued an import-substitution industrialisation strategy, which was largely urban-based, especially in the 1960s and the 1970s (see Saasa, 1996). The economy of Zambia was then a command economy, characterised by extensive state interventions, price controls, and the absence of competition. The state-owned industries were highly protected, further increasing the scope of state-owned enterprises, which accounted for approximately three-quarters of the Zambian economy by 1990 (see Saasa, 1996; Resnick & Thurlow, 2008; McCulloch *et al*, 2000). The government's excessive focus on building railways and roads around mines and manufacturing industries strengthened its import-substitution industrialisation strategy (see Resnick & Thurlow, 2008).

The economy of Zambia started showing signs of decline in the mid-1970s, when copper prices begun to fall. For example, between 1974 and 1988, foreign earnings from copper declined by 23%. The shortage of foreign exchange stimulated domestic inflation in Zambia

during this period (see Saasa, 1996). In addition, extensive government interventions, and the subsequent lack of competition and price distortions, limited the growth of the agricultural sector and that of industry (see Saasa, 1996). For a country whose export earnings largely depended on copper revenues (specifically, 90% of its earnings), the cumulative downturn was significant. Zambia's economy deteriorated as a consequence, with an escalating balance-of-payment deficit and a rapidly growing external debt.

In an attempt to turn the deteriorating economic conditions around, the government of Zambia, through the aid of the IMF and the World Bank, started the road toward stabilisation (see Larmer, 2005). The Structural Adjustment Programme (SAP), which was popular in other developing countries, was launched in Zambia in 1983, after some discussion with the officials of the IMF and the World Bank. The programme could be streamlined into five phases: (i) the preparatory phase 1980-1983; (ii) first adoption 1983-1987; (iii) abandoned phase mid-1987-1989[6]; (iv) the reintroduction of intensive liberalisation 1990-1991; and (v) full-scale SAP late-1991-1998. The SAP, which is best described as a "stop-go" programme in the Zambian case, was mainly focused on restoring the macroeconomic balance, and to stimulate economic growth (see Saasa, 1996; Larmer, 2005).

The main policy interventions under the SAP were: (a) the elimination of subsidies on agricultural inputs and outputs, such as those on fertilizers and maize; (b) the privatisation of parastatal companies, the adoption of the Privatization Act of 1992, and the establishment of the Zambia Privatization Agency; (c) the retrenchment of redundant civil service employees, and decentralisation of the government; (d) the building of an independent central bank, the Bank of Zambia; and (e) the liberalisation of interest and exchange rates, the abolishment of administrative controls in all markets, and the creation of capital markets in Zambia (see Saasa, 1996; Larmer, 2005; Resnick & Thurlow, 2008). The main achievement of the SAP

[6] Following some criticisms that the SAP led to increased malnutrition and death among the population, the SAP was temporarily abandoned. The government launched the New Economic Recovery Programme (NERP) to replace the SAP. The NERP reverted the economy to the command economy with economic growth being pursued using domestic resources. The policy initiatives under the NERP included: (i) a fixed exchange rate, which would be determined by a foreign-exchange-allocation committee; (ii) price control of some 23 "strategic" commodities; (iii) fixed interest rates; and (iv) a ceiling on debt servicing at 10% of export earnings (see Bigsten & Kayizzi-Mugerwa, 2000).

was that it was able to realign prices, which previously had been distorted (see Resnick & Thurlow, 2008).

By 1991, the Zambian economy had been successfully liberalised. The policy alternative under the liberalised economy, as envisaged by policy-makers in Zambia, was to employ the private sector as the driver of economic growth. Policy-makers also identified strong connections between a conducive investment climate, economic growth, wealth creation, and poverty reduction. In addition, policy-makers recognised the urge to design a fresh framework for economic management, which would integrate privatisation, better governance, trade openness, and a sound investment climate (see Siame, 2007).

Consequently, after several months of deliberations, the Zambian government designed and launched the Private Sector Development Reform Programme (PSDRP) in 2004, which built the bedrock to stimulate the private sector led economic growth in the country. The PSDRP was designed in line with the OECD's Policy Framework for Investment (PFI), and under Zambia's National Long-Term Vision 2030 agenda (see OECD, 2011). The PSDRP is best described as an expansive inter-sectorial programme (see Siame, 2007), which primarily focused on the following thematic areas: (i) the policy environment and institutions; (ii) laws and regulations; (iii) infrastructure; (iv) business facilitation and economic diversification; (v) trade expansion; and (vi) citizens' empowerment.

The main objectives of the PSDRP were to be implemented in two phases (Phase I, 2006-2009, and Phase II, 2009-2014). These were intended to: (a) create an enabling macroeconomic environment, and strengthen the public agencies that support private sector development (PSD), and enhance public or private dialogue; (b) improve regulatory frameworks and revise the investment code to foster PSD; (c) enhance the infrastructural platform for PSD, by encouraging private investment in infrastructure; (d) remove administrative barriers to business entry and operation, and facilitate the development of high-growth sectors; (e) to create access to regional and international markets by Zambian businesses; and (f) to unlock the growth potential of the medium and small scale enterprise MSME sector through business development support and local empowerment initiatives (see Siame, 2007; OECD, 2011).

According to Siame (2007), some of objectives of the PSDRP have been realised. These include macroeconomic stability, the establishment of the Citizens' Economic Empowerment Commission and the Zambia Development Agency, the shortening of business registration from 21 to 3 days, the approval of the Information and Communication Technology Policy, and the Private-Public Partnership Policy, the enactment of the Market Bill, and the establishment of the Credit Reference Bureau. However, the PSDRP has also been limited by factors, such as the lack of commitment on the part of some ministries, the lack of convergence of interest, administrative barriers, and programme design defects (see Siame, 2007).

Another strategic policy designed to improve economic performance in Zambia was the Poverty Reduction Strategy (PRS). This policy was designed to meet the objectives stated in a similar strategy in 1999 – the National Poverty Reduction Action Plan (NPRAP). The NPRAP was designed earlier to promote growth and reduce poverty; but it was abandoned in 2002. Thus, the PRS was launched in 2002 as its successor (see Republic of Zambia, 2000). The PRS focused on three main goals: (i) efficient management; (ii) sustainable economic growth; and (iii) human resource development, with particular emphasis on group interventions, cross-cutting priorities and urban development (Republic of Zambia, 2000). The PRS spanned the period 2002-2005. The strategy failed to meet certain specific goals. First, the targeted overall budget deficit of 3% was not achieved; the realised deficit was 6.7%. Second, borrowing to finance the overall deficit was beyond the target. Third, government continued to borrow from the financial sector, thereby further increasing monetary growth and inflationary pressures. Fourth, the outlay of funds to the agricultural sector fell drastically. Finally, domestic revenues remained at 18.3% of GDP – 1.7% less than the target. Overall, the growth and poverty reduction prospects of the PRS were not achieved (see Republic of Zambia, 2006).

The Fourth National Development Plan was launched in 1989, but was abandoned in 1991, due to the controversy surrounding its design, and political instability. For a long time, development planning has not featured in the government's macroeconomic policies and strategies (see Republic of Zambia, 2006). In June 2002, the Transitional National Development Plan (TNDP) was launched, beginning a new era of development planning. This plan worked alongside the Poverty Reduction Strategy Paper; but as noted earlier on, the majority of the targets set under these strategies were missed.

Thus, the government of Zambia introduced five-year planning instruments under the Vision 2030 agenda. The first of the five-year planning instruments was the Fifth National Development Plan (FNDP), which was launched in 2006. The theme of the FNDP (2006-2010) revolved around wealth and job creation through the participation of the citizens and via technology. The broad theme was divided into two sub-themes, namely: the economic sub-theme, and the social sub-theme. The FNDP built on the successes and limitations of the PRS and the TNDP through achieving and sustaining financial and fiscal stability, and enhancing structural reforms, in order to attain economic growth. The specific macroeconomic objectives of the FNDP were to: (i) achieve and sustain single-digit inflation; (ii) achieve financial and exchange rate stability; (iii) accelerate pro-poor economic growth; (iv) sustain a viable current account position; and (v) reduce the domestic debt to sustainable levels (see Republic of Zambia, 2006).

The general focus of the FNDP was rather to accelerate pro-poor growth than to reach the level achieved under the PRSP and the TNDP. The targets were as follows: (a) to increase the overall growth rate to an annual average of at least 7%; and (b) to ensure that economic growth was broad-based and rapid in the sectors mostly dominated by the poor (Republic of Zambia, 2006). The FNDP (2006-2010) is reported to have achieved significant progress, especially in terms of economic growth. An average annual growth of 6.1% has been achieved. In spite of this, Zambia was still facing challenges, particularly in infrastructure, human development, and the adverse effects of the recent global financial crises (Republic of Zambia, 2011).

Consequently, the successor plan, the Sixth National Development Plan (SNDP), which covers the period 2011-2015, was launched in 2011. The SNDP builds on the achievements and the lessons learnt under the FNDP (2006-2010), with the ambition of transforming the lives of the Zambian people, as specified in the Vision 2030 agenda (see Republic of Zambia, 2011). The SNDP follows the theme of the FNDP, which is “sustaining economic growth and poverty reduction” with the strategic focus on human resource development and infrastructural development. The specific macroeconomic objectives of the SNDP are similar to those stated in the FNDP paper, which were to: (i) accelerate infrastructural development, economic growth and diversification; (ii) promote rural investment; and (iii) accelerate poverty reduction and to enhance human development. The priority areas of the plan included

agriculture, livestock and fisheries, mining, tourism, manufacturing, and trade and commerce (Republic of Zambia, 2011).

3.4.3 Trends in Exchange Rate and Economic Growth in Zambia

Even though a fixed exchange regime was used before Zambia's independence, it was still pursued until 1982. The rate was devalued from 0.7142 in 1971 to 0.7143 in 1972. After that, the exchange rate was revalued thrice – in 1973, 1974 and in 1975. From the 1975 rate of 0.6432, the rate increased to 0.8007 in 1978. The rate declined from 0.8007 in 1978 to 0.7887 in 1980. During the crawling regime (i.e. 1983-1986), the kwacha per US dollar rate increased from 0.8696 in 1981 to 7.7885 in 1986, representing an increment of about 795.653%. The rate was increased on a year-on-year basis (except in 1988) when the fixed exchange rate regime was adopted for the second time between 1987 and 1992. For instance, the exchange rate was increased from 8.266 in 1988 to 13.8137 in 1989, and again from 30.28911 in 1990 to 64.63971 in 1991. Even between 1991 and 1992, the rate was almost tripled. The exchange rate depreciated massively after it was liberalised in 1992. The response of real GDP (in US dollars) to the fixed and crawling exchange regime was very weak. The real GDP moved around an average of $8 900 million between 1970 and 1991. Beyond 1991 when the exchange rate was liberalised, real GDP increased year-on-year to 2010 except for a small decline between 1994 and 1996. Figure 3.3 depicts the trend of the exchange rate and real GDP in Zambia during the period 1970-2010.

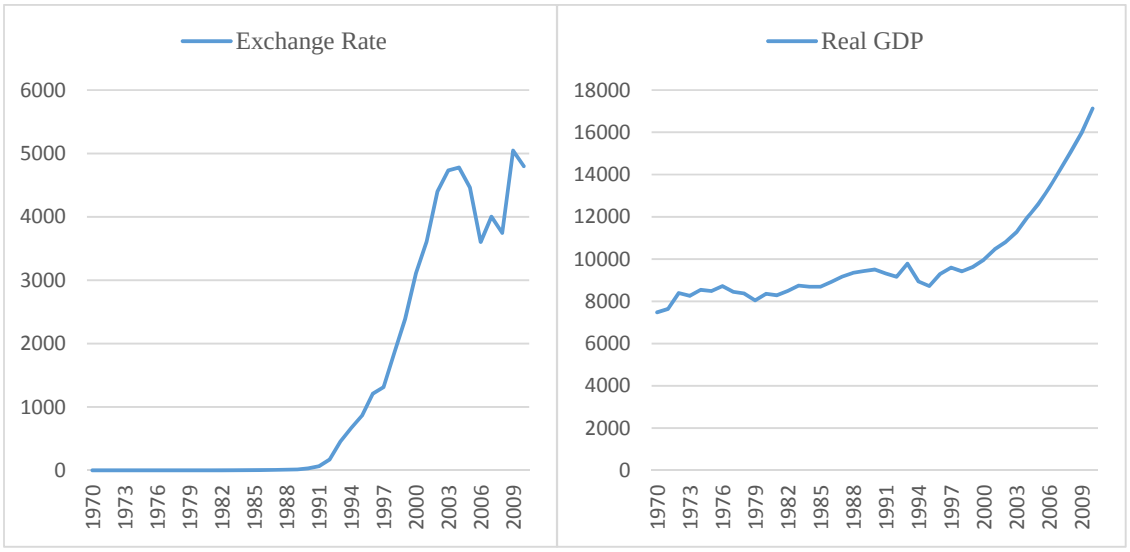

Figure 3.3: Trends in Exchange Rate and Economic Growth in Zambia

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.5 Historical Perspective of Lesotho

Lesotho, officially known as the Kingdom of Lesotho, is a monarchy that became independent in 1966. Lesotho is a landlocked country, being totally surrounded by South Africa. The total landmass of the country is approximately 30 355 km^2; and has a population of slightly above 2 million people. The majority of the people live in the capital, Maseru (United Nations, 2009). According to the United Nations Development Programme (UNDP), 40% of the people in Lesotho live below the international poverty line (i.e. US$1.25 per day). The rate was even higher in 2003, about 44% (UNDP, 2008). HIV/AIDS remains a chronic problem. The prevalence rate of HIV/AIDS in 2009 alone was 23.9% (Central Intelligence Agency, 2014a).

Economically, Lesotho is highly integrated with South Africa. The country depends so much on remittances from the Southern African Customs Union, SACU (see Central Intelligence Agency, 2014b; World Bank, 2014a). The key sectors are agriculture and livestock, manufacturing (especially garments), and mining. Through the African Growth and Opportunity Act (AGOA), Lesotho became the largest exporter of garments to the US in Africa in 2014. Her major natural resources are water and diamonds. Her human development index (HDI) of 0.486 implies that Lesotho ranks 162 out of 187 countries in terms of human development (see UNDP, 2008). Nonetheless, Lesotho became a lower-middle-income country recently (World Bank, 2014a). The economy has been negatively impacted by the global financial crisis, which started in 2007. The reduction in garment import in the US, the decline in the demand for diamonds during the crisis, and the decline in worker remittances due the prolonged mining sector strikes in South Africa slowed down the country's GDP growth to 0.9% in 2009 (World Bank, 2014a). Table 3.4 shows some key demographic and socioeconomic indicators in Lesotho during 2014.

Table 3.4: Key Demographic and Socioeconomic Indicators in Lesotho (2014)

Indicator	Estimate
Area of land	30,355 km^2
Population	2031,348
GDP (PPP)	$4.277 billion
GDP per capita (PPP)	$2,244
Economic growth rate (%)	5.9
Inflation rate (%)	4.93
Exchange rate (Lesotho loti per US dollar)	10.98
Unemployment rate (%)	5.9
Human development index	0.486
Current account balance to GDP (%)	-25.23
External debt to GDP (%)	68.40
Share of industry in GDP (%)	36.57
Share of service in GDP (%)	55.60
Share of agriculture in GDP (%)	7.83
Number of licensed banks	4

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.5.1 Exchange Rate Regimes and Recent Policies in Lesotho

Lesotho pursued relatively simple foreign exchange rate regimes, unlike the rest of the countries in this study. For a very long period (i.e. between 1910 and 1980), Lesotho pursued an exchange arrangement without a separate legal tender. The official legal tender was then the South African rand. In January 1980, following Lesotho's decision to join the Common Monetary Area (CMA), the country switched to a peg system (CBL, 2006). The official currency of Lesotho, the loti, was introduced and pegged to the South African rand. The rand was also allowed to flow freely in the economy of Lesotho as legal tender. This system was maintained until February 1983. However, on February 7, 1983, the peg system with adjustment (or the dual market system) was modified into a peg system without adjustment. The reference currency was still the South African rand. The peg system with no adjustment was in place until September 2, 1985 when authorities switched back to the peg system with adjustment previously pursued (see IMF, 2004). Again, the reference currency was the South African rand. The dual market system was abolished in March 13, 1995. From March 13,

1995 to date, the Lesotho economy has been under a peg system with no adjustment, with the loti pegged to the South African rand (see IMF, 2012).

According to the Central Bank of Lesotho (CBL), the CMA peg system, which has been adopted by Lesotho, has had a positive impact on the Lesotho economy. It has provided macroeconomic stability and a robust anchor to inflationary expectation, in spite of the volatility of the South African rand (CBL, 2006). Some policy interventions have also been carried out in the foreign exchange market of Lesotho since the 1980s. For instance, three commercial banks were authorised to deal in the foreign exchange market. The current and capital accounts were also liberalised in 1998. In addition, the CBL was charged with the power to directly approve foreign exchange requirements for all capital account transactions (IMF, 2004).

3.5.2 Recent Economic Growth Policies and Programmes in Lesotho

The Fourth Five-Year National Development Plan was launched in the fiscal year 1986/87 by the Government of Lesotho. This development plan lasted over the period 1986/87-1990/91. The development plan was aimed at speeding up the rate of development, maximising the nation's income and employment, and reducing poverty through rural development. Human resource development was also one of the aims of the development plan (see Government of Lesotho, 1986). The strategic implementation of the development plan involved an all-inclusive participation of the people (Government of Lesotho, 1986).

One of the earliest growth policy reforms implemented in Lesotho was the Structural Adjustment Programme (SAP) of 1988. The financial and the external sectors of the economy were deteriorating at the time, which had a dampening effect on the economic growth of the country. The Central Bank of Lesotho (CBL) reports that its net holding of foreign assets had declined from 15.5 weeks of imports cover to 10.5 weeks at the end of 1987. In addition, the fiscal deficit had increased from 6.3% of gross national product (GNP) to 10.5% by 1987 (see CBL, 1991). The SAP was, therefore, launched to reverse these deteriorating economic conditions. According to the CBL (1991), the SAP was specifically directed towards adjusting the balance sheet and balance-of-payments position of the country as well as restructuring institutions in order to foster economic growth. The Lesotho SAP, unlike SAPs in other countries, did not entail trade liberalisation, exchange rate adjustments, or interest rate liberalisation.

The Poverty Reduction Strategy Paper (PRSP) was launched in 2002 as a successor to the Policy Framework Paper with the aim of promoting poverty reduction in Lesotho. This strategy was motivated by the World Bank and was already introduced in other poor countries during the late 1990s and the early 2000s. The PRSP was driven by the following key features: (a) country-driven, (b) result-oriented, (c) comprehensive, (d) partnership-based, and (e) framed within a medium-term macroeconomic strategy. The main objectives of the PRSP were already captured in the Sixth National Development Plan (NDP 6). Thus, the PRSP was just a major component of the Seventh National Development Plan (NDP 7), which lasted from 2000 to 2003 (see Government of Lesotho, 1997). The PRSP was considered essential because Lesotho was among the poorest countries in the World (see World Bank, 1999). The policy targeted a growth rate of 4% per annum, and an inflation rate of 5% per annum (Ministry of Development Planning, 2000).

The Government of Lesotho undertook a countrywide consultation to formulate a long-term vision for Lesotho in 2000. Consequently, the Lesotho Vision 2020 was launched with the vision of transforming the economy into a prosperous, peaceful, and a well-governed one that is free of poverty and diseases by the year 2020 (see Government of Lesotho, 2000). The long-term objectives of the Vision 2020 were to: (i) establish a long-term vision for the country, (ii) find alternative strategies for growth, human and political development by 2020, (iii) ensure countrywide participation in socioeconomic dialogue, (iv) identify alternative approaches for developing Lesotho, and (v) create a conducive environment for achieving the Vision (Government of Lesotho, 2000).

The National Strategic Development Plan (NSDP), which spans the period 2012-2017 was designed to succeed the PRSP and the INDF[7]; it would also form the basis for achieving the strategic goals of the National Vision 2020 (Government of Lesotho, 2012). The National Vision 2020 of Lesotho had the overarching goal of achieving sustainable development and reducing poverty. To realise this goal, the NDP focused on the following strategic goals: (i) pursue job-oriented growth, (ii) enhance peace, democratic and accountable governance, (iii) build strong infrastructure and institutions, (iv) build technology-based human development,

[7] The Interim National Development Framework (INDF) was launched as a bridge between the PRSP and the five-year National Strategic Development Plan (NSDP). The INDF was a tool used to guide the resource allocation in order that NSDP would be completed (see Government of Lesotho, 2012).

(v) reduce HIV/AIDS and improve healthcare delivery, and (vi) create a sustainable environment (Government of Lesotho, 2012). The Government of Lesotho developed the National Adaptation Programme of Action (NAPA) in 2007 in order to better prepare the country for climate change. The main sectors examined during the preparation of the NAPA included water, rangelands, agriculture, soils, forestry, energy and health. The NAPA was to be implemented in line with the National Vision 2020, the Millennium Development Goals and the National Strategic Development Plan (Government of Lesotho, 2013).

3.5.3 Trends in Exchange Rate and Economic Growth in Lesotho

The exchange rate of Lesotho (loti per US dollar) depreciated by 7.62% from 0.7143 in 1970 to 0.7687 in 1972. The real GDP declined initially from $557.793 million in 1970 to $505.732 in 1971, but increased to $602.416 million in 1972. In spite of the fact that the loti experienced a mild appreciation of 11.61% between 1972 and 1974, the real GDP increased from 1972 to 1974. Between 1974 and 2002, the exchange rate again depreciated. In response, real GDP increased year-on-year for most of the years, even beyond 2002. Though the exchange rate appreciated between 2002 and 2006, real GDP had not been affected. The real GDP continually increased up to 2010. Figure 3.4 shows the trend of the exchange rate and the real GDP in Lesotho for the period 1970-2010.

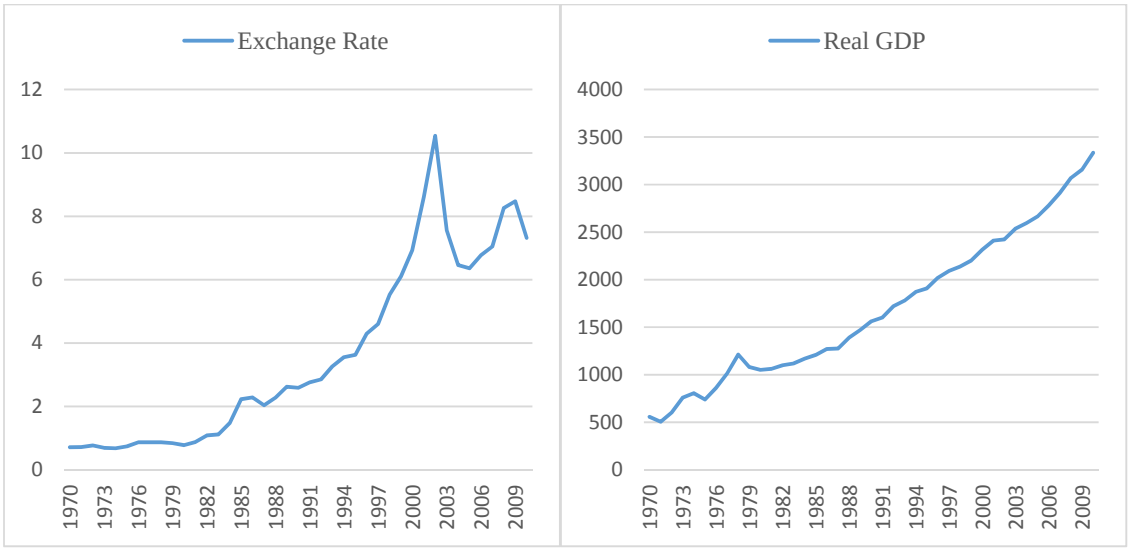

Figure 3.4: Trends in Exchange Rate and Economic Growth in Lesotho

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.6 Historical Perspective of Botswana

The Republic of Botswana is a landlocked country that is located in southern Africa. Botswana's neighbours include Namibia, Zimbabwe, South Africa, and Zambia (see Central Intelligence Agency, 2014c). The country gained independence in 1966. Botswana has a total landmass of about 581 730 km^2 and a population of slightly above 2 million people. Thus, the country is considered one of the least dense countries in the world. The majority of her inhabitants dwell in the capital, Gaborone. The rise of Botswana into an important economic power on the African continent happened suddenly. In the 1960s, the country was considered one of the poorest in the world with an annual per capita income of barely US$70. Today, the country is understood to be among the fastest growing economies in the world (Central Intelligence Agency, 2014c). Botswana's GDP per capita was approximately US$16 400 in 2013 alone (WDI, 2014).

In addition, Botswana has a relatively politically and economically stable environment. According to the IMF, the country's economic growth averaged 9% annually between 1966 and 1999 (WDI, 2014); her GDP, for instance, is considered the fourth largest in Africa. The country also boasts the highest sovereign credit rating in Africa and a sound financial system (African Economic Outlook, 2014). Botswana has a moderate standard of living and the highest level of human capital development in SSA (Nations Online, 2014). The country is a member of key regional and economic groupings such as the United Nations (UN), the African Union (AU), the Southern African Development Community (SADC), and the Common Monetary Area (CMA). The key sectors of the Botswana economy are the agriculture sector, tourism and mining. The main setback of the country is HIV/AIDS, which has afflicted at least 25% of the total population. Table 3.5 shows some of the key socioeconomic and demographic indicators in Botswana during 2014.

Table 3.5: Key Demographic and Socioeconomic Indicators in Botswana (2014)

Indicator	Estimate
Area of land	581,730 km^2
Population	2,038,228
GDP (PPP)	$35,989 billion
GDP per capita (PPP)	$17,106
Economic growth rate (%)	5.9
Inflation rate (%)	7.54
Exchange rate (Botswana pula per US dollar)	9.12
Unemployment rate (%)	23.8
Human development index	0.683
Current account balance to GDP (%)	-7.41
External debt to GDP (%)	17.75
Share of industry in GDP (%)	36.91
Share of service in GDP (%)	60.56
Share of agriculture in GDP (%)	2.53
Number of licensed banks	10

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.6.1 Exchange Rate Regimes and Recent Policies in Botswana

Botswana was a member of the Rand Monetary Area (also known as the Common Monetary Area) from independence in 1966 till 1976. Under the Rand Monetary Area framework, the South African rand was the legal tender in Botswana. The rand was pegged against the British pound and the US dollar (see Masalila & Motshidi, 2003). In 1976, Botswana adopted a fixed exchange rate regime with adjustable pegs when the Botswana currency, the pula, was introduced as the legal tender. The pula was pegged to the US dollar at 1.15 per dollar in the same year, meaning the pula was on a par with the rand (Bank of Botswana, 2001).

The first significant intervention in the foreign exchange market of Botswana took place in April 1977 when the pula was revalued by 5% in order to control inflation (see Masalila & Motshidi, 2003). Also, in June 1980, the pula was unpegged from the US dollar. A currency basket comprising the rand and the Special Drawing Rights (SDR) was introduced for the pula. This was mainly implemented to minimise the volatility between the pula and the rand. In November of the same year, the pula was revalued by 5% by the Bank of Botswana, which

aimed to contain the imported inflation following the depreciation of pula against the rand. In May 1982, the Bank of Botswana intervened in the foreign exchange market once more. This time, the pula was devalued by 10% as a measure to resolve the balance-of-payment crisis of the period 1981-1982 (see Jefferis & Harvey, 1995; Masalila & Motshidi, 2003).

The impact of the rand on the pula seems to be very strong. In February 1984, the rand depreciated significantly against the dollar due to foreign debt overhung. The pula depreciated significantly against the dollar as a result. The Bank of Botswana decided to undertake another devaluation exercise to enhance the external competitiveness of the country's export, as the pula experienced significant appreciation against the rand. Thus, the pula was devalued by 5% against the rand. In August of the same year, the authorities adjusted the weight of the rand in the pula basket to maintain a close relationship between the rand and the pula. This was then followed by a devaluation exercise in January 1985 when the pula was devalued by 15%. The goal of this devaluation exercise, according the Bank of Botswana, was to maintain the external competitiveness of the pula (see Government of Botswana, 1985).

From January 1985 to January 1986, the rand appreciated significantly against the pula. Consequently, the Bank of Botswana reacted by introducing a new pula basket in January 1986 in order to align the pula with the rand. After this intervention, the foreign exchange market was not tampered with by the Bank of Botswana for at least two years. However, in June 1989, the pula was revalued by 5% to contain imported inflation. The new rate did not last long as the authorities decided to devalue the rate by 5% in August 1990, and again in August 1991 in a bid to enhance the external competitiveness of the pula (see Jefferis and Harvey, 1995). In June 1994, the monetary authority of Botswana decided to adjust the weight composition of the pula basket (which contains the SDR and the rand) only on technical grounds. According to Masalila and Motshidisi (2003), the rand has been assigned greater weight due to the significant proportion of economic activities, which are rand-denominated. From 1994 to date, Botswana has operated a fixed exchange rate regime with the pula pegged to a basket of currencies.

3.6.2 Recent Economic Growth Policies and Programmes in Botswana

The early policy reforms in Botswana focused solely on poverty reduction. One such key policy was the National Policy for Rural Development (NPRD) launched in 1972 as a major

component of the National Development Plan of 1970/1975. The NPRD, first published in the Government Paper No. 1 of 1972, sought to ensure social justice, equality of opportunities, and democratic governance. The main targets of the NPRD were: (a) to ensure rapid and large returns to the country from intensive capital investment in the mining and other viable modern industries, and (b) to reinvest the proceeds in order to promote labour intensive activities and improve rural areas (see Chambers & Feldman, 1973).

One of the critical policies designed to improve the economic and business climate of Botswana was the Financial Assistance Policy (FAP) in the early 1990s. The policy was designed and implemented mainly to facilitate the development of new productive enterprises, the expansion of existing ones, and the diversification of the economy, which heavily relied on the mining and cattle sectors. Among the main objectives outlined in the policy document were: (i) promoting rapid industrialisation, (ii) creating employment, (iii) promoting rural industrialisation, (iv) boosting the development of Small and Medium Scale Enterprises (SMEs), and (iv) developing human resources (see Republic of Botswana, 1991).
In 1997, the Government of Botswana adopted the Long Term Vision 2016 after nationwide consultations. The multidimensional initiative covered social, economic, cultural, political, and spiritual aspects of the Botswana populace. The Vision 2016 was designed to serve as the master plan for all national development plans with the objectives of: (i) sustaining economic development, (ii) ensuring rapid economic growth, (iii) achieving economic independence, and (iv) enhancing social justice. Its thematic areas included education, human resource development, and mineral wealth (see Republic of Botswana, 2002).

One of the immediate national plans launched, as part of the Vision 2016 agenda, was the National Development Plan 8 (NDP 8). The NDP 8 spanned the period 1997-2003 with the theme of sustainable economic diversification. The objective of the NDP 8 was to achieve rapid economic growth and enhance human resource development. A specific annual average growth target of 5.2% was stated in the NDP8 document (see Republic of Botswana, 2002). The pillars of the NDP 8 were: (a) human resource development, (b) sustainable use of natural resources, (c) sustainable economic growth and diversification, and (d) good governance, free-market economy, and political stability. The Mid Term Review of the NDP 8 was completed in October 2000. The review showed that the growth target of 5.2% per annum was exceeded; the actual growth rate recorded was 6.8%. This was attributed to the unexpected growth spurt in the mining sector (see Republic of Botswana, 2002). But this

remarkable growth rate still fell far short of the growth target of the Vision 2016. The major setbacks of the NDP 8 included increasing HIV/AIDS infections, and the high rate of unemployment, reported to be 19.6% (see Republic of Botswana, 2002).

The National Master Plan for Arable Agriculture and Diary Development (NAMPAADD) outlined in the Government White Paper No. 1 of Botswana was approved in April 2002 with the aim of enhancing productivity of the agriculture sector, and ensuring the efficient and sustainable use of the country's resources (MOA, 2002). The NAMPAAD was one of the key policy interventions designed to enable Botswana to realise her Vision 2016 ambitions. The NAMPAADD had the specific objectives of: (i) commercialising agriculture, (ii) ensuring that Botswana attains food security, (iii) creating employment, and (iv) improving the contribution of agriculture to the GDP of the country. Its scope included rain-fed agriculture, irrigated agriculture, and dairy farming (see MOA, 2002).

In October 2003, Botswana launched her National Poverty Reduction Strategy (NPRS) in response to the missed targets of the NDP 8. The Government of Botswana realised the need to integrate the concepts of poverty reduction, income enhancement, mass participation, and human resource development into its development plans. The critical areas of the NPRS were employment; HIV/AIDS; organisational capacity of the poor; protecting the poor and vulnerable; and institutional capacity (see OECD, 2003).

The National Development Plan 9 (NDP 9) was implemented in 2003 to continue from where previous national policies had left off. The NDP 9, which spanned 2003-2009 aimed to: (i) enhance employment, (ii) reduce poverty, (iii) reform the public sector, (iv) ensure environmental protection, (v) promote economic diversification, (vi) achieve macroeconomic and financial stability, (vii) promote human resource development, and (viii) combat HIV/AIDS and manage disasters (see IMF, 2005). The Mid Term Review (MTR) of the NDP 9 indicated that most of the targets were missed. For example, the realised growth was 4.7% against the target of 5.5%, employment was 5.5% below the target, unemployment was still very high at 23.8%, 30.3% of the population was below the poverty line, and the incidence of HIV/AIDS for people in the 15-49 age bracket was 35% (IMF, 2005).

As a direct response to these challenges, the Government of Botswana launched the National Development Plan 10 (NDP 10) in 2009 with the theme: "Creating the conditions for

accelerated private sector growth in order to reach Vision 2016 targets." The NDP 10 aimed at ensuring continued infrastructure investment, investment in education and training, enhancing the business climate for private sector investment, and providing support for the service sector (see Republic of Botswana, 2007; MFDP, 2013). The thematic areas of the NDP 10 included: economy and employment; social improvement; sustainable environment; and governance, safety and security. The MTR of the NDP 10 revealed key issues such as poverty, drought and disease outbreaks, and external shocks as setbacks to the plan (see MFDP, 2013).

The Government of Botswana implemented the Public Finance Management (PFM) reform programme in 2009 with the aim of ensuring prudent management of public finances. The ultimate goal was to optimise the utilisation of public resources for long-term sustainable development. The programme was aided by the 2009 Public Expenditure and Financial Accountability (PEFA) assessment fund being financed by the European Union (see MFDP, 2010). The PEFA enabled the PFM to spot areas requiring reform. The PFM was implemented together with the NDP 10 and the Vision 2016 frameworks. The PFM was composed of: (i) legal and institutional framework, (ii) budget planning and formulation, (iii) budget execution, (iv) budget control and oversight, and (v) revenue management. To strengthen the capacity of the PFM, the Government of Botswana launched the Medium Term Expenditure Framework (MTEF) in 2010/2011, which aimed to restore sustainable public finance over the medium term. The MTEF targeted the elimination of the country's budget deficit by 2012/2013 (see MFDP, 2010).

In addition, the Private Sector Development Strategy (PSDS) was implemented in 2009 as part of the strategies of the Vision 2016 and the NDP 10. The PSDS was designed to provide a systematic and coherent framework to promote the development of the private sector (see Government of Botswana, 2008). The key objectives of the PSDS (2009-2013) were to: (i) promote and support the presence of the private sector in international markets, (ii) enhance the presence of the private sector in the domestic market, (iii) promote the growth of SMEs, (iv) promote domestic and foreign investment, (v) enhance private sector productivity, (vi) reduce HIV/AIDS infections, promote gender equality and protect the environment, and (vi) to improve upon the services rendered by support institutions. The PSDS was guided by the following pillars: trade expansion; productivity; trade support institutions; and business climate (see Government of Botswana, 2008).

3.6.3 Trends in Exchange Rate and Economic Growth in Botswana

The exchange rate of Botswana (i.e. pula per US dollar) was devalued to 0.7164 in 1970 and revalued to 0.7152 in 1971. The rate then increased from 0.7152 pula per dollar in 1971 to 0.7691 pula per dollar in 1972. From the 1972 figure of 0.7691 pula per dollar, the exchange rate declined to 0.6795 in 1974. The rate then increased from this figure to 0.8696 pula per dollar by 1976. Between 1976 and 1980, the exchange rate was on the decline. The rate fell from 0.8696 pula per dollar in 1976 to 0.7772 in 1980. The exchange rate then increased from 0.7772 in 1980 to roughly 1.9026 in 1985. Although the pula per dollar fell between 1985 and 1987, and also between 1989 and 1990, the rate increased on a year-on-year basis from 1990 to 2002. In fact, over this period, the pula per dollar experienced a depreciation of about 240.119%. In spite of these exchange rate adjustments and the irregular pattern, the real GDP (in US dollars) did not appear to have been impacted. In fact, only once has the real GDP declined (i.e. between 2008 and 2009, when the real GDP decreased from $18 748.647 million to $17 844.099 million). For the entire study period, the real GDP experienced increments. The movement of the exchange rate and the real GDP between 1970 and 2010 in Botswana is depicted in Figure 3.5.

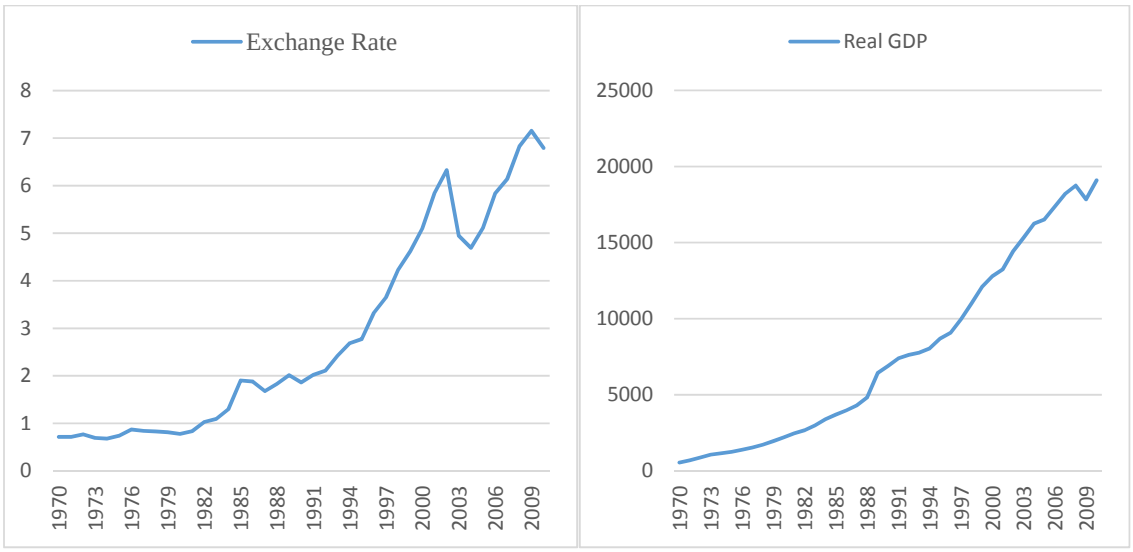

Figure 3.5: Trends in Exchange Rate and Economic Growth in Botswana (1970-2010)

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.7 Historical Perspective of Mauritius

The Republic of Mauritius is one of the few island nations in Africa. The country is located in the Indian Ocean and approximately 2 000 km off the south-eastern coast of the African continent. The country was formed from the islands of Mauritius, Agalega, Saint Brandon, and Rodriques (see MFED, 2011). Mauritius became independent in 1968 and a republic in 1992. The country covers a land area of about 2 040 km^2 and, thus, is regarded as one of the smallest nations in the world. In addition, Mauritius has one of the smallest populations in the world, with a population of slightly over one million people (see UNDP, 2014). Most of the country's people live in Port Louis, the capital city (MFED, 2011).

Mauritius was best described as a low-income agricultural-dependent country at independence. Today, the country has been successfully transformed into a middle-income diversified economy (see BEBA, 2012). The country now depends on tourism, textiles, sugar, information communication technology, financial services, seafood, and renewable energy, among others (see WDI, 2014; African Economic Outlook, 2013). The country has no exploitable natural resources and, therefore, depends solely on imported petroleum (WDI, 2014). Mauritius has been widely rated in several areas. The country is recognised as one of the largest Exclusive Economic Zones in the world (see BEBA, 2012). The country also rates highly in governance, competitiveness, and investment climate (WEO, 2014). According to the World Bank, Mauritius is the best in Africa and 19th in the world, in terms of "ease with doing business" (see BEBA, 2012). The World Bank also classifies the country as an upper-middle income economy (WDI, 2014). Table 3.6 shows some of the key demographic and socioeconomic indicators in Mauritius during 2014.

Table 3.6: Key Demographic and Socioeconomic Indicators in Mauritius (2014)

Indicator	Estimate
Area of land	2,040 km^2
Population	1,252,404
GDP (PPP)	$22.025 billion
GDP per capita (PPP)	$16,820
Economic growth rate (%)	3.2
Inflation rate (%)	3.54
Exchange rate (Mauritian rupee per US dollar)	31.30
Unemployment rate (%)	8.7
Human development index	0.771
Current account balance to GDP (%)	-10.48
External debt to GDP (%)	42.05
Share of industry in GDP (%)	23.07
Share of service in GDP (%)	73.66
Share of agriculture in GDP (%)	3.27
Number of licensed banks	21

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.7.1 Exchange Rate Regimes and Recent Policies in Mauritius

The exchange rate regimes in Mauritius have been fairly mixed. Just before independence in 1968, the country shifted from a currency board to a pegged system in November 1967. The Mauritius currency, the rupee, was pegged to the British pound (see IMF, 2008; Imam & Minoiu, 2011). Under this pegged system, the country employed a dual exchange market in which capital account transactions were separated from current account transactions. According to Imam and Minoiu (2008), capital transfers attracted a stamp duty of 15% under the pegged system.

Mauritius created a central exchange rate with Special Drawing Rights (SDRs) in June 1972, following the weakening of the British pound in 1971. The second exchange rate for capital transfers remained in place. The rupee was officially pegged to the SDR in January 1976 around a bandwidth of 2%. This was the case in theory, but the rate was actually a crawling band around the US dollar, according to Imam and Minoiu (2008). Between 1976 and 1978, the rupee was considered overvalued. Thus, the Bank of Mauritius undertook devaluation

exercises in 1979 and 1981. That apart, the stamp duty was increased from 36% to 45% for capital transfers in July 1981 (see IMF, 2008; Imam & Minoiu, 2011).

The Bank of Mauritius again intervened in the foreign market in June 1982 by delinking the rupee from the SDR. The rupee was then pegged to a trade-weighted basket of currencies of the country's major trade partners under an IMF liberalisation initiative. In spite of these changes, the exchange rate remained pegged de facto to the US dollar with a bandwidth of 5% (see Broda, 2002; Reinhard & Rogoff, 2004). There was a limit specified on the sale of foreign currency for travelling purposes as a form of capital control. The monetary authorities maintained a multiple currency from this period till the mid-1990s. As part of the multiple currency policy, a tax of 15% was charged on some capital remittances. This tax remained in operation till 1992, when all forms of exchange rate restrictions were eliminated. The *de facto* crawling bandwidth was reduced from 5% to 2% in 1992. Foreign currency transactions were fully liberalised in July 1994. Thus, the country adopted a managed float exchange rate regime from this period onwards. The Bank of Mauritius occasionally intervenes in the foreign exchange market in order to minimise exchange rate volatilities.

3.7.2 Recent Economic Growth Policies and Programmes in Mauritius

The economy of Mauritius looked gloomy at the beginning of the millennium due to her overreliance on sugar and textile export, which was losing ground in the world market. The government of Mauritius responded swiftly by dispatching a team to Jamaica, Puerto Rico, Singapore, Taiwan and Hong Kong to examine the nature of the export polices of these small nations (see Bheenick & Schapiro, 1991). The report of the team was incorporated into a proactive industrial development framework, which was passed on December 1970 as the Export Processing Zone (EPZ) Act, the legal framework of the EPZ policy. The aim of the EPZ was to attract foreign investment in labour intensive manufacturing industries in the Mauritian economy. The key policy instruments were: (i) tax holidays, (ii) freedom of profit repatriation, (iii) laxity on location of industries, and (iv) duty exemption on import of equipment, machinery, and raw materials (see Bheenick & Schapiro, 1991).

Due to the liberal nature of this policy reform, foreign investment soon fluxed in the economy. The immediate success was remarkable. For example, 89 businesses operated in the country by 1977 with textile plants accounting for 52% of these businesses. In addition, enterprises alone under the EPZs accounted for more than 60% of Mauritius' gross export

earnings and employed one-third of the Mauritian work force by 1980. The EPZ policy was fraught with challenges, however. At the end of 1982, about one-third of the EPZ-created firms had shut down; 15 shut downs were recorded in 1978 alone. The oil price shocks, the general recession in the industrialised countries, internal political unrest, and natural disasters during the 1980s grossly sidelined the EPZ policy (see Bheenick & Schapiro, 1991).

For a very long time, the EPZ policy remained the key economic policy reform in Mauritius, albeit significant interventions were carried out, especially on fiscal discipline. In 2005, the government of Mauritius initiated a series of policy interventions with the aims of diversifying the economy, improving the investment climate, facilitating business activities, attracting foreign investment, as well as opening up the economy. For example, the Business Facilitation Act of 2006 was passed in order to reduce the bureaucracy involved in securing a business licence to operate in the economy (see Board of Investment, 2008). The Act enabled prospective businesses to operate within three days after the business licences had been acquired. In addition, the previous residence permits and work permits for foreign investors, professionals and entrepreneurs have been merged into a single permit called the occupation permit, issuable within three working days (see Board of Investment, 2008).

The most recent policy reform in the country is the Maurice Ile Durable (MID), which was launched in 2008 but formally implemented in 2012. This long-term policy initiative traces its roots to the global energy crisis in 2007. The main aim of the MID was to establish Mauritius as a world model of sustainable development, especially among the small island economies (Republic of Mauritius, 2013). The specific objectives of the MID policy were stated in line with the so-called “five Es”. In energy, the policy was aimed at attaining efficient energy use in the country, which was delinked from fossil fuel. In the environment, the MID policy was to ensure the effective and sustainable management of the ecosystem. In the economy, the policy aimed to achieve a green economy with decent jobs, and long-term career prospects. In education, the MID policy aimed to create an all-inclusive educational system of development. And finally, in terms of equity, the policy aimed to achieve an all-inclusive participation for growth and wealth sharing (see Republic of Mauritius, 2013). The targets were set in line with the objectives. Some of these targets included 35% renewable energy use by 2025; increase of employment in green jobs from 6.3% in 2010 to 10% in 2020; 100% literacy rate by 2020; and improvement in the current income status. The MID faced some challenges including: (i) difficulty in motivating the green economy, (ii)

difficulty in reversing the deteriorating ecosystem, (iii) difficulty in gathering data in order to monitor the progress of the MID, and (iv) commitment issues (see Republic of Mauritius, 2013).

3.7.3 Trends in Exchange Rate and Economic Growth in Mauritius

The exchange rate in Mauritius (the rupee per US dollar) was 5.5555 in 1970 and declined to 5.4858 in 1971. The exchange rate declined further to 5.3385 in 1972. From this figure, the rate increased to 6.6815 in 1976, and then declined to 6.1633 in 1978. Between 1978 and 1985, the exchange rate experienced massive year-on-year depreciation. The rate increased from 6.1633 in 1978 to 15.4425 in 1985, representing a depreciation of approximately 150.556%. From 1985 onwards, the pattern became very irregular until 1995. Generally, the exchange rate has shown an upward trend over the period studied. The real GDP (in US dollars) has only declined once over the period 1970-2010 (i.e. from $3 266.554 million in 1979 to $2 937.897 million in 1980). Thus, the depreciation, as depicted by an upward trend in the exchange rate, appeared to have stimulated economic growth in Mauritius. The movement of the exchange rate and the real GDP between 1970 and 2010 in Mauritius is depicted in Figure 3.6.

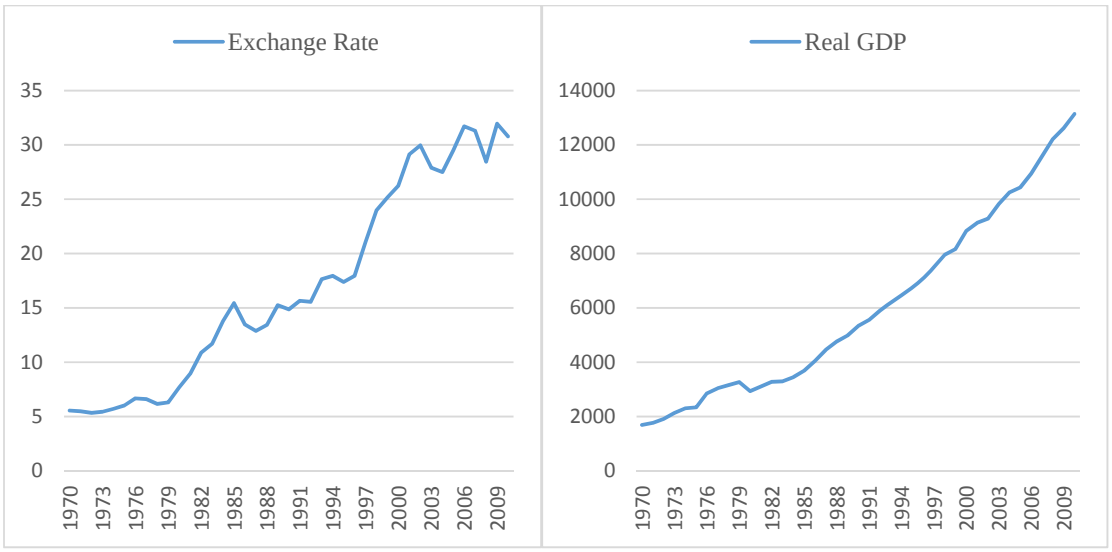

Figure 3.6: Trends in Exchange Rate and Economic Growth in Mauritius

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.8 Historical Perspective of Namibia

The Republic of Namibia is located in southern Africa. The country shares borders with Angola, South Africa, Zambia, Botswana and the Atlantic Ocean. Namibia became independent in 1992. The country covers a total land area of 825 615 km^2 and is inhabited by some 2 113 077 people (GeoHive, 2014; WDI, 2014). Namibia remains the second least populated country in the world after Mongolia (UN, 2009). This has been attributed to the aridity of the climate resulting in the majority of the land being covered by the Namid Desert (Spriggs, 2001). Most of Namibia's inhabitants are found in the capital city, Windhoek.

According to the World Bank, Namibia is an upper-middle income country and ranks 98^{th} out of 189 countries in terms of "ease of doing business" in 2013 (World Bank, 2014b). Namibia has a stable political and economic climate, and a highly developed financial system. The major economic activities of the country are herding, agriculture, tourism and mining – especially diamonds, uranium, gold, silver and base metals (see BAA, 2013). The economy of Namibia is highly tied to the South African economy due to the country's past (see Central Intelligence Agency, 2014d). The key sectors of the economy are mining, agriculture, manufacturing and tourism. The country faces major challenges such as high rate of unemployment (about 27.4% in 2012), very high cost of living, and high prevalence of HIV/AIDS (see NSA, 2012). Table 3.7 shows some of the key demographic and socioeconomic indicators in Namibia during 2014.

Table 3.7: Key Demographic and Socioeconomic Indicators in Namibia (2014)

Indicator	Estimate
Area of land	825,615 km^2
Population	2,113,077
GDP (PPP)	$18.80 billion
GDP per capita (PPP)	$8,577
Economic growth rate (%)	4.4
Inflation rate (%)	5.6
Exchange rate (Namibian dollar per US dollar)	10.98
Unemployment rate (%)	16.7
Human development index	0.624
Current account balance to GDP (%)	-1.19
External debt to GDP (%)	28.1
Share of industry in GDP (%)	29.64
Share of service in GDP (%)	63.29
Share of agriculture in GDP (%)	7.07
Number of licensed banks	6

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.8.1 Exchange Rate Regimes and Recent Policies in Namibia

Before independence in 1992, Namibia was a territory under the control of South Africa. Thus, Namibia was a *de facto* member of the Rand Monetary Area (RMA) in 1974 when the Rand Monetary Agreement was signed (see Dwight, 2006). The RMA was replaced by the Common Monetary Area (CMA) in 1986. At independence in 1992, Namibia joined the CMA as a *de jure* member under the Multilateral Monetary Agreement (see Van Der Merwe, 1996; Dwight, 2006). Namibia also introduced its official currency, the Namibian dollar, the same year.

The government of Namibia signed the Bilateral Monetary Agreement (BMA) in 1993. This agreement outlined the key exchange rate obligations of Namibia. Under the BMA, the Namibian dollar was set on a par with the South African rand. The Namibian dollar was provided 100% backing by the South African Reserve Bank. The Bank of Namibia was allowed to separately manage its reserves. Namibia was also granted access to South Africa's foreign exchange reserves. The rand was agreed to as legal tender in Namibia. The foreign

exchange controls in Namibia were supposed to conform to South Africa's foreign control policies. Moreover, South Africa was obligated to consult Namibia when making changes to her foreign exchange policies (see Dwight, 2006). Namibia continues to be a member of CMA to date. The IMF classifies the exchange rate regime of Namibia as a conventional fixed peg arrangement (see IMF, 2008).

3.8.2 Recent Economic Growth Policies and Programmes in Namibia

One of the early policy initiatives in Namibia was the National Agriculture Policy (NAP) of 1995. The policy was implemented under the National Development Plan 1 (NDP 1) to promote agriculture sector productivity and enhance food security while preserving the ecosystem (see Republic of Namibia, 1995). The policy document outlined key objectives including: (i) raising growth rates and stability in farm income and produce, (ii) improving nutrition and food security, (iii) creating employment and better living conditions in rural areas, iv) enhancing agriculture investment and balance of payment, (v) improving the usage of land and natural resources, and (vi) ensuring balance growth between the rural and urban areas. The main strategy was to promote partnerships, seek technical assistance from external agencies, reduce agricultural subsidies, and reduce tariffs on farm inputs (see Republic of Namibia, 1995).

The National Development Plan 2 (NDP 2) was launched to redress the objectives and targets not achieve under the NDP1 in 2001. The vision of the NDP 2 was "Sustainable and equitable improvement in the quality of life of all the people in Namibia" (see Republic of Namibia, 2007). The policy objectives of the NDP 2, as stated in the Government Paper, were to: (i) reduce poverty, (ii) create employment, (iii) promote economic empowerment, (iv) stimulate and sustain economic growth, (v) reduce inequalities in income distribution, (vi) reduce regional development inequalities, (vii) promote gender equality and equity, (viii) enhance environmental and ecological sustainability, and (ix) combat the further spread of HIV/AIDS (see Republic of Namibia, 2007). The NDP 2 outlined several targets, some of which included: attaining sustainable economic development with growth rate averaging 4.3% annually between 2001 and 2006; an increase in private investment by 4.1% per year; increased investment in the private sector from 73% to 90%; and to bring down the GINI coefficient from 0.67 to less than 0.6 at the end of 2006 (see Republic of Namibia, 2007). Under the NDP 2, the economy of Namibia expanded beyond the targets. Real economic growth averaged around 4.7% over the 2001-2006 period. Nonetheless, challenges such as

inequality, poverty, low human resource development, and unemployment remained (see Republic of Namibia, 2008).

As part of the NDP 2, the Government of Namibia approved the Poverty Reduction Strategy (PRS) in 1998. The PRS was designed and implemented in 2001 as the National Poverty Reduction Action Programme (NPRAP). The NPRAP spanned the 2001-2005 period. The NPRAP concentrated on three strategic issues, namely: efficient and equitable delivery of public resources; equitable agricultural expansion; and non-agriculture economic empowerment of the poor. The NPRAP also covered the following thematic areas: long-term vision for the country; new ways of generating income among the poor; safety nets, especially, for the poor; and public resource use (see Republic of Namibia, 2002). In 2004, the Youth Enterprise Promotion Policy (YEPP) was implemented to continue the progress made by the NPRAP and to also remedy one of the gaps identified under the NDP 1 (see National Youth Council, 2004). The YEPP aimed to raise awareness of the potential of the youth; foster collaboration between stakeholders; promote the participation of the youth in enterprise programmes; and monitor programmes on enterprise development with emphasis on the youth (see National Youth Council, 2004).

In 2004, the government of Namibia launched a comprehensive long-term policy initiative, the Namibia Vision 2030, which outlined the ambitions of the country. The Vision 2030 was designed to diversify and open up the economy, and emphasised a resource-based industrial sector, commercialising agriculture, and developing human resources (see Republic of Namibia, 2004). The Vision 2030 prioritised the close collaboration of the private and public sector to drive these objectives. The principle of sustainable development was at the core of the Vision 2030 agenda. This long-term policy enveloped five thematic areas, namely: education, science and technology; health and development; sustainable agriculture; peace and social justice; and gender equality (see Republic of Namibia, 2004).

The National Development Programme 3 (NDP 3) was implemented in 2007 to build on the momentum gathered under NDP 2. In particular, the NDP 3 was part of the development planning initiative, which was expected to facilitate the progression towards achieving the Namibia Vision 2030. In fact, the NDP 3 was seen as the first systematic strategy to transform the Vision 2030 agenda into realistic policies and actions (see Republic of Namibia, 2008). The NDP 3, which lasted between 2007 and 2012, derived all of its

objectives from the Vision 2030 agenda. Unlike the previous NDPs, the NDP 3 was designed based on the so-called Integrated Results Based Management (IRBM) approach. This was to help bolster the planning, coordination and implementation of the NDP 3 (see Republic of Namibia, 2008). The NDP 3 recorded remarkable success. Yet, as in the case of the previous NDPs, most of the targets were missed (see Republic of Namibia, 2012a).

In 2013, the National Development Programme 4 (NDP 4) was launched to improve upon the progress made by the NDP 3. The development plan was launched because the government of Namibia felt that the implementation and execution of the previous NDPs was very slow; and thus, the Vision 2030 objectives might not be realised (see Republic of Namibia, 2012a). The NDP 4 was therefore aimed at speeding up the strategic implementation of the policy initiatives in the Vision 2030. The NDP 4 is expected to last until 2017. The policy is different from the previous policies in that it has only a few carefully selected goals. These overarching goals of the NDP 4 include: (i) sustaining growth, (ii) improving employment, and (iii) increasing income equality. The NDP 4 covers thematic areas including logistics, manufacturing, agriculture with special emphasis towards attaining macroeconomic stability, developing human resources, attracting foreign investment, and maintaining a sustainable environment (see Republic of Namibia, 2012a).

The Namibia Industrial Policy (NIP) was implemented in 2012 as part of the NDP 4 to promote the Vision 2030 agenda (Republic of Namibia, 2012b). The key targets of the NIP included: (a) improving the contribution of the manufacturing sector to GDP to 80%; increasing exports of processed goods to 70% of total exports; improving the contribution of SMEs to GDP to more 30%; and building modern infrastructure such as railways, telecommunications and roads (see Republic of Namibia, 2012b).

3.8.3 Trends in Exchange Rate and Economic Growth in Namibia

The exchange rate in Namibia (Namibian dollar per US dollar) was 0.7131 between 1970 and 1971 but increased to 0.7728 in 1972. This would be followed by a two-year decline; the rate declined from the 1972 value to approximately 0.6795 in 1974. From this value, the exchange rate increased to 0.8696 in 1976 and remained so till 1979, when the rate declined to 0.8420. The rate declined further to 0.7788 in 1980. From the 1980 value, the rate increased on a year-on-year basis until 1987 when it fell from 2.2850 in 1986 to 2.0360 in 1987. The exchange rate increased year-on-year from that point, barring a temporary decline between

1989 and 1990, until 2003. The real GDP (in US dollars), however, increased moderately between 1970 and 1990. Beyond 1990, the real GDP experienced rapid increments. Between 1990 and 2001, the real GDP increased by 71.177%. As in all the other countries before this one, the general depreciation of the exchange rate appeared to have fostered real GDP increment. The movement of the exchange rate and the real GDP between 1970 and 2010 in Namibia is depicted in Figure 3.7.

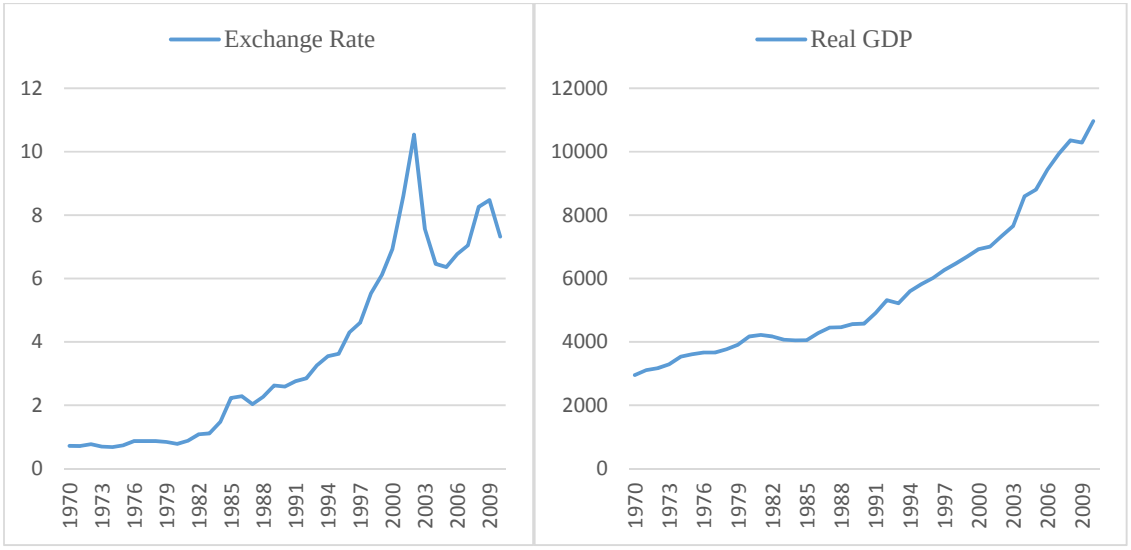

Figure 3.7: Trends in Exchange Rate and Economic Growth in Namibia

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.9 Historical Perspective of South Africa

The Republic of South Africa is the largest country in southern Africa – both by land area and by population. The country covers approximately 1 221 037 km^2 (25th-largest in the world) and a population of 51 770 560, making it the 25th-most populous country in the world (see SouthAfrica.info, 2007). South Africa's boundaries are the South Atlantic and Indian Oceans, Swaziland, Mozambique, Namibia, Botswana and Zimbabwe (SouthAfrica.info, 2007). Lesotho lies entirely within South Africa (SouthAfrica.info, 2007). South Africa became independent in 1910 and later a republic in 1961. However, all-inclusive democracy was adopted only in 1994. The country has never experienced a *coup d'état* and has regularly undertaken elections.

The World Bank classifies South Africa as a mixed upper-middle income economy, which is newly industrialised (WDI, 2014). The economy of South Africa is said to be the second largest in Africa and the 28th largest in the world (WDI, 2014). South Africa also ranks as the economy with the seventh highest per capita income in Africa in terms of purchasing power parity (UNDP, 2008). The country has a vast regional presence with a very stable economic and investment climate, often described as one of the top foreign direct investment destinations in the world (see Walls, 2013). The key sectors of the South African economy include tourism, manufacturing, services and agriculture. The agriculture sector of the country is the lowest employer when compared to most African countries (see Human Rights Watch, 2001). The informal economy has negligible influence in South Africa. The OECD reports that the informal sector only provides 15% of jobs in the country (see The Economist, 2010).

Despite South Africa's supremacy among most African countries, about a quarter of the labour force in the country is unemployed and living below the international poverty line of US$1.25 per day (UNDP, 2008). The country is also rated among the top ten countries in the world with significant income inequality (see Central Intelligence Agency, 2013b). According to the World Bank, South Africa falls within the countries with wide gaps between the human development index (HDI) and the per capita income (World Bank, 2011b). Table 3.8 shows some of the key socioeconomic and demographic indicators in South Africa during 2014.

Table 3.8: Key Demographic and Socioeconomic Indicators in South Africa (2014)

Indicator	Estimate
Area of land	1,221,037 km^2
Population	51,770,560
GDP (PPP)	$623.201 billion
GDP per capita (PPP)	$11,914
Economic growth rate (%)	1.89
Inflation rate (%)	5.71
Exchange rate (rand per US dollar)	10.98
Unemployment rate (%)	25
Human development index	0.658
Current account balance to GDP (%)	-.5.24
External debt to GDP (%)	36.59
Share of industry in GDP (%)	27.58
Share of service in GDP (%)	70.03
Share of agriculture in GDP (%)	2.39
Number of licensed banks	38

Sources: Extracted from WDI (2014) and African Economic Outlook (2014).

3.9.1 Exchange Rate Regimes and Recent Policies in South Africa

Before becoming a republic in 1961, South Africa practised various exchange rate mechanisms. For example, between 1921 and 1944, the country's exchange rate was based on the gold standard. The South African Reserve Bank (SARB) was established in 1921, and in April 1922, the new currency, the South African pound, was issued and pegged on a par with the British pound. Then, in December 1932, the SARB abolished the convertibility of the South African pound to gold (see Van Der Merwe, 1996). By 1944, the SARB had replaced the gold standard with a fixed exchange rate regime. The South African pound was pegged to the British pound and the US dollar, with occasional adjustments to correct misalignments until 1961, when the country became independent (see Van Der Merwe, 1996; Nel, 2000). The exchange rate was originally fixed at 1 SA pound per US$4.03 and later devalued to 1 SA pound per US$2.80 in 1946. In 1961, the South African rand replaced the South African pound. The exchange rate was fixed at 1 SA rand per US$1.40 in the same year and remained so until December 1971 (see Van Der Merwe, 1996).

The South African rand was delinked from the US dollar and pegged to the British pound between December 1971 and October 1972 due to the strong depreciation of the dollar within that period. The country switched to the Smithsonian realignment and devalued the rand by 12.3% in December 1971. From October 1972 until January 1979, South Africa adopted a managed float regime with parallel market. First, the rand was delinked from the British pound and pegged to the US dollar in October 1972. This system was later replaced in June 1974 by a managed float system, in line with the Rand Monetary Area (RMA) agreements. Three countries (namely, South Africa, Lesotho and Swaziland) formed the RMA in June 1974. Thus, South Africa officially replaced an independent exchange management with a managed float regime on signing the RMA agreements. Under the agreements, SARB could only adjust the exchange rate in order to smooth out fluctuations. The exchange rate was devalued in September 1975 by 17.5% and fixed at 1 SA rand per US$1.15 till 1979.

In 1977, the De Kock Commission was established to review the exchange rate and monetary policies of the country. The commission submitted its findings to the government on November 1978. Following these findings, South Africa adopted a managed float regime with dual exchange rates between January 1979 and February 1983 (see De Kock, 1985; Van Der Merwe, 1996). The regime featured two exchange rates: the commercial rand and the financial rand. As per the recommendations of the De Kock Commission, the mandatory buying and selling rates for the US dollar were abolished (see Van Der Merwe, 1996). Also, the SARB discontinued the announcement of its predetermined buying and selling rates of the US dollar, in February 1979 (see van der Merwe, 1996; Nel, 2000). However, in February, the same year, the SARB introduced the managed float system without dual exchange rates. Besides, exchange controls on non-residents were abolished, the same year. SARB decided to temporally suspend its exchange reforms following the strong depreciation of the rand in 1985. Instead, the SARB tightened capital controls (see Nel, 2000).

South Africa would soon revert to a managed float system with dual exchange rates in September 1985. The financial rand was re-introduced, while the Common Monetary Area (CMA) replaced the RMA in July 1986 (see van der Merwe, 1996). In March 1992, SARB bought and sold in financial rand transactions with the aim of exiting that market. The country decided to unify the dual exchange rates in March 1995 and, consequently, operated a unified floating regime from March 1995 until 1999. As part of the drift from the dual exchange rates to the unified floating system, SARB exited from short-term transactions, and

scrapped the financial rand in March 1995. From February 2000 to date, South Africa has operated a fully floating exchange regime. SARB occasionally interferes in the foreign markets using short- and long-term measures to smooth out exchange rate volatility.

3.9.2 Recent Economic Growth Policies and Programmes in South Africa

The government of South Africa has implemented various policies to promote economic growth in the country in the past. For example, the National Development Plan (NDP) 2030 was designed with the aim of eliminating poverty and inequality, after nationwide consultations. The development plan was the result of the major challenges that were identified by the National Planning Commission's Diagnostic Report, which was received in June 2011 (see National Planning Commission, 2013). The report highlighted the achievements and setbacks of South Africa since 1994. The strategy entails all-inclusive participatory growth, capacity building, and leadership development. The priority areas of the NDP 2030 include: uniting the country to achieve prosperity and equity; promoting patriotism to enhance development, democracy and accountability; promoting faster economic growth; promoting capital investment and labour absorption; and promoting strong leadership (see National Planning Commission, 2013).

The Strategic Plan (2011-2014) was launched in 2011 with the overarching goal of achieving social cohesion and development in rural areas. This rural growth strategy outlined the following specific objectives: (i) ensuring a sound corporate governance and excellent service delivery; (ii) reforming legislative and institutional policies; (iii) effective land planning in rural communities; (iv) improving access to land in rural communities; and (v) enhancing food security and employment (Republic of South Africa, 2011a). The strategy towards achieving these objectives involves "a rapid and fundamental change in the relations (systems and patterns of ownership and control) of land, livestock, cropping and community" (see Republic of South Africa, 2011a).

The South African Agricultural Production Strategy (SAAPS) forms one of the main recent growth-oriented policies implemented by the South African government. The SAAPS sought to restructure and position the agriculture sector of the country in order to enhance the sector's contribution to GDP and overall employment. Given the recent climate changes, the policy aimed to promote national food safety and security in the long term (see Republic of South Africa, 2011b). The policy also forms one of the key strategies adopted by the country

to promote rural economic growth and poverty reduction. The SAAPS was launched in 2011, and is expected to be terminated in the year 2025 (Republic of South Africa, 2011b).

The Youth Enterprise Development Strategy (YEDS) was launched recently by the government of South Africa in response to the general increase in youth unemployment in the country. Among the key objectives of the YEDS were: (i) to improve the contribution of enterprises owned and controlled by the youth to GDP from 5% to 15% by 2023; (ii) to increase enterprise start-ups by the youth in all sectors from less than 10% to 50% in 2023; (iii) to enhance savings and investment habits among the youth; and (iv) to increase financial and non-financial support for the youth in enterprise development (Republic of South Africa, 2013).

3.9.3 Trends in Exchange Rate and Economic Growth in South Africa

The exchange rate in South Africa, the rand per US dollar, was devalued in December 1971 by 12.3% and pegged to the British pound. In dollar terms, the rate was 0.7152 rand per US dollar in 1971, and later increased to 0.7687 in 1972. The exchange rate declined from this figure to 0.6795 in 1974 when the RMA agreement was signed and a managed float exchange rate regime adopted. From this value, the exchange rate depreciated to 0.8696 in 1976 and remained so until 1979 when it fell to 0.8420. The exchange rate declined (appreciated) further to 0.7788 in 1980. From this value, the exchange rate depreciated yearly until 1987, following some reforms in the financial and monetary system being influenced by the De Kock Commission. Following a temporary appreciation of the rand between 1989 and 1990, the rand depreciated on a consistent basis from 1991 to 2002. At the end of 2002, the exchange rate had depreciated by 281.729%! The government of South Africa responded to this depreciation by introducing tight capital controls and raising interest rates. The rapid inflow of foreign direct investment as a direct response to the high interest rates caused the rand per US dollar to decline from 10.5408 in 2002 to 6.3593 in 2005. The real GDP (in US dollars) has shown considerable increment from 1970. For example, the real GDP increased from $141 554.3996 million in 1970 to $178 187.933 million in 1978. Between 1981 and 1987, the real GDP increment was moderate. Beyond 1987, however, the real GDP rapidly increased year-on-year. At the end the period 1988-2010, the real GDP had increased by 72.629%. The movement of the exchange rate and the real GDP between 1970 and 2010 in South Africa is depicted in Figure 3.8.

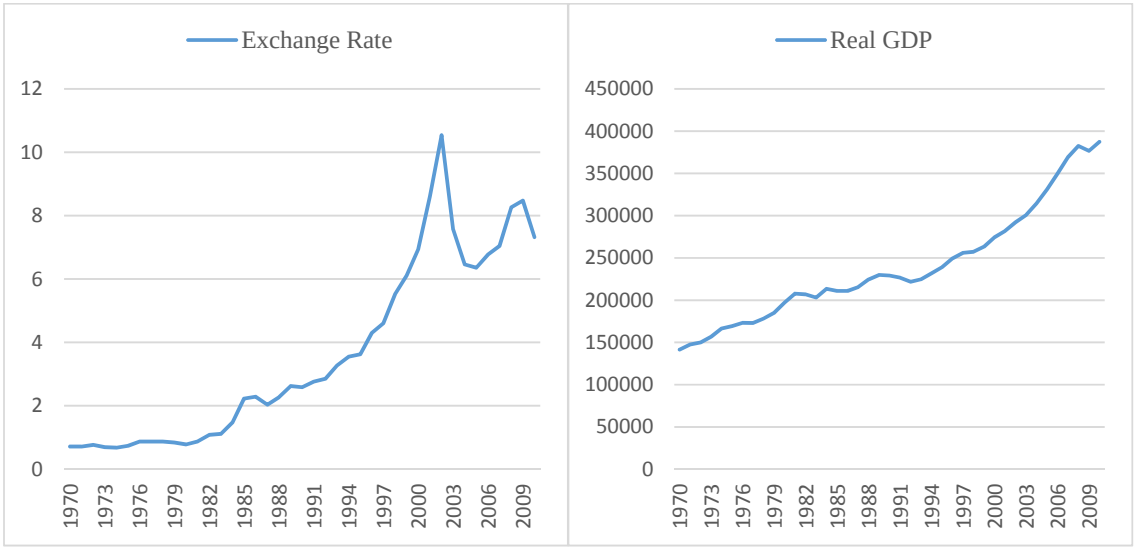

Figure 3.8: Trends in Exchange Rate and Economic Growth in South Africa

Source: Constructed from Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013).

3.10 Conclusion

In this chapter, the country-based literature on eight middle-income countries in Africa was discussed. The chapter presented the exchange rate regimes and policy interventions of these countries. The chapter also outlined some of the recent growth-oriented policies and programmes pursued in these countries. In addition, the trends in the exchange rate and the economic growth of these countries were presented. The general conclusions were that countries in the Common Monetary Area (CMA) pursued the same exchange rate policies in which their currencies were being pegged to a currency basket. For countries outside the CMA, namely Ghana, Nigeria, Zambia, and Mauritius, fixed exchange rate regimes were adopted at independence until the mid-1980s or the early 1990s when they liberalised their exchange rates. Furthermore, in all the eight countries studied, it appeared that the real GDP increased significantly when the exchange rates depreciated; especially in the 1990s when these countries employed more flexible exchange rates than when the currencies were overvalued. Finally, poverty reduction strategies appeared to cut across all the key economic growth reforms implemented in these countries.

CHAPTER 4

REVIEW OF RELATED LITERATURE

4.1 Introduction

In this chapter, the relevant literature pertaining to the links between the real exchange rate and economic growth is discussed. The importance of this chapter lies in the fact that it identifies the relevant gaps that might be filled by critically examining what has already been explored both theoretically and empirically. The first part of the chapter concentrates on a fundamental concept, the Balassa-Samuelson Hypothesis (BSH), since this concept is crucial to the development of the various measures of the real exchange rate undervaluation or overvaluation replete in recent literature. To this end, the controversies, the theory, and the empirical tests of the BSH are discussed in the first part of this chapter. In the second part, the theoretical linkages of the real exchange rate and economic growth are explored. In addition, a review of the empirical evidence on the linkages between the real exchange rate and economic growth is provided. In the final part of the chapter, conclusions to this chapter are provided.

4.2 The Balassa-Samuelson Hypothesis

4.2.1 The Controversy

The Balassa-Samuelson Hypothesis (BSH), or Effect, has been a controversial concept – not primarily because of its validity, but on account of its naming. The notion that in the processes of economic growth, the effect of relative incremental productivity in the tradable sector raises the relative prices of non-tradable goods relative to tradable goods within an economy was independently conceived by Balassa (1964) and Samuelson (1964). Clague and Tanzi (1972) referred to the concept as “Balassa’s Theory”; but Grunwald and Salazar-Carrillo (1972) termed it “Balassa’s Proposition”. In fact, David (1973) indicated that the hypothesis had long been conjectured independently by Samuelson.

The idea had been described in earlier works, such as those of Ricardo (1911), Harrod (1933), and Viner (1937), as recognised by Grunwald and Salazar-Carrillo (1972), and Kravis *et al* (1978). Indeed, such was the controversy surrounding the attribution of the BSH that Samuelson (1994) conceded that Ricardo, Harrod, and Viner had already mentioned it in their works. Samuelson (1994) suggested the BSH be named the *Ricardo-Viner-Harrod-Balassa-*

Samuelson-Penn-Bhagwati Effect, in his famous letter "Facets of Balassa-Samuelson Thirty Years Later".

Other names for the hypothesis exist. For instance, David (1972) coined it as the *rule of five eights* in his paper; Officer (1976) named it as the *productivity bias in purchasing power parity*; while Kravis and Lipsey (1983) termed it as the *Harrod-Balassa-Samuelson Effect*. Samuelson (1994) also suggested that the concept be named the *Penn Effect*, in recognition that the Penn World Tables were crucial to the empirical validation of this theory. Nonetheless, the commonly used terminology is the BSH. In this study, the concept is referred as the *Balassa-Samuelson Hypothesis* (BSH).

4.2.2 The Theory

Until Rogoff (1992a), the Balassa-Samuelson Hypothesis (BSH) had remained a descriptive phenomenon without formal mathematical models to ground it. The seminal works of Harrod (1933) and Samuelson (1964) provided descriptions of the nature of the model and its building blocks. Balassa (1964) went a step further, by providing an empirical verification of the BSH. Other studies before Rogoff (1992a), except those of Kravis and Lipsey (1983), and Bhagwati (1984), were mostly empirical in nature. These studies concentrated on the supply side of the economy, by modelling linear relationships between the relative price level and the level of productivity.[1]

In spite of a rigorous theoretical insight into the BSH, Bhagwati's (1984) model has not received the recognition that it deserves. One possible explanation could be that Bhagwati (1984) employed techniques that were not popular in mainstream economics. Bhagwati (1984) developed the BS model within a general equilibrium setting. As he pointed out, the model was a formal extension of the argument of Kravis *et al* (1982)[2]. He used Lerner's diagrammatic techniques and multifactor-production functions with differential international productivity. He also relaxed the restrictive axiom of equal wage-rent and capital-labour ratios between developed and developing countries. He then demonstrated that a poor country with an abundant labour supply would charge lower prices for its services, because it specialised in labour-intensive methods of production.

The playing field was completely changed when Rogoff (1992a) proposed a fully-specified model for the BSH. This model, which was formulated within the general equilibrium setting,

was developed using two Cobb-Douglas production functions for two domestically produced goods. These goods were tradables *"T"* and non-tradables *"N"*. The goods originated from two sectors of the economy: the tradable sector and the non-tradable sector. Three inputs were used to produce *"T"* and *"N"*: labour *"L"*, capital *"K"*, and technology *"A"*. The production functions for each of the goods were of the form:

$$Y_{Tt} = A_{Tt} K_{Tt}^{\theta T} L_{Tt}^{1-\theta T} \tag{4.1}$$

$$Y_{Nt} = A_{Nt} K_{Nt}^{\theta N} L_{Nt}^{1-\theta N} \tag{4.2}$$

Rogoff (1992a) formulated the BSH model on the assumptions that: (i) the *law of one price* holds in the tradable sector; (ii) there is perfect international capital mobility; (iii) there is perfect market competition; and (iv) there is perfect factor mobility between these two sectors of the economy. Based on these assumptions, Rogoff (1992a) proved that a change in the relative price of non-tradable goods depended on a change in the relative productivity of the two sectors. This relation was shown as:

$$dp = (\theta_N/\theta_T) da_T - da_N \tag{4.3}$$

where d is the differential; and lower cases represent the logarithm of the variables. Rogoff (1992b) contends that if capital and labour are taken as given in each of the sectors and if capital markets are assumed to be closed to international borrowing and lending, a more realistic result can be attained. In this case, the following result is obtained:

$$dp = \beta_T da_T - \beta_N da_N - [(\beta_T - 1) dg_T - (\beta_N - 1) dg_N] \tag{4.4}$$

where β is the output-consumption ratio; and g is the logarithm of government consumption. This result, according to Rogoff (1992a), is identical to the Balassa-Samuelson result in (4.3); because any productivity shocks in (4.4) have *isomorphic effect* as the one in (4.3). This model allowed empirical studies to explore the impact of the demand side of economies on long-term relative price levels. Obstfeld and Rogoff (1996) have since provided an extension to Rogoff's (1992a) model. Their model included an additional factor of production. They also relaxed the axiom of international capital movement. Obstfeld and Rogoff (1996) then

derived the BSH by basing it on the *factor-price equalization* concept of the international trade theory.

In a variant formulation of the BSH model, De Gregorio *et al* (1994b) introduced terms of trade, as well as the demand side of the economy. Their approach differed significantly from that of Rogoff (1992a), because they relaxed the assumptions stated in Rogoff's (1992a) paper. De Gregorio *et al* (1994b) relaxed the following assumptions: (i) perfect international capital mobility; (ii) the *law of one price* for tradable goods; and (iii) the existence of perfect competition in the goods and input markets. De Gregorio *et al* (1994b) derived a relative supply curve, which had a non-zero slope. Based on these assumptions, they derived an equation that relates the net effect of government spending to the relative prices of non-tradable goods, and the demand for non-tradable goods. They demonstrated that, in the long run, terms of trade and the demand sides of the economy have a significant impact on relative prices. This conclusion has had a considerable influence on subsequent empirical studies, which have incorporated terms-of-trade and demand-side variables in order to verify the BSH.

In a separate study, Asea and Mendoza (1994) formulated the BSH in a long-run neo-classical growth framework and in a general equilibrium setting. This model took into account the preferences of consumers. Asea and Mendoza (1994) derived a relation where relative prices depended on the relative productivity of the tradable and the non-tradable sectors, as well as the marginal rate of substitution between the tradable and the non-tradable sectors. They also demonstrated that the ratio of sectorial output *per capita* determined the relative price of non-tradable goods, instead of the aggregate output *per capita.*

Unlike the previous models of the BSH, the recent models are built on the idea of imperfect competition and endogenous tradability. Such models could be found in the work of Ghironi and Melitz (2005), Bergin *et al* (2006), and Méjean (2008). Ghironi and Melitz (2005), for instance, explained the BSH in terms of a stochastic general equilibrium, two-country model of trade, and macroeconomic dynamics. In this model, productivity varied across monopolistically competitive firms in the two countries. These firms encountered sunk-costs in the domestic market, in addition to fixed and per unit export costs. In that setting, firms could only export when they were productive. According to Ghironi and Melitz (2005), exogenous shocks to aggregate productivity and trade or entry costs influenced firms to enter

and exit the exports and the local markets, changing the composition of baskets of goods across countries with time. Under the axiom of flexible prices, their model provides an intuitive insight into the BSH in response to aggregate productivity differentials and deregulation.

Bergin *et al* (2006) proposed a model that resolved the critical assumption of the standard BSH that productivity gains are concentrated by chance in existing tradable goods sectors. They showed how productivity gains in producing particular goods could result in such goods being traded endogenously. They based their approach on a framework in which goods were differentiated according to their tradability and productivity. Bergin *et al* (2006) assumed monopolistic competition, a continuum-of-goods, and endogenous tradability. Their model shed light on how the trading pattern embedded in the BSH could develop over the course of time.

Méjean (2008) extended the BS model to examine the determinants of relative prices. She incorporated an endogenous location of tradable goods producers into the standard BS model. Méjean (2008) demonstrated that asymmetric productivity improvements in the tradable sector influenced new firms to enter the market. The entrance of these new firms into the market, according to Méjean (2008), exerted upward pressure on relative wages and benefited domestic savers on trade costs. Thus, the relative prices reacted to these shocks by either rising or falling, in general equilibrium. In effect, her model reaffirmed the evidence of the BS effect, which was induced by the relocation of producers of tradable goods.

4.2.3 The Empirical Evidence

Since the BSH gained notice in the 1960s, the hypothesis has been tested several times in the empirical literature. The first review of the empirical literature on the BSH could be found in Officer (1976). Bahmani-Oskooee and Nasir (2005) also provided a review of the empirical literature. One of the objectives of this chapter is to provide a fresh review of the empirical studies on the BSH. The study classified the literature into three groups: (i) cross-sectional approaches; (ii) time-series approaches; and (iii) panel-data approaches. The classification was considered necessary because previous reviews (see Officer, 1976; Bahmani-Oskooee & Nasir, 2005) have shown that the approach adopted was crucial in establishing the BSH.

4.2.3.1 Cross-Sectional Approaches

Table 4.1 shows a summary of the cross-sectional studies on the BSH. It must be noted that Balassa (1964) provided the earliest empirical evidence of the BSH. Balassa (1964) found two crucial pieces of evidence in support of the BSH, employing the data from 12 OECD countries. First, by computing sectorial purchasing power parity (PPP) for the year 1950, he found that the prices of non-tradable goods were relatively lower in economies whose incomes were relatively low. Second, by using the data for the year 1960, he regressed the deviation of PPP from the equilibrium exchange rate on GNP *per capita*. He found the GNP *per capita* to have a positive and statistically significant coefficient. These two pieces of evidence, according to Balassa (1964), confirmed the BS effect.

Other researchers soon followed the approach employed by Balassa (1964). For example, De Vries (1968) employed a dataset consisting of 64 countries. Using a similar cross-sectional regression to that which appeared in Balassa's (1964) paper, he found the coefficient of productivity to be positive, but statistically insignificant. This author, thus, rejected the BSH. However, his approach appeared questionable, since the PPP and the productivity proxies were extracted from different years. In addition, the algorithm used by De Vries (1968) to convert the GDP from the local currency into the US dollar has cast doubt on his findings (see Officer, 1976).

Clague and Tanzi (1972) found strong evidence in support of the BSH for 12 OECD countries. In the same study, they found weak evidence in support of the BSH for 19 Latin American countries. The authors employed a modified version of the Balassa's (1964) cross-sectional regression. Clague and Tanzi (1972) included human capital, natural resources, and labour as additional regressors in their model. They argued that Balassa's (1964) model was underspecified, and that the BSH might hold, provided that human capital, labour and natural resources were taken into account. They argued that tradable goods were more likely to command relatively lower prices than non-tradable goods, in resource-abundant countries.

In addition, Grundwald and Salazar-Carrillo (1972) identified the BS effect in their study, which involved 10 countries in the Latin American Free Trade Association (LAFTA). The authors employed the rank-correlation test for their study. In particular, the correlation coefficient between the real exchange rate and the GDP *per capita* were found to be -0.27 and -0.30, respectively, when the GDP *per capita* was calculated using the official rate and

the market rate. The glaring drawback of this study was that the real exchange rate and the GDP *per capita* were constructed by using data, which were from two different time periods (see Bahmani-Oskooee & Nasir, 2005).

Officer (1976) estimated a cross-country regression for each year from 1950 to 1973; he varied the measure of productivity (i.e. between GDP *per capita*, GDP per worker), and the ratio of productivity between the tradable goods and the non-tradable goods sectors, and the base country (alternating between the USA and Germany). Using a sample of 15 industrialised countries, Officer (1976) found no evidence in favour of the BSH. He critiqued the earlier approaches, which had employed different time periods for the real exchange rate and the productivity (for instance, those found in De Vries, 1972; and Grunwald and Salazar-Carrillo, 1972); and the reference country, such as the US (as found in Balassa, 1964). Bahmani-Oskooee and Niroomand (1996) found similar results by replicating Officer's (1976) study, by estimating a cross-sectional regression from 1974 to 1989 (see Bahmani-Oskooee & Nasir, 2005).

Kravis and Lipsey (1983) estimated cross-sectional regressions, using six benchmark ICP countries for 1970 and 1973, and 34 benchmark ICP countries for 1975. They controlled for structural factors using various variables. The authors found strong evidence in support of the BSH. The main contribution of their study was that it shed light on the role of structural factors in the movement of relative prices. Among the structural factors identified in their study were factor endowments, the size of the economy relative to the world economy, and the industrial composition of GDP (see Kravis & Lipsey, 1983).

In a variant form of Clague and Tanzi's (1972) cross-sectional regression, Clague (1986) found some evidence in favour of the BSH. His approach, which was sector-specific, used 31 countries from the International Comparison Project (ICP) for the year 1975. Clague (1986) found trade balance, minerals per GDP, and tourism to be statistically more significant in explaining the logarithm of the real exchange rate (price levels) in developed countries than in developing countries. The logarithm of income was, however, insignificant, contrary to Clague and Tanzi's (1972) findings. Rather than relative productivity, the model included absolute productivity. This differed significantly from the standard approaches. In a follow-up study, Clague (1988) found the data from 19 Latin American countries to exhibit the BSH.

The coefficient of the income *per capita* was positive and significant in all the cross-sectional regressions.

Bergstrand (1991) incorporated the demand- and supply-side proxies into his specification. He drew a demand function from a Stone-Geary utility function, and a supply function of Ronald Jones, to derive a reduced-form cross-sectional regression. The regressors of his specification were the productivity levels in commodities relative to services, the capital-labour ratio, and income *per capita*. The author found no evidence of the BS effect. He argued that incorporating identical proxies might have influenced the findings. Bergstrand followed up this study with another study in 1992. This time, Bergstrand (1992) found evidence in support of the BSH, when he introduced changes in government expenditures into his previous model.

Falvey and Gemmell (1991) formulated an empirical general equilibrium model, in which the composite price of non-tradable goods depended on agricultural land, mineral resources, balance-of-trade deficit, the composite price of tradable goods, capital, population size, skilled and unskilled labour, and the expenditure function. They assumed, contrary to previous studies, that productivity and relative price changes were endogenously explained by the set of identical exogenous variables listed. They found support for the BSH, using this standard general-equilibrium model. Their study was innovative, because it was the first to employ a general-equilibrium approach to test the BSH.

Heston *et al* (1994) tested whether the tradable/non-tradable price difference was lower for countries with a higher *per capita* income than for countries with a lower *per capita* income, which was implied by the BS effect. They estimated cross-sectional regressions for the years 1970, 1975, 1980 and 1985, based on the prices compiled by the International Comparison Programme. They found the difference between the price parities of the tradable and the non-tradable goods to move along with income, as predicted by the BSH.

Finally, Choudhri and Schembri (2010) examined the BSH, using a standard dynamic stochastic general-equilibrium framework. They modified the textbook BS model to include product differentiation *a la* Armington and Krugman specifications. They found the BSH to be fragile in their modified model. Their results showed that minimal variations in the elasticity of substitution between the local and foreign tradable goods ensured a negative or

positive (small or large) impact of tradable-goods productivity on the real exchange rate. They argued that their evidence might explain the mixed nature of the empirical findings pertaining to the real exchange rate-productivity nexus.

Table 4.1: Cross-sectional Evidence

Author (Year)	Dependent Variable(s)	Independent Variable(s)	Countries and Period	Conclusion
Balassa (1964)	Real exchange rate	Nominal GNP per capita	12 OECD countries 1960	Supported
De Vries (1968)	PPP	Productivity	62 countries 1958; 1966	Not supported
Clague and Tanzi (1972)	PPP/Official exchange rate	PPP adjusted income; Official exchange rate adjusted income; Import/Export; Import duties/Import; Export duties/Export; Education index	12 OECD countries; 19 Latin American countries 1960	Supported
Grundwald and Salazar-Carrillo (1972)	Real exchange rates	Per capita real GDP	10 LAFTA countries 1968; 1963	Supported
Officer (1976)	PPP/Official exchange	GDP per capita; GDP per labour; Productivity ratio	15 Developed countries 1950 – 1973	Not supported
Bahmani-Oskooee and Niroomand (1996)	Real exchange rate	Productivity ratio	21 Developed countries; 80 Developing countries 1974 – 1989	Not supported
Kravis and Lipsey (1983)	PPP; Relative prices	Per capita real GDP; Openness; Share of non-tradables; Money growth	6 ICP benchmark; 34 ICP benchmark 1972(6); 1973(6); 1975(34)	Supported
Clague (1986)	PPP/Market rates	Share of non-tradables in GDP; Education; Money growth; Share of mineral in GDP; Real income; Trade balance; Dummy for LDC; Foreign trade ratio	31 countries 1975	Inconclusive
Clague (1988)	Real exchange rates	Per capita GDP; Education index; Tourism; Foreign trade; Natural resources	19 countries 1970	Supported
Bergstrand (1991)	Relative price of non-tradables	Productivity; Capital-labour ratio; Per capita income	21 countries 1975	Not supported
Bergstrand (1992)	Relative price of non-tradables	Productivity of both sectors; Capital; Labour; GDP per capita; Military expenditure	21 countries 1975	Supported

		per capita		
Falvey and Gemmell (1991)	Price differentials for services	Change in agriculture land; Change in capital; Change in skilled labour; Change in unskilled labour; Change in mineral resources; Expenditure	60 countries 1980	Supported
Heston *et al* (1994)	Real exchange rates	Per capita GDP	34 countries (1970; 1975); 85 countries (1980; 1985)	Supported
Choudhri and Schembri (2010)	Real exchange rates; Terms of Trade	Productivity changes	N/A	Inconclusive

Note: N/A implies non-available. The approach was not based on a particular country, and numerical simulation was employed.

4.2.3.2 Time Series Approaches

Table 4.2 shows a summary of the time series studies on the BSH. Beginning with Hsieh (1982), researchers have gradually shifted away from using cross-sectional regressions to verify the BSH. Hsieh (1982) noted that previous studies might have suffered from misspecification by not accounting for country-specific factors. He attempted to resolve this setback by using time series techniques. Hsieh found evidence in favour of the BSH for Germany and Japan, using annual data spanning 1954-1976. His approach, however, probably suffered statistically because the variables were in levels. The variables were more likely than not to have had unit roots. This implies that his results could have been spurious. Consequently, studies which followed Hsieh (1982) employed co-integration techniques to overcome this apparent setback.

Rogoff (1992b) advanced a theoretical explanation of the non-stationary nature of the exchange rate. He also argued that his model provided a framework for investigating the impact of capital-market liberalisation on the volatility of the relative price of tradable and non-tradable goods. Rogoff (1992b) also argued that his methodology could be used to examine the effects of productivity and government spending shocks on the real exchange rate. He employed the Engle-Granger two-step co-integration technique to examine the long-run nexus between the real exchange rate and government spending in Japan. Using quarterly data, which spanned the period 1975-1990, Rogoff (1992b) found that permanent shocks to the productivity of tradable goods have no impact on the real exchange rate, after accounting for oil price shocks. Thus, his results do not support the BSH.

Bahmani-Oskoee (1992) examined the BSH in a similar fashion as Rogoff (1992b), using the Engle-Granger two-step co-integration technique for Japan, Canada, France, Germany, the UK, and Italy. His results suggested that the BSH was valid for Italy, the UK, and Japan. The BSH was refuted for France, Germany and Canada. Bahmani-Oskooee and Rhee (1996) varied the co-integration technique, which was employed in Bahmani-Oskooee (1992) and Rogoff (1992b), to test for the validity of the BSH in Korea. They used the Johansen co-integration approach, and found that the BSH was supported in Korea. In both studies, the USA was used as the reference country.

Strauss (1995) also investigated the BSH in 13 OECD countries for the period 1960-1990, with Germany as the reference country. He employed the Johansen co-integration technique and found two relationships: (i) the real exchange rates and productivity were related in 10 out of the 13 OECD countries; and (ii) the relative prices of non-tradable goods and productivity were related in 6 out of the 13 OECD countries. His findings did not appear to support the BSH. He reassessed these findings in another study in 1996, using Hsieh's (1982) model and the same data span he had earlier employed. This time, Strauss (1996) studied 7 OECD countries, again using Germany as the reference country. His results confirmed the BSH for 6 out of the 7 OECD countries.

Ito *et al* (1999) investigated the BSH for Asian countries. They considered, in particular, countries in the Asia-Pacific Economic Cooperation Council (APEC). Ito *et al* (1999) decomposed the BSH into four steps: (i) the differential in productivity growth rates between the tradable and non-tradable sectors caused relative price changes; (ii) the ratio of non-tradable prices to tradable prices is higher in a fast-growing economy; (iii) the ratio of tradable prices across countries remains constant (or in the special case when tradable prices are equalised across countries); and (iv) a combination of (ii) and (iii) caused real exchange rate appreciation. Using a simple linear regression model and the ordinary least squares (OLS) technique, they found the BSH to be supported in Japan, Mexico, Papua New Guinea, Chile and the newly industrialised economies (NIEs).

DeLoach (2001) examined the long-run relationship between the relative price of non-tradable goods and the real output in the USA, to establish the BSH. He used the method of maximum likelihood, and found a consistent and significant long-run relationship between

the relative price of non-tradable goods and real output. This confirmed the BSH. In addition, he found that real oil price shocks must be incorporated into the BSH; and that permanent oil price shocks affected the relative prices of non-tradable goods. He pointed out that the evidence in favour of co-integration was weak. Thus, other long-run determinants of relative prices must be considered in future studies.

Égert (2002a) examined the BSH for the Czech Republic, Hungary, Poland, Slovakia and Slovenia during the transition process. He employed the Johansen approach to co-integration and the vector error-correction technique to model the standard BS framework for these countries. The author found that the BSH did not differ across these countries. Besides, he found little support of any inflation differentials associated with higher productivity for the Czech Republic and Slovakia. Furthermore, his results do not appear to show that any real appreciation had been supported by productivity increases in all countries. In another study, he found the BS effect to exist internally, in Estonia (see Égert, 2005). His study was based on highly disaggregated sectorial GDP and consumer price index (CPI) data. The insight provided by his 2005 study was that the BSH was evident only when market-based services were employed and regulated prices were excluded.

Faria and Leon-Ledesma (2003) resolved the problems associated with testing the BSH by using time series approaches, namely: the possibility of spurious regression estimates due to the mixed order of integration of the series, and the likelihood of unstable long-run relationships between the series. They tackled these problems by using the ARDL bounds testing technique. Employing quarterly datasets on relative prices and output for Germany, Japan, UK, and the US, they found evidence that did not lend support to the BSH in the long run. Their results suggested that the PPP holds in the long run. Further tests from their study indicated that the real exchange rate has an impact on relative growth rates.

Bahmani-Oskooee and Nasir (2004) tested the BSH for 44 countries, using a dataset spanning 1960-1990. They re-assessed the results of previous studies, which had employed cross-sectional techniques, and the ones that had employed time series techniques for only a few countries. The authors used the ARDL co-integration and error-correction mechanisms. They found strong evidence of the BS effect for 32 countries, comprising both developed and developing countries. Their results showed that for the rest of the 12 countries in which the

BSH had failed, most were under-developed. They attributed the failure to establish the BSH in these 12 countries to trade restrictions, capital controls, and speculations.

Katsimi (2004) tested the existence of the BS effect in 7 EU countries, using the Johansen co-integration, Hansen and Phillips' Fully Modified OLS, and Hendry's ARDL techniques in an extended BS model. The dataset comprised the annual observation of prices, wages, and productivity for the period 1970-1996 from the OECD's Intersectoral Database (ISDB). The EU countries tested included the UK, France, Germany, Italy, Denmark, Belgium and Finland. He found evidence in favour of the BSH for 6 of the 7 EU countries. Specifically, he found productivity differentials between the tradable and the non-tradable goods sectors to have a positive and significant effect on inflation in Germany, the UK and France. However, in Belgium and Denmark, this was only evident when he allowed for sectorial differences in wages.

Mihaljek and Klau (2004) explained the differences in inflation between six Central European economies, which included Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia, relative to productivity growth between the tradable and non-tradable sectors – the main implication of the BSH. Using a quarterly data of 10 years, they found productivity differentials to explain, on average, 0.2 to 2.0% of the annual inflation differentials of these countries relative to the Euro Area. These estimated results, according to Mihaljek and Klau (2004), implied that productivity differentials explained a minimal portion of the domestic inflation in the Central European economies. They argued that the estimated impact was smaller, because their study took into account the impact of productivity differentials on inflation differentials between these countries, unlike previous studies, which had only accounted for the impact of productivity differentials on domestic inflation. While their study confirmed the BSH for this group of countries, the effect was small.

Gente (2006) attempted to resolve two overarching questions in her study, namely: (i) whether the BSH was valid in fast-growing Asian economies; and (ii) whether other factors were likely to explain real exchange rate changes in these economies. She developed a two-sector model in which a given small open economy was constrained in terms of capital flows. She argued that the real exchange rate depended on productivity and on factors such as time preference, the age-dependency ratio, and the level of external constraint. She calibrated her constrained economy model and found that the model appeared closer to the observed

empirical evidence for Singapore, China, Malaysia, Thailand and Hong Kong for the period 1970-1992. The author argued on the basis of her findings that the BSH must be modified, to be able to provide additional insight into the fundamental drivers of the real exchange rate appreciation in developing countries.

Lothian and Taylor (2008) examined the BSH in a non-linear setting, which allowed for shifts in the real exchange rate volatility across nominal regimes. They characterised, statistically, the non-linearity of the real exchange rate using the exponential smooth transition autoregressive (ESTAR) model. Their study was based on three industrialised countries: the UK (1820-2001); the US (1820-2001); and France (1890-1998). Their results were found to support the BSH for the UK-US real exchange rate, but not for the UK-French real exchange rate. They argued that the BSH was not supported for the UK-French real exchange rate, because of the parallel industrial development of the UK and France, which was not the case for the UK and the USA.

Thomas and King (2008) extended Chinn's (2000) study by relaxing the restrictive assumptions and expanding the sample size. They argued that the use of restrictive assumptions and the smaller sample size could have had an impact on Chinn's test of the BSH for 9 Asian countries. Chinn's (2000) sample size ranged from 12 (China) to 21 (Japan), with a median of 16 observations. Thus, these authors contended that the small sample size might have compelled Chinn (2000) to use those simplified assumptions, in order to be able to account for short-run dynamics. Thomas and King (2008) found fair evidence for the BSH when they applied Chinn's model to their larger dataset. They obtained relatively strong evidence for the BSH when they relaxed the restrictive assumptions of Chinn's model.

Finally, Chowdhury (2012) tested the BSH in the seven South Asian countries employed by Faria and Leon-Ledesma (2003), using the ARDL bounds testing technique. His dataset was drawn from the Penn World Tables 7, with varying sample sizes, which terminated in the year 2007. He found two endogenous structural breaks in the data and incorporated them into the empirical model to capture any non-linearity in the series. This author found no evidence in support of the BSH in 6 out of the 7 South Asian countries, namely: Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. However, his results supported the BSH for Bangladesh over the period 1959-2003. His results suggested, specifically, that a percentage

increment in the productivity of labour in Bangladesh relative to the US, had led to about 2.5% appreciation of the real exchange rate in Bangladesh.

Table 4.2: Time Series Evidence

Author (Year)	Dependent Variables(s)	Independent Variable(s)	Countries and Period	Conclusion
Hsieh (1982)	Real exchange rate	Productivity proxies: 1. Growth in labour productivity differentials (foreign and domestic); 2. Rate of growth of unit labour costs of tradables	8 OECD countries 1954 – 1976	Supported
Rogoff (1992b)	Real exchange rate	Productivity; Oil price; Government spending	Japan and US 1975Q1 – 1990Q3	Not supported
Bahmani-Oskoee (1992)	Real exchange rate	Productivity ratios	6 Developing countries 1960 – 1988	Inconclusive
Strauss (1995)	Real exchange rate; Relative prices of non-tradables; PPP	Productivity	14 OECD countries 1960 – 1990	Not supported
Bahmani-Oskooee and Rhee (1996)	Real exchange rate	Relative productivity	Korea 1979 – 1993	Supported
Strauss (1996)	Real exchange rate; Relative prices of non-tradables; PPP	Productivity	7 OECD countries 1960 – 1990	Supported
Ito *et al* (1999)	Average change in the real exchange rate	Relative growth rate	APEC countries 1973 – 1995 (except Chile); 1975 – 1995 (Chile)	Supported
DeLoach (2001)	Relative prices	Real price of oil; Real output	9 Countries Varying (quarterly)	Supported
Égert (2002a)	Real exchange rate	Relative prices; Labour productivity	The Czech Republic; Hungary; Poland; Slovakia; Slovenia Varying (monthly)	Not supported
Faria and Leon-Ledesma (2003)	Relative prices	Per capita output	Germany; Japan; United Kingdom; US 1960Q1 – 1996Q4	Not supported
Bahmani-Oskooee	Real exchange rate	Productivity ratio	44 countries	Inconclusive

and Nasir (2004)			1960 – 1990	
Katsimi (2004)	Relative prices	Productivity proxies: 1. Sectorial wage differentials; 2. Productivity differentials	7 EU countries 1970 – 1996	Inconclusive
Mihaljek and Klau (2004)	Differential inflation	Productivity growth	6 Central European economies 1993Q1 – 2002Q1	Supported
Égert (2005)	Relative prices; Real exchange rate	Productivity differential	Estonia 1993Q1 – 2002Q1	Supported
Gente (2006)	Real exchange rate	Productivity; Preference; Age dependency ratio; Level of external constraint	6 Asian countries 1970 – 1992	Supported
Lothian and Taylor (2008)	Real exchange rate	Real GDP per capita	US; UK; France 1820 – 2001 for UK; 1820 – 2001 for US; 1890 – 1998 for France	Inconclusive
Thomas and King (2008)	Real exchange rate	Labour productivity; Financial crisis dummy; Government spending; Terms of trade; Real oil price; Real per capita income	9 Asian countries Varying	Supported
Chowdhury (2012)	Relative prices	Relative productivity	7 Asian countries Varying	Inconclusive

4.2.3.3 Panel Data Approaches

Table 4.3 shows a summary of the panel data studies on the BSH. Asea and Mendoza (1994) were among the earliest to test the BSH in a neoclassical general equilibrium model. They derived two main long-run balanced growth implications of the BSH: (i) productivity differentials explained the international differences in non-tradable relative prices; and (ii) deviations from PPP reflected differences in non-tradable prices. They examined their closed-form solutions with panel data methods – fixed effects, random effects, and seemingly unrelated regression (SUR) – applied to the long-run components of the sectorial data from OECD countries, which had been constructed using the Hodrick-Prescott filter. Their results supported the BSH. However, the results were weak in explaining the long-run deviations from the PPP.

De Gregorio *et al* (1994a) attempted to account for the cause of the real appreciation of the exchange rates in France, Germany, Italy, Spain and the UK. These authors employed time series and panel regressions to do this. For the time series approach, they used country-level data for each country, spanning the period 1960-1991; the pooled data, on the other hand, covered the period 1971-1989. They made two crucial assumptions in their framework: (i) that non-tradable goods were produced by firms operating in a monopolistically competitive market; and (ii) that wages were determined by labour unions, which were centralised. They estimated the time series regressions with the OLS method, and the panel regressions with the SUR method. They found the BSH to have played a crucial role in the real exchange rate appreciation. They also found that the private sector demand was significant in explaining the appreciation. In another study, De Gregorio *et al* (1994b) examined the drivers of sectorial differences in inflation for 14 OECD economies. They estimated a reduced-form equation, with sectorial data over the period 1970-1985. They found demand-side factors, such as income growth and real government expenditure, to be crucial in explaining sectorial differences in inflation. Their study, therefore, provided support for the BSH for these OECD countries.

In addition, Chinn (1997) examined the determinants of real exchange rates in the short and long run for 14 OECD countries over the period 1970-1991. The author estimated the Phillips-Loretan (1991) non-linear model with the Johansen and the Pedroni co-integration techniques for time series data and panel data, respectively. The results showed that real exchange rates and productivity differentials were strongly related in the long run under panel data rather than under time series data. Thus, the BSH played a critical role in explaining the real exchange rates for these countries. In a similar study, Chinn (2000) tested the relationship between real exchange rates and relative productivity ratios for 9 East Asian countries over the period 1970-1992. He found real exchange rates and relative productivity ratios to be related for Japan, Malaysia and the Philippines (and Indonesia and Korea when oil prices were incorporated), using time series regressions. Also, he found real exchange rates and relative productivity ratios to be related for Indonesia, Japan, Korea, Malaysia and the Philippines, using a panel data regression. These results appeared to support the BSH for some of these countries. The evidence from the panel data regression was more supportive of the BSH than the findings from the time series regressions.

Canzoneri *et al* (1999) tested the two main implications of the BSH: (i) the relative price of non-tradable goods in each country reflected the productivity of labour in the tradable and non-tradable goods sectors; and (ii) purchasing-power parity (PPP) held for tradable goods. They examined these implications, using a panel data spanning 1970-1992 for 13 OECD countries. The results from their panel co-integration test indicated that the relative price of non-tradable goods and the relative sectorial labour productivity in the tradable and non-tradable goods were related in the long run. The evidence in favour of the PPP for tradable goods was weak. Their study lent some support to the BSH.

Bahmani-Oskooee and Nasir (2001) examined the BSH in a panel framework of 69 countries, which spanned the period 1960-1990. They used four different panel data estimation approaches – the OLS, the GLS, the LSDV, and the GLSDV – to estimate the empirical model. They found their results to support the BSH. Their results were also sensitive to the model specification and the estimation procedure. In a different study, Bahmani-Oskooee and Nasir (2002) tested the BSH in an empirical model, which controlled for institutional rigidities, such as corruption, inefficient bureaucracy, and the absence of the rule of law. Using a panel of 65 countries over the period 1982-1990, they estimated cross-sectional regressions and panel regressions. Their results confirmed the BSH, even after controlling for institutional rigidities. They also found institutional rigidities to explain the movement of the real exchange rates in these countries.

Drine and Rault (2002) compared the performance of time series techniques with panel data techniques in verifying the BSH, using the annual data for six Asian countries. In particular, they compared results from the Pedroni co-integration test to those of the Johansen co-integration test. The evidence of a long-term relationship between real exchange and productivity differentials was supported by the Johansen test for the sample. However, the hypothesis was rejected by the Pedroni test. They argued that the absence of a positive relationship between the productivity differential and the relative prices was the reason for the rejection. Drine and Rault (2003) undertook a similar study for 20 Latin American countries, using both time series techniques and panel data techniques. They found that the time series techniques rejected the BSH in 11 of the 20 countries. The panel data techniques, however, found fairly strong evidence in favour of the BSH. The authors, again, examined the BSH, using the annual data for 12 OECD countries in 2005, comparing the results from the time series techniques to those of the panel data techniques. The results of the time series

techniques were unable to detect the BSH for the 12 OECD countries. The panel data techniques did detect the BSH for 8 of the 12 countries (see Drine & Rault, 2005).

Égert (2002b) examined the BSH in five countries in Europe: the Czech Republic, Hungary, Poland, Slovenia, and Slovakia over the period 1991Q1-2001Q2. He employed time series and panel techniques to do this. He found the BSH to be valid for these countries, using both techniques. In a similar study, Égert *et al* (2003) verified the BSH for nine Central and East European countries, using panel co-integration techniques. They found the BSH to hold for these countries. They argued that the real appreciation of the exchange rate of these countries over the last decade was partly due to the BS effect. The remaining cause, they argued, was due to the trend increase in the prices of tradable goods.

Guillaumont Jeanneney and Hua (2002) explained the observed differences in inflation between Chinese provinces with the aid of the BS effect. They derived a three-good framework, which accommodated the specific features of the Chinese economy: the BS effect and the demand-side factors. They tested their framework using cross-sectional and panel data techniques over the sample period 1992-1999. Their results indicated that the BS effect was fundamental in explaining the observed differences in inflation among the Chinese provinces. They argued that their evidence could indicate that the Chinese economy was a market economy. The relevance of their study was that it confirmed the BSH for China.

Fischer (2004) contended that studies which continued to solely attribute the continuous real appreciation of the exchange rates of the Central and East European (CEE) transition countries to the BS effect might well require revision. In a simple model, he argued that productivity shocks are being transmitted through a Balassa-type supply channel, and through an investment-demand channel. He tested this model using a panel of CEE countries. According to Fischer, the results were consistent with the conclusions of his simple model – investment demand, apart from the BS effect, played a role in the real appreciation of the exchange rates of the CEE countries.

Choudhri and Khan (2005) contended that the BSH had been less examined in the developing country context. They therefore examined whether or not the BS effect could be used to explain the long-term behaviour of real exchange rates in the developing countries. They set up a multi-country model, in which each country employed fixed endowments of labour and

capital to produce tradable and non-tradable goods under perfect competition, in a similar fashion to Armington (1969). They estimated the resulting implications of the model for the BSH for 16 developing countries over the period 1976-1994, using the Dynamic Ordinary Least Squares (DOLS). Their results supported the BSH for the 16 developing countries.

Garcia-Solanes *et al* (2008) investigated the plausibility of the BSH for two groups of EU member countries, namely: six new member states (NMS), and six old member states (OMS), using panel data techniques. These authors adapted the two-step procedure of Canzoneri *et al* (1999) to do this. They calculated the productivity of labour, sectorial prices, and real exchange rates for the period 1995Q1-2004Q3, with the fourth quarter of 1995 as the base. Their results supported the BSH for the NMS, but rejected the hypothesis for the OMS. The NMS framework allowed for the incorporation of variables, which accounted for quality improvements in the tradable sector and increases in the demand for domestic tradable goods. They argued that the BSH was refuted in the case of the OMS, because national markets of tradable goods remained segmented. They attributed this segmentation to political interests, imperfect competition, and transportation costs (see Garcia-Solanes *et al*, 2008).

Genius and Tzouvelekas (2008) examined the BSH for 59 countries: both developing and developed countries. They estimated the standard BS model within a panel data setting using the OLS and the Prais-Winsten feasible generalised least squares (FGLS) techniques for the period 1965-1992. They found the BSH did not hold for most of the African and Latin American countries in their sample. The BSH was valid for OECD and Asian countries in the sample. Their results also underscored the role of time-effects in the BSH. They argued that labour productivity effects on the real exchange rate were weakened in the Seventies; they attributed this to the end of the Bretton-Woods agreement, and to the first oil price shock.

Peltonen and Sager (2009) investigated the relationship between equilibrium exchange rates and productivity, using panel data techniques. They, in particular, investigated whether or not productivity shocks in either the tradable or the non-tradable sectors of the domestic economy might have caused depreciation of the real exchange rate, consistent with the findings of Bergin *et al* (2006). Their study was based on 21 advanced economies, 24 emerging market economies, and 19 other economies, for the period 1990-2004. They found a significant correlation between real exchange rates and relative productivity differentials in the tradable and non-tradable sectors. These authors argued that the significant role of the non-tradable

sector in exchange rate determination, and the large correlation between exchange rates and productivity shocks from the non-tradable sector, as shown by their results, was in contrast with the BSH. This, they contended, was valid even after they had controlled for the exchange rate regime and the *numéraire* currency.

Guo and Hall (2010) examined the role of the BS effect in explaining regional inflation in China over the period 1985-2000. They extended the model developed by Asea and Mendoza (1994) to incorporate asymmetric productivity shocks across the sectors of the Chinese economy. They constructed proxies for inflation and industrial input for the regions and sectors. These authors employed non-stationary panel data techniques to examine their extended model. The results of their estimations showed that the Chinese data favoured the BS effect. In addition, their results – which were based on the Asea-Mendoza model – showed that the Chinese data did not favour the restrictions.

Finally, Chong *et al* (2012) estimated the equilibrium adjustment paths of the real exchange rate semi-parametrically in a dynamic panel setting, employing new local projections techniques for co-integrated systems. Their study was based on 21 OECD countries for the period 1973Q2-2008Q4. Their results provided support for the BSH for these countries. They found, in addition, that adjustment to the equilibrium has a half-life closer to 1.5 to 2 years, in the long run. This adjustment was considerably shorter than the ones that had been presented in previous studies. Short-run demand shocks and frictions were found to be more crucial in this mechanism than technology and real shocks.

Table 4.3: Panel Data Evidence

Author (Year)	Dependent Variable(s)	Independent Variable(s)	Countries and Period	Conclusion
Asea and Mendoza (1994)	Relative price proxies used: 1. Real exchange rate; 2. Relative price of non-tradables	Capital-labour ratios of tradables and non-tradables; Investment-output ratio	14 OECD countries 1970 – 1985	Supported
De Gregorio *et al* (1994a)	Real exchange rates	TFP differentials; Government expenditure to GDP; Nominal share of private spending in tradables	France; Germany; Italy; Spain; UK 1971 – 1989 (pooled) 1960 – 1991 (time series)	Supported
De Gregorio *et al* (1994b)	Relative prices of non-tradables	TFP; Government expenditure to GDP; Real	14 OECD countries	Supported

		GDP per capita; Differential inflation	1970 – 1985	
Chinn (1997)	Real exchange rates	Productivity differentials; Oil prices	14 OECD countries 1970 – 1991	Supported
Canzoneri *et al* (1999)	Real exchange rate	Productivity	13 OECD countries 1970 – 1992	Supported
Chinn (2000)	Relative price proxies used: 1. Real exchange rates; 2. Relative prices; 3. Productivity differentials	Average labour productivity; Government consumption; Oil prices	9 East Asian countries 1970 – 1992	Supported
Bahmani-Oskooee and Nasir (2001)	Real exchange rate	Productivity	69 countries 1960 – 1990	Supported
Bahmani-Oskooee and Nasir (2002)	Real exchange rate	Productivity; Corruption; Bureaucracy; Law and order	65 countries 1982 – 1990	Supported
Drine and Rault (2002)	Real effective exchange rate	Average Productivity of tradable and non-tradable sectors	India; Indonesia; the Philippines; Singapore; Thailand 1983 – 1998	Not supported
Égert (2002b)	Relative price proxies used: 1. Real exchange rate; 2. Relative price of non-tradables	Average labour productivity	9 transition Central and Eastern European (CEE) countries 1995 – 2000	Supported
Guillaumont Jeanneney and Hua (2002)	Real effective exchange rate	GDP per capita (national); GDP per capita (province); Provincial budget expenditure; Terms of Trade; Credit policy	China 1992 – 1999	Supported
Drine and Rault (2003)	Real exchange rate	Real GDP per capita	20 Latin American countries 1960 – 1999	Supported
Égert *et al* (2003)	Relative price proxies used: 1. Relative prices of non-tradables; 2. Real exchange rate	Labour productivity;	9 transition (CEE) countries 1995Q1 – 2000Q4	Supported
Fischer (2004)	Real exchange rate	Real interest rate; TFP; Relative government consumption	Varying number of CEE countries Varying Samples	Supported

Choudhri and Khan (2005)	Relative price proxies used: 1. Real exchange rate; 2. Differential relative prices	Terms of trade; Productivity ratio	16 countries 1976 – 1994	Supported
Drine and Rault, 2005	Real exchange rate	Productivity proxies used: 1. Real GDP per capita; 2. Added sectoral value; 3. average productivity of both sectors	12 OECD countries 1970 – 2002	Inconclusive
Garcia-Solanes *et al* (2008)	Real exchange rate	Real income differentials	EU: 6 New Member States; 6 Old Member States 1995Q1 – 2004Q3	Inconclusive
Genius and Tzouvelekas (2008)	Real exchange rate	GDP per capita	59 developed and developing countries 1965 – 1992	Inconclusive
Peltonen and Sager (2009)	Real exchange rate	Relative sectoral labour productivity; EMU dummy, Currency crisis dummy; Term of Trade, Net Foreign Assets; Government consumption	64 countries: 21 Advanced; 24 Emerging Markets Economies; 19 Others 1990 – 2004	Not supported
Guo and Hall (2010)	Relative price proxies used: 1. Real exchange rate; 2. Relative price differences	Labour productivity; Sectoral capita stock	China 1985 – 2000	Supported
Chong *et al* (2012)	Real exchange rate	Real GDP per capita	21 OECD countries 1973Q2 – 2008Q4	Supported

4.3 The Real Exchange Rate and Economic Growth

4.3.1 The Theoretical Models

The theoretical literature on the linkages between the real exchange rate and economic growth is still very limited. The real exchange rate has, for a long time, been viewed as not affecting economic growth. Traditional models of economic growth have viewed the real exchange rate as an endogenous variable. Therefore, the real exchange rate has mostly been determined in the past within the general equilibrium frameworks in which its values were influenced by productivity, preferences and factor endowments, among other parameters (see Razmi *et al*, 2012). It is now obvious, from recent empirical findings, that the real exchange

rate correlates with the nominal exchange rate, at least, the majority of the time. And since the nominal exchange rate could be manipulated by policies in order to stimulate economic activities, it should be logical for us to expect the real exchange rate to work in a similar fashion. A very detailed theoretical insight into the growth impact of real exchange rates was developed by Rodrik (2008). Since then, other theoretical papers have emerged. Beginning with Rodrik (2008), the study presents the theoretical literature on the links between the real exchange rate and economic growth, in what follows.

Rodrik (2008) examined the impact of the real exchange rate on economic growth within a simple dynamic equilibrium framework. He set up a small open economic structure in which the tradable and non-tradable sectors were "taxed" or distorted. The "taxes" created a significant wedge between private and social benefits. He demonstrated that when taxes in the tradable sector are larger than those in the non-tradable sector, resources in the economy would be misallocated. Moreover, the tradable sector would be small, resulting in suboptimal growth rate. An economic structure such as this, Rodrik argued, could experience growth if its real exchange rate depreciated mildly. The reason, he explained, was that if the real exchange rate depreciated, tradable goods become lucrative. Rodrik attributed the taxes in such an economy to the existence of weak institutions and market failures.

Gala (2008), and Gala and Libanio (2010) extended Bhaduri and Marglin's (1990) model to evaluate the links between the real exchange rate and economic growth. They specified two functions: (i) an aggregate investment function, which depended on capacity utilisation and profit margins; and (ii) a consumption function, which depended on real wages. They derived two equations that related savings and investment levels to real exchange rates and real wages. They showed that, if workers do not save, higher real wages and real appreciation would lower savings rates and consumption levels. Alternatively, lower real wages and real depreciation would stimulate profit growth and investment. Aggregate demand, capacity utilisation, and savings would also be stimulated, as a consequence. They concluded that competitive currencies might increase investment and savings, and stimulate capital accumulation and economic growth.

Aghion *et al* (2009) examined the interaction between exchange rate flexibility and financial development, and how their interaction impacted productivity growth. They examined this issue within a simple open economy, which was populated by overlapping generations of

two-period lived entrepreneurs and workers. In their model, productivity grows as a consequence of innovation by entrepreneurs who have enough funds to contain short-run liquidity shocks. In addition, nominal exchange rate movements influenced macroeconomic volatility, given wage stickiness. They argued that unless exchange rates were pegged, risk premium shocks induced excess exchange rate volatility sufficiently to offset real shocks. These authors concluded that higher levels of volatility marred economic growth, especially in countries with small capital markets, where macroeconomic volatility was largely due to financial shocks.

Korinek and Serven (2010) evaluated the impact of real exchange rate intervention on welfare in a formal dynamic model of an economy characterised by learning-by-investing externalities. Their model was a small open economy model with two intermediate goods sectors – the tradable and the non-tradable goods sectors – that employs labour and capital. The tradable and the non-tradable goods were combined to produce a final item, which was suitable for both consumption and investment. The capital account of this small open economy was closed for private agents but open to the government, which can trade financial assets with the rest of the world. They demonstrated that real undervaluation raised the relative price of tradable goods relative to non-tradable goods, which distorted the economy. And given that the tradable goods sector was more capital-intensive, the returns on capital would be increased, leading to a faster rate of capital accumulation, based on the Stolper-Samuelson theorem. In addition, given that learning-by-investing externalities were directly related to capital accumulation, there would be dynamic welfare gains. Thus, a devalued real exchange rate via capital accumulation would be socially desired, if the learning-by-investing impact in the economy is strong.

Gente and Nourry (2011) developed a two-sector overlapping generations model. This model related capital movements to economic growth and real exchange rate. Gente and Nourry's (2011) model contained two production sectors: the tradable sector and the non-tradable sector. They assumed a world of two countries, which accumulated human capital and experienced endogenous growth. In addition, they normalised the price of tradables, so that the price of non-tradables represented the domestic real exchange rate. Gente and Nourry (2011) demonstrated that trade openness and capital movements resulted in the divergence between countries' growth rates barring cross-border externalities in human capital accumulation. And that capital mobility could induce real exchange rate misalignments,

which reduced economic growth and promoted divergence in income, in a less altruistic economy. Thus, in their 2x2x2 overlapping generations model, economic growth depended on real exchange rate through human capital accumulation.

Razmi *et al* (2012) investigated the links between the real exchange rate and sustainable economic growth. They developed a stylised model for a small open economy with two sectors: a modern sector that produces tradable goods; and a traditional sector that produces non-tradable goods. The modern sector employs capital, which was usually imported, but the traditional sector did not. The crucial assumption of the model was that there was substantial hidden unemployment in the economy. According to these authors, the real exchange rate determined the composition of employment in this economy. Thus, the real exchange rate could be employed to stimulate the accumulation of capital and economic growth in this economy. They argued that non-tradable output and employment were demand-led; so that increase in investment could stimulate output and growth rate (i.e. growth is investment-led). However, the investment stimulus affected balance-of-payment. This meant that suitable real exchange rate policies must be pursued to ensure sustainability of the investment-led growth stimulus. Thus, the real exchange rate was crucial to successful economic development, according to these authors.

Lima and Porcile (2013) examined the role of different preferences of government, capitalists and workers in influencing the dynamics of the real exchange rate. They built a dynamic open economy of capacity utilisation and growth, which has a monetary authority that regulates the nominal exchange rate. Capitalists and workers who have different consumption patterns populated this economy. They assumed further that: (i) the economy produced a single good that can be consumed or invested; (ii) this good was produced through a combination of two domestic factors (labour and capital) or imported intermediate input; and (iii) that capitalist firms operated in an oligopolistic market and produced the domestic good. They showed that economic growth and capacity utilisation moved with the real exchange rate. They also showed the nominal exchange rate to move whenever the real exchange rate differed from the desire rate of the government and the capitalists. Lima and Porcile argued that when government preoccupied itself with preserving workers' share of income by regulating the nominal exchange rate, the economy undergoes endogenous cyclical fluctuation in the real exchange rate and growth, which appeared to be experienced by developing countries. These

authors shed light on the need to incorporate the real exchange rate and income distribution in future growth regressions.

Bussière *et al* (2014) developed a simple open economy model that linked productivity and interest rate shocks to the real exchange rate, gross domestic product, and current account. Their model assumed that firms faced idiosyncratic fixed costs so that initial steady state gross profits covered the fixed costs of each marginal firm. The gross profits were affected by productivity and interest rate shocks. Thus, in the short term, firms, which were unable to cover their fixed costs, must shut down. Also, the model assumed that no firm could be created in the short term due to the huge amount of time and capital required. Bussière *et al* (2014) showed that shocks, which adversely affected gross profits in the tradable goods sector, reduced the number of firms in that sector, but none was created in the non-tradable goods sector. Because they assumed that each firm faced decreasing returns to scale, lower number of firms resulted in lower output. They argued that shocks to world interest rate (in the form of increment) triggered a real appreciation, and reduced profits in the non-tradable goods sector. This resulted in the reduction of the number firms, and output. Similarly, a reduction in world interest rate reduced profits in the tradable goods sector, and consequently, output. Therefore, either way, shocks to the interest rates reduced output. Appreciations due to capital inflows, they argued, were associated with weak economic growth. Conversely, appreciations associated with productivity shocks led to high economic growth. They argued that real appreciations due to capital flow shocks were accompanied by low growth because of frictions (externalities) in their model (see Bussière *et al*, 2014).

4.3.2 The Empirical Evidence

On the empirical front, various studies have looked into the links between the real exchange rate and economic growth around most parts of the globe. The debate has often revolved around what constituted the right measure of real exchange undervaluation or overvaluation. Another important argument on the real exchange rate issue is whether or not real exchange rate misalignments dampen economic growth and whether the effect is linear. In this section, the study points out two main gaps this thesis fills: (a) the disagreement on the measure of real exchange rate undervaluation or overvaluation, and (b) the evidence on the linearity hypothesis. Table 4.4 shows a summary of the empirical studies on the impact of real exchange rate (misalignments) on economic growth.

Ghura and Grennes (1993) were, perhaps, the first to empirically examine the impact of real exchange rate misalignments on economic performance for sub-Saharan African (SSA) countries. These authors employed a pooled and cross-sectional data for 33 SSA countries over the period 1972-1987 to examine two issues: (i) the impact of real exchange rate misalignments on economic performance; and (ii) the impact of the variability of the real exchange rate on economic performance. They employed three measures of misalignments: purchasing power parity (PPP)-based measure, model-based measure, and the black market premia. The evidence from their regression estimates indicates that real exchange rate misalignments have an adverse impact on economic performance. In addition, they found higher levels of real exchange rate variability to enhance macroeconomic instability, which does not promote economic performance.

Domac and Shabsigh (1999) argued that the adverse role of real exchange rate misalignments on economic performance has rarely been examined in Arab countries. They pointed out that the lack of consensus on what measure should be used as an indicator of misalignment could account for the dearth in the literature, especially for the Arab countries. Their paper, thus, fills this gap by examining the effect of real exchange rate misalignments on economic performance for Egypt, Jordan, Morocco and Tunisia, and also by constructing three alternative measures of exchange rate misalignment. The three measures of misalignment constructed were: (a) a purchasing power parity-based measure, (b) a black market rate-based measure, and (c) a model-based measure that captures "policy induced misalignment." Using Three Stage Least Squares and a pooled data from 1970 to 1995, Domac and Shabsigh (1999) find economic performance to be adversely affected by all the measures of real exchange rate misalignment. Their findings were in line with the harmful effects of misalignment on economic growth predicted by endogenous growth models. The paper also indicates that other factors influence economic growth. For instance, both capital stock and population have the theoretical signs predicted by the Solow Model. The authors concluded that the decline in the economic growth rate in these countries should be attributed to economic mismanagement rather than a decline in external terms of trade.

Bleaney and Greenaway (2001) attempted to explain why the specialisation in primary product exports has an adverse impact on economic growth. They argued that the high volatility of primary product prices explains this phenomenon. They examined their argument empirically using a sample of 14 sub-Saharan African countries, namely: Botswana, Burkina

Faso, Cameroon, Cote d'Ivoire, The Gambia, Ghana, Kenya, Malawi, Mauritius, Niger, Senegal, Tanzania, Togo and Zimbabwe over the period 1980-1995. They modelled the price volatility using a GARCH(1,1) process. Their growth regressions included terms of trade and real exchange rate variables, inflation and two lags of GDP. Their investment regressions included these same variables. Their findings indicate that economic growth increases when terms of trade increases, and the real exchange rate remains competitive. Their findings imply, therefore, that competitive exchange rates are crucial for economic growth in the sub-Saharan African countries sampled.

Moreover, Aguirre and Calderon (2005) provided answers to the fundamental debates surrounding the appropriate measures of real exchange rate misalignment, and how real exchange rate misalignments (and real exchange rate volatility) affect economic growth. They calculated real exchange rate misalignments as deviations of actual real exchange rates from their equilibrium levels for 60 countries over the 1965-2003 period, employing panel and time series co-integration techniques. In particular, the African countries included in their sample were South Africa, Tunisia, Morocco, Egypt, Algeria, Côte d'Ivoire and Botswana. Aguirre and Calderon (2005) found real exchange rate misalignments to adversely affect growth, using dynamic panel techniques; however, they found the impact to be nonlinear. They argued that growth declines are larger for larger misalignments. Again, Aguirre and Calderon (2005) revealed that whereas large undervaluation was associated with declining growth, mild undervaluation was growth-enhancing. This study indicated that a growth-led real exchange rate policy would be difficult to pursue and that highly volatile real exchange rate misalignments do not favour economic growth.

Dubas *et al* (2005) studied the links between exchange rate regimes and economic growth across countries. In doing this, they advanced a new econometric technique for deriving *de facto* exchange rate regime classifications. Their technique assumed that *de jure* exchange rate regimes are outcomes of a multinomial logit choice problem, which is conditioned on a country's effective exchange rate volatility, international reserves and a bilateral exchange rate. The "true" exchange rate regime was then estimated as a random-effects panel regression. They obtained the "effective" *de facto* exchange rate regime classification by assigning country-year observations to the regime, which has the highest predictive probability estimated from the multinomial logit choice problem. The authors drew a panel of 180 countries spanning 1960-2002. They then regressed economic growth on the exchange

rate regimes. Their empirical results suggest that economic growth was higher under stable currency-value regimes. They concluded that countries that were adamant to float their exchange rates attained higher economic growth.

Hausmann *et al* (2005) identified the turning points in economic growth across countries in their study. They considered episodes of rapid growth accelerations, which were sustained for not less than eight years, using innovative linear regression techniques. The authors defined growth acceleration as an increment in growth per capita equal to or greater than 2%. The growth rate was qualified as being "acceleration" if it could be sustained for eight years or more and the post-acceleration growth rate was at least 3.5% annually. Their sample consisted of 110 countries, which varied between the 1957 and 1992 period. They found that 60 of the countries had at least one growth acceleration rate over the study period. African countries dominated the episodes of growth acceleration in the entire sample, when the authors took into account growth accelerations per continents. Overall, more than 80 episodes of acceleration were identified by their study. Of particular importance to the current study is that Hausmann *et al* (2005) found the growth accelerations to be positively correlated with real exchange rate depreciations. This suggests that real appreciations are important for economic growth, given other factors.

Gala and Lucinda (2006) studied the effects of exchange rate misalignments on economic growth for a panel of 58 developing countries over the period 1960-1999. Their main contribution to the literature is that they constructed an index of overvaluation, which took into account the Balassa-Samuelson effect. They argued that by constructing an exchange rate index, which adjusted for the Balassa-Samuelson effect, they were able to control for the series of appreciation that resulted from productivity increases. These authors, then, presented empirical estimates that were based on OLS and GMM techniques. Their estimates imply that productivity differentials are crucial in evaluating the impact of exchange rate misalignments on economic growth. In addition, they found that a more devalued exchange rate has a positive and significant impact on economic growth. Specifically, they found that if the real exchange rate is devalued by 10%, given that other factors remain unchanged, the real income per capita increases on average by 0.122%.

Freund and Pierola (2008) investigated how exchange rate stimulates exports in developing countries and whether the channel was consistent with some type of externality or market

failure. They studied 92 episodes of export surges, which they defined as significant increase in manufacturing export growth sustained for seven years or more. The relevant African countries included in their study were South Africa, Benin, Burkina Faso, Congo, Equatorial Guinea, and Togo. Freund and Pierola (2008) found export surges in developing countries to be accompanied by excess real exchange rate depreciation and a reduction in exchange rate volatility. Their study revealed that the role of real exchange rate was less conspicuous in developed economies, contrary to what was seen in developing economies. The main reason attributed to this was that depreciation spurs significant resource reallocation in the export sectors of developing countries. Firms in developing economies are able to venture into new products and markets as depreciation ensues, and that the percentage of new entrants' failure declines. The study indicated that new products and new markets accounted for 25% of export growth during the surge in developing countries. Freund and Pierola (2008) argued that competitive currencies are essential for firm expansion (both in terms of product and market space) for exports, which stimulates huge trade reorientation.

Gala (2008) argued that the literature had ignored the theoretical building blocks and, instead, concentrated on the measures of real exchange misalignments and how these misalignments affect economic growth. Gala (2008) contributes to the literature by bringing in more theoretical elements and providing new econometric evidence. His study focuses on macro programming aspects of development, neglecting the more traditional trade and industrial policy treatments. Building on the Bhaduri-Marglin Framework, Gala (2008) showed that competitive currencies might increase the investment and savings necessary for economic growth. The study further showed that even when the model is extended to an open economy, real devaluation decreases the real wage and increases profit margins for given productivity levels. Income, exports and investment would rise insofar as the two macro-functions in the model are sufficiently elastic; and that the overall effect on external accounts would be positive provided that the Marshall-Lerner conditions are satisfied (see Gala, 2008). Using PPP based measures of real exchange rate for a panel of 58 developing countries (including South Africa, Botswana, Malawi, Zambia, Zimbabwe and Congo DR) from 1960 to 1999, the study found real exchange rate levels to be relevant to GDP per capita growth rates.

Rodrik (2008) examined the relationship between real exchange rate movement and economic growth for a group of developed and developing countries. The main contribution of the study was to show that undervaluation enhances economic growth, just as

overvaluation hurts it. That is, Rodrik (2008) established the symmetry (linearity) hypothesis. To do this, Rodrik (2008) constructed a time-varying index of real exchange rate undervaluation based on Penn World Tables data on price levels in individual countries. This index was calculated as real exchange rate adjusted for the Balassa-Samuelson effect. Using a panel data set consisting of a maximum of 184 countries and eleven 5-year time periods from 1950-54 to 2000-04, in a variety of fixed-effects panel specifications, Rodrik found a systematic positive relationship between economic growth and undervaluation. This relationship, he argued, seemed to hold only for developing countries; it disappeared when the samples were limited to richer countries. Rodrik (2008) explained that while it is difficult ascertaining causality, in this instance, causality is likely to run from undervaluation to growth rather than the other way round. Rodrik (2008) continued that tradable economic activities are "special" in developing countries, but these activities were hampered by institutional and market failures, which keep these countries poor. Rodrik (2008) was convinced that real exchange rate depreciations enhance the profits of investing in tradables and, thus, act in *second-best* fashion to ease the economic cost of markets and institutional failures; this explains why undervaluations are strongly associated with higher economic growth, in his opinion.

Aghion *et al* (2009) examined the role of exchange rate volatility on productivity growth. The innovation of their study is that they introduced the level of financial sector development into their model. These authors employed the Generalised Method of Moments (GMM) on a dynamic panel consisting of 83 countries over the period 1960-2000. They found the real exchange rate volatility to have a negative impact on productivity growth at a lower level of financial development. In addition, they found the impact of the real exchange rate volatility on productivity growth to be nonlinear. They argued that their findings were robust to outliers, time window, and alternative measures of financial development and exchange rate volatility.

Béreau *et al* (2009) examined the links between the real exchange rate misalignments and economy in 32 countries, both developed and developing, for the period 1980-2007. To avoid the use of purchasing power parity (PPP)-based measures of the real exchange rate misalignments, these authors constructed the variable using the behavioural equilibrium exchange rate (BEER) approach. They accounted for possible short-term deviations associated with their BEER misalignments index using various panel co-integration

techniques. They argued that the effect of the real exchange rate misalignments on growth could be nonlinear. They resolved this problem using the panel smooth transition regressions (PSTR). Their results suggest that overvaluation reduces economic growth; undervaluation, on the other hand, enhances economic growth.

Berg and Miao (2010) studied the impact of real exchange rate misalignments on economic growth. Their empirical investigation was aimed at verifying two contradictory conclusions – the Washington Consensus argument that real exchange rates misalignments do not favour economic growth, and Rodrik's (2008) conclusion that undervaluation enhances economic growth. They examined these conflicting views by constructing two indexes of misalignment: one that was based on the fundamental equilibrium exchange rate (FEER) approach, and the other which was based on Rodrik's (2008) approach. Their empirical analysis involved a sample of 181 countries, which spanned 11 five-year time periods from 1950-54 through 2000-04. They found evidence in support of the Rodrik's (2008) conclusion; meanwhile, the argument put forward by the Washington Consensus was refuted by their findings.

Sallenave (2010) also studied the links between real exchange rate misalignments and economic growth using the G20 countries over the period 1980-2006. She first constructed the measure of real exchange rate misalignments for this group of countries using the behavioural equilibrium exchange rate (BEER) approach. She then set up a standard empirical panel growth regression model, which had per capita GDP growth as the dependent variable, and the index of real exchange rate misalignments as the independent variable, in addition to other variables. She estimated this regression model for three separate time periods: 1980-2006; 1980-1995; and 1996-2006. Of relevance to the current study is that she finds real exchange rate misalignments to have a negative and significant impact on economic growth.

Rapetti *et al* (2011) argued that the approach used by Rodrik (2008) to classify the sample into developed and developing countries could have influenced his findings. To rectify this problem, the authors employed alternative approaches. They employed standard growth regressions for 181 countries for 11 five-year periods, which spanned the period 1950-2004. First, they estimated the regressions using Ordinary Least Squares (OLS) and accounted for fixed effects. Second, they estimated the regressions using dynamic GMM technique and accounted for the possibility of simultaneity bias. These authors found undervaluation to

enhance economic growth; and that the effect of undervaluation on economic growth was larger and more robust for developing countries. Their findings also suggest that the effect of undervaluation on economic growth was nonlinear.

Benhima (2012) argued that the economic growth of a dollarised country may be sensitive to exchange rate flexibility. The author investigated this hypothesis within augmented growth regressions, which incorporated a measure of exchange rate flexibility, external dollarisation, and the interaction of these two variables. She verified the empirical validity of her hypothesis using a dynamic panel of 76 countries covering the period 1995-2004. Her results suggested that the higher the level of dollarisation, the stronger the impact of a flexible exchange rate on economic growth. The impact was found to be negative and significant. Her findings, she concluded, were robust to alternative specifications, and endogeneity.

Bussière *et al* (2012) investigated how currency collapses – defined as large nominal depreciations or devaluations – impacted on output levels. They employed an expanded dataset that included 108 emerging and developing countries for the period 1960-2006. They used a mixture of techniques for their empirical investigations: (i) conditional probabilities to examine the likelihood of expansionary depreciations or devaluations and to determine the significance of initial business cycle conditions; (ii) event analysis to evaluate the short- and medium-term behaviours of exchange rates and output levels near currency collapses; (iii) a two-way fixed effects panel regression to support previous methodology; and (iv) a dynamic panel analysis to evaluate the complete short- and long-term impact of currency collapses on output levels. They found, principally, that currency collapses were associated with permanent output losses in the long term. Their estimated output losses ranged between 2% and 6% of the gross domestic product. They also found that the output losses occurred prior to the currency collapses; and that the factors enhancing such collapses are mostly culpable.

Elbadawi *et al* (2012) investigated the links between foreign aid, exchange rate misalignments and economic growth in SSA. According to Elbadawi *et al* (2012), studies, which modelled equilibrium real exchange rates and derive real exchange rate misalignment series, missed controlling explicitly for foreign aid. They argued that when the amounts of foreign aid are unsustainable, real exchange rate misalignment in the form of appreciation could pose dampening threats to exports and economic performance. Elbadawi *et al* (2012) conceded that this dampening effect would be contingent on the foreign assistance

management. Their paper, thus, controls explicitly for foreign aid. Elbadawi *et al* (2012) estimated an error correction version of Elbadawi and Soto's (2008) dynamic general equilibrium model for a world panel comprising annual data for 77 countries spanning 1970-2004, including 36 SSA economies. Elbadawi *et al* (2012) used three econometric estimation methods for the error correction specification: (i) the pooled mean group estimator, (ii) the mean group estimator, and (iii) the dynamic fixed-effects estimator. Their paper finds foreign aid to be a major contributor to exchange rate overvaluation. Besides, foreign aid strongly enhances economic growth for countries with less overvalued exchange rates. Elbadawi *et al* (2012) concluded that whereas overvaluation reduces economic growth, the negative impact would be mild when countries' financial systems are well-developed. Particularly relevant to the current study is the simulation results from their paper. These authors showed that in a low-level financial development regime, a unit standard deviation change in misalignment would lower economic growth by 0.8%. They showed that, if financial development in SSA were at the median level, the loss in economic growth would be 0.7%.

In addition, Gluzman *et al* (2012) contended that the channels through which real exchange rate affect economic growth have not been clearly explained by the literature. As part of examining the growth effects of currency undervaluation, the paper also evaluated the mercantilists contention that undervaluation enhances economic growth. By way of panel regressions, following Rodrik (2005), Gluzman *et al* (2012) find undervaluation to be positively and contemporaneously associated with economic growth. They established the channels through which undervaluation affects economic growth by running a separate panel regression using the components of GDP (i.e., consumption, savings, investment, exports, and imports). They also undertook this exercise in order to test the presence of the export growth-import substitution channel ingrained in the mercantilists view. The authors find undervaluation to positively affect savings, investment and employment. Meanwhile, there was no evidence in support of the export growth-import substitution channel. Thus, undervaluation enhances economic growth through savings, investment, and employment except the external sector. The authors conceded that, whether undervaluation causes growth by itself remains a complex question. Indeed, they noticed the underlying drivers of undervaluation may be either exogenous or endogenous. Hence, Gluzman *et al* (2012) caution that their findings should be interpreted as showing the transmission channels through which policies or factors operated, and not as an ultimate solution to the causality problem.

Razmi *et al* (2012) identified capital accumulation and underemployment as important variables that enhance the correlation between competitive real exchange rates and economic growth in developing countries. They identified this link using panel data regressions for a dataset consisting of 153 countries, spanning the period 1960-2004. Their measure of the real exchange rate undervaluation was based on Rodrik's (2008) approach. In addition, they classified countries into developed and developing, using Rodrik's (2008) classification. They used investment growth as the dependent variable; this variable shows the rate at which capital is accumulated. They argued that the presence of underemployment and the imported capital goods dependency were the channels through which the real exchange rate impacted economic growth, and as such, their panel data regressions accounted for these variables. Their findings suggest that undervaluation has a positive and significant effect on investment growth, especially in developing countries.

Vieira and MacDonald (2012) examined the role of real exchange rate misalignments on economic growth by constructing various indexes of misalignments. First, they constructed seven indexes of real exchange rate misalignments based on fixed effects and random effects. Second, they constructed two additional indexes of misalignment based on panel co-integration. They then employed a standard panel data growth regression model to examine how these measures of misalignment affected economic growth. Using a panel data consisting of 90 countries over the period 1980-2004 and the two-step System GMM estimation technique, these authors found a strong and positive impact of the various measures of misalignments on long-term economic growth, especially for the developing countries in their sample. They concluded that real exchange rate depreciation enhances economic growth, and real exchange rate appreciation dampens economic growth.

Levy-Yeyati *et al* (2013) argued that countries have exhibited the "fear of floating" syndrome in recent times, mainly not to prevent large depreciations, but to rather limit appreciations. They supported their argument by developing a measure of policy intervention, which measures whether countries intervened in the exchange rate market to defend or depress their exchange rate. Their empirical results, which were based on 179 countries and two sample periods: 1974-2007 and 1993-2007, indicate that countries, indeed, exhibit the "fear of appreciation" syndrome. These authors examined, in addition, whether the view that countries defended their exchange rates in order to protect their industries – a concept advanced by neo-mercantilists – was valid or not. Their findings largely supported the view

that depreciated exchange rates promote economic growth, but rather than through export booms or import substitutions as argued by the neo-mercantilists, the channel of growth transmission lies in deepened domestic capital accumulation and savings.

Finally, Bussière *et al* (2014) examined the direction of causal flow between real appreciation and economic growth. The authors also examined the impact of real appreciation on capital flow surges. In order to obviate endogeneity and selection bias problems, they introduced the propensity score matching (PSM) technique, which was mainly used in labour and health economics. These authors drew annual data covering the period 1960-2011 for 68 countries – consisting of 30 advanced and 38 emerging economies. Their empirical findings imply that real appreciations linked with higher productivity have a stronger effect on economic growth than real appreciations linked with inflow of capital. They argued that their conclusions were robust even when they limited their specifications to cases of strong real appreciations.

Table 4.4: Real Exchange Rate and Economic Growth: The Empirical Evidence

Author(s)	Dependent Variable	Independent Variable(s)	Method(s)	Sample Period (Number of Countries)	Conclusion(s)
Ghura and Grennes (1993)	Real GDP per capita growth	Capital stock; Population growth; Measures of RER misalignments; TOT growth; Investment	Panel regression; OLS	1972 – 1987 (33 SSA countries)	RER misalignments affect economic performance negatively
Domac and Shabsigh (1999)	Real GDP per capita growth	RER variability; Investment/GDP; TOT growth; Population growth	Panel regression; 3SLS	1970 – 1995 (4 countries; Egypt, Jordan, Morocco and Tunisia)	RER misalignments affect economic performance negatively
Bleaney and Greenaway (2001)	GDP growth	TOT; TOT volatility; RER; RER volatility; Inflation and two lags of GDP	GARCH(1,1) ; Panel regression; OLS	1980 – 1995 (14 SSA countries)	Competitive RERs foster economic growth
Aguirre and Calderon (2005)	Real per capita GDP growth	Initial GDP per capita; Initial output gap; RER misalignment indexes; TOT shocks; Government consumption/GDP; Human capital; Financial depth; Trade openness; Inflation; Currency crises index; Time and country dummies	Panel regression; OLS; GMM	1965 – 2003 (60 countries)	RER misalignments affect economic performance negatively; the effect is nonlinear
Dubas *et al*	GDP growth	Exchange rate regimes	Panel Data; Multinomial	1960 – 2002	Stable currency value regimes promote

(2005)			logit	(180 countries)	economic growth
Hausmann *et al* (2005)	Growth acceleration	TOT; Imports/GDP; Exports/GDP; Inflation; Investment/GDP; RER	Time series regression; OLS; Correlation Analysis	Varying periods between 1957 and 1992 (110 countries)	Positive correlation between growth accelerations and RER depreciations
Gala and Lucinda (2006)	GDP per capita growth	Initial GDP per capita; Schooling; Infrastructure; Institutions; Price Stability; RER index	Panel regression; OLS; Pooled OLS; GMM	1960 – 1999 (58 developing countries)	RER undervaluation has a positive and significant impact on economic growth
Freund and Pierola (2008)	Export growth	RER Misalignment; Country size; Trade liberalization; lagged GDP	Panel regression; OLS; Correlation Analysis	1980 – 2005 (130 countries)	Competitive currencies are essential for firm expansion and export surges in developing countries
Gala (2008)	GDP per capita growth	Initial GDP per capita; Initial output gap; Education; Public infrastructure; Governance; Lack of price stability; TOT shocks; Population; Year dummies	OLS; Pooled OLS; GMM	1960 – 1999 (58 developing countries)	RER misalignments affect economic performance negatively
Rodrik (2008)	GDP per capita growth	RER undervaluation index; TOT; Lagged growth; Initial income; Time dummies	Panel regression; Fixed effect OLS; GMM	Eleven 5-year time periods from 1950-54 to 2000-04 (184 countries)	RER undervaluation positively affect economic growth, for developing countries; the effect is linear
Aghion *et al* (2009)	Productivity growth	Exchange rate flexibility and volatility indexes; Level of financial development; Initial output per worker; Education; Trade openness; Government burden; Lack of price stability; Banking or currency crisis dummy	Panel regression; GMM	1960 – 2000 (83 countries)	RER Volatility negatively affects economic growth at low level of financial development; the effect is nonlinear
Béreau *et al* (2009)	GDP per capita	RER misalignment; Inflation; Initial GDP per capita; Investment; Trade openness; TOT growth; Government burden	Panel smooth transition regressions (PSTR); GMM	1980 – 2007 (32 developed and developing countries)	RER overvaluation reduces economic growth; RER undervaluation enhances economic growth; the effect is nonlinear
Berg and Miao (2010)	Per capita GDP growth	Initial GDP per capita; RER misalignment indexes; TOT; Trade openness; Government consumption; Investment; Time and country dummies	Panel regressions; OLS; GMM	Eleven 5-year time periods from 1950-54 to 2000-04 (181 countries)	RER undervaluation enhances economic growth; the effect is linear
Sallenave	Per capita	RER misalignments index;	Hodrick-	1980 – 2006	RER misalignments

(2010)	GDP growth	Human capital; Initial GDP per capita; Investment; Trade openness; TOT growth; Government burden;	Prescott filter; GARCH(1,1) ; Panel unit root; Panel co-integration; GMM	(G20 countries)	adversely impact on economic growth
Rapetti *et al* (2011)	Real per capita GDP growth	Initial GDP per capita; RER undervaluation index; Government consumption; Inflation; Gross domestic saving; Trade openness; Human capital; TOT; Foreign debt; RER volatility; Rule of law index; Time and country dummies	Panel regressions; OLS; GMM	Eleven 5-year periods spanning 1950 – 2004 (181 countries)	RER undervaluation enhances economic growth; the effect is nonlinear
Benhima (2012)	Growth in real output per worker	Exchange rate flexibility; Dollarization; The interaction of the two; Initial output per worker; Financial development; RER volatility; TOT volatility; Education; Trade openness; Inflation; Government burden; Institutional quality; Net external debt	Panel regression; GMM	From 1995-1999 to 2000-2004 (76 countries)	Flexible exchange rates negatively affect economic growth under higher levels of dollarization.
Bussière *et al* (2012)	Output growth	Indexes of currency collapses; Inflation	Conditional probabilities; Event analysis; Two-way fixed effects panel regression;	1960 – 2006 (108 emerging and developing countries)	Currency collapses are associated with permanent output losses in the long-run
Elbadawi *et al* (2012)	GDP per capita growth	Aid/GDP; RER misalignment index; Financial development index; Initial GDP per capita; Initial cyclical GDP component; Inflation; Government expenditure/GDP; Human capital investment; Rule of law index; Trade openness	ARDL; Panel regression; GMM	1970 – 2004 (77 countries, including 36 SSA countries)	RER overvaluation has a strong negative impact on economic growth, when the financial system is less-developed.
Gluzman *et al* (2012)	GDP per capita growth	RER undervaluation index;	Panel regression; OLS; GMM	N/A	RER undervaluation positively and contemporaneously affect economic growth
Razmi *et al*	Average annual rate	RER undervaluation index; RER volatility; Average	Panel regressions;	1960 – 2004	RER undervaluation has positive and significant

(2012)	of investment growth	years of education; Rule of law index; Lagged real GDP per capita; Trade openness; Government consumption/GDP; Gross domestic saving; TOT; Time and country dummies	GMM;	(153 countries)	effect on investment growth, especially in developing countries
Vieira and MacDonald (2012)	GDP per capita growth	Different Measures of RER misalignment; Education index; Rule of law index; Government consumption; Inflation	Panel regressions; Two-step System GMM; Difference GMM	1980 – 2004 (90 countries)	RER depreciation enhances economic growth
Levy-Yeyati *et al* (2013)	Percentage change of the real gross domestic product	Measures of exchange rate intervention; TOT; External demand shocks; Capital inflows; Initial GDP per capita; Population growth; Initial output gap; Country and time dummies	Panel regression; OLS	1974 – 2007 and 1993 – 2007 (179 countries)	Depreciated exchange rates promote economic growth through deepened domestic capital accumulation and savings
Bussière *et al* (2014)	Productivity increase	Global uncertainty index; commodity price index; US interest rate; changes in real GDP; Private credit/GDP; Productivity; Interest rate differential; Reserves/GDP; Current account/GDP; Capital account openness; Exchange rate regime dummy	Propensity score matching (PSM); Logit estimations	1960 – 2011 (68 countries consisting of 30 advanced and 38 emerging economies)	Real appreciations linked with higher productivity have stronger effect on economic growth than real appreciations linked with inflow of capital

Note: N/A=non-available, GDP=gross domestic product, RER=real exchange rate, TOT=terms of trade, OLS=ordinary least squares, GMM=Generalised Method of Moments, ARDL=autoregressive distributed lag model, and GARCH=generalised autoregressive conditional heteroskedasticity.

4.4 Conclusion

The theoretical and the empirical literature on the links between the real exchange rate and economic growth have been explored in this chapter. The fundamental concept relevant to the empirical estimation of the real exchange rate undervaluation or overvaluation, the BSH, has also been examined. Generally, the empirical tests on the validity of the BSH have been carried out in the literature with cross-sectional data, time series data, or panel data. This review shows that the BSH has been mostly supported by the empirical studies that are based on panel data. The empirical studies that are based on cross-sectional and times series data have higher chances of refuting the BSH. The results from this review also show that the data on developed countries strongly support the hypothesis; more so than the data on developing

countries. The real exchange rate undervaluation (or overvaluation) has been found, in the empirical literature reviewed herein, to impact positively (or negatively) on economic growth. Nevertheless, the choice of the appropriate measure of the real exchange rate under- or overvaluation remains a point of debate in the literature. It would appear that Rodrik's (2008) measure of the real exchange rate under- or overvaluation is now popular in the most recent studies; although, other recent studies have constructed measures of under- or overvaluation that are based on the fundamental or behavioural exchange equilibrium exchange rate (FEER or BEER) approaches. In spite of its popularity, Rodrik's (2008) approach has been criticised, especially by Woodford (2009), for exaggerating the effect of the real exchange rate under- or overvaluation on economic growth. This is one of the contentions the current study explores. Apart from Aguirre and Calderon (2005), Rodrik (2008), Aghion *et al* (2009), Béreau *et al* (2009) and Rapetti *et al* (2011), the rest of the studies failed to examine whether or not the real exchange has a linear(or symmetric) effect on economic growth. This is the other gap the current study fills.

CHAPTER 5

METHODOLOGY OF THE STUDY

5.1 Introduction

This chapter presents the empirical models that are used to verify the hypotheses of the study, stated in the first chapter. The chapter begins by briefly discussing the theoretical foundations on which the empirical models rest. After a brief discussion of the theoretical building blocks of the empirical models in the second section, a simple empirical specification that permits us to verify the Balassa-Samuelson Hypothesis (BSH) is presented in the third section. The BSH, which the study assumes *a priori* to hold, motivates the construction of the Rodrik-type undervaluation index.

Still in the third section of the chapter, a fully-specified model that relates the undervaluation index to economic growth is presented. In addition, an alternative model that relates a Hodrick-Prescott based measure of undervaluation to economic growth is presented, following the arguments advanced by Woodford (2009). The main idea behind these two separate but related specifications is to verify Woodford's assertion that the Rodrik-type index overestimates the impact of exchange rate misalignments on economic growth. The study follows these two specifications by adding two more specifications. The first uses the undervaluation index to evaluate the linearity hypothesis. The second evaluates the linearity hypothesis using the alternative measure of undervaluation. In the fourth section of the chapter, concrete justifications for the choice of control variables are provided, as well as the source of the data. The estimation procedure and its relevance are explained in this section as well. In the final section, a conclusion to the chapter is provided.

5.2 Theoretical Model

The theoretical model stems from Rodrik (2008) and Woodford (2009) papers. This model draws inspirations from the conceptual implications of the seminal works of Harrod (1933), Balassa (1964), Samuelson (1964) and Bhagwati (1984) called the Balassa-Samuelson Hypothesis (BSH). The Balassa-Samuelson framework lays down the mechanisms through which real macroeconomic variables, such as productivity changes, affect real exchange rate. In particular, the framework demonstrates that in the processes of economic growth, the effect of relative incremental productivity in the tradable sector raises the relative prices of

non-tradable goods to tradable goods within an economy (see Harrod, 1933; Balassa, 1964; Bhagwati, 1984; and Rogoff, 1992a). The mechanism, in turn, has cross-country implications for real exchange rates.

Rodrik (2008) provides a logical extension of the Balassa-Samuelson framework to capture the operative channel through which real exchange rates stimulate or mar economic growth in developing countries.[8] In this model, Rodrik (2008) identifies the operative channel as the size of the tradable sector. He argues that the tradable sector is seriously impeded by government or market failures, which prevent poor countries from converging towards high levels of income. Essentially, these impediments are narrowed down to institutional weaknesses, and product-market failures.

Woodford (2009) put forward important arguments, which improve upon Rodrik's (2008) empirical specification. Woodford (2009) is skeptical about Rodrik's (2008) measure of undervaluation. He also argues that Rodrik (2008) did not discuss the measures that should be carried out to maintain an undervalued exchange rate, and whether there is a possibility for a country that pursues undervaluation, as a growth strategy, will be capable of maintaining persistent undervaluation. These two contentions provide the motivations for the empirical specifications of the study.

5.3 The Empirical Models

5.3.1 The Balassa-Samuelson Hypothesis and the Undervaluation Index

Throughout this chapter, the study relies on the recent insights of Rodrik (2008) and Woodford (2009) in specifying the empirical models. One of the crucial aims of the study is to verify the validity of the Balassa-Samuelson Hypothesis (BSH). The validity of the hypothesis motivates the construction of the undervaluation index proposed by Rodrik (2008). In order to achieve this aim, the study begins by extracting exchange rates (*XRAT*) and purchasing power parity (*PPP*) conversion factors from the Penn World Tables, version 8.0, compiled by Feenstra *et al* (2013). The first step for constructing this index is to calculate the so-called "real exchange rate" (*RER*) and find its natural logarithm *à la* Rodrik (2008). This is done as follows:

[8] See alternative theoretical linkages between the real exchange rate and economic growth in Gala (2008), Aghion *et al.* (2009), Korinek and Serven (2010), Gente and Noury (2011), and Bussière *et al.* (2014).

$$lnRER_{it} = ln(XRAT_{it}/PPP_{it}) \quad (5.1)$$

where i is the country under consideration, and t is a five-year time period. A five-year time period is chosen in order to eliminate noise effects that are often inherent in annual data, and also because real exchange rate effects could take more than a year to appear (see Freund & Pierola, 2008; Rodrik, 2008; Aghion *et al*, 2009; and Rapetti *et al*, 2011). As a robustness check for the five-year averaging, a similar index of undervaluation based on one-year annual data (i.e. the study sets set *t=1* instead of *t=5*) is constructed. *XRAT* and *PPP* are denoted in national currency units per US dollar. An *RER* of more than unity indicates a more depreciated currency than implied by purchasing power parity (see Rodrik, 2008).

It is known, in practice, that non-traded goods are cheaper in poorer countries than their richer counterparts. This is the so-called Balassa-Samuelson Effect (see Harrod, 1933; Balassa, 1964; Samuelson, 1964; and Bhagwati, 1984). Therefore, the index of undervaluation, which the study borrows from Rodrik (2008), accounts for this phenomenon. The study examines the BSH by specifying and testing the coefficient of $lnPROD_{it}$ in the following model:

$$lnRER_{it} = \alpha + \beta lnPROD_{it} + f_t + \varepsilon_{it} \quad (5.2)$$

where α and β are parameters of the model, $PROD_{it}$ is relative productivity measured as real per capita GDP of country i divided by real per capita GDP of the US in time period t (see Officer, 1976)[9], ln is the natural logarithm, f_t is a fixed effect for time period t, and ε_{it} is the error term for country i at time period t. β is expected to be negative and significant (see Rodrik, 2008; Rapetti *et al*, 2011; Gluzmann *et al*, 2012; and Vieira & MacDonald, 2012); this would establish the Balassa-Samuelson Hypothesis. As is the case in most empirical studies (see, for instance, Ito *et al*, 1999; Gala, 2008; Rodrik, 2008; Gluzmann *et al*, 2012; and Vieira & MacDonald, 2012), the Balassa-Samuelson Effect is expected to be present in the estimate. The study then constructs a measure of undervaluation using the difference between the actual real exchange in *Equation* (5.2) and the adjusted Balassa-Samuelson rate as:

[9] Rodrik (2008) used real per capita GDP, which has been criticised by Officer (1976). Therefore, this study uses relative productivity as recommended by officer (1976).

$$lnUNDERV_{it} = lnRER_{it} - \widehat{lnRER}_{it} \quad (5.3)$$

where $\widehat{lnRER}_{it}$ represents the predicted values of the natural logarithm of the real exchange rate in *Equation* (5.2); and $lnUNDERV_{it}$ is the undervaluation index that the study has been talking about.

According to Rodrik (2008), the undervaluation index is a convenient indicator of real exchange rate misalignment due to its ease with comparability across time and space. An undervaluation index ($UNDERV$) greater than unity implies that the home country's currency is undervalued; below unity implies that the home country's currency is overvalued. This approach, Rodrik (2008) argues, is fairly close to that of Johnson *et al* (2007). However, Johnson *et al*'s (2007) approach departs from the one employed in this study because they estimate different cross-sections for *Equation* (5.2) for each year, while the study estimates a single panel (see Rodrik, 2008).

In the spirit of Rodrik (2008), the study's definition of *undervaluation* is based on price comparisons. This definition is in stark contrast with an alternative definition (see Rodrik, 2008). The alternative definition is constructed by formulating a small-scale macro model and estimating the real exchange rate level required to yield balance-of-payments equilibrium. This could be seen in studies like Elbadawi (1994), and Aguirre and Calderon (2005).

5.3.2 Real Exchange Rate Undervaluation and Economic Growth

In addition to testing the BSH, the study proposed examining the impact of the real exchange rate misalignment on economic growth. In order to realise this aim, the study first specifies a simplified growth regression that relates the undervaluation index and initial income level to the real GDP per capita growth in the form:

$$growth_{it} = \gamma + \theta lnRGDP_{it-1} + \delta lnUNDERV_{it} + f_i + f_t + \mu_{it} \quad (5.4)$$

where $growth_{it}$ is the annual rate of growth in country *i's* per capita real GDP from the five-year period, *t-1*, to the next five-year period, *t*. Specified this way, *Equation* (5.4) makes room for a convergence term (initial income level per capita, $RGDP_{it-1}$) and a set of country

and time dummies, f_i and f_t, respectively. γ, θ, and δ are the parameters of the model; μ_{it} is the error term for country i in period t. δ is the objective parameter that measures the effect of changes in undervaluation on changes in growth rates within countries; this parameter is expected to be positive, implying that an increase in undervaluation enhances economic growth. The initial level of GDP per capita ($RGDP_{it-1}$) is included as a determinant of economic growth in line with growth literature on the conditional convergence hypothesis (see Barro, 1991; Mankiw *et al*, 1992; and Romer, 2012). The conditional convergence hypothesis states that, given the same structural and macroeconomic features, countries with low GDP per capita should grow faster because of diminishing returns on the stock of capital (see Romer, 2012).

An alternative version of *Equation* (5.4) is in order to verify Woodford's (2009) critique. Woodford (2009) argues that Rodrik's (2008) measure of undervaluation overestimates the association between real exchange rate misalignments and economic growth. Woodford (2009) proposes that the real exchange rate should be used, as is in the conversional literature, instead of the undervaluation index. He cautions that when the real exchange rate is used, the definition of developing countries should be considered from different perspectives. This study would take up the issue by specifying a variant form of *Equation* (5.4), replacing $lnUNDERV$ with a Hodrick-Prescott measure of undervaluation as:

$$growth_{it} = \rho + \sigma lnRGDP_{it-1} + \tau lnUNDERX_{it} + f_i + f_t + \mu_{it} \qquad (5.5)$$

In this form, the definition of variables remains as before. ρ, σ and τ are the parameters to be estimated. The *a priori* sign of τ should be negative, so that undervaluation (i.e. decreases in $lnUNDERX$) enhances growth, while increases hurt it. *Equation (5.5)* enables the study to determine whether the choice of the undervaluation measure has a bearing on the effect of real exchange rate misalignment on economic growth.

The alternative measure of undervaluation, $lnUNDERX$, is obtained using the time series filtering technique of Hodrick and Prescott (1997) to the panel setting by fitting a minimization problem of the form:

$$\min_{\tau}\left(\sum_{t=1}^{T}(lnRER_{it}-\gamma_{it})^2+\lambda\sum_{t=2}^{T-1}[(\gamma_{it+1}-\gamma_{it})-(\gamma_{it}-\gamma_{it-1})]^2\right)\forall\, i. \tag{5.6}$$

where the real exchange rate, $lnRER$, is assumed to be decomposable into trend (γ) and cyclical (c) components. That is, $lnRER=\gamma+c+\omega$, where ω is the irregular component. In this form, the objective is to find the γ which satisfies the minimisation problem in (5.6) across countries. The sum of the squared deviations, $d_{it}=lnRER_{it}-\gamma_{it}$, penalizes the short-run deviations in the variable $lnRER$. The second term is a product of the multiplier (λ) and the sum of squares of the second differences in the trend component of the $lnRER$. This term penalizes deviations in the growth of the trend component of the $lnRER$. Higher values of λ entail higher penalties. λ=1600, 6.25, and 129600 for quarterly, annual and monthly data, respectively (see Hodrick & Prescott, 1997; and Ravn & Uhlig, 2002). The cyclical component of $lnRER$, c, is then extracted by assuming that the expected value of ω is zero. The cyclical component of $lnRER$ is used as the alternative measure of undervaluation, following Aguirre and Calderon (2005). If this measure is above the trend component, it signifies overvaluation, and if below, the home currency is undervalued. Generally, if the measure declines, then the home currency is experiencing depreciation.

Whereas *Equations* (5.4) and (5.5) provide the simplest specifications for examining the effect of the real exchange rate misalignment on economic growth, they suffer from variable omission bias. Generally speaking, economic growth is expected to be determined by certain basic factors. The basic Solow Model shows that the evolution of output over time depends on the growth rates of capital, labour and technology (see Romer, 2012). Consequently, an extended model must be specified. To formulate a fully-specified model, the study is motivated by Barro (1991), Mankiw *et al* (1992), Easterly (2001), Acemoglu *et al* (2002), Fajnzylber *et al* (2002), Levy-Yeyati and Sturzenegger (2003), Gala (2008), Aghion *et al* (2009), and Gluzmann *et al* (2012). The fully-specified augmented neoclassical growth model is of the form:

$$growth_{it}=\alpha_0+\alpha_1 lnRGDP_{it-1}+\alpha_2 lnUNDERV_{it}+\Psi X_{it}+f_i+f_t+\epsilon_{it} \tag{5.7}$$

Equation (5.7) enables us to consider the real exchange rate measure advanced by Rodrik (2008). Similarly, the model that takes into account the Woodford (2009) critique is formulated as:

$$growth_{it} = \alpha_0 + \alpha_1 lnRGDP_{it-1} + \alpha_2 lnUNDERX_{it} + \Psi lnX_{it} + f_i + f_t + \epsilon_{it} \quad (5.8)$$

Equations (5.7) and (5.8) are the extended versions of *Equations* (5.4) and (5.5). All the variables except X, retain their definitions as before. X is a vector of *1xk* variables representing the standard determinants of economic growth considered in the neoclassical growth literature. Ψ is a vector of *kx1* parameters to be estimated. ϵ represents the white-noise error term. The vectors of variables are in two forms: (i) the fundamental determinants of growth, namely, the initial level of income, human capital, physical capital, population growth; (ii) the variables employed in recent studies, namely: inflation, terms of trade, trade openness, and government debt burden.

Human capital has considerable impact on total factor productivity (see Barro, 1991; Levy-Yeyati & Sturzenegger, 2003; and Romer, 2012). However, its measure is quite debatable. Following Psacharopoulos (1994) and Barro (2001), human capital is included in the model. Similarly, most exogenous growth models have underscored the importance of population growth in determining the rate of economic growth. For most of these models, the steady-state level of GDP per capita has an inverse relationship with population growth (see Sørensen & Whitta-Jacobsen, 2005). In semi-endogenous growth models, however, the relationship is positive (see, Moral-Benito, 2012; and León-González & Vinayagathasan, 2015). This study, therefore, includes population growth as one of the growth determinants. Other authors also included population growth in their studies (see Ghura & Grennes, 1993; Domac & Shabsigh, 1999; Levy-Yeyati & Sturzenegger, 2003; and Gala, 2008). The coefficient on population growth is expected to have a positive or negative sign.

That aside, all growth models include physical capital as a fundamental determinant of economic growth (see Barro, 1991; Mankiw *et al*, 1992; Ghura & Grennes, 1993; Domac & Shabsigh, 1999; Levy-Yeyati & Sturzenegger, 2003; and Gluzmann *et al*, 2012, among others). Countries that are fast growing (for instance, China, India, Brazil and Turkey) today, have a huge amount of physical capital stock. This study employs capital stock (rkna) to

proxy physical capital following the tradition of the growth literature. High capital stock correlates with high economic growth rate in the literature (see Grossman & Helpman, 1991). Hence, physical capital is expected to exert a positive influence on economic growth.

Inflation also plays a critical role in determining economic growth. A high rate of inflation may inhibit growth because it increases the cost of borrowing, thereby lowering the rate of physical capital investment (see Sarel, 1996; Barro, 2003; and De Gregorio, 2006). Inflation may also relate to growth nonlinearly, so that its effect is only significant above a certain threshold level (see Sarel, 1996; and Boyd *et al* 2001). Hence, the variable is included in the model. The other variables that are included in the empirical specifications are government burden, terms of trade shocks and trade openness. Government debt burden, in this study, is measured as government consumption per GDP. This variable has been included in recent studies such as Levy-Yeyati and Sturzenegger (2003), Gala (2008), and Aghion *et al* (2009). Terms of trade shocks have favourable or deleterious consequences on growth (see Gala, 2008). Improved terms of trade enhance a country's ability to consolidate gains from trade for development purposes. However, poor and persistent terms of trade exert a negative influence on a country's ability to gain from trade. Terms of trade is defined in the study as the relative price of export to import.[10] The quantum of goods and services flowing into a country depends on the country's degree of openness. Various empirical studies have shown that trade openness is vital for economic growth. Following the recent literature (see Bleaney & Greenaway, 2001; Aguirre & Calderon, 2005; Aghion *et al*, 2009; Berg & Miao, 2010, among others) this variable is defined as the sum of export and import as a fraction of GDP.

5.3.3 Testing the Linearity Hypothesis

The final objective of the study is to evaluate whether the impact of real exchange rate misalignments on economic growth is linear (symmetric). Less technically, the study wants to verify these two questions: (i) Does undervaluation enhance economic growth just as overvaluation hurts it? (ii) And does the impact depend on the quantum of real exchange rate misalignment? The literature remains divisive over this issue (see Razin & Collins, 1997; Dooley *et al*, 2003; Aguirre & Calderon, 2005; Chinn, 2005; Rodrik, 2008; Rapetti *et al*, 2011, among others). One of the two simple approaches used in examining the linearity hypothesis, which is employed in this study, is a sequential process of interacting the real

[10] See Ghura and Grennes (1993), Bleaney and Greenaway (2001), Levy-Yeyati and Sturzenegger (2003), Aguirre and Calderon (2005), Berg and Miao (2010) among others for a similar definition.

exchange rate misalignment indexes with the level, squared, and cubic terms of the real GDP per capita. These new variables are then incorporated successively in separate regression models.[11] For instance, the interaction of the misalignment indexes and the real GDP per capita would alter *Equations* (5.6) and (5.7) into the forms:

$$growth_{it} = \alpha_0 + \alpha_1 lnRGDP_{it-1} + \alpha_2 lnUNDERV_{it} + \alpha_3 lnRGDP_{it} xUNDERV_{it} + \Psi X_{it} + f_i + f_t + \epsilon_{it} \quad (5.9)$$

$$growth_{it} = \alpha_0 + \alpha_1 lnRGDP_{it-1} + \alpha_2 lnRER_{it} + \alpha_3 lnRGDP_{it} xUNDERX_{it} + \Psi lnX_{it} + f_i + f_t + \epsilon_{it} \quad (5.10)$$

The study repeats these iterative specifications by adding $lnRGDP_{it}^2 xUNDERV_{it}$, and $lnRGDP_{it}^3 xUNDERV_{it}$, and $lnRGDP_{it}^2 xUNDERX_{it}$ and $lnRGDP_{it}^3 xUNDERX_{it}$ into *Equations* (5.9) and (5.10), respectively. The performance of the t- and R^2-statistics, as this iterative experiment is undertaken, provides an indication of which specifications are better (see Rapetti *et al*, 2011, for a similar exercise). In particular, a rejection of *Equations* (5.9) and (5.10) would imply the existence of nonlinearities.

The other approach is also sequential. For this approach, the study estimates *Equation* (5.6) systematically for successive narrower bands of *LNUNDERV*. Following Rodrik (2008), the study estimates *Equation* (5.7) with such restrictions as *LNUNDERV*>-1.50; *LNUNDERV*>-1.00, in that order until -0.50<*LNUNDERV*<0.50. Then the behaviour of the coefficient of the undervaluation term for all these restrictions, together with the coefficient attained for the baseline regression in *Equation* (5.7), is examined. If the coefficient is not uniform, then it can be concluded that the impact of undervaluation on growth depends on the quantum of undervaluation. The interpretation holds, conversely.

5.4 Estimation of the Empirical Model

5.4.1 Estimation Techniques

The study estimates *Equations* (5.4), (5.5), (5.7), (5.8), (5.9), and (5.10) using the within-effects estimation technique. This approach is suitable for estimating the models used in this study because the real exchange rate misalignment index and the key control variables may be related to some country-specific factors such as institutional characteristics, geographic location, and ethnicity among others, that may not be observed by the researcher. If the

[11] For more technical approaches, see Hansen (1999), and González *et al.* (2005).

models are estimated using techniques that do not control for the unobservable factors, then the coefficient estimates may be inconsistent. The within-effects estimator overcomes this problem by demeaning the variables through within transformation – thereby generating consistent coefficient estimates. To cater for any possible specification and endogeneity biases, the study also estimates these equations in the form of dynamic panel regressions using the generalised method of moments (GMM) for dynamic panels due to Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). System GMM estimators may perform better than difference GMM estimators in the presence of instruments with high degrees of persistence. For this reason, the study only reports the results based on the system GMM estimator. The two-step system GMM estimator employs an 'optimal' weighting matrix, making it asymptotically efficient when compared with the one-step alternative (see Roodman, 2009a). Therefore, the study reports only the two-step results. The study performs various diagnostic tests, including the Arellano-Bond test, and the Sargan and Hansen tests to assess the reliability of the results.

5.4.1.1 The Fixed Effects (Within-effects) Estimation Technique

Suppose the simplest specification in the empirical exercise, *Equation* (5.4), is used. This equation can be rewritten as a linear unobserved effects model for N observations and T time periods in the form:

$$y_{it} = \beta' X_{it} + \alpha_i + \varepsilon_{it} \tag{5.11}$$

where y_{it} is the dependent variable (i.e. growth) observed for country i at time t, X_{it} is the time-invariant $1xk$ regressor matrix (i.e. the determinants of growth), β' is a vector of parameters, α_i is the unobserved time-invariant country effects. ε_{it} is the error term. Unlike X_{it}, α_i cannot be observed by the econometrician.

The within-effects estimator allows such unobserved time-invariant effects to correlate with the regressor matrix X_{it}. This is the critical distinction between this estimator and the Random-effects estimator. Since α_i are not observed, the econometrician cannot directly control for them. The idea behind the within-effects estimator is to eliminate α_i by demeaning the variables using the within transformation:

$$y_{it} - \bar{y}_{it} = \beta'(X_{it} - \bar{X}_{it}) + (\alpha_i - \bar{\alpha}_i) + (\varepsilon_{it} - \bar{\varepsilon}_{it}) \quad (5.12)$$

$$\tilde{y}_{it} = \beta'\tilde{X}_{it} + \tilde{\varepsilon}_{it} \quad (5.13)$$

where $\bar{y}_{it} = \frac{1}{T}\sum_{t=1}^{T} y_{it}$, $\bar{X}_{it} = \frac{1}{T}\sum_{t=1}^{T} X_{it}$ and $\bar{\varepsilon}_{it} = \frac{1}{T}\sum_{t=1}^{T} \varepsilon_{it}$. Since α_i is constant, $\bar{\alpha}_i = \alpha_i$. These unobserved time-invariant effects are thus eliminated by construction. The within-effects estimator $\hat{\beta}_{FE}$ is then obtain by OLS on the regression of $\tilde{y}_{it}$ on $\tilde{X}_{it}$ as:

$$\hat{\beta}_{FE} = (\tilde{X}'\tilde{X})^{-1}\tilde{X}'\tilde{y} \quad (5.14)$$

5.4.1.2 The GMM Techniques

Suppose that *Equation* (5.4) can be written as a linear unobserved effects model for N observations and T time periods in the form:

$$\Delta y_{it} = (\alpha - 1)y_{it-1} + \beta' X_{it} + \alpha_i + \eta_t + \varepsilon_{it} \quad (5.15)$$

where Δy_{it} is the dependent variable (i.e. growth defined as the first difference of log real per capita GDP) observed for country i at time t, y_{it-1} denotes the initial level of real per capita GDP for country i at time t, X_{it} is the time-invariant $1xk$ regressor matrix (i.e. the determinants of growth), β' is a vector of parameters, α_i and η_t are the unobserved time-invariant country and time effects, and ε_{it} is the error term. The lagged independent variable, y_{it-1}, is correlated with the country-specific effects, α_i, making OLS estimates of (5.15) to be biased and inconsistent. The time-specific effects, η_t, are included to also capture cross-sectional dependence of national growth rates of real per capita GDP, which may be correlated through common shocks. This equation can also be written as:

$$y_{it} = \alpha y_{it-1} + \beta' X_{it} + \alpha_i + \eta_t + \varepsilon_{it} \quad (5.16)$$

The same problem arises if OLS is applied to this equation, because it contains the lag term (i.e. initial real per capita GDP). OLS estimates of parameters in *Equation* (5.16) will be biased and inconsistent, since the lag term, y_{it-1}, is correlated with country-specific effects, α_i. One popular approach to removing these country-specific effects is by using the within-effects transformation as in *Equations* (5.12) and (5.13). However, one potential problem

remains: endogeneity. It is impossible to guarantee that initial real per capita GDP and the other explanatory variables are exogenous. To control for potential endogeneity problems, GMM estimators are very suitable.

Holtz-Eakin *et al* (1988), and Arellano and Bond (1991) proposed the first-difference transformation of *Equation* (5.16) to remove the correlation between the initial real per capita GDP with the country-specific effects, α_i, in the error term:

$$\Delta y_{it} = \alpha(y_{it-1} - y_{it-2}) + \beta'(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad (5.17)$$

To surmount the issue of endogeneity, Arellano and Bond (1991) argued for the lagged levels of the explanatory variables to be used as instruments. This dynamic panel estimator, commonly referred to as difference GMM, uses the following moment conditions:

$$E[y_{it-l}(\varepsilon_{it} - \varepsilon_{it-1})] = 0 \text{ for } l \geq 2;\ t = 3, \dots, T \quad (5.17a)$$

$$E[X_{it-l}(\varepsilon_{it} - \varepsilon_{it-1})] = 0 \text{ for } l \geq 2;\ t = 3, \dots, T \quad (5.17b)$$

However, Blundell and Bond (1998) have shown that if the explanatory variables are time-persistent, the transformed lagged levels of these variables are weak instruments for the transformed variables. This, they argued, affects the small sample and asymptotic properties of the difference GMM estimator. To improve the performance of this estimator, Blundell and Bond (1998) developed a system GMM estimator (i.e. modified version of the estimator developed in Arellano & Bover, 1995), which augments the difference GMM estimator by simultaneously estimating in differences and levels, with the two equations being distinctly instrumented. Note that the regression in levels allows the study to examine the cross-country nexus between the variables of interest. The instruments for the equation in differences are the same as above. However, the instruments for equation in levels are lagged differences of the explanatory variables. The instruments are valid under the assumption that there may be a correlation between the levels of the explanatory variables and the country-specific effects in (5.16), and that there is no correlation between the differences of these variables and the country-specific effects. From this assumption, the following stationarity properties emerge:

$$E\left[y_{it+p}\alpha_i\right] = E\left[y_{it+q}\alpha_i\right] \text{ and } E\left[X_{it+p}\alpha_i\right] = E\left[X_{it+q}\alpha_i\right] \text{ for all } p \text{ and } q \quad (5.18)$$

The following additional moment conditions for the regression in levels are required:

$$E[(y_{it-l} - y_{it-l-1})(\alpha_i - \varepsilon_{it})] = 0 \text{ for } l = 1 \quad (5.18a)$$

$$E[(X_{it-l} - X_{it-l-1})(\alpha_i - \varepsilon_{it})] = 0 \text{ for } l = 1 \quad (5.18b)$$

The dynamic panel GMM entails the moment conditions in *Equations* (5.17), (5.17a), (5.18a) and (5.18b) in order to yield efficient and consistent estimates. For the estimates to be consistent, the dynamic panel GMM requires that the instruments are valid, and that the error terms are serially uncorrelated. One issue may arise when using the dynamic panel GMM. The estimator may suffer from a potential instrument explosion. In this case, the instrument count may become equal to or larger than the number of cross-sections, hence overfitting the instrumented variables. In such circumstances, the estimator may fail to remove the endogenous components of the variables, resulting in biased, inconsistent and inefficient parameter estimates in a similar fashion to estimates generated by non-instrumenting estimators.

The instrument count problem can be avoided in two ways. First, the study can restrict the instruments to a certain number of lags. Second, the study can collapse the instrument matrix. In the latter case, the following equations are in order:

$$E[y_{it-l}(\varepsilon_{it} - \varepsilon_{it-1})] = 0 \text{ for } l \geq 2 \quad (5.19a)$$

$$E[X_{it-l}(\varepsilon_{it} - \varepsilon_{it-1})] = 0 \text{ for } l \geq 2 \quad (5.19b)$$

In the context of dynamic panel GMM, the moment conditions of the standard difference GMM (5.17a) and (5.17b) are substituted with (5.19a) and (5.19b), giving rise to the system GMM estimator. The orthogonality assumption between the lagged levels and the differenced error term in the new moment conditions is the same as (5.17a) and (5.17b). However, in the case of the new moment conditions, the aim is to only derive the estimator, which minimises the magnitude of the empirical moments $\sum_t y_{it-l}(e_{it} - e_{it-1})$ for each l, instead of separate

moments $\sum_{tl} y_{it-l}(e_{it} - e_{it-1})$ for each l and t. This is the Windmeijer correction (see Windmeijer, 2005). It significantly reduces the potential biases that result because of over-identification problems, and improves the efficiency of the parameter estimates without loss of information, since lags are not jettisoned.

5.4.2 Data

The study employs panel data. The reason for using panel data is that the study is able to pool together the time series and cross-sectional characteristics of the dataset. The data for most of the variables are extracted from the Penn World Table, versions 7.1 and 8.0, compiled by Heston *et al* (2012) and Feenstra *et al* (2013), respectively. In all, 15 countries from SSA are included in the sample. They are Botswana, Congo DR, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Kenya, Ghana, Mali and Nigeria. The sample is divided into two subsamples. These countries are selected mainly by considering the availability of data. The first subsample consists of middle-income SSA countries, namely: Botswana, Ghana, Lesotho, Mauritius, Namibia, Nigeria, South Africa and Zambia. The second subsample contains low-income SSA countries, namely: Congo DR, Mozambique, Tanzania, Mali, Ethiopia, Malawi and Kenya. The rationale for breaking the sample into two income groups is that income levels may play a critical role in the growth impact of real exchange rate misalignments. A sample period of 41 years (1970-2010), which is further divided into eight five-year non-overlapping time periods, is used for both subsamples. Detail description of the data is presented in the Data Appendix.

5.5 Conclusion

In this chapter, the study discussed the theoretical foundations on which the empirical models are built. It has also provided a specification that leads to the verification of the Balassa-Samuelson Hypothesis – a crucial motivator for constructing the *undervaluation index*. Supposing the Balassa-Samuelson Hypothesis holds, which the study assumed *a priori* it does, the study presented a stepwise procedure for estimating the *undervaluation index*. After illustrating the steps for estimating the index, the study specified a simple model that related this undervaluation index to the real per capita GDP growth. In order to put the study into tractable perspective, an alternative model, which controlled for Woodford's (2009) critique, has also been presented. Basically, this second model related a Hodrick-Prescott (1997) based measure of undervaluation to the real per capita GDP growth. Considering that the simple models clearly suffer from variable omission bias, the study presented their fully-specified

versions. The fully-specified versions accounted for the fundamental determinants of economic growth and other control variables that have been used in the recent literature. One other crucial objective of the study is to examine the possible presence of a nonlinear impact of real exchange rate misalignment on economic growth. The study presented variant forms of the fully-specified models that captured the possible nonlinearities in quadratic and cubic forms. When all these were set, the estimation procedure, the control variables, and the justifications for choosing the estimation procedure, as well as the control variables, were discussed. The chapter ended by describing the sample and the source of the data, with further details being moved to the Data Appendix.

CHAPTER 6

PRESENTATION OF RESULTS AND FINDINGS

6.1 Introduction

This chapter contains the results from estimating the equations presented in Chapter 5. The nature of undervaluation in the selected SSA countries is first presented. The examination of the Balassa-Samuelson Hypothesis (BSH) is then presented, according to the classification of income groups (i.e. for the lower-income and the middle-income countries in SSA) and of the time windows (i.e. $t=1$ and $t=5$). After confirming the BSH for each of the two groups of countries, as well as for the full sample, the study then constructed a Rodrik-type measure of undervaluation. The constructed measure is used to examine, in a simplified model, how undervaluation affects economic growth. An alternative measure of undervaluation is also used in the simplified model as a robustness check for the Rodrik-type measure of undervaluation. To control for omitted variables, the study estimates the fully-specified models presented in Chapter 5. Endogeneity is a potential source of bias in models of this kind. So, the study estimates the fully-specified models using the GMM techniques discussed in Chapter 5. Finally, the study examines the possibility of nonlinearities in the impact of undervaluation on economic growth. In all cases, the study provides results for both Rodrik's measure and the alternative measure of undervaluation.

6.2 The Nature of Undervaluation in the Selected Countries

Before proceeding to present the main results, the study first shows the nature of undervaluation in these countries. Recall that if *UNDERV* is above unity, then the home country's currency is said to be undervalued, and below implies that the currency is overvalued (see also, Rodrik, 2008). Since the study measures undervaluation as *lnUNDERV*, the interpretation changes slightly. If *lnUNDERV* is above zero, then the currency is undervalued; if below zero, the currency is overvalued. Table 6.1 shows the mean undervaluation for both the low income and middle income countries in the sample. In the low-income countries, only Congo DR and Mozambique have experienced mean overvaluation for the entire period. The remaining low income countries, namely Ethiopia, Kenya, Malawi, Mali, and Tanzania, their currencies have been undervalued, on the average. Regarding the middle-income countries, it is clear that only Ghana, Namibia, and Zambia recorded mean overvaluation during the study period. The rest, namely Botswana, Lesotho,

Mauritius, Nigeria, South Africa have all recorded mean undervaluation during the same period. The observed behaviour of undervaluation in most of these countries appear to be consistent with Elbadawi *et al* (2012), who documented that the currencies of most SSA countries have experienced undervaluation particularly between 1980 and 1996, when the liberalisation policies were implemented. The evidence in support of undervaluation in majority of the countries in the sample during the study period indicates that undervaluation may probably be a time rather than a cross-country issue.

Table 6.1: Mean Undervaluation in the Selected Countries

Low Income Countries		**Middle Income Countries**	
Country	**Mean *lnUNDERV***	**Country**	**Mean *lnUNDERV***
Congo DR	-0.079	Botswana	0.079
Ethiopia	0.247	Ghana	-0.217
Kenya	0.102	Lesotho	0.094
Malawi	0.091	Mauritius	0.006
Mali	0.210	Namibia	-0.189
Mozambique	-0.554	Nigeria	0.083
Tanzania	0.002	South Africa	0.139
		Zambia	-0.014

6.3 Testing the Balassa-Samuelson Hypothesis

The first objective of this study is to test the Balassa-Samuelson Hypothesis (BSH). To achieve this objective, the study estimates *Equation* (5.2) using the within-effects option for low-income countries, middle-income countries, and for all countries in the sample. These results are presented in Table 6.2.

Table 6.2: Testing the Balassa-Samuelson Hypothesis

LNRER	[1] Low Income Countries [One-Year]	[2] Low Income Countries [Five-Year]	[3] Middle Income Countries [One-Year]	[4] Middle Income Countries [Five-Year]	[5] All Countries [One-Year]	[6] All Countries [Five-Year]
LNPROD	-0.304*** (-5.64)	-0.265*** (-6.41)	-0.164** (-2.84)	-0.184* (-1.95)	-0.048** (-2.36)	-0.072*** (-4.55)
Constant	2.132* (1.99)	1.824** (2.64)	-0.580*** (-5.99)	-0.774** (-2.25)	0.021*** (3.22)	-0.195* (-1.93)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Countries	7	7	8	8	15	15
Observations	287	57	328	64	615	120

Note: t-statistics are reported in the parentheses; *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

As discussed earlier, there is evidence in favour of the BSH if the coefficient attached to relative productivity in *Equation* (5.2) is negative. From Table 6.2, the estimated coefficient is negative for all the cases considered. In addition, the estimated coefficient is significant at the conventional levels, in all the cases considered. On account of this evidence, the BSH is well-established in both the low and middle income countries as well as the combination of the two groups of countries. The results further suggest that relative productivity has stronger influence on the exchange rate in the low-income countries than the middle-income countries. This is consistent with the BSH as well. These results agree with the findings of some of the previous studies (see, for example, Ito *et al*, 1999; Gala, 2008; Rodrik, 2008; Gluzmann *et al*, 2012; and Vieira & MacDonald, 2012).

6.4 The Effects of Undervaluation on Economic Growth

6.4.1 The Baseline Model

The natural step, after establishing that the BSH holds, is to examine the impact of real exchange rate misalignments on economic growth in the SSA countries covered in the sample. To realise this objective, the study constructed the Rodrik-type real exchange rate

undervaluation index[12] as shown in Chapter 5. Then, the study first fits a baseline regression that features the constructed index of undervaluation. The study also fits a baseline regression that accommodates Woodford's (2009) contention. That is, the study fits a regression that features an alternative undervaluation index developed using the Hodrick-Prescott filter. As has become a tradition in the literature, the baseline regression features the dependent variable (in this case, economic growth), the convergence term, and the independent variable of interest (i.e. undervaluation index, in this study). As a standard, the study estimates the baseline regression under one-year and five-year time windows, and also under the country groupings. The results are presented in Tables 6.3a and 6.3b.

Table 6.3a: The Baseline Model with the Rodrik-type Undervaluation Index

	[1]	[2]	[3]	[4]	[5]	[6]
Growth	Low Income Countries [One-Year]	Low Income Countries [Five-Year]	Middle Income Countries [One-Year]	Middle Income Countries [Five-Year]	All Countries [One-Year]	All Countries [Five-Year]
LNRGDP(-1)	-0.832**	-0.327**	-0.921**	-0.393**	-0.858**	-0.544***
	(-2.23)	(-2.80)	(-2.95)	(-2.44)	(-2.24)	(-3.31)
LNUNDERV	1.046***	0.344**	0.858**	0.268**	1.094***	0.536**
	(3.33)	(3.02)	(2.91)	(2.68)	(3.25)	(2.68)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Countries	7	7	8	8	15	15
Observations	280	54	320	56	600	110

Note: t-statistics are reported in the parentheses; ** and *** denote significance at 5% and 1%, respectively. *LNRGDP(-1)* is the initial lag of real GDP per capita.

In Table 6.3a, the study presents the within-effects results for the baseline model in which the Rodrik-type undervaluation index is used as independent variable (see *Equation* (5.4) of Chapter 5). Panels [1] and [2] report the results for the low-income countries under the *t=1* and *t=5*. The estimated coefficient for undervaluation is positive and significant at 5% under the two time windows. The estimated coefficient for the convergence term is also significant at the conventional levels. Undervaluation appears to impact on economic growth in the low-

[12] See Rodrik (2008) for this index. Chapter 5 also describes this index.

income countries. Panels [3] and [4] show the results for the middle-income countries under *t=1* and *t=5*. The estimated coefficient for undervaluation is positive and significant at the conventional levels. A point worth noting is that the coefficient for undervaluation has lessened for the middle-income countries, when compared to the coefficient reported for the low-income countries. This point has been widely documented in previous studies. There is an ongoing debate that the impact of undervaluation on economic growth decreases with increasing income (see Rodrik, 2008). That seems to be the case in this particular instance. The coefficient for the convergence term is negative and significant at 5% for the middle-income countries, indicating that the initial level of income matters, as documented in the convergence literature (see, for example, Barro, 1991; Mankiw *et al*, 1992; Aguirre & Calderon, 2005; and Romer, 2012).

Panels [5] and [6] in Table 6.3a show the results when the two income blocs are combined into a single bloc. Here, the coefficient for the undervaluation index is positive and significant at the conventional levels. Similarly, the convergence term is negative and statistically significant. The traditional literature on cross-country income differences has emphasised the role of initial income (see Barro, 1991). Therefore, these results support the literature.

Table 6.3b: The Baseline Model with the Alternative Measure of Undervaluation

	[1]	[2]	[3]	[4]	[5]	[6]
Growth	Low Income Countries [One-Year]	Low Income Countries [Five-Year]	Middle Income Countries [One-Year]	Middle Income Countries [Five-Year]	All Countries [One-Year]	All Countries [Five-Year]
LNRGDP(-1)	-1.838** (-2.34)	-0.877* (-2.14)	-0.983* (-2.03)	-0.631** (-2.60)	-2.586* (-2.01)	-0.846*** (-3.47)
LNUNDERX	-1.071** (-2.98)	-0.281*** (-3.63)	-0.780** (-2.74)	-0.140** (-2.50)	-1.178** (-2.48)	-0.217** (-2.53)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Countries	7	7	8	8	15	15
Observations	280	54	320	56	600	110

Note: t-statistics are reported in the parentheses; *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

As a sensitivity check, the study fits and estimates an alternative simple model with the measure of undervaluation using the Hodrick-Prescott filter. This is in order to test whether Rodrik's (2008) measure overestimates the elasticities as argued by Woodford (see *Equation* (5.5) of Chapter 5). The within-effects estimates are shown in Table 6.3b. Note that the *a priori* sign of the undervaluation coefficient, in this case, is negative. Panels [1] and [2] show the results obtained for the low-income countries under *t=1* and *t=5*. The estimated coefficient for the alternative measure of undervaluation is negative and significant at the conventional levels. That aside, the convergence term is negative and significant at the conventional levels. Hence, both the initial level of income and undervaluation play a critical role in growth for the low-income countries. Similarly, Panels [3] and [4] show the results obtained for the middle-income countries. Both the convergence and undervaluation terms are negative and statistically significant, suggesting that they influence growth within these countries. Finally, Panels [5] and [6] show the results for all the countries in the sample. As in the previous cases, both the convergence and undervaluation terms are negative and statistically significant, suggesting that they influence growth within all the countries.

On account of these results, it appears that Rodrik's (2008) measure overestimates the impact of undervaluation on growth when compared with the alternative measure, thus confirming Woodford's (2009) assertions. A careful look at the results also shows that the elasticities obtained for the 1-year time window are high. The likelihood of unit roots and volatilities in the undervaluation index, the convergence term, and growth may be driving these high elasticities, thereby making the 1-year results unreliable. Hence, the rest of the discussion will focus on only the 5-year results. Notice, also, that the basic determinants of growth are not included in the baseline model that has been presented so far. Hence, the results reported here could be misleading, due to omitted variable bias. The remaining sections focus on the fully-specified models.

6.4.2 The Fully-Specified Model

The results in Tables 6.3a and 6.3b are based on simplified regressions. An obvious drawback of these results is omitted variable bias. Cross-country studies on economic growth have emphasised certain key macroeconomic drivers of growth. The results would only make sense if some of the core determinants of growth are included in the models. The two

regressions that reflect the inclusion of some of these core determinants of growth are presented in *Equations* (5.7) and (5.8) of Chapter 5. The study estimates these two equations with the within-effects estimator and presents the estimates in Tables 6.4a and 6.4b.

Table 6.4a: The Fully-Specified Model with the Rodrik-type Undervaluation Index

	[1]	[2]	[3]	[4]	[5]	[6]
Growth	Low Income Countries [One-Year]	Low Income Countries [Five-Year]	Middle Income Countries [One-Year]	Middle Income Countries [Five-Year]	All Countries [One-Year]	All Countries [Five-Year]
LNRGDP(-1)	-1.410**	-0.594*	-1.496***	-0.978*	-3.321**	-0.972**
	(-2.73)	(-2.20)	(-3.85)	(-2.81)	(-2.64)	(-2.77)
LNHC	1.325***	0.336**	0.623**	0.371*	0.740*	0.164
	(3.70)	(2.71)	(2.44)	(1.97)	(2.08)	(1.29)
LNPC	0.264***	0.390**	0.523**	0.140*	0.920**	0.220**
	(3.33)	(2.50)	(2.20)	(1.96)	(2.44)	(2.30)
LNPOP	0.538*	0.280**	0.811***	0.378***	0.971**	0.272**
	(1.95)	(2.46)	(3.42)	(3.83)	(2.03)	(2.26)
LNUNDERV	1.235***	0.560**	0.923**	0.353***	1.117***	0.667***
	(7.22)	(2.69)	(2.49)	(3.36)	(3.31)	(3.83)
LNINF	-1.131***	-1.069**	-0.944	-0.157	-0.848**	-0.664*
	(-8.62)	(-2.60)	(-0.15)	(-0.23)	(-2.38)	(-2.06)
LNTOT	3.695**	4.235**	2.066	1.559**	4.844	1.648*
	(2.81)	(2.74)	(0.03)	(2.62)	(0.48)	(1.96)
LNOPEN	-0.850	-0.928	-0.900	-2.536	-0.461	-1.008
	(-0.12)	(-0.02)	(-1.02)	(-1.11)	(-0.44)	(-0.69)
LNGDB	-1.451	-0.615	-1.691***	-0.532**	-0.643**	-0.338**
	(-1.40)	(-1.72)	(-3.07)	(-2.48)	(-2.86)	(-2.25)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Countries	7	7	8	8	15	15
Observations	226	50	275	52	501	110

Note: t-statistics are reported in the parentheses; *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

Table 6.4a shows the results obtained from estimating the fully-specified model, which contains the Rodrik-type measure of undervaluation and some core control variables that appear in the growth literature. The key determinants include human capital, population growth, physical capital, inflation, terms of trade, trade openness, and government consumption expenditure.[13] In Panels [1] and [2], the within-effects estimates for the low-income group under *t=1* and *t=5* are reported. The estimated coefficient of the undervaluation index is positive and significant at the conventional levels. In particular, the estimated coefficient of the undervaluation implies that if undervaluation increases by 1%, growth would increase by approximately 0.6%, assuming the other growth determinants remain constant.

Panels [3] and [4] report the within-effects estimates for the middle-income SSA countries. Similar to the results reported for the low-income countries, the estimated coefficient on the undervaluation index is positive and significant both under *t=1* and *t=5*. For the middle-income case, the estimated impact of undervaluation on growth has reduced drastically when compared to the results obtained for the low-income countries. This account seems to buttress previous studies, which found the impact of undervaluation to dissipate as income level rises (see Rodrik, 2008). A percentage increment in undervaluation generates approximately 0.4% economic growth in the middle-income SSA countries considered in this study, given that the other determinants remain constant.

Panels [5] and [6] report the within-effects estimates for the fully-specified model with the Rodrik-type measure of undervaluation and the controls when the two income groups are combined. The reported within-effects results for all the countries in the sample do not differ greatly from those reported for the middle-income countries. The estimated coefficient for the undervaluation index is significant at the conventional levels. A 1% increment generates roughly 0.7% economic growth, should the other growth determinants remain unchanged.

While the results appear to support existing theories and findings, the primary concern is the magnitude of the estimated impact of undervaluation on economic growth for these three classifications. The existing empirical studies document a mild impact of undervaluation on economic growth for developing countries. For instance, Rodrik (2008) reports the magnitude

[13] A detail discussion of the motivation for including these variables can be found in Chapter 5.

of the impact to be approximately 0.026 for the developing countries considered in his study. Similarly, Ghura and Grennes (1993) report the magnitude of the impact to be roughly 0.036 for the SSA countries considered in their study. Nonetheless, visual inspection of the coefficients reported in Table 6.4a appear to manifest one particular econometric fact – the larger the sample, the more precise the estimated coefficients. From the table, it is evident that the combined sample yields moderately estimated coefficients, at least for the majority of the growth determinants. It is also worth noting that the studies cited herein employed larger cross-sectional units than the one in this study. Hence, the high coefficient estimates reported here could be driven by the small samples used in the estimations. Future studies could consider expanding the dataset (i.e. in terms of time and cross-sectional dimensions) in order to carefully consider this issue.

Regarding the other variables, it is evident that the initial level of income plays a significant role in growth. For all classifications, its coefficient is negative and statistically significant, suggesting convergence. In other words, this shows that countries with lower income per capita tend to grow faster. This conclusion ties with those of Barro (1991), Mankiw *et al* (1992), Aguirre and Calderon (2005), Rodrik (2008), and Gluzmann *et al* (2012), among others. Human capital is positive in all cases but it is not significant when the two groups are combined. The coefficient estimates are reasonable. The evidence that improvement in human capital is associated with growth is consistent with the literature (see, for example, Barro, 1991, 2001; Levy-Yeyati & Sturzenegger, 2003; and Romer, 2012). Physical capital enhances growth as shown by the positive and statistically significant coefficients. This is in line with the literature as well (see Barro, 1991; Mankiw *et al*, 1992; Ghura & Grennes, 1993; Domac & Shabsigh, 1999; Levy-Yeyati & Sturzenegger, 2003; and Gluzmann *et al*, 2012, among others). In addition, population growth is found to be significant in the regression estimates. In particular, the results suggest that population growth is associated with growth, which is consistent with other studies (see, for example, Moral-Benito, 2012; and León-González & Vinayagathasan, 2015). Moreover, terms of trade relate positively with growth, while inflation, trade openness and government consumption expenditure relate with it negatively. These findings are also documented in the existing studies (see Sarel, 1996; Bleaney & Greenaway, 2001; Barro, 2003; Aguirre & Calderon, 2005; De Gregorio, 2006; Aghion *et al*, 2009; and Berg & Miao, 2010, among others).

Table 6.4b: The Fully-Specified Model with the Alternative Measure of Undervaluation

Growth	[1] Low Income Countries [One-Year]	[2] Low Income Countries [Five-Year]	[3] Middle Income Countries [One-Year]	[4] Middle Income Countries [Five-Year]	[5] All Countries [One-Year]	[6] All Countries [Five-Year]
LNRGDP(-1)	-2.764*	-0.650*	-3.234***	-0.421***	-1.434**	-0.624**
	(-2.01)	(-2.04)	(-3.30)	(-3.80)	(-2.24)	(-2.68)
LNHC	0.892**	0.349*	1.602**	0.490***	1.655*	0.126**
	(2.90)	(2.16)	(2.23)	(3.90)	(1.88)	(2.29)
LNPC	0.273**	0.184**	0.222**	0.234**	1.116***	0.538**
	(2.60)	(2.36)	(2.49)	(2.66)	(3.52)	(2.35)
LNPOP	1.708	0.634**	1.441**	0.461***	1.176**	0.274**
	(1.58)	(2.22)	(2.74)	(2.99)	(2.34)	(2.44)
LNUNDERX	-2.888***	-0.381**	-1.754***	-0.184***	-2.579**	-0.228
	(-4.78)	(-2.65)	(-3.05)	(-3.33)	(-2.41)	(-1.50)
LNINF	-1.213***	-0.436**	-1.146**	-0.280***	-0.935**	-0.360**
	(-3.55)	(-2.89)	(-2.36)	(-3.09)	(-2.38)	(-2.44)
LNTOT	3.687*	1.116**	0.367***	1.054	1.410***	0.494**
	(1.98)	(2.64)	(5.14)	(1.07)	(3.18)	(2.64)
LNOPEN	-0.753	-1.594***	-1.406*	-3.002**	-0.530**	-1.693
	(-1.17)	(-3.07)	(1.87)	(-1.44)	(-2.57)	(-1.25)
LNGDB	-1.566	-3.551*	-1.392	-2.608**	-0.255**	-0.155
	(-1.47)	(-2.00)	(-1.39)	(-2.45)	(-2.31)	(-0.10)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Observations	226	50	275	52	501	110

Note: t-statistics are reported in the parentheses; *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

Table 6.4b reports the sensitivity analysis of the Rodrik-type undervaluation index considered in Table 6.4a. As with the previous discussion, the alternative measure of undervaluation enables the study to consider Woodford's critique. The results in this table are also obtained with the within-effects technique. Panels [1] and [2] show the results for the low-income sample. Evidently, the coefficient for the alternative measure of undervaluation is negative and significant. In Panels [3] and [4], similar results are reported for the within-effects

estimates in the case of the middle-income SSA countries. That is, the estimated coefficient for the alternative undervaluation index is negative and significant under the one- and five-year time windows. Panels [5] and [6] also show the results of the within-effects estimates for all the countries in the sample. For this case, the coefficient of the undervaluation index is negative but insignificant for the five-year window. From the results, the study gathers that the impact of undervaluation measured using the alternative index is relatively lower than the one reported under the Rodrik-type measure. This evidence appears to validate Woodford's (2009) contention that Rodrik's (2008) measure overestimates the impact of undervaluation on economic growth.

The remaining variables have the same signs as those reported in Table 6.4a. The statistically significant variables are the convergence term, human capital, physical capital, population growth, inflation, and terms of trade. The significance of trade openness and government consumption expenditure is relatively weak. As a cautionary note, it must be pointed out that not much should be inferred from these results since the potential presence of endogeneity bias could confound any judgment at this stage. The next section attempts to deal with potential endogeneity in the specifications.

6.4.3 Controlling for Potential Endogeneity in the Fully-Specified Model

An issue that could arise thereby making the results presented so far unreliable is endogeneity. Endogeneity can arise in various ways. Firstly, it is possible that a country's exchange rate will experience misalignments due to a slow down or improvement in growth. For example, if a country's non-tradable sector experiences high marginal productivity, the price of labour would increase, other factors unchanged. This adjustment has implications on the overall price level, and therefore the movement of the real exchange rate. In fact, productivity growth, which ultimately influences long-term economic growth plays a critical role in exchange rate movements as per the BSH. Hence, what appears as undervaluation-driven growth may actually be growth-driven undervaluation – meaning that the above results may be masked by reverse causality. Although, Rodrik (2008) argues that his index is robust to reverse causality, this is not guaranteed. Secondly, undervaluation could be correlated with other unobserved country characteristics, which could make identification problematic. Thirdly, in specifications of the forms utilised in the study, there are potential omitted variables that are likely to be correlated with both undervaluation and economic growth

making the results biased (see Iyke, 2017). Finally, the presence of the convergence term as an explanatory variable introduces dynamic panel bias (see Roodman, 2009a, b).

To overcome the endogeneity problem, the study uses the generalized method of moments (GMM), proposed in Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The choice of instruments plays a critical role when using GMM techniques. Windmeijer (2005) notes that the average bias of parameters is lowered when instrument counts are lowered. Similarly, Roodman (2009a) observes that parameters are overestimated as instrument count rises. In addition, León-González and Montolio (2015) show that models that add nearer lags as instruments produce larger posterior probability. Nevertheless, despite its importance, the literature provides no clear guidance on the optimal number of instruments to include in a model (see León-González & Vinagayathasan, 2015; and Iyke, 2017).

This study uses the two-step system GMM estimator with the Windmeijer (2005) corrected cluster-robust errors when controlling for endogeneity in the specifications. The system GMM is preferred to the difference GMM because the latter is prone to the problem of weak instruments (see Staiger & Stock, 1997; and Roodman, 2009a). To minimise gaps in the data, the study employs the forward orthogonal deviations to transform the variables.[14] The study follows Roodman (2009a, b) and experiment with different specifications by controlling the *a priori* estimate of the covariance matrices of the idiosyncratic errors, by collapsing the instrument matrices, and by minimising the instrument counts using the principal component analysis technique in Mehrhoff (2009), Bai and Ng (2010), and Kapetanios and Marcellino (2010).

The study treated the initial level of income and undervaluation as the only endogenous variables, the rest as predetermined, and the time dummies as strictly exogenous. The results based on this identification strategy are presented in Tables 6.5a and 6.5b. Following the standard approach adopted throughout the study, the estimates for the Rodrik-type undervaluation index and the alternative index under *t=1* and *t=5* time windows are reported successively.

[14] See Arellano and Bover (1995) for further discussion.

Table 6.5a: Controlling for Endogeneity in the Model with the Rodrik-type Undervaluation Index

	[1]	[2]	[3]	[4]	[5]	[6]
	Low Income Countries [One-Year]	Low Income Countries [Five-Year]	Middle Income Countries [One-Year]	Middle Income Countries [Five-Year]	All Countries [One-Year]	All Countries [Five-Year]
Growth	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM
LNRGDP(-1)	-0.949**	-0.481**	-0.877***	-0.562***	-0.848**	-0.262**
	(-2.11)	(-2.86)	(-3.35)	(-3.66)	(-2.66)	(-2.39)
LNHC	0.759	0.232**	0.783*	0.264**	1.324**	0.294*
	(1.28)	(2.51)	(1.88)	(2.33)	(2.84)	(1.96)
LNPC	0.039	0.442***	0.504**	0.207*	0.933**	0.644
	(1.34)	(3.30)	(2.19)	(1.89)	(2.22)	(0.45)
LNPOP	0.802**	0.238**	0.400**	0.303**	0.389**	0.221*
	(2.32)	(2.13)	(2.41)	(2.28)	(2.69)	(1.91)
LNUNDERV	0.915**	0.337**	0.739***	0.240**	0.981**	0.452**
	(2.53)	(2.85)	(3.40)	(2.78)	(2.20)	(2.49)
LNINF	-0.428	-0.199*	-0.901**	-0.592**	-1.285	-0.538
	(-0.86)	(-1.85)	(-2.44)	(-2.46)	(-1.55)	(-1.24)
LNTOT	0.251**	0.387**	1.005	0.538	1.297*	0.276
	(2.55)	(2.16)	(1.45)	(1.10)	(1.64)	(0.15)
LNOPEN	-3.2627	-1.077	-0.335***	-0.653***	-0.903**	-0.469**
	(-1.49)	(-1.36)	(-4.07)	(-4.14)	(-1.97)	(-2.49)
LNGDB	-0.673	-0.480	-0.331**	-0.116**	-0.547	-0.273
	(-0.59)	(-1.54)	(2.34)	(-2.61)	(-1.47)	(-1.29)
Countries	7	7	8	8	15	15

Observations	226	50	275	52	501	102
Number of Instruments	47	15	32	12	53	18
Arellano–Bond Test	0.755	0.614	0.191	0.289	0.223	0.104
Sargan Test	0.919	0.437	0.358	0.685	0.151	0.450
Hansen Test	0.874	0.583	0.483	0.638	0.261	0.483
Portion of variance	0.923	0.869	0.920	0.860	0.912	0.832
Kaiser-Meyer-Olkin measure	0.840	0.801	0.617	0.737	0.940	0.817

Note: (i) t-statistics are reported in the parentheses. (ii) *, **, and *** denote significance at 10%, 5%, and 1%, respectively. (iii) Diff-GMM and Sys-GMM denote, respectively, difference GMM and system GMM estimations. (iv) the diagnostic tests are the Arellano-Bond test for AR(2) in first differences, Sargan test of overidentification restrictions, Hansen test of overidentification restrictions, Portion of variance explained by the components, and Kaiser-Meyer-Olkin measure of sampling adequacy.

Table 6.5a reports the two-step system GMM estimates of the fully-specified model containing the Rodrik-type undervaluation index. Panels [1] and [2] contain the estimates for the low-income SSA countries under *t=1* and *t=5*. Undervaluation positively and significantly correlates with economic growth in the low-income countries, from the GMM estimates. The estimated impact of undervaluation on growth is roughly 0.34% for a 1% increase in undervaluation, other factors remaining the same. Similarly, Panels [3] and [4] report the results of the GMM estimates for the middle-income SSA countries in the sample. The coefficient of the undervaluation index is positive and significant at conventional levels for *t=1* and *t=5*. The results indicate that a percentage increase in undervaluation leads to approximately 0.24% increase in growth, other factors remaining unchanged. A crucial result must be re-emphasised here: the effect of undervaluation weakens as countries migrate from a low-income bracket to a middle-income bracket. That is, the role of undervaluation appears to reduce as the income level increases. Rodrik (2008) also notes this in his study. The estimates for the combined sample are reported in Panels [5] and [6]. The results show that the coefficients of the undervaluation term are positive and significant under *t=1* and *t=5*. It can be summarised that a percentage increase in undervaluation, given other growth determinants unchanged, generates roughly 0.45% increase in growth.

The results reveal another econometric issue that needs brief discussion. It is obvious that the impact of undervaluation is stronger when the one-year time window is considered. A general consensus in the empirical literature is that certain macroeconomic variables, including the real exchange rate, can be very "noisy" when considered monthly, quarterly, or annually. In other words, such variables exhibit undesirable mean-reverting properties. The standard empirical procedure for eliminating such noise effects in a series of this nature is through five-year averaging (see Freund & Pierola, 2008; Rodrik, 2008; Aghion *et al*, 2009; and Rapetti *et al*, 2011). Hence, the fact that the coefficients under *t=1* are overestimated is expected, and indeed, is the reason the study maintains the one-year time window – to elaborate this issue.

The remaining variables have the expected signs as those reported earlier, with varying levels of significance. The main diagnostic tests, namely the Arellano-Bond test, and the Sargan and Hansen tests, indicate that there is no second order autocorrelation and that the instruments are valid. Hence, the results are reliable.

The two-step system GMM estimates for the fully-specified model with the alternative measure of undervaluation are presented in Table 6.5b. Panels [1] and [2] report the difference and system GMM estimates for the low-income SSA countries in the sample. The results show undervaluation to negatively and significantly correlate with economic growth. Note that the interpretation, in this case, is that undervaluation enhances growth while overvaluation hurts it. The same can be said for Panels [3] and [4], and Panels [5] and [6], the GMM estimates for the middle-income SSA countries and the combined sample, respectively. The diagnostic tests reported at the bottom of Table 6.5b suggest that the results are reliably estimated.

The fact that the impact of undervaluation on growth diminishes as the income level rises has already been discussed. What the study finds worthy of mention is how the coefficient of undervaluation estimated for the conventional measures fares with the Rodrik-type measure. From Panels [3], [4], [5], and [6] in Table 6.5b, it can immediately be noticed that the coefficients for the alternative undervaluation term are moderately estimated compared to those reported in Table 6.5a. There appears to be some evidence in favour of Woodford's (2009) argument that Rodrik's (2008) measure may have exaggerated the impact of undervaluation on economic growth. From this perspective, it would be interesting to see how a measure of undervaluation constructed without accounting for the Balassa-Samuelson (BS) effect performs. Fortunately, the alternative measure of undervaluation does not account for the BS effect and therefore supports Woodford's (2009) argument. Of particular concern to this study is how undervaluation, measured in Rodrik sense, impacts on growth. The investigation finds some elements of truth that undervaluation has indeed influenced economic growth in the SSA countries considered in this study. The effect is much more pronounced in the low-income SSA countries than in the middle-income SSA countries.

Table 6.5b: Controlling for Endogeneity in the Model with the Alternative Index

	[1]	[2]	[3]	[4]	[5]	[6]
	Low Income Countries [One-Year]	Low Income Countries [Five-Year]	Middle Income Countries [One-Year]	Middle Income Countries [Five-Year]	All Countries [One-Year]	All Countries [Five-Year]
Growth	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM
LNRGDP(-1)	-0.779***	-0.297***	-0.792***	-0.314**	-0.810**	-0.157**
	(-4.78)	(-5.33)	(-3.48)	(-2.56)	(-2.47)	(-2.86)
LNHC	0.711**	0.616**	0.359**	0.483**	0.619	0.480*
	(2.55)	(2.13)	(2.88)	(2.38)	(1.12)	(1.92)
LNPC	0.635**	0.112	0.159**	0.403	0.341*	0.389
	(2.62)	(0.02)	(2.17)	(1.50)	(1.87)	(0.47)
LNPOP	0.9743	0.438*	0.338*	0.634**	0.422**	0.298**
	(1.56)	(1.89)	(1.83)	(2.30)	(2.38)	(2.33)
LNUNDERX	-0.874*	-0.282**	-0.608*	-0.235***	-0.749**	-0.328*
	(-1.88)	(-2.22)	(-1.97)	(-3.56)	(-2.16)	(-1.95)
LNINF	-0.1805	-0.652**	-0.473**	-0.250**	-0.592**	-0.384**
	(-1.04)	(-2.97)	(-2.19)	(-2.69)	(-2.50)	(-2.14)
LNTOT	0.562***	0.270**	0.148**	0.217**	0.962**	0.338*
	(5.02)	(2.79)	(2.60)	(2.26)	(2.77)	(1.98)
LNOPEN	-1.5850	-0.096**	-0.319	-0.520**	-0.491*	-0.430**
	(-0.40)	(-3.01)	(-0.92)	(-2.41)	(-1.86)	(-2.58)
LNGDB	-0.3905	-0.811**	-0.691*	-0.208	-0.773**	-0.801
	(-0.09)	(-2.29)	(-2.05)	(-0.62)	(-2.83)	(-0.60)
Countries	7	7	8	8	15	15

Observations	226	50	275	52	501	107
Number of Instruments	44	15	32	12	48	16
Arellano–Bond Test	0.661	0.679	0.389	0.472	0.176	0.350
Sargan Test	0.932	0.782	0.147	0.460	0.394	0.522
Hansen Test	0.904	0.657	0.188	0.568	0.456	0.473
Portion of variance	0.923	0.869	0.920	0.860	0.912	0.832
Kaiser-Meyer-Olkin measure	0.840	0.801	0.617	0.637	0.940	0.817

Note: (i) t-statistics are reported in the parentheses. (ii) *, ** and *** denote significance at 10%, 5%, and 1%, respectively. (iii) Diff-GMM and Sys-GMM denote, respectively, difference GMM and system GMM estimations. (iv) the diagnostic tests are the Arellano-Bond test for AR(2) in first differences, Sargan test of overidentification restrictions, Hansen test of overidentification restrictions, Portion of variance explained by the components, and Kaiser-Meyer-Olkin measure of sampling adequacy.

6.5 Testing for Potential Nonlinear Effects of Undervaluation on Growth

Having established that real exchange rate undervaluation affects economic growth in a positive manner, the next step is to test whether the effect of undervaluation on economic growth is linear. That is, the study seeks to provide answers to the following questions: (i) Does undervaluation enhance economic growth just as overvaluation hurts it? (ii) Does the impact of undervaluation on growth depend on the size of undervaluation? As has been discussed elsewhere in this study, these questions have sparked considerable research, but the conclusions are divergent (see Razin & Collins, 1997; Dooley *et al*, 2003; Aguirre & Calderon, 2005; Chinn, 2005; Rodrik, 2008; and Rapetti *et al*, 2011). There are other ways of dealing with the linearity testing (see, for example, Hansen, 1999; and González *et al*, 2005). In this study, however, two relatively simple but effective approaches are employed.[15] The baseline models for the first approach could be found in *Equations* (5.9) and (5.10) of Chapter 5. The second approach has also been described in Chapter 5. The study provides within-effects estimations of *Equations* (5.9) and (5.10) in Tables 6.6a, 6.6b, 6.6c, and 6.6d. These tables show the first approach.

From Tables 6.6a and 6.6b, it is clear that the *t-statistic* cannot adjudge the best model, since Panels [2], [4], and [6] all show that at least, one of the linear, quadratic, and cubic terms are significant. However, the R^2*-statistic* indicates clearly that the linear model fits the data better. That is, from Panels [2], [4], and [6] the R^2*-statistic* is higher under the linear specifications than under the quadratic and cubic specifications. The implication here is that the effect of undervaluation on growth is fairly linear for countries in the low-income and the middle-income countries, as well as in the combined sample.

[15] See Rapetti *et al.* (2011), for the discussion of this approach. A brief discussion of this approach has also been provided in Section 5.3.3 of Chapter 5.

Table 6.6a: Testing Nonlinear Effects: Rodrik-type Undervaluation Index

	[1] Low Income Countries [One-Year]			[2] Low Income Countries [Five-Year]			[3] Middle Income Countries [One-Year]			[4] Middle Income Countries [Five-Year]		
Growth	a	b	c	a	b	c	a	b	c	a	b	c
LNRGDP(-1)	-4.428** (-2.59)	-4.425** (-2.59)	-4.422*** (-3.59)	-8.312*** (-3.21)	-8.311*** (-3.19)	-8.311*** (-3.16)	-6.329*** (-4.50)	-6.373*** (-4.31)	-6.377*** (-4.12)	-4.044** (-2.82)	-4.135** (-2.82)	-4.179* (-1.81)
LNHC	1.337 (1.68)	1.334 (1.68)	1.331* (1.96)	0.211** (2.71)	0.216** (2.70)	0.206** (2.69)	1.385 (0.37)	1.316 (0.33)	1.398 (0.32)	0.139 (0.03)	0.306 (0.07)	0.776 (0.17)
LNPC	0.251** (2.29)	0.254** (2.29)	0.257** (2.30)	0.661 (0.17)	0.629 (0.16)	0.596 (0.15)	2.260** (2.96)	2.303** (2.92)	2.338** (2.83)	3.025 (1.60)	3.329 (1.72)	3.573 (1.80)
LNPOP	0.467* (2.16)	0.487* (2.14)	0.507* (2.12)	0.342 (0.61)	0.339 (0.60)	0.334 (0.60)	0.20*** (4.50)	0.345*** (4.39)	0.439*** (4.22)	1.442 (0.55)	1.510 (0.57)	1.580 (0.60)
LNUNDERV	-4.842** (-2.41)	-5.093** (-2.89)	-5.175** (-2.38)	-1.734** (-2.87)	-1.143* (-2.51)	-2.415** (-2.65)	-1.078** (-2.81)	-6.274 (-1.81)	-2.183 (-0.90)	-1.665*** (-3.96)	-4.361** (-2.56)	-0.576 (-0.12)
Linear	**0.045*** **(2.03)**			**2.489**** **(3.03)**			**2.311***** **(3.43)**			**2.030***** **(3.23)**		
Quadratic		0.002 (0.03)			0.137** (3.08)			0.112** (2.95)			0.089 (1.13)	
Cubic			0.000 (0.02)			0.010*** (3.12)			0.007** (2.56)			0.005* (2.05)
LNINF	-1.131*** (-9.11)	-1.131*** (-9.12)	-1.131*** (-9.10)	-0.876* (-1.98)	-0.880* (-1.99)	-0.884* (-2.00)	-0.054 (-0.21)	-0.053 (-0.20)	-0.052 (-0.19)	-0.022* (-2.03)	-0.037 (-0.05)	-0.051* (-2.07)
LNTOT	3.675 (0.79)	3.679 (0.79)	3.685 (0.79)	1.048 (0.19)	0.987*** (3.18)	0.930*** (3.16)	0.297 (0.14)	0.162 (0.08)	0.041 (0.02)	4.130 (1.41)	4.311 (1.50)	4.458 (1.58)
LNOPEN	-2.8567***	-2.8552***	-2.853***	-3.236***	-3.231***	-3.227***	-1.078	-1.082	-1.086	-2.224	-2.302	-2.365**

	(-4.05)	(-4.05)	(-4.05)	(-3.77)	(-3.81)	(-3.86)	(-1.30)	(-1.31)	(-1.31)	(-1.02)	(-1.05)	(-3.08)
LNGDB	-1.453	-1.453	-1.452	-3.158**	-3.169**	-3.182**	1.890***	1.933***	1.967***	2.842**	2.840**	2.831**
	(-1.28)	(-1.28)	(-1.27)	(-2.63)	(-2.63)	(-2.62)	(5.85)	(5.78)	(5.56)	(2.64)	(2.61)	(2.57)
Countries	7	7	7	7	7	7	8	8	8	8	8	8
Observations	226	226	226	50	50	50	275	275	275	52	52	52
R^2	**0.206**	0.173	0.189	**0.246**	0.145	0.140	**0.192**	0.1687	0.686	**0.387**	0.346	0.307

Note: (i) t-statistics are reported in the parentheses. (ii) *, ** and *** denote significance at 10%, 5%, and 1%, respectively. (iii) Linear=lnRGDP*UNDERV, Quadratic=lnRGDP^2*UNDERV, and Cubic=lnRGDP^3*UNDERV

Table 6.6b: Testing Nonlinear Effects: Rodrik-type Undervaluation Index

	[5] All Countries [One-Year]			[6] All Countries [Five-Year]		
Growth	a	b	c	a	b	c
LNRGDP(-1)	-3.767** (-2.75)	-3.734** (-2.73)	-3.699** (-2.72)	-4.424* (-1.85)	-4.367* (-1.81)	-4.302* (-1.78)
LNHC	1.882 (1.36)	1.916 (1.37)	1.972 (1.38)	1.250* (1.94)	1.474* (1.89)	1.722* (1.84)
LNPC	0.583** (2.30)	0.659** (2.33)	0.715** (2.35)	0.931** (2.28)	0.027** (2.29)	0.093** (2.30)
LNPOP	-6.314** (-2.32)	-6.349** (-2.24)	-6.361* (-2.18)	0.946 (1.71)	0.898 (1.59)	0.858 (1.50)
LNUNDERV	-2.341** (-2.57)	-0.330* (-2.07)	-1.629** (-2.54)	-3.924** (-2.62)	-0.573** (-2.11)	-1.477** (-2.50)
Linear	**1.130*** **(1.97)**			**1.117*** **(1.96)**		
Quadratic		0.051** (2.95)			0.046* (1.86)	
Cubic			0.003 (0.94)			0.002 (0.77)
LNINF	-0.857** (-2.47)	-0.862** (-2.47)	-0.866** (-2.46)	-0.964* (-2.10)	-0.969* (-2.09)	-0.972* (-2.09)
LNTOT	-0.595 (-0.41)	-0.659** (-2.44)	-0.706 (-0.45)	4.194 (1.70)	4.360 (1.69)	4.473 (1.68)

LNOPEN	-0.657**	-0.632*	-0.610	-0.683	-0.742	-0.796
	(-2.66)	(-1.83)	(-0.60)	(-0.48)	(-0.51)	(-0.54)
LNGDB	-0.766	-0.762*	-0.756*	-0.379	-0.381	-0.379
	(-1.00)	(-1.99)	(-1.98)	(-0.29)	(-0.29)	(-0.28)
Countries	15	15	15	15	15	15
Observations	501	501	501	110	110	110
R^2	**0.119**	0.071	0.071	**0.326**	0.204	0.204

Note: (i) t-statistics are reported in the parentheses. (ii) * and ** denote significance at 10% and 5%, respectively. (iii) Linear=lnRGDP*UNDERV, Quadratic=$lnRGDP^2$*UNDERV, and Cubic=$lnRGDP^3$*UNDERV

Now consider the case of the alternative undervaluation index. These results are displayed in Tables 6.6c and 6.6d. These results are not too different from the ones obtained using the Rodrik-type measure of undervaluation above. Looking at the *t-statistic*, the study is unable to establish the best model, since Panels [2], [4], and [6] all show that at least, one of the linear, quadratic, and cubic terms are significant. However, as with the above case, the R^2-*statistic* suggests that the linear model fits the data better than the other models. That is, from Panels [2], [4], and [6], the study gathers that the R^2-*statistic* is higher under the linear specifications than under the quadratic and cubic specifications. This implies that the effect of undervaluation on growth is linear for countries in the low-income and the middle-income countries, as well as in the combined sample. For this conclusion to hold good, further robustness checks are in order. In what follows, the study presents an alternative assessment of the linearity issue.

Table 6.6c: Testing Nonlinear Effects: Alternative Undervaluation Index

	[1]			[2]			[3]			[4]		
	Low Income Countries [One-Year]			Low Income Countries [Five-Year]			Middle Income Countries [One-Year]			Middle Income Countries [Five-Year]		
Growth	a	b	c	a	b	c	a	b	c	a	b	c
LNRGDP(-1)	-2.741**	-2.053**	-2.739**	-7.070**	-7.158**	-7.237**	-3.138***	-3.141***	-3.145***	-2.295**	-2.244**	-2.194**
	(-2.36)	(-2.44)	(-2.66)	(-2.21)	(-2.22)	(-2.23)	(-4.26)	(-4.23)	(-4.25)	(-2.87)	(-2.84)	(-2.81)
LNHC	1.909	1.902	1.906	2.580**	2.290**	1.984**	0.614	0.630	0.644	0.463	0.555	0.636
	(0.89)	(0.90)	(1.61)	(2.92)	(2.85)	(2.79)	(1.23)	(1.23)	(1.23)	(0.81)	(0.82)	(0.83)
LNPC	0.286**	0.649**	0.287**	0.541	0.379*	0.227	0.168	0.170	0.173	0.502	2.456**	2.410**
	(2.61)	(2.65)	(2.61)	(1.73)	(1.79)	(0.66)	(0.07)	(0.07)	(0.07)	(0.72)	(2.70)	(2.68)
LNPOP	1.699	1.909	1.698	1.295***	1.250***	1.204***	3.372	3.380	3.387	2.638*	2.598*	2.564*
	(1.53)	(1.73)	(1.54)	(3.48)	(3.38)	(3.25)	(0.72)	(0.72)	(0.73)	(1.96)	(1.95)	(1.95)
LNUNDERX	1.009*	1.694*	3.207**	7.654***	3.395***	2.503**	1.176**	1.935**	2.094***	5.8149***	5.092***	1.320***
	(2.02)	(2.07)	(2.19)	(3.85)	(3.31)	(2.78)	(2.41)	(2.99)	(3.37)	(3.36)	(4.03)	(4.78)
wLinear	**-0.393****			**-1.464*****			**-1.089****			**-2.093****		
	(-2.58)			**(-3.84)**			**(-2.86)**			**(-2.45)**		
wQuadratic		-0.035**			-0.433***			-0.056**			-0.102**	
		(-2.13)			(-3.39)			(-2.12)			(-2.25)	
wCubic			-0.002**			-0.029**			-0.003**			-0.006**
			(-3.09)			(-3.00)			(-2.32)			(-2.09)
LNINF	-1.208***	-1.135***	-1.207***	-0.890*	-0.892*	-0.895*	-0.141	-0.138	-0.135	-0.082***	-0.073***	-0.065***
	(-4.13)	(-4.15)	(-4.09)	(-1.84)	(-1.81)	(-1.79)	(-0.34)	(-0.34)	(-0.33)	(-4.09)	(-4.55)	(-4.07)
LNTOT	5.690	5.423	5.690	1.667	1.601	1.556	0.188*	0.203**	0.220**	-3.419	-3.375	-3.337
	(0.98)	(0.94)	(0.98)	(0.23)	(0.22)	(0.21)	(2.08)	(2.18)	(3.09)	(-1.10)	(-1.07)	(-1.05)

LNOPEN	-0.743 (-1.11)	-0.483 (-0.63)	-0.743 (-1.12)	-1.220 (-1.37)	-1.214 (-1.40)	-1.211 (-1.43)	-1.412**- (-2.82)	-1.411* (-1.81)	-1.409* (-1.81)	-2.922** (-2.38)	-2.915** (-2.38)	-2.909** (-2.38)
LNGDB	-1.551 (-1.52)	-1.403 (-1.34)	-1.549 (-1.52)	-3.759** (-2.42)	-3.805** (-2.42)	-3.847** (-2.43)	1.436 (1.47)	1.435 (1.46)	1.433 (1.46)	2.843** (2.47)	2.828** (2.45)	2.811** (2.43)
Countries	7	7	7	7	7	7	8	8	8	8	8	8
Observations	226	226	226	50	50	50	275	275	275	52	52	52
R^2	**0.229**	0.2364	0.217	**0.241**	0.239	0.238	**0.182**	0.181	0.181	**0.366**	0.363	0.361

Note: (i) t-statistics are reported in the parentheses. (ii) *, ** and *** denote significance at 10%, 5%, and 1%, respectively. (iii) wLinear=lnRGDP*UNDERX, wQuadratic=lnRGDP^2*UNDERX, and wCubic=lnRGDP^3*UNDERX

Table 6.6d: Testing Nonlinear Effects: Alternative Undervaluation Index

	[5] All Countries [One-Year]			[6] All Countries [Five-Year]		
Growth	a	b	c	a	b	c
LNRGDP(-1)	-1.434** (-3.03)	-1.433** (-3.03)	-1.431** (-3.03)	-2.739* (-1.98)	-2.738* (-1.97)	-2.735* (-1.97)
LNHC	1.653* (1.87)	1.659* (1.87)	1.667* (1.87)	1.219 (1.27)	1.256 (1.27)	1.290 (1.27)
LNPC	0.166** (2.51)	0.165** (2.51)	0.164** (2.51)	0.513** (2.53)	0.516** (2.53)	0.517** (2.53)
LNPOP	2.178** (2.52)	2.173** (2.52)	2.168** (2.52)	1.143** (2.32)	1.134** (2.32)	1.126** (2.31)
LNUNDERX	0.141** (2.36)	4.950** (2.91)	5.168 (1.49)	5.85** (2.39)	4.670** (2.64)	4.211 (0.91)
wLinear	**0.047*** **(2.04)**			**0.387**** **(2.55)**		
wQuadratic		0.004** (3.07)			0.027** (2.27)	
wCubic			0.001 (0.20)			0.002 (0.52)
LNINF	-0.935** (-2.38)	-0.935** (-2.38)	-0.935** (-2.38)	-1.161** (-2.44)	-1.160** (-2.44)	-1.159** (-2.45)
LNTOT	0.413* (2.19)	0.406* (2.18)	0.401* (2.18)	-2.509 (-0.64)	-2.513 (-0.64)	-2.517 (-0.64)
LNOPEN	-0.530 (-0.57)	-0.530 (-0.57)	-0.531 (-0.57)	-1.695 (-1.25)	-1.693 (-1.25)	-1.691 (-1.25)

LNGDB	-0.256 (-0.31)	-0.255 (-0.31)	-0.254 (-0.31)	-0.147** (-3.09)	-0.141** (-3.09)	-0.135** (-3.09)
Countries	15	15	15	15	15	15
Observations	501	501	501	110	110	110
R^2	**0.092**	0.081	0.081	**0.208**	0.202	0.206

Note: (i) t-statistics are reported in the parentheses. (ii) * and ** denote significance at 10% and 5% respectively. (iii) wLinear=lnRGDP*UNDERX, wQuadratic=$lnRGDP^2$*UNDERX, and wCubic=$lnRGDP^3$*UNDERX.

The above test for nonlinear effects of undervaluation on economic growth does not reveal the whole story. To further uncover the linearity story, the study follows a simple estimation procedure introduced in Rodrik (2008). The procedure requires that the study estimates the fully-specified regression model, which contains the Rodrik-type measure of undervaluation systematically for successively narrower bands of the index, *LNUNDERV*. Tables 6.6e and 6.5f show the within-effects results obtained by following Rodrik's procedure.

Panel [1] in both tables simply reproduces the within-effects results presented in Panels [5] and [6] in Table 6.4a. In Panel [2] of Tables 6.6e and 6.6f, all observations with $LNUNDERV > -1.50$ (i.e. overvaluations in excess of 150%) are excluded; in Panel [3] of Tables 6.5e and 6.5f, observations with $LNUNDERV > -1.00$ (i.e. overvaluations in excess of 100%) are excluded, in that order. Panel [6] of Tables 6.6e and 6.6f shows the results when the study restricted the range to overvaluations or undervaluations less than 50%. Statistically speaking, the coefficients estimated for all these restrictions are similar. On the basis of these results, the study could conclude that, if nonlinearities do exist, they are not significant. That is, the impact of misalignment on economic growth does not depend on the magnitude of undervaluation or overvaluation. The study does not find any convincing evidence of nonlinear (or asymmetric) impact of undervaluation on economic growth. In other words, undervaluation enhances growth just as overvaluation hurts it. This conclusion further buttresses the above results. It also ties with Rodrik's (2008) conclusion.

Table 6.6e: Testing for Outliers and Nonlinearities in the Full Sample (One-Year Window)

Growth	[1] Baseline Regression [One-Year]	[2] LNUNDERV>-1.50 [One-Year]	[3] LNUNDERV>-1.00 [One-Year]	[4] LNUNDERV>-0.50 [One-Year]	[5] LNUNDERV>-0.25 [One-Year]	[6] -0.50<LNUNDERV<0.50 [One-Year]
LNRGDP(-1)	-3.321**	-3.351***	-3.344***	-2.820**	-2.941**	-2.874**
	(-2.64)	(-3.29)	(-3.21)	(-2.71)	(-2.60)	(-2.79)
LNHC	0.740*	0.678**	0.770**	0.756**	0.540**	0.818**
	(2.08)	(2.99)	(2.93)	(2.74)	(3.00)	(2.31)
LNPC	0.920**	0.946	0.821	0.882**	0.718	0.824**
	(2.44)	(0.94)	(0.81)	(2.28)	(0.67)	(2.11)
LNPOP	0.971**	0.845**	0.612*	0.888	0.606**	0.742*
	(2.03)	(2.06)	(1.93)	(1.48)	(2.54)	(1.95)
LNUNDERV	1.117***	0.109***	0.127***	0.114**	1.116	0.134**
	(3.31)	(5.44)	(4.38)	(2.78)	(1.34)	(3.07)
LNINF	-0.848**	-0.872***	-0.867***	-0.786***	-0.731**	-0.864***
	(-2.38)	(-3.69)	(-3.64)	(-3.20)	(-2.81)	(-3.34)
LNTOT	4.844	3.949	3.849	3.846	4.272**	4.864
	(0.48)	(0.74)	(0.66)	(0.66)	(2.27)	(0.66)
LNOPEN	-0.461	-0.467	-0.419**	-0.360	-0.376	-0.490
	(-0.44)	(-0.70)	(-2.62)	(-0.23)	(-0.10)	(-0.69)
LNGDB	-0.643**	-0.638	-0.556	-0.584	-0.538	-0.536*
	(-2.86)	(-1.16)	(-1.00)	(-1.06)	(-0.65)	(-1.96)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Countries	15	15	15	15	15	15
Observations	501	498	494	478	437	466

Table 6.6f: Testing for Outliers and Nonlinearities in the Full Sample (Five-Year Window)

Growth	[1] Baseline Regression [Five-Year]	[2] LNUNDERV>-1.50 [Five-Year]	[3] LNUNDERV>-1.00 [Five-Year]	[4] LNUNDERV>-0.50 [Five-Year]	[5] LNUNDERV>-0.25 [Five-Year]	[6] -0.50<LNUNDERV<0.50 [Five-Year]
LNRGDP(-1)	-0.972**	-0.972**	-0.888**	-0.866**	-0.924	-0.866**
	(-2.77)	(-2.18)	(-2.12)	(-2.11)	(-0.10)	(-2.11)
LNHC	0.164	0.164	0.193	0.237**	0.187*	0.137
	(1.29)	(1.34)	(1.34)	(2.77)	(1.81)	(0.77)
LNPC	0.220**	0.220*	0.191*	0.308*	0.343	0.308*
	(2.30)	(1.90)	(1.87)	(1.86)	(0.15)	(1.86)
LNPOP	0.272**	0.272*	0.271*	0.201	0.185	0.221*
	(2.26)	(2.05)	(1.88)	(0.91)	(1.03)	(1.91)
LNUNDERV	0.667***	0.667***	0.666**	0.675**	0.715*	0.675*
	(3.83)	(3.29)	(2.11)	(2.31)	(1.93)	(1.91)
LNINF	-0.664*	-0.664**	-0.661**	-0.681**	-0.515	-0.681**
	(-2.06)	(-2.67)	(-2.65)	(-2.69)	(-0.99)	(-2.69)
LNTOT	1.648*	1.648*	0.792*	0.623**	0.603**	0.623**
	(1.96)	(1.97)	(1.79)	(2.05)	(2.71)	(2.05)
LNOPEN	-1.008	-1.008	-1.006	-1.076	-1.051	-1.076
	(-0.69)	(-0.85)	(-0.84)	(-1.51)	(-1.63)	(-1.51)
LNGDB	-0.338**	-0.338**	-0.458	-0.887*	-0.288	-0.287
	(-2.25)	(-2.37)	(-0.49)	(-2.09)	(-0.50)	(-0.09)
Time dummy	yes	yes	yes	yes	yes	yes
Country dummy	yes	yes	yes	yes	yes	yes
Countries	15	15	15	15	15	15
Observations	110	110	90	86	77	86

Note: (i) t-statistic is in the parentheses; (ii) *, ** and *** denote significance at 10%, 5%, and 1%, respectively; (iii) the results are only reported for the coefficient of undervaluation, *LNUNDERV*.

6.6 Conclusion

In this chapter, the results obtained by applying the models outlined in Chapter 5 to the dataset have been presented. Following a systematic procedure adopted throughout the chapters, the study presented the results for the low-income SSA countries, the middle-income SSA countries, and for the full sample. In order of the study objectives, the results for the Balassa-Samuelson Hypothesis were first presented. Next, the study reported the results for the impact of misalignment on growth. Then, it reported the results for endogeneity. Finally, the study presented the results for nonlinearity analysis.

CHAPTER 7

CONCLUSIONS AND POLICY RECOMMENDATIONS

7.1 Introduction

This is the final chapter of the study. The chapter presents the key findings of this study. The findings are provided in order of the study objectives and hypotheses. This chapter also outlines some policy recommendations that are deducted from the key findings. Finally, the chapter points out the key limitations of the study and suggests possible areas of research. The chapter is written in five sections, including the present section.

7.2 Summary of the Study

The general aim of this study is to examine the impact of real exchange rate misalignments on economic growth in SSA countries. Specifically, the study seeks to: test the Balassa-Samuelson Hypothesis (BSH), examine the effect of undervaluation on economic growth in SSA countries, determine whether the effect of undervaluation on economic growth in SSA countries depends on the measure of undervaluation used, and to examine whether the effect of undervaluation on economic growth in SSA countries is linear.

In line with these objectives, the study conjectures and tests the hypotheses that: Balassa-Samuelson Hypothesis holds in SSA countries, real undervaluation of the exchange rate enhances economic growth in SSA countries, the effect of undervaluation on economic growth in SSA countries depends on the measure of undervaluation employed, and that the effect of undervaluation on economic growth in SSA countries is linear.

7.3 Empirical Findings of the Study

For the hypothesis that the BSH holds in the SSA, the study finds a negative and highly significant coefficient of the relative productivity term for all three categories (i.e. low-income SSA countries, middle-income SSA countries, and the full sample). Thus, the study finds a well-established BSH for the SSA countries considered. These findings concur with previous findings (see Ito *et al*, 1999; Gala, 2008; Rodrik, 2008; Gluzmann *et al*, 2012; and Vieira & MacDonald, 2012).

Having established the BSH, the study constructed an index of undervaluation in order to test the hypothesis that real undervaluation of the exchange rate enhances economic growth in SSA countries. Using the baseline regression model with key controls, the study estimates a positive and significant coefficient for the undervaluation indexes in the low-income SSA countries. The estimated coefficient of the undervaluation indexes implies that if undervaluation increases by 1%, growth would increase by approximately 0.38-0.56%, assuming the other growth determinants remain constant, in the low-income SSA countries. The study also estimates a positive and significant coefficient for the undervaluation indexes in the middle-income SSA countries. However, the estimated impact and significance of undervaluation on growth has reduced drastically when compared with the results obtained for the low-income SSA countries. A percentage increment in undervaluation generates approximately 0.18-0.34% economic growth in the middle-income SSA countries considered in this study, given that the other determinants remain constant.

In order to document evidence that is robust to endogeneity, the study estimated the fully-specified model using GMM techniques. After controlling for endogeneity, undervaluation positively and significantly correlates with economic growth in the low-income SSA countries. The estimated impact of undervaluation on growth for the low-income SSA countries is roughly 0.28-0.34%, if undervaluation increases by 1%. Similarly, the coefficient of the undervaluation indexes is positive and significant at conventional levels in the middle-income SSA countries. The results indicate that a percentage change in undervaluation, given other determinants of growth unchanged, result in approximately 0.24% percentage change in economic growth, respectively, in the middle-income SSA countries.

The study found that the effect of undervaluation weakens as countries migrate from a low-income bracket to a middle-income bracket. That is, the role of undervaluation appears to dissipate as income level increases, which is consistent with the evidence documented by Rodrik (2008). The study also finds that the estimated impact of undervaluation on economic growth is higher than those reported in some previous studies. For instance, Rodrik (2008) reports the magnitude of the impact to be approximately 0.026% for the developing countries considered in his study. Similarly, Ghura and Grennes (1993) report the magnitude of the impact to be roughly 0.036% for the SSA countries considered in their study. Nonetheless, visual inspection of the reported coefficients appears to manifest one particular econometric

fact – the larger the sample, the more precise the estimated coefficients. As attestation to this fact, it could be seen that the results obtained for the full sample in the study yield moderately estimated coefficients, at least for the majority of the growth determinants. It is also worth mentioning that these previous studies employed larger cross-sectional units than the one employed in this study.

Since the study found undervaluation to enhance economic growth, it proceeded to test the hypothesis that the effect of undervaluation on economic growth in the SSA countries depends on the measure of undervaluation employed. Using the fully-specified model with control variables and a Hodrick-Prescott based measure of undervaluation, the study found the impact of undervaluation on growth to be influenced by the measure of undervaluation employed in the specifications. The elasticities estimated for the alternative measure of undervaluation are relatively smaller than the ones for the Rodrik-type undervaluation index. Therefore, based on the estimated elasticities, it could be concluded that the Rodrik-type index may overestimate the size of the impact of undervaluation on economic growth.

Finally, the study tested the hypothesis that the effect of real exchange rate undervaluation on economic growth in the SSA countries is linear. One way the study achieved this objective is by following the approach used in Rapetti *et al* (2011). The approach entails that the study interacts *LNRGDP*, and its squared and cubic terms with the undervaluation index. Then, the study estimates systematically by including these new variables, one after the other, in the fully-specified model and compares their *t*- and R^2*-statistics*. The results obtained from this approach clearly established evidence in support of the nonlinear impact of undervaluation on economic growth. To buttress this finding, the study uses a different approach introduced in Rodrik (2008). This approach requires that the study systematically estimates the fully-specified model for successively narrower bands of the undervaluation index, and compares the corresponding coefficients of the undervaluation index to the one obtained for the baseline regression. The estimates, following this approach, provide no evidence of nonlinearities because the coefficients of the undervaluation index are approximately the same for all restrictions and the baseline regression. Thus, the impact of undervaluation on growth is independent of the size of undervaluation. This conclusion agrees with the one documented by Rodrik (2008).

7.4 Policy Recommendations

There are distinctively two main policy recommendations that could be drawn from the findings of this study. First, the well-established Balassa-Samuelson Effect for these SSA countries implies that there are significant differences in prices between their tradable and non-tradable sectors. This means that the non-tradable sectors of these SSA economies are inefficient. To ensure price and wage parities between the tradable and the non-tradable sectors of these economies, governments will have to implement policies that induce productivity in the non-tradable sectors of these economies. A critical feature of the non-tradable sector of the SSA economies is the prevalence of the unskilled workforce. Free but compulsory vocational education and training could be vital, should governments consider re-invigorating this sector.

Second, there is strong evidence that real undervaluation is crucial for economic growth in these countries. SSA countries are considered to be the economies with overvalued currencies in the world, according to the World Bank (1984). These overvalued currencies, according to the World Bank, have hampered SSA development. The study finds this to be valid as well, for some of the countries. The obvious reason for such prevalence of overvalued currencies in the SSA countries is due to low productivity growth. SSA countries could learn from some notable Asian countries. The literature has indicated that undervalued currencies have been crucial for the rapid growth of most Eastern Asian countries, notably Japan, South Korea, Taiwan, Hong Kong, Singapore and China (see Dollar, 1992). The study does not suggest that SSA countries should enforce undervalued currencies, since this is against international trade agreements. On the contrary, the study believes that SSA countries could benefit immensely from favourable growth policies that could naturally create undervalued currencies in the near future. Such policies may include, among others, investment in research and development, creating an enabling environment for foreign direct investment, prioritising practical education and training, and building strong government and institutions, alongside strong property rights. These initiatives act as first best mechanisms to promote growth. Undervalued currencies are important because they act as second best policies to dislodge idle factors in the non-tradable sectors to the relatively productive sectors of these economies.

7.5 Limitations and Suggested Areas for Future Research

The apparent limitation of this study is that the channels through which undervaluation or overvaluation enhances or mars economic growth has not been explored. Effective policy recommendations could be succinctly and convincingly drawn by carefully exploring the transmission mechanisms involved in the impact of undervaluation or overvaluation on growth. However, this is not to say that the conclusions and policy recommendations made here are not binding. In light of this, future research could be directed towards examining these channels.

Another limitation of this study lies in the narrow nature of the cross-sectional dimension of the dataset used to estimate the regression models. As the estimated impact of undervaluation on growth shows, more moderate coefficients could have been realised if a wider spectrum of low- and middle-income SSA countries were included. Due to this limitation, the study is cautious in interpreting the approximate size of the impact of undervaluation on economic growth. To improve on the current results and offer better interpretations, the study recommends that future research expands the current dataset, particularly by increasing the number of countries.

The final drawback of the study stems from the fact that only one alternative undervaluation index was employed for the sensitivity analysis. As a sensitive or robustness check for the performance of the Rodrik-type measure of undervaluation, the study recommends additional measures of undervaluation to be used in future studies. That way, a better comparison could be made by considering the significance and the magnitude of the Rodrik-type undervaluation index to these new indexes.

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DATA APPENDIX

Table A.1: Description of the Data

Indicator	Definition	Source
growth	Annual rate of growth in country i's real GDP per capita at constant 2005 national prices (%)	Calculated from PWT 8.0
RGDP	Domestic real GDP per capita at constant 2005 national prices (in mil. 2005US$)	PWT 8.0
RGDP(-1)	Lag of real GDP per capita	Obtained from PWT 8.0
RGDP_us	US real GDP per capita at constant 2005 national prices (in mil. 2005US$)	PWT 8.0
PROD	Relative productivity measured as RGDP divided by RGDP_us	Calculated from PWT 8.0
HC	Index of human capital per person, based on years of schooling (Barro/Lee, 2012) and returns to education (Psacharopoulos, 1994)	PWT 8.0
PC	Capital stock at constant 2005 national prices (in mil. 2005US$)	PWT 8.0
INF	Inflation, consumer prices (annual %)	WDI
POP	Population (in millions)	PWT 8.0
POPG	Population growth calculated as annual percentage growth of POP	Calculated from PWT 8.0
pl_x	Price level of exports, price level of USA GDPo in 2005=1	PWT 8.0
pl_m	Price level of imports, price level of USA GDPo in 2005=1	PWT 8.0
TOT	Terms of Trade calculated as pl_x divided by pl_m	Calculated from PWT 8.0
OPEN	Trade Openness at 2005 constant prices (%)	PWT 7.1
GDB	Government Consumption Share of PPP Converted GDP Per Capita at 2005 constant prices [rgdpl]	PWT 7.1
XRAT	Exchange Rate to US$	PWT 7.1
PPP	Purchasing Power Parity over GDP (in national currency units per US$)	PWT 7.1
RER	Real exchange rate calculated as XRAT divided by PPP	Calculated from PWT 7.1
UNDERV	Measure of undervaluation following Rodrik (2008)	Calculated
UNDERX	A measure of undervaluation obtained using the Hodrick-Prescott (1997) Filter	Calculated
Time (t)	1970-1974; 1975-1979, …, 2005-2009	Non-overlapping five-year averaging