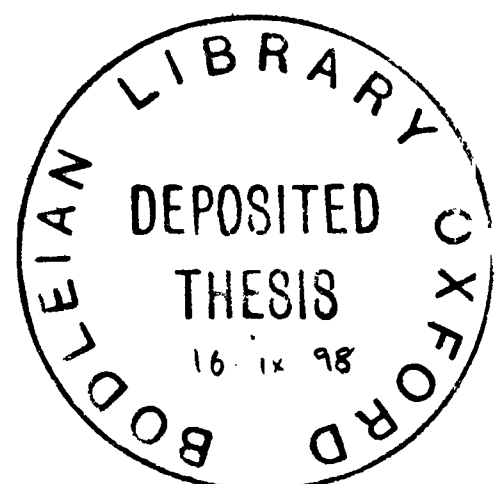


Exchange Rate Policy Options for Namibia

Meshack Tuneer Tjirongo
St. Antony's College, Oxford

Thesis Submitted for the Degree of Doctor of Philosophy
Sub-Faculty of Economics
University of Oxford
Trinity Term 1998



Abstract

Exchange Rate Policy Options for Namibia

By Meshack Tunee Tjirongo

St. Antony's College, Oxford

A Thesis Submitted for the Degree of Doctor of Philosophy

Sub-Faculty of Economics

University of Oxford, Trinity Term 1998

The thesis assesses the costs and benefits of Namibia's membership of the CMA to determine whether the CMA is an optimal currency area at least from the perspective of Namibia. This issue is examined from two main perspectives: (a) whether real exchange rate (RER) adjustment is frustrated by the inability to use the nominal exchange rate as an instrument of adjustment. Evidence of persistent RER misalignment may be seen as a necessary condition for an independent nominal exchange rate regime, however, it is not sufficient. (b) In this case, we examine whether nominal devaluations will have sustained effects on RER adjustment, given Namibia's structural features, such as the high degree of openness and a small nontradable sector. An equilibrium RER for Namibia is estimated using a single equation model of RER determination. The model is used to compute RER misalignments to determine whether there are sustained long periods of misalignments. To test whether nominal exchange rates can be effective in changing relative prices, a simple model was developed to measure pass-through of foreign price and exchange rate changes to domestic prices and wages. This provides useful information regarding whether nominal devaluations can be sustained. The results show that RER misalignments have been small, while the extent and speed of pass-through is complete and instantaneous for most items, suggesting that nominal devaluations in Namibia are not likely to have real effects.

Even if it was the case that monetary autonomy cannot be supported on grounds of affecting relative prices, it may nevertheless be important for Namibia to pursue an independent exchange rate strategy. To examine this possibility, the analysis was extended by looking at costs and benefits of OCAs which do not rely on the ability to change relative prices. Benefits arising from savings on transactions costs and on foreign exchange reserves amounted to 3.8% and 2.4% of GDP, respectively. Further, we demonstrated that past "shocks" between Namibia and South Africa were highly correlated. The findings of the thesis suggest that the CMA is an optimal exchange regime for Namibia.

Table of Contents

Chapter 1 Introduction

1.1 Motivation.....	1
1.2 Objectives of the Thesis.....	4
1.3 Structure of the Thesis	6
1.4 Analytical Tools	7

Chapter 2 The Namibian Economy

2.1 Introduction	8
2.2 Structural Features of the Namibian Economy and Growth Performance.....	9
2.3 Public Sector	21
2.4 The Structure of the Financial Sector	24
2.5 External Sector	27
2.6 The Labour Market	30
2.7. Summary and Conclusions	36
Appendix Table 2.1: GDP by Industry (1990)	237
Appendix Table 2.2: Merchandise Exports at Constant 1990 Prices (N\$'000)	238
Appendix Table 2.3: Trade Unions and Membership	238

Chapter 3 Choice of Exchange Rate Regime for Namibia:Lessons from the Theory of Optimum Currency Areas

3.1 Introduction	38
3.2 The Southern Africa Customs Union (SACU).....	39
3.3 The Common Monetary Area (CMA)	41
3.4 Criteria for Optimum Currency Areas	46
3.5 Summary and Conclusions	59
Appendix 3A: SACU: Revenue Share from the Customs Revenue Pool	239
Appendix 3B: Highlights of the Common Monetary Area.....	240

Chapter 4 Is the CMA an Optimal Currency Area?

4.1 Some Empirical Evidence for Namibia	60
4. 2 Summary and Conclusions	65
Appendix 4.1: Structure of Exports for Namibia and South Africa (R million)	241

Chapter 5 Estimating Equilibrium Real Exchange Rates for Namibia

5.1 Introduction66

5.2 Computations of the Real Exchange Rates for Namibia69

5.3 The Model of Real Exchange Rate Determination86

5.4: Developments in Namibia’s RER fundamentals.....98

5.5: Time Series Analysis of the RER Fundamentals104

5.6 Empirical Estimation of the Model107

5.7 The Equilibrium Real Exchange Rate113

5.8 Summary, Conclusions and Policy Implications120

Appendix Table 5.1:Namibia and South Africa’s Trading Partners (Averages:1989-95).....241

Appendix Table 5.2:Namibia: REER, Equilibrium RER Indexes, and RER Misalignment..242

Appendix Table 5.3:RER Misalignment Decomposed243

Chapter 6 Exchange Rate, Import Prices and Wages in Namibia:Estimating Exchange Rate Pass-Through

6.1 Introduction122

6.2 Exchange Rate Pass-Through127

6.3 Wage determination in Namibia135

6.4 Analytical Framework146

6.5 Pass-Through Empirics156

6.6 Conclusions and Policy Implications165

Appendix Table 6.1: Consumer Price Indexes243

Appendix Table 6.2: Unit Root Tests244

Appendix Table 6.3: Cointegration Tests (Food Items)244

Appendix Table 6.4: Cointegration Tests (Non-Food Items)245

Chapter 7 Further Costs and Benefits of CMA for Namibia

7.1 Introduction166

7.2. Benefits167

7.3 Costs185

7.4 Summary and Conclusions211

Appendix Table 7.1: External Shocks and Response Measures (as % of GDP).....245

Chapter 8 Conclusions and Policy Implications214

References220

Appendix Tables237

Acknowledgements

First, I would like to thank my supervisors Dr. Christopher Adam and Professor Paul Collier for their guidance throughout the preparation of this thesis. I am also grateful to many people at the Centre for the Study of African Economies who have spared time to share their ideas with me on this study. Especially, I benefitted a great deal from discussions with Professor Steven O'Connell of Swarthmore College during his short-term visits to the Centre. Second, I would like to thank the Ford Foundation, the Namibian Economic Research and Policy Unit and the African Economic Research Consortium, without whose financial support the study would not have been possible to complete. Third, my sincere thanks go to my family, Etalemahu, Netsanet and Abiy for providing love, understanding and encouragement throughout my studies. Finally, I would like to dedicate this thesis to my mother, Silpah Kangeenge Tjirongo, who passed way in August 1994. Had it not been for her wisdom to take me to school, today I would be herding cattle or working in the mines, like the majority of my compatriots.

Chapter 1

1.1 Introduction

Following the conventional theory of optimum currency areas (OCAs) and the current developments in the economic literature emphasizing the roles for rules and credibility in policy-making, the thesis evaluates the costs and benefits of Namibia's continued participation in the Common Monetary Area (CMA). The CMA is one of the oldest and most successful monetary integration schemes in Sub-Saharan Africa, involving Namibia, Lesotho and Swaziland (LNS) on the one hand and South Africa, on the other¹. However, since the late 1970s, the CMA has gradually evolved from the highest stage of monetary union to a relatively loose system that can be described as an exchange rate union, in the terminology of Corden (1972). The main reason for this gradual disintegration concerns the hegemonic nature of the CMA arrangement, whereby South Africa sets the monetary and exchange rate policies for the area without consultation of the smaller member countries. Accordingly, it has been argued that it was only by coincidence that the exchange rate policy designed to correct South Africa's global balance of payments will be consistent with the balance of payments requirements of the smaller member countries (Guma, 1985). Botswana's decision to opt out of the Rand Monetary Area was prompted by what it perceived as limitations on its ability to formulate a monetary policy consistent with the country's development needs (Government of Botswana, 1975). In 1986 and 1989, Swaziland and Lesotho negotiated

¹Botswana was a de facto member of the rand currency zone until 1976.

different levels of autonomy in elements of monetary policy. In fact, Swaziland negotiated what is tantamount to an exit clause from the CMA.

The demands for national autonomy over monetary policy as well as closer regional integration and the stimulation of intra-regional trade in Southern Africa, may seem to be in conflict. The primary benefit for a small country like Namibia in fixing its exchange rate to a larger and more industrialized neighbour like South Africa, is to import financial discipline or, as Giavazzi and Pagano (1988) succinctly put it, "to borrow credibility" in its monetary policy management. Moreover, the turmoil in financial and currency markets at the end of 1997 has shown that innovations in technology and the ready availability of information have enabled economic agents to spot weaknesses and inconsistencies in national policies more efficiently than before. In this context, one greater advantage of pegging to the rand in the case of LNS, is that the currency is shielded from short-term developments in the domestic economy (e.g. a sudden rise in government deficit, negative developments in the current account, strikes, and political unrest).

Namibia is the most recent country in Southern Africa to gain independence, which it attained in 1990. As such it has to redefine and establish its role within the Southern African Development Conference (SADC) and the CMA based on its own national development priorities. Namibia, which has been a de facto member of the CMA, formalised its membership in 1992. Under the CMA, the Namibia dollar was introduced in 1993. The authorities indicated that the one-to-one parity between the Namibia dollar and the rand was revocable. As Kiguel et al. (1992) argue that the currency being fixed to the dollar for the

time being to be reviewed in the future, constitutes a weak form of commitment and hence is likely to generate uncertainty. Such uncertainties regarding the future monetary and exchange policy in Namibia could hinder long-term investments. In this context, an evaluation of the costs and benefits of Namibia's participation in the CMA is necessary. This will ascertain whether the CMA is optimal for Namibia, or whether the country would be best served by adopting an independent exchange rate policy from the CMA, as Botswana did in 1976.

Namibia is a small and highly open economy, which renders the country highly susceptible to external shocks. With nominal exchange rate variation ruled out, any attempt to stabilize the real exchange rate in response to external shocks would have to be effected through a reduction in nominal prices and wages. The analysis of the structure of the labour market in Namibia draws inconclusive results: the formal sector exhibits some wage rigidity, while wages in the informal sector can be said to be flexible. This suggests that wages may not be flexible enough to bring about adjustment following an adverse shock, with minimal cost in terms of lost output and unemployment. Further, labour mobility between Namibia and South Africa is not high. This effectively suggests there might be a need for the nominal exchange rate as an instrument for adjustment. However, the key question is not whether nominal exchange rate as an instrument of policy is desirable or not, but whether real devaluations can be sustained given the small nontradable sector, the high degree of openness and the high speed of pass-through. The results clearly show that the nominal exchange rate will have limited effects because of the high speed of pass-through of South African prices to Namibian prices and nominal wages.

1.2 Objectives of the Study

The main objective of the thesis is to assess the costs and benefits of Namibia's membership of the CMA to determine whether the CMA is an optimal currency area at least from the perspective of Namibia. The thesis examines this issue from two main perspectives.

First, we examine whether real exchange rate (RER) adjustment is frustrated by the inability to use the nominal exchange rate as an instrument of adjustment. We start by examining whether there is persistent RER misalignments in Namibia. To do so, we compute the RER, estimate the equilibrium RER, and finally calculate the RER misalignments.

Second, evidence of persistent RER misalignment may be seen as a necessary condition for an independent nominal exchange rate regime. However, it is not sufficient: we therefore examine whether nominal devaluations will have sustained effects on the RER adjustment, given Namibia's structural features, such as the small nontradable sector and a very high degree of openness. The degree of openness has implications on the efficacy of the nominal exchange rate as an instrument of adjustment. As Argy (1992) emphasized, the more open the economy to trade, the smaller the degree of money illusion, thus an exchange rate change will be less effective in securing an improvement in the RER. This analysis is extended by estimating the speed and the extent to which changes in exchange rates and foreign prices are passed onto domestic prices in Namibia.

Even if it is the case that there is no case for independence on grounds of affecting relative prices, it may nevertheless be in the interest of Namibia to pursue an independent exchange rate strategy. To examine this possibility we therefore extend the analysis by looking at further costs and benefits of OCAs which do not rely exclusively on the ability to change relative prices. In the final section, therefore costs and benefits of both static and dynamic nature are discussed and assessed. Benefits arising from the CMA include: resource savings in terms of transactions costs and foreign exchange savings; credibility of Namibia's monetary and exchange rate policy; price stability vis-à-vis Namibia's major trading partner, South Africa. The benefits are evaluated against the costs such as the loss of potential revenues from seigniorage due to convergence to lower inflation rate of the CMA; the size and frequency of shocks buffeting the Namibian economy and whether those shocks were symmetrical vis-à-vis South Africa.

The findings of the thesis suggest that there is **no strong case** for monetary autonomy in Namibia. This is especially strongly supported by the fact that despite the lack of a nominal exchange rate, real exchange rate misalignments in Namibia have averaged only 20%, which is far lower than in some countries with flexible exchange rate systems. More important is the high speed of pass-through, which suggests that nominal devaluations of the Namibia dollar will not bring about sustained real exchange rate adjustment. In addition, the thesis provides evidence that past shocks to the two countries had symmetric effects. Under the circumstances, the CMA could well be the optimal exchange regime for Namibia.

1.3 Structure of the Thesis

The rest of the thesis is organised as follows. The second chapter presents a descriptive analysis of the Namibian economy, highlighting the structural features and growth performance during 1980-95. Chapter 3 describes the operations and institutional setup of the two important regional integration schemes in Southern Africa: the CMA and the Southern Africa Customs Union (SACU). In addition, the chapter discusses relevant theoretical background on monetary integration, i.e. the theory of OCAs, including the recent discussion on the so-called new theory of OCAs, which focuses on credibility issues. From the criteria outlined in the OCAs theory, Chapter 4 presents evidence to establish whether the CMA is an optimal currency area. Building on the inconclusive evidence regarding whether the CMA is an optimal currency area, Chapter 5 computes real exchange rates for Namibia; estimates equilibrium real exchange rates and the extent of real exchange rate misalignments; and assesses the impact of such misalignments on some selected indicators of economic performance. Chapter 6 assesses the extent to which movements in exchange rates and foreign prices influence wages and domestic prices in Namibia. Further costs and benefits of Namibia's participation in the CMA are analysed in Chapter 7. The major benefits estimated include efficiency gains from the elimination of transactions costs involved in converting currencies and savings on foreign exchange reserves. On the cost side, estimates are derived for seigniorage revenue for Namibia and other SADC countries, for shocks to the Namibian economy and the symmetry of shocks for SACU and selected non-SACU countries. Chapter 8 highlights the key results of the thesis, draws conclusions and discusses policy implications.

1.4 Analytical Tools

The study follows an eclectic approach. There is no single analytical framework. Instead, several models are developed to test specific hypotheses or questions. In addition, where data constraints hamper detailed examination of issues, we will draw inferences from empirical studies and the theoretical literature. Empirical analyses are carried out in Chapters 4, 5, 6 and 7, utilising standard models, in some cases with modifications consistent with the institutional setup in Namibia. Utilising the standard methods in the calculation of real exchange rates in Chapter 5, the thesis identifies certain factors that may lead to biases in the actual real exchange rate so computed, and therefore have implications on the size of RER misalignments. This problem is demonstrated by computing two bilateral real exchange rates for Namibia, one based on the standard CPI, and the other based on the adjusted CPI. The real exchange rate derived using the adjusted CPI shows little deviation between Namibia's RER and that for South Africa. Using the Edwards (1989, 1994) model of real exchange rate determination, an equilibrium real exchange rate for Namibia is estimated, and we go beyond the standard approach by assessing the impact of misalignments on some selected key variables of the economy. Chapter 6 builds on Chhibber's model (1992) to develop an analytical framework to estimate exchange and price pass-through between Namibia and South Africa, and between Namibia and the rest of the world. In Chapter 7, several empirical measurements are undertaken. Notably, a spreadsheet method is developed to measure the costs associated with currency conversion and to estimate the savings that arise from the need to hold foreign exchange reserves in short-term instruments. Estimates of seigniorage revenue and inflation tax are performed utilising the standard Cagan model. Utilising the

Balassa methodology, terms of trade shocks are decomposed, while simple Autoregressive (AR) and Autoregressive Distributed Lag (ADL) models are estimated to assess whether shocks to the region are symmetric or asymmetric.

Chapter 2

The Namibian Economy

2.1 Introduction

The chapter presents a descriptive analysis of the Namibian economy, highlighting the structural features and growth performance during 1980-95, the period for which detailed data on various aspects of the economy are available. The analysis will focus on the following sectors: the real sector, the public sector, the financial sector, the external sector and the labour market.

The Namibian economy is highly open, in terms of orientation of both its production and consumption. Its main produce includes minerals, fish and beef which are exported. Namibia is not well suited to arable agricultural production, and also owing to the capital nature of its production (mainly mining and fishing), food and raw materials constitute the bulk of imports. Against this background, the country is highly vulnerable to developments in the external environment, outside the control of the Namibian authorities. Dual structural features characterise the economy, prevalent in product, labour and financial markets. Therefore, it is important to distinguish between formal and informal sectors, especially in agriculture and the labour market. Agriculture provides a livelihood for the majority of the population, while mining is the largest productive sector.

The structure of the chapter is as follows: Section 2.1 covers the introduction. Section 2.2 presents the structural features of the Namibian economy (focusing on the real sector of the economy) and also highlights growth performance in key sectors of the economy during 1980-95; Section 2.3 describes the structure of the public sector, assessing the levels and composition of government revenues and expenditures and fiscal performance; Sections 2.4 and 2.5 present the financial sector and external sector, respectively. Section 2.6 covers the labour market while the last section presents the summary and conclusions.

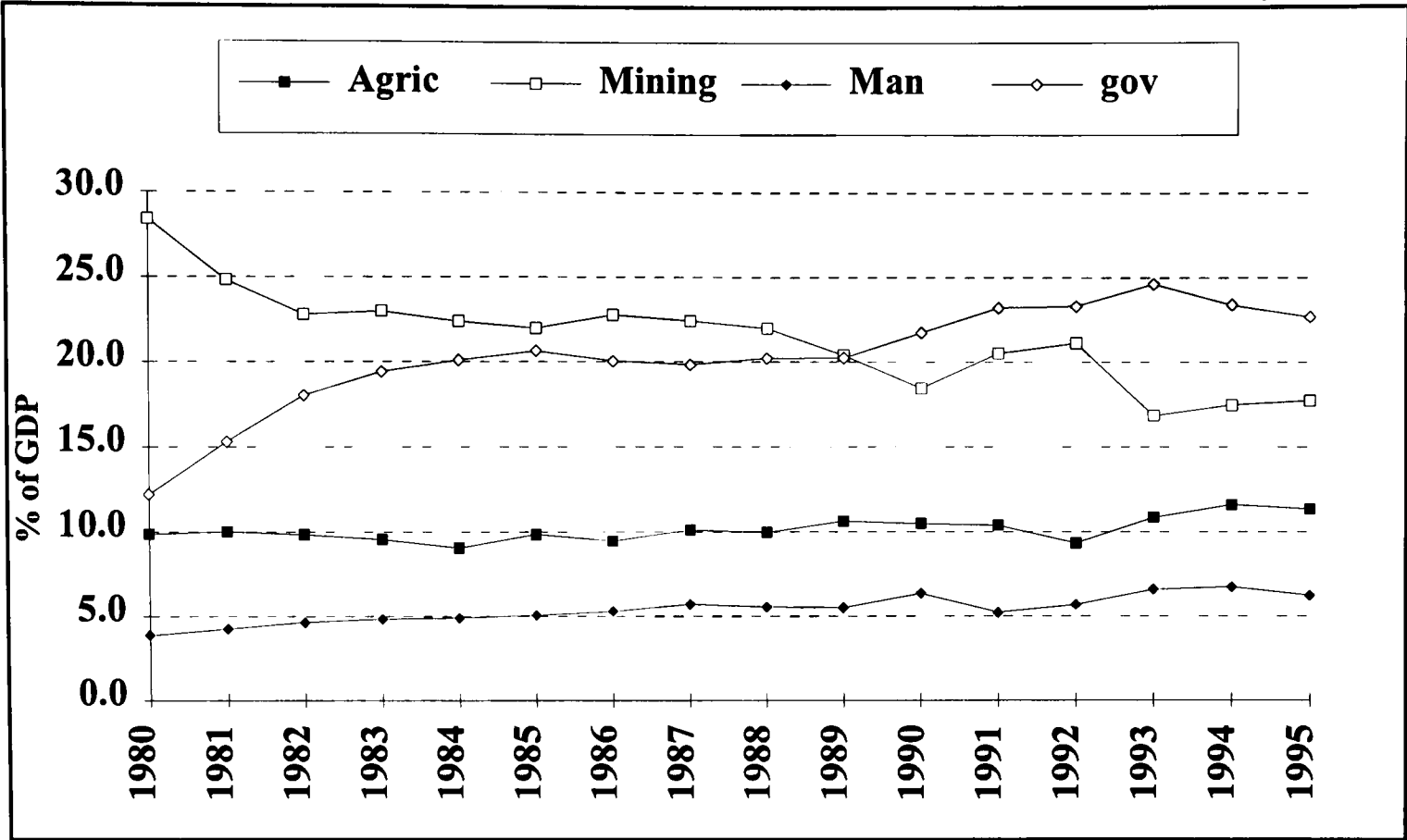
2.2 Structural Features of the Namibian Economy and Growth Performance

The structure of the Namibian economy exhibits similar characteristics to those of many developing countries. The dominant sectors are mining and government services². Agricultural output represents about 11% of GDP. However, the sector accounts for the bulk of total employment of the labour force. The manufacturing sector is small and its employment potential is also limited because of the capital-intensive nature of the operations that currently exist³. Figure 2.1 shows the time profile of some selected sectors of the Namibian economy, all at constant 1990 prices. It is apparent that mining played a significant role in the economy, although its share in the economy has witnessed a gradual decline. It has not yet returned to its peak production of the late 1970s. The government sector rose dramatically in the 1980s, while agriculture and manufacturing remained relatively stable throughout the period.

²However, the mining sector's share in GDP has been on the decline (from 29% in 1980 to 18% in 1995), while the share of the government sector rose from 12% to 23% during the same period.

³Its share of GDP increased from 4% in 1980 to about 6% in 1995.

Figure 2.1: Time Profiles of Some Selected Sectors of the Namibian Economy



Source: Statistical Abstract (1996), CSO

2.2.1 Sectoral Developments

The primary sectors (agriculture and mining) witnessed contraction in the early 1980s. This largely reflected the slump in diamond prices, owing to prolonged recession in industrial countries in the early part of that decade. Problems in the diamond mining sector were also experienced in the 1990s, but this time the problem originated from the oversupply of diamonds sold to the market outside Central Selling Organisation (CSO)⁴. In addition, uranium suffered some setback in the early 1990s, while agriculture was affected by droughts during 1981-84 and 1991-92. However, the recovery of fishing from 1990 has partially offset the gradual decline in the primary sector.

⁴ The cartel which controls the marketing of at least 80% of the world’s diamonds.

In the secondary sectors (manufacturing, water and electricity, and construction), performance was mixed. While construction contracted throughout the 1980s, manufacturing and energy sectors registered good growth performance. The acceleration in the performance of the tertiary sectors somewhat offset the declines observed in the primary sectors.

a) Agriculture

A dual system characterises the agricultural sector, divided between commercial and subsistence agriculture. The two systems differ markedly in terms of land tenure, resource flows, crops cultivated and technology⁵. Commercial agriculture has access to agricultural credit, extension service, and international markets. Ownership of land is highly inequitable (commercial farmers, who only constitute 5% of farmers, control the bulk of the land). Reflecting the wide disparities, the bulk of marketed agricultural output originates from commercial agriculture. Despite its potential as an employer of last resort⁶, farming faces many constraints, mainly a shortage of suitable water and land. Of the huge land size (824 000 km²) only 53% of the area is regarded as suitable for agriculture. The only perennial rivers in the country are found along the borders, while underground water is both very scarce and salty.

⁵ Geographically, subsistence farming is concentrated in the northern region of the country, which is more fertile and well suited to crop production (mainly millet, maize and sorghum). Commercial farming is found in the arid southern and central parts of the country, which are best suited for extensive ranching of livestock (cattle and small stock, with crop production and other activities such as poultry, pig farming and small scale fishing being largely undeveloped).

⁶ The 1991 censuses showed that about 73% of the population lives in rural areas and is engaged in subsistence agriculture and other activities. The 1993-94 household income and expenditure survey also showed that 41% of households in Namibia derived their incomes from subsistence agriculture.

The dominant agricultural activity is livestock farming, comprising cattle and small stock. Several crops are also produced including maize, wheat and sunflower, millet and a variety of beans. Agricultural exports account for a third of the country's total export revenues. Namibia's exports are destined to South Africa and, since the 1990s, the EU market. However, South Africa still absorbs about 55% and 93% of cattle and small stock exports, respectively. In terms of food security, the country is self-sufficient in livestock products, mainly beef and mutton, but not for poultry and pork, which are imported. Domestic consumption of the main three crops (maize, wheat and sunflower) far outstrips domestic production, therefore the shortfall has to be met by imports. Import dependency (measured as a ratio of imports to consumption) is very high, especially for wheat and sunflower. For maize, which is the staple food for the majority of the population, at least 70% of domestic consumption is met through imports. It is also discernible that the dependency on imports deepens during years of drought.

b) Fishing

Namibia has one of the largest and most productive coastal fishing grounds in Africa. The Namibian fishing grounds are rich in small fish species (IMF, 1995). The two major coastal towns of Walvis Bay (pelagic species) in the west and Luderitz (lobsters) in the south became important centres for the fishing industry, which started in the 1950s.

Until 1990, Namibian waters were open for fishing to international trawlers. There were no conservation measures in place and as a result overfishing occurred in large scale⁷. Following independence, a 200-nautical mile exclusive economic zone (EEZ) was established, which brought the coastal waters under the Namibian authorities. Fishing activities by foreign fleets were suspended to allow fish resources to recover. A structure for monitoring and control of the EEZ was established to enforce conservation measures. The new measures included minimum fish size regulations; prohibitions of fishing in certain shallow waters; and a quota system based on an annual total allowable catch (TAC) for most species (World Bank, 1993). The new measures affected the fishing sector substantially. Private sector investment flowed into the fishing sector, while the fishing stocks also recovered dramatically. Consequently, the value-added by the fishing sector (including fish processing) in GDP rose from about 2% in 1980 to 8% in 1995. Fish and fish products accounted for 22% of total exports in 1995 compared with 8% in 1989, the year before Namibian independence. Exports of fish and fish products now come second after mining.

c) Mining

Although its dominance has gradually declined over the past decade, mining remains the most important sector in the Namibian economy. The decline in mining reflects a combination of supply and demand factors. On the demand side, the major problem can be

⁷Namibia's status before independence (neither an independent country nor a province of South Africa) meant that there was no internationally recognised coastal state management authority. South Africa declared a 12-mile territorial sea and a 200-mile exclusive fishing zone off the coast of South Africa, including Walvis Bay, in 1977. Because South Africa's occupation of Namibia was illegal, the international community did not accept South Africa's claim on Walvis Bay. As a result, international trawlers fished freely in Namibian waters. Fishing took place without control of access, and few benefits accrued to Namibia (IMF, 1995).

traced to the recession in industrial countries at the beginning of the 1980s, and the supply of East European minerals to western markets, which had the effect of depressing commodity prices, which were already low. These factors had negative effects on Namibia's minerals.

The international demand for diamonds plummeted during the period 1981-83, in the aftermath of the 1979-80 oil price-induced recession in industrial countries. The speculative demand that prompted unprecedented increases in diamond prices in the late 1970s thus collapsed in 1981. De Beers responded by cutting supply drastically, while leaving producer prices relatively unchanged. This was accomplished by imposing strict quantity restrictions on the supply of rough diamonds on all producers. As a result total diamond production in Namibia nearly halved from 1.6 million carats in 1980 to 0.8 million carats in 1989 (see Figure 2.2). The quota restrictions were removed in 1986. However, the recovery in mining, which followed was soon checked by another setback in uranium and base metals in the late 1980s. Uranium, which was the second largest export-earner after diamonds, lost markets due to trade and financial sanctions imposed on South Africa in 1986 (Chamber of Mines, 1993). The sanctions made it difficult to renew the long-term contracts or secure new ones. In addition, spot prices for uranium were depressed. Therefore, Rössing cut production significantly, producing only the quantity it needed to fulfill its remaining long-term supply commitments (see Figure 2.3).

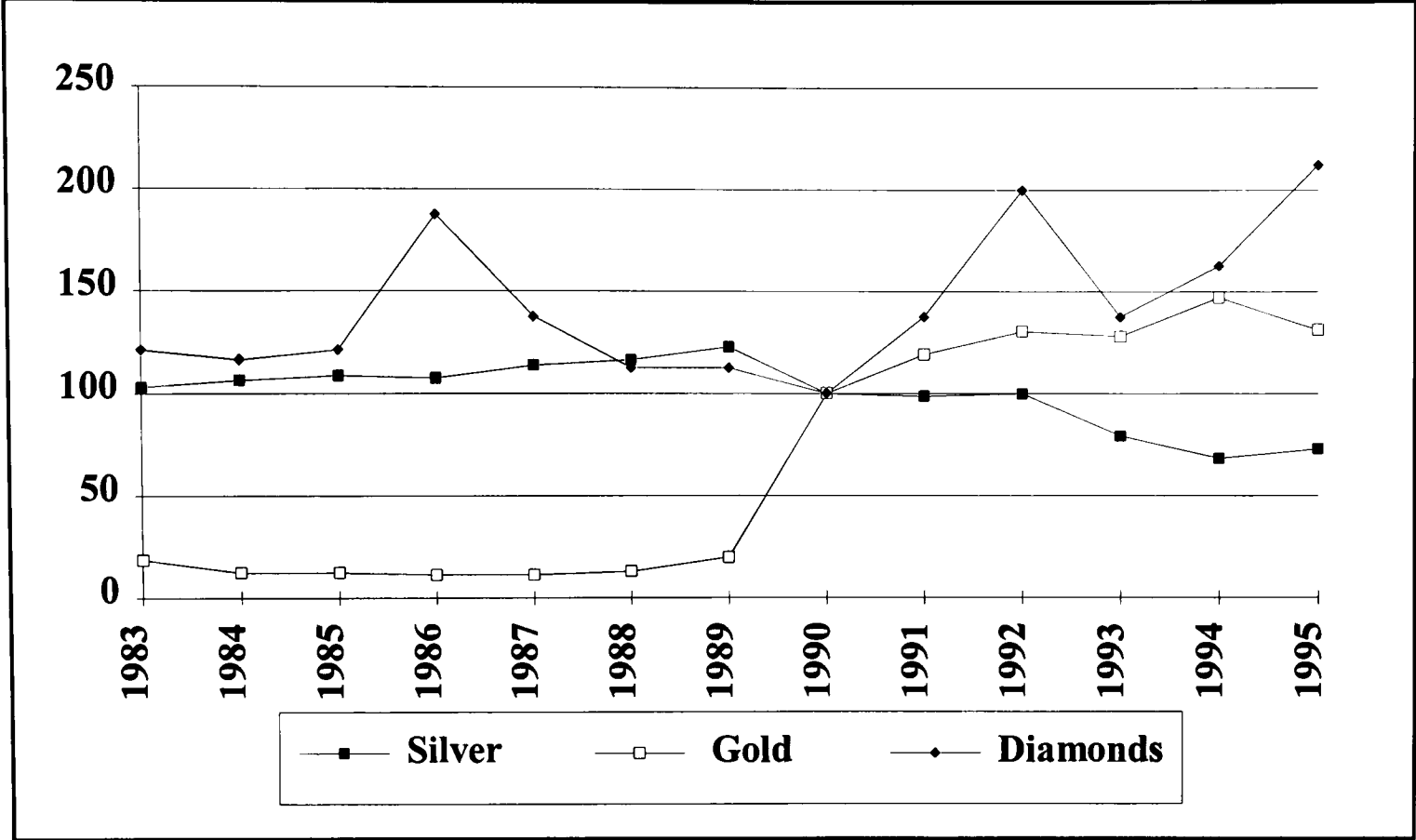
On the supply side, the ores at the old base metal mines were showing signs of decline, or were near the end of their life (i.e. Tsumeb Mine and the closure of the tin mine at Uis in 1992). In the case of diamonds, the average carat content, which averaged 41 carats per 100

tons of ore in 1965 had declined to 5 carats per 100 tons by 1992. However, to compensate for this, two new diamond mines were opened in 1991, while technological improvement has enhanced diamond recovery from offshore mining. A new gold mine also came into operation in 1989.

Despite, its declining trend (as a proportion of GDP and exports) mining remains the single dominant sector, accounting for at least 60% of total export earnings. It is also the largest source of corporate tax revenue and the biggest private sector employer. There are about thirty different minerals in Namibia, of which the most important, in terms of value and scale of operation, are diamonds and uranium. In addition, there are precious metals such as gold and silver, and base metals and concentrates (i.e. copper, lead, zinc, tin, cadmium, arsenic and antimony); industrial minerals (salt, flouspar, lithium); dimension stones (marble and granite); and semi-precious stones (amethyst, agate, tourmaline). Namdeb⁸, formerly Consolidated Diamond Mining (CDM) and Rössing account for 75% of the production value of the mining sector. Namdeb ranks sixth in production volume of near-gem and gem diamonds worldwide, while Rössing is ranked fifth in western world uranium production, with 9.5% of world output. No beneficiation takes place in the country, hence all the minerals are exported in raw or semi-processed form. Mining is an enclave sector with few linkages to other sectors of the Namibian economy, except in construction, water and electricity. The bulk of its inputs is imported, while its output is exported.

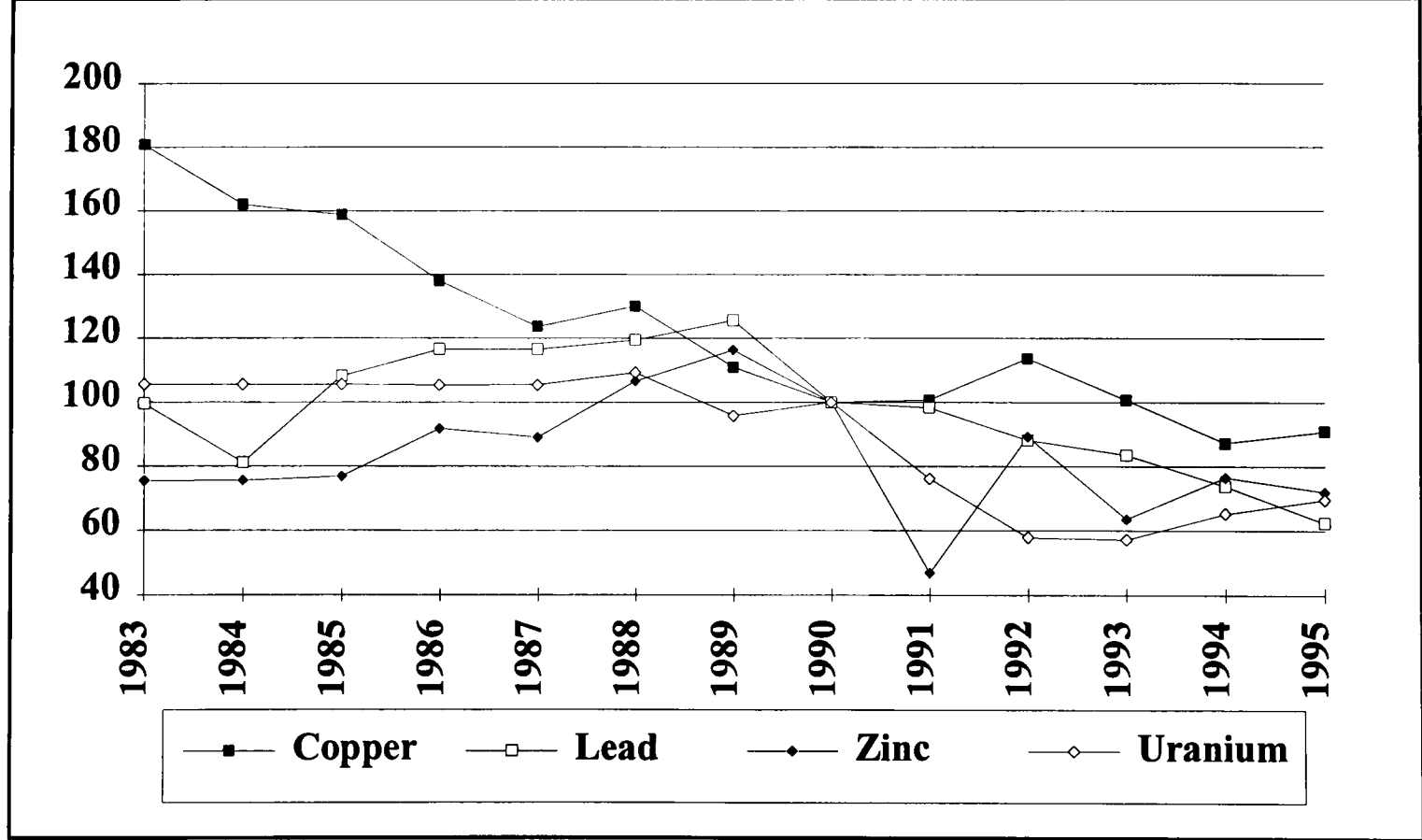
⁸The partnership formed in 1994 between the government of Namibia and De Beers Centenary AG.

Figure 2.2: Namibia's Precious Metals Volume Index (1990=100)



Source: Statistical Abstract (1996), CSO

Figure 2.3: Namibia's Base Metals Volume Index (1990=100)



Source: Statistical Abstract (1996), CSO

d) Secondary Sectors

Reflecting the main productive sectors of the economy, the dominant manufacturing activities are meat and fish processing. Meanwhile most manufactured products, including consumer goods, are imported from South Africa and the rest of the world. The sector is very small, both in terms of its contribution to employment and total income. In terms of contribution to GDP, its share has increased significantly over the 16-year period and it accounted for 6.2% of GDP in 1995. According to the 1991 census, total employment in manufacturing amounted to 23 000 (about 6% of the labour force in formal employment). The construction sector, like mining, witnessed substantial declines during the 1980s. Its share in GDP, which stood at 6% in 1980 had contracted to 2% in 1991, although it recovered somewhat during 1992-95. Several factors contributed to the poor performance in the construction sector. The downturn in economic activity and political instability during the 1980s dampened private sector building activity. This is witnessed by the revival of private sector building activity from 1991, in response to increased demand for office space in Windhoek and other urban centres. However, the scaling down of government's capital programs after independence had an offsetting effect on overall construction activity.

e) Tertiary Sectors

Unlike for the primary sectors, performance in the tertiary sectors does not exhibit climate-induced variations. The key sectors in this group include government services; finance, real estate and business services; wholesale and retail trade; and other services. Notably, the share

of the tertiary sectors offsets the declining contribution of the primary sectors. The major impetus for the growth of the tertiary sector came mainly from faster growth in the government sector.

Hartmann (1987) attributes the sudden increase in government's share to the transfer of various public sector services formerly handled in Pretoria to Namibia. The introduction of 13 ethnically based governments implied a significant growth of public sector services in various regions of the country. Transport and communications activities have expanded consistently averaging about 6% during the 16-year period. Its share in total output rose modestly from 4.8% in 1980 to 5.6% in 1995. The completion of the Trans-Caprivi and the Trans-Kalahari highways, linking Namibia to its landlocked neighbours (Zambia and Botswana) will have significant impact on the growth of transport activity.

2.2.2 Growth Performance

The discussion refers to Appendix Table 2.1, which presents the indexes of GDP (at constant prices) by industrial sector over the period 1980-95. This presentation makes it easier to identify upward and downward movements in the series. Starting from 1980 as the base, the real growth performance of each sector during the 16-year period can be analysed. The downturn in the agricultural sector is evident during 1983-86 and in 1992, reflecting droughts. The mining sector never returned to the levels witnessed in 1980, although it appears that the downturn has been reversed somewhat at the end of the period. Construction was badly affected during the period, however, there was evidence of some recovery towards

the end of the period. A further examination of the data reveals that the period 1983-86 is generally associated with poor growth performance across major industrial sectors, which in turn, dragged down the overall GDP growth during the period. The only sectors that experienced significant growth during the period were the government and services.

GDP experienced a severely restrained growth from 1981-85. The imposition of trade and financial sanctions against South Africa (from 1986) and increasing political instability also contributed to the poor economic performance during the latter part of the 1980s. However, these negative developments were somewhat mitigated by the strong export performance owing to the recovery in agriculture and diamonds and the weaker rand, therefore, boosting overall GDP growth in the latter part of the period. The average rates of real GDP growth were -0.6% during 1981-85, 2.6% during 1986-90 and 4.8% during 1991-95. Over the 16-year period from 1980-95, real GDP growth averaged 2.4%. Equivalently, real GDP in 1995 was only 1.4 times larger than it was in 1980, while per capita income was 20% lower than it was in 1980⁹.

Table 2.1 shows that construction and mining sectors were the only sectors which experienced overall decline, on average, during 1981-95. Furthermore, growth in both sectors was highly variable, as measured by the standard deviation. The high variation in the growth rates of the key sectors of mining, agriculture, and fishing, government, construction,

⁹In 1989 armed conflict had ceased, and UNTAG (United Nations Transitional Assistance Group) set up the process that led to a peaceful transition to Namibia's independence in 1990. The peace dividends included substantial aid flows; resumption of direct investment flows; increased mineral exploration activity; opening of new mines; the lifting of sanctions; and consequently, the declining trend in total income, gross domestic fixed investment, and per capita income were reversed.

transport and manufacturing, explain the fluctuations in the overall performance of the economy during the period under review.

Table 2.1: Sectoral GDP Growth (1981-95): Mean, Standard Deviation

	Agri	Min	Man	Con	Trd	Trap	Fin	Ser	Gov	GDP
Mean	3.1	-1.0	5.4	-2.6	2.0	3.6	2.0	3.0	6.3	2.2
Std Dev	6.5	10.8	7.9	16.9	4.2	5.8	2.0	4.2	6.5	3.4

Source: National Accounts, CSO, Namibia, 1995

Notes: Agri-agriculture; Min-mining and quarrying; Man-manufacturing; Con-construction, water & energy; Trd-wholesale & retail trade; Trp-transport & communications; Fin-finance, real estate and business services; Ser-other services; Gov-government services; GDP-real gross domestic product.

2.3 Public Sector

This section describes the public sector, focusing on the revenue and expenditures of the central government, in the context of institutional constraints on government borrowing directly from the central bank. Table 2.2 presents fiscal operations of the central government for the pre-1990 and post-1990 periods. The central government absorbs a larger proportion of output in Namibia compared with other developing countries. The average share of total expenditures in GDP is 38%, which is much higher than the range of 20-26% for most developing countries (see Ag  nor and Montiel, 1996). Changes in the structure of revenues and expenditures in the post-1990 period can be observed. Notably, there has been phenomenal growth in expenditure on wages and salaries, which accounted for an average of 46% of total current expenditure in the post-1990 period. This reflects mainly the consolidation of 13 ethnic based government structures set up during the colonial period and the expansion of the civil service to accommodate the creation of new ministries. In contrast,

decreases were recorded in the allocations to transfer and interest payments. The latter reflected the capitalisation of interest on rescheduled debt with South Africa.

Total revenue and grants as a share of GDP is about 37% for Namibia, which is higher than the 20% average for developing countries. The main sources of central government revenue include taxes from incomes, international trade and domestic goods and services (each contribute an equivalent of about 10% of GDP). This pattern is consistent with many developing countries, where direct taxes on domestic goods and services and taxes on international trade account for roughly equal shares, in contrast to industrial countries where income taxes account for the largest share, and taxes on international trade are negligible. SACU transfers from the common customs revenue pool play a significant role in the BLNS countries (i.e. Botswana, Lesotho, Namibia and Swaziland) as reflected in Table 2.2 for Namibia. The structure of revenue sources changed after 1990. Notably, domestic taxes on goods and services became an important source of revenues, with its share in total revenue and grants rising to an average of 27% compared with 19% in the earlier period. Similarly, the share of SACU revenues rose to 27% of total revenue and grants (in comparison to 19% in the four-year period before independence). Reflecting the depressed conditions in the mining sector, the contribution of corporate tax in the post-1990 period was substantially reduced. Grants also showed a secular decline, amounting to only 2.4% as a share of GDP in the post-1990 period compared with 10% in the earlier period. Non-tax revenues are still very small, accounting for about 4% of GDP, and remained somewhat unchanged. Other important sources of revenue for developing countries include seigniorage and grants, which for Namibia represent negligible contributions at this stage.

Table 2.2: Central Government Operations (averages for 1984/85--1993/94)

	(As % of GDP)		(As % of total revenue and grants)	
	Pre-1990	Post-1990	Pre-1990	Post-1990
Total revenue and grants	41.4	36.5	100.0	100.0
Total tax revenue	27.5	31.4	66.6	86.1
Of which SACU	1.3	9.9	3.2	26.9
Non-tax revenue	3.8	4.2	9.3	11.5
Grants	10.1	0.9	24.1	2.4
Total expenditures	40.7	39.4	100.0	100.0
Current expenditure	33.9	33.8	83.5	85.7
Wages/salaries	9.2	18.1	22.7	46.0
Goods/services	8.6	9.9	21.3	25.2
Interest payments	3.3	0.8	8.0	2.0
Subsidies/transfers	12.8	4.9	31.5	12.5
Capital expenditure	6.8	5.6	16.5	14.3
Budget deficit(excl. grants)	-9.4	-3.8		
Budget deficit(incl. grants)	0.7	-2.9		

Source: Namibia Expenditure Review (1995) and Central Statistics Office, 1996

Notes: Pre-1990 period covers fiscal years 1984/85-1989/90 and the post-1990 period cover 1990/91-1993/94.

According to the IMF country report (1995), the current fiscal policy stance of the Namibian authorities is to hold the overall deficit (including grants) as a share of GDP constant at about the same level as in the preceding two fiscal years. Meanwhile, in the long-term the government aims to achieve a progressive reduction in personnel costs as a share of GDP, thus reducing the budget deficit. However, it is apparent that fiscal policy has not been consistent with these broader objectives as the budget deficit (including grants) has been rising in the post-independence period, except in 1995/96. The budget deficit (excluding grants) as a share of GDP averaged 9.4% in the six years before independence, however, grants averaging 10% (as a share of GDP) ensured that the corresponding budget balance (including grants) had a small surplus. In the post-1990 period, the grants diminished, and the budget deficit, excluding grants, also fell to an average of 3%.

2.4 The Structure of the Financial Sector

The financial sector consists of the Bank of Namibia (BoN) at the apex, five commercial banks (all with substantial foreign ownership), two building societies, twelve insurance companies and several pension funds, and three public financial enterprises. For a country with a population of 1.6 million, Namibia may seem over banked, however, the situation is significantly different. Dualism characterises the financial sector. Financial services are heavily concentrated in urban areas, and conspicuously absent in the rural areas, where most of the population reside. Namibia also has a stock exchange, established in 1992.

The BoN was established in July 1990, and assumed responsibilities for the management of Namibia's foreign exchange reserves and government debt, administration of exchange controls, and supervision of financial institutions¹⁰. It also acts as the banker to the government and other banks; provides limited facility to act as lender of last resort to the banking system and issues the national currency. However, Namibia's membership of the CMA suggests that there are few monetary policy instruments in the hands of the authorities. The Bank's major policy involvement was in planning and introducing the national currency.

The national currency, the Namibia dollar, was introduced on 15 September 1993¹¹. The Namibia dollar is pegged at parity with the South African rand, which also has legal tender status in Namibia. The introduction of the national currency enabled the Bank to build

¹⁰Except insurance and pension funds, whose supervision is the responsibility of the Ministry of Finance.

¹¹Coins were introduced in January 1994.

foreign exchange reserves, as rand withdrawn from circulation forms part of the reserves. This is shown in Table 2.3. Net foreign assets which stood at about N\$93.6 million dollars¹² in the second quarter of 1993, nearly quadrupled to N\$346 million at the end of September.

It appears that foreign assets and central government deposits experienced a permanent jump from the time of the introduction of the national currency. Net foreign assets (government deposits) averaged N\$660 million (N\$265 million) compared with N\$162 million (N\$139 million) before the introduction of the currency. The rise in net foreign assets therefore can be attributed not only to the introduction of the national currency. A significant portion reflects the increase in government deposits at BoN. These in turn can be traced to the increase in treasury bills issuance. The government started issuing Treasury Bills in May 1991. Initially, the purpose for issuing Treasury Bills was to assist in the development of money markets in Namibia. At the time the government did not need to borrow, and the amounts of the Treasury Bill issues were small, just about N\$5 million, and they were also issued infrequently. However, the demand was overwhelming and the Treasury Bills were over-subscribed. In response to the demand, the government increased the amounts of Treasury Bill issues, and the proceeds were deposited with BoN. This is especially evident from Figures 2.4 and 2.5. In addition, the government increased revenue share from the SACU pool. In 1992, the government also started shifting its deposits from the commercial banks to BoN. Without its own currency, the main source of revenue for the Bank came from government transfers. Therefore, the transfer of deposits from the commercial banks was aimed to generate revenue for the central bank.

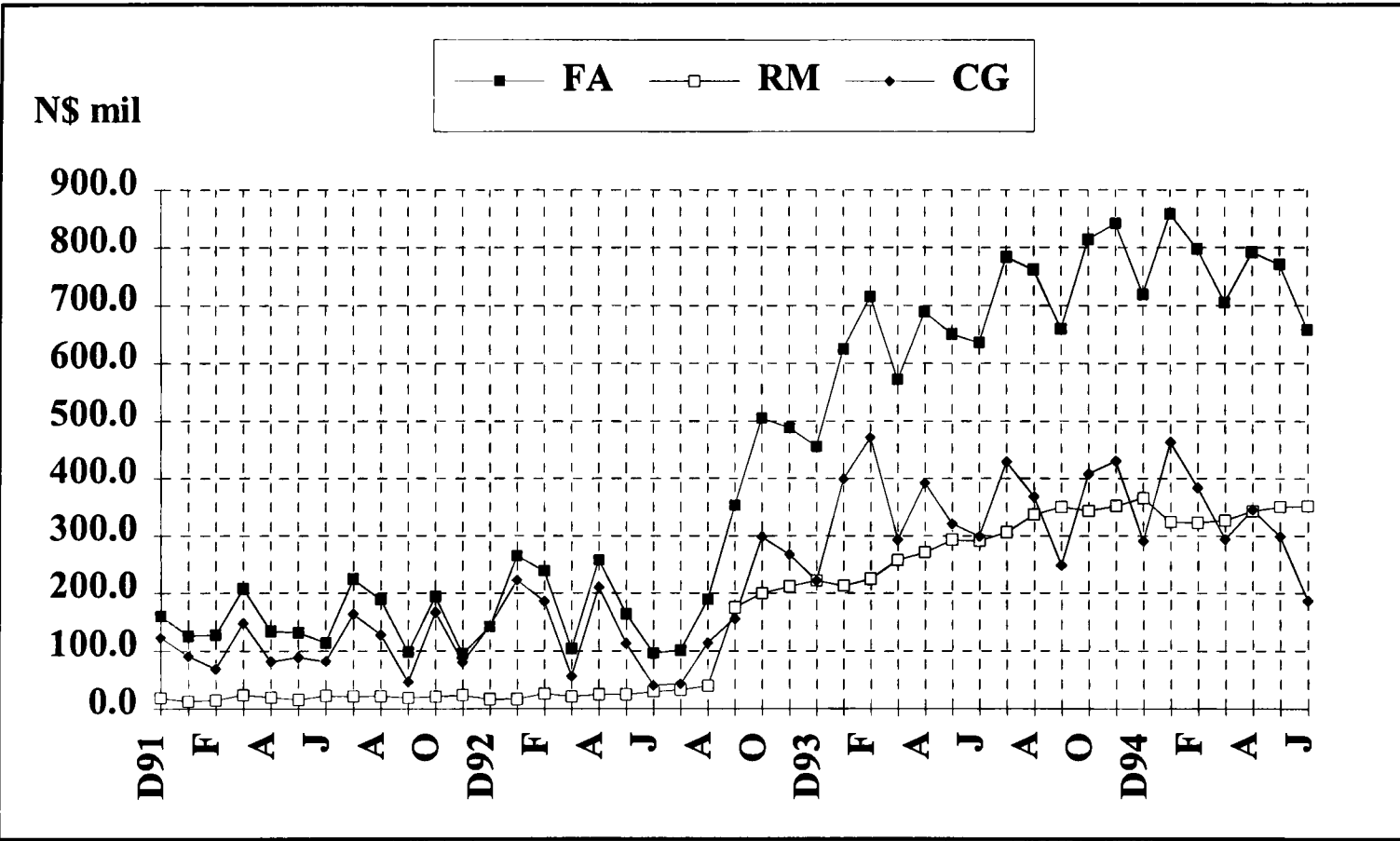
¹²Just equivalent to 1 week of import cover.

Table 2.3: Bank of Namibia Detailed Account

	Net foreign assets	Domestic assets	Reserve money	Central govt deposits	Long-term external liabilities	Capital and reserves	Other items (net)
1990	192.8	---	39.8	150.4	---	10.0	-7.5
1991	159.4	0.1	30.6	123.1	---	21.8	-16.0
1992	134.6	510.6	16.4	143.5	502.0	31.9	-48.6
1993 I	93.6	524.6	21.1	56.7	508.5	40.7	-8.9
II	93.6	552.4	29.1	40.9	542.5	41.9	-8.4
III	346.1	555.9	174.8	156.2	542.5	43.5	-15.0
IV	446.2	620.0	221.9	221.7	603.1	40.6	-21.0
1994 I	559.5	630.4	257.8	293.8	609.6	56.0	-27.3
II	631.2	660.7	291.6	299.6	647.1	79.1	-25.5
III	644.5	665.0	350.4	249.0	647.1	75.1	-12.1
IV	705.2	720.5	366.3	291.2	698.5	71.2	-1.5
1995 I	704.5	731.6	327.2	294.5	721.8	118.3	-24.5
II	657.3	756.3	351.8	186.6	751.9	127.4	-2.9
III	631.8	761.1	363.3	131.5	767.7	123.5	8.1
IV	824.0	784.4	405.8	280.8	791.2	119.5	12.3

Source: Bank of Namibia, Quarterly bulletin, various years.

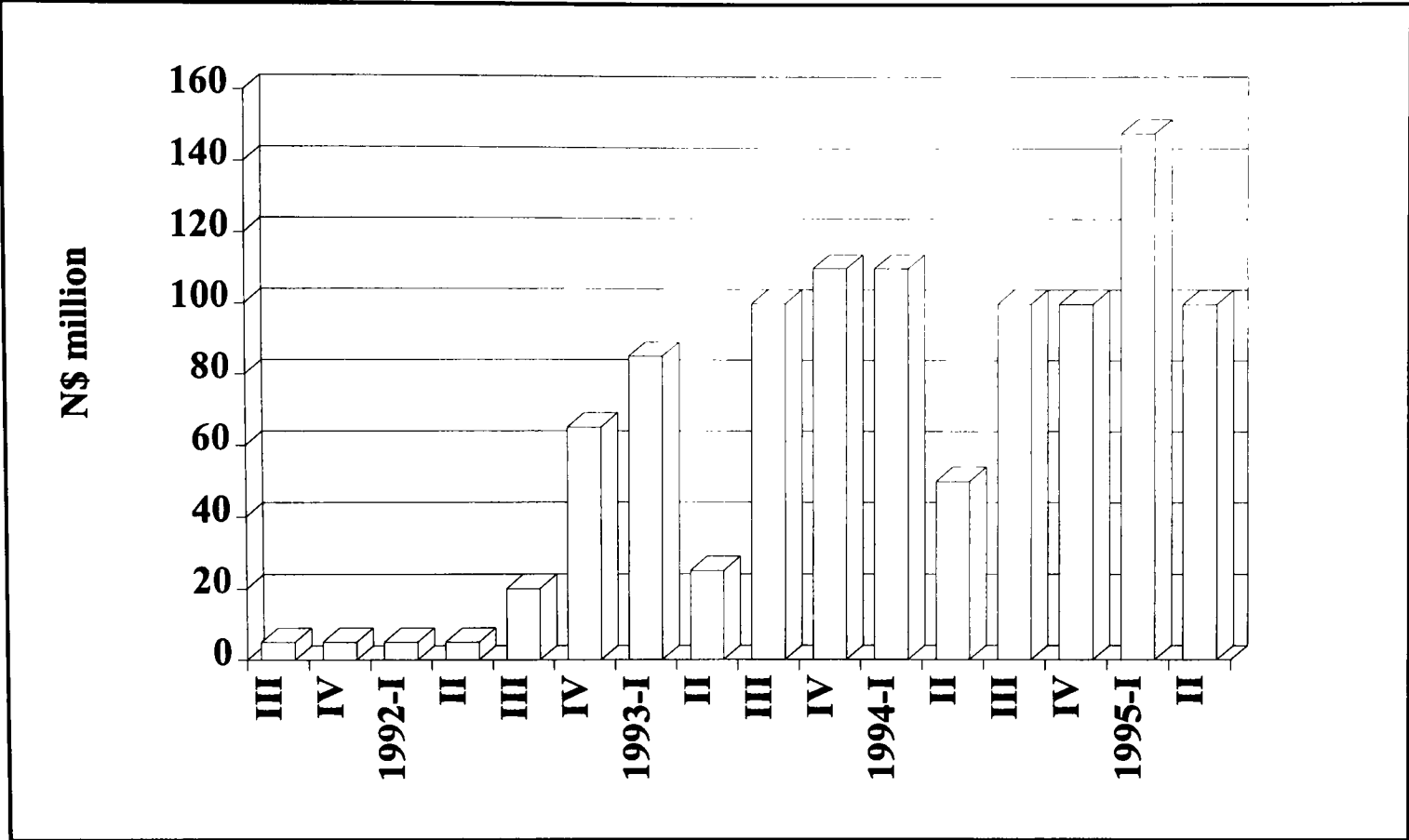
Figure 2.4: Net Foreign Assets, Reserve Money and Central Government Deposits



Source: Bank of Namibia, Quarterly bulletin, various years

Note: FA-net foreign assets; RM-reserve money; CG-central governments deposits at BoN.

Figure 2.5: Treasury Bills Issued



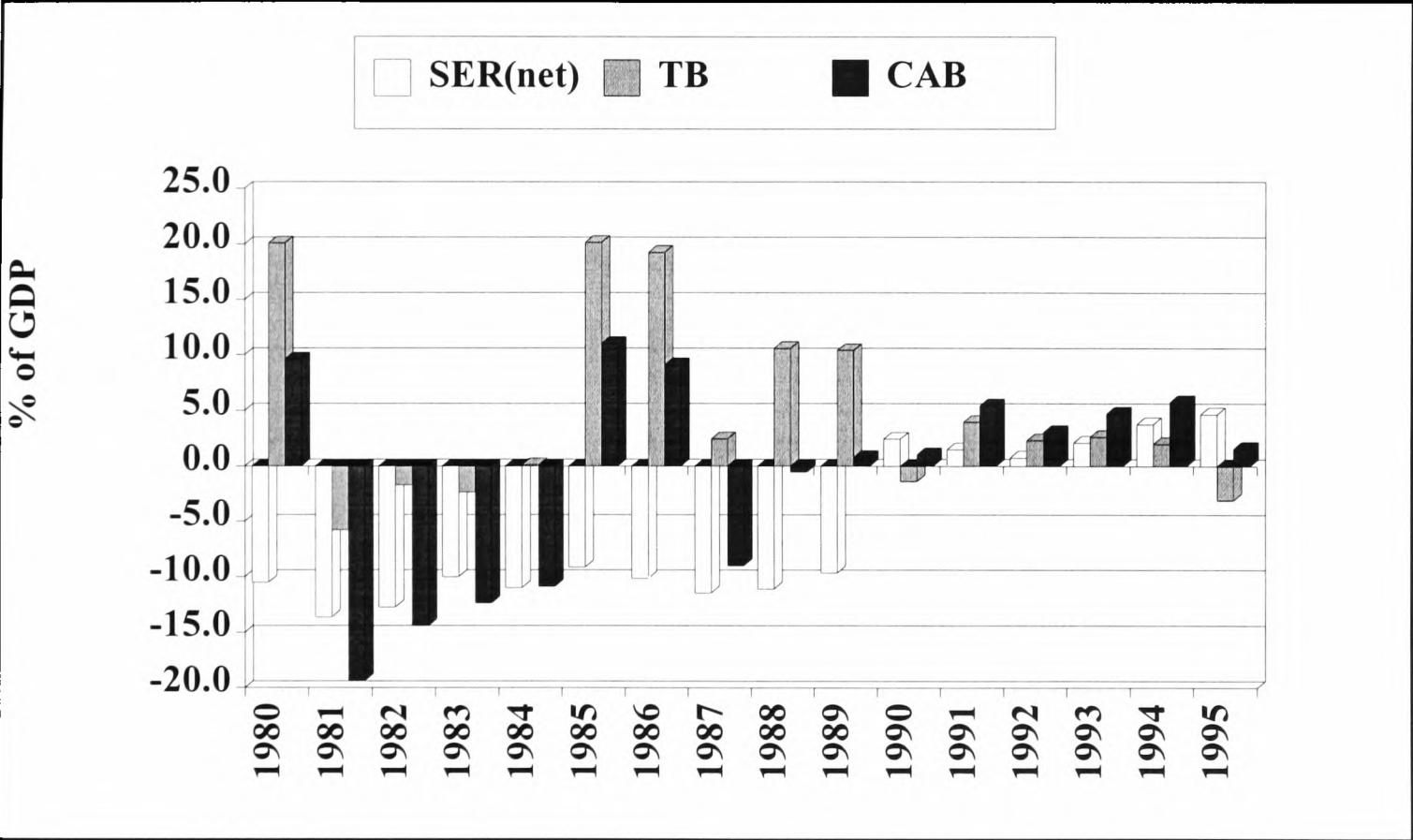
Source: Bank of Namibia, Quarterly bulletin, various years

2.5 External Sector

The purpose of this section is to describe developments of Namibia’s external sector, focusing on the current account for the period 1980-95. Comprehensive balance of payments data for Namibia are available only from 1990. Therefore, the discussion will focus on the two major components of the current account, exports and imports. Figure 2.6 presents the time profiles of the trade balance, net services and the current account balance for the period 1980-95. The current account balance shows significant deficits at the beginning of the decade, reflecting several factors. Most significantly, the trade balance turned into deficit, which therefore reinforced, the deficit in net services. Detailed data are not available to explain what accounted for the huge deficits in the services account. The largest components of the services account include transport services, mainly reflecting fees Namibians pay for

hiring foreign fishing boats and payments for foreign services associated with business and financial management. However, since the early 1990s the deficit on the services account had shrunk, reflecting mainly the reduction in transport fees as Namibians gradually acquired fishing boats of their own (IMF Report, 1995). The huge current account surpluses during 1985-86 reflect the recovery in the mining and agricultural sectors. The current account registered some surpluses in the last five years, largely on the account of increased transfers from the SACU revenue pool, as well as owing to good performance of the diamond and fishing industries.

Figure 2.6: Net Services, Trade and Current Account Balances



Source: Namibia Public Expenditure Review and Bank of Namibia, Quarterly Bulletin, various years
 Notes: SER(net)-net services; TB-trade balance; CAB-current account balance

Namibia's exports are dominated by primary commodities: minerals, fish and livestock products (see Appendix Table 2.2 for details). Total mineral exports still account for 60-70% of merchandise exports. Fish, both processed and unprocessed, generate over 20% of total value of exports, and their share is expected to rise even further in the next decade. In

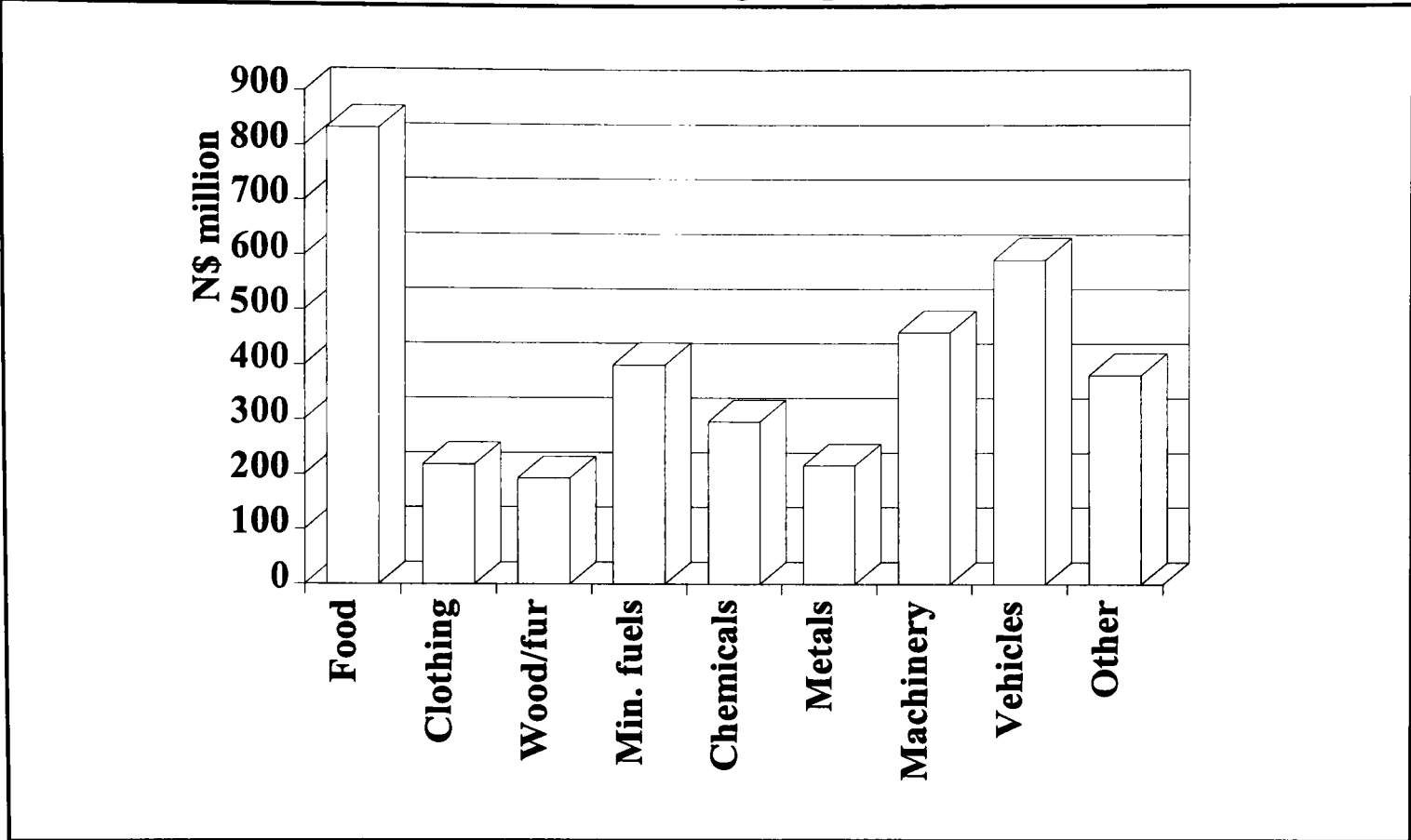
domestic currency terms, exports of fish and fish products rose, in real terms, from N\$191 million in 1980¹³ to N\$792 million in 1993, representing 23% of total merchandise exports. Agricultural exports (cattle, beef, karakul pelts, and small stock), have been a very important source of foreign exchange earnings. However, recurrent droughts and the gradual deterioration in terms of trade against the agricultural sector in particular have affected the performance of agricultural exports. The long drought spell from 1982 to 1986 had a deleterious effect on livestock production (live animals and beef make a major share of agricultural exports). However, since the mid-1980s, the recovery somewhat consolidated.

Figure 2.7 displays the structure of imports in Namibia. It is noticeable that food is the largest single import category. As reflected earlier, Namibia imports about 80% of its cereal requirements. The second important category of imports includes intermediate goods, used in the operation of the mining industry, such as minerals fuels, chemical and chemical products, metal and metal products, vehicles and transport equipment and machinery and electrical equipments. As a group, these categories of imports amount to about 50% of total imports.

The preceding discussion concludes the descriptive analysis of the Namibian economy. Specifically, the analysis highlighted that the economy is dominated by primary exports, whose prices are vulnerable to fluctuations in economic conditions in industrial countries. The latter part of the chapter describes the structure of the labour market.

¹³During the 1980s fish resources reached the lowest production levels due to over-fishing, especially as the prospects for Namibia's independence looked certain in the late 1970s.

Figure 2.7: The Structure of Imports (average imports 1990-94) in N\$ million



Source: Bank of Namibia, Quarterly Bulletin, various years

2.6 The Labour Market

The labour market in Namibia today reflects some aspects of the broader economic structure of the economy, and to a greater extent the social and historical developments of the country. The analysis starts with a brief review of historical developments that might shed light on the structure of the labour market in Namibia today. Second, the structural characteristics of the labour market will be presented.

According to Wood (1988), German policy for South West Africa was that settlers had to be self-sufficient. Farming (and later, mining) was the only economic activity that seemed to have potential for settlers and thus they needed more land. This, however, brought them into conflict with the indigenous population. These conflicts escalated into a full-blown war

between the indigenous population (led by the Herero and Nama) and the Germans from 1904-07. The indigenous population¹⁴ lost the war, their land and livestock. Thus, the war had brought acute shortages of labour for the expansion of farming and other commercial activities. The discovery of minerals (diamonds in 1908), other mining activities, and the construction of road and rail network, exacerbated the labour shortages.

These developments would later shape the evolution and structure of the labour market in Namibia. In the so-called Police Zone¹⁵, reserves were created, but since agricultural activity was not allowed, employment became the main means of survival for the indigenous population¹⁶. The workers outside the Police Zone were employed on a contract system. This system was later institutionalised through the formation of the South West Africa Native Labour Association (SWANLA¹⁷) to ensure an orderly and timely delivery of labour to employers. This produced the contract work system that would become the dominant part of the labour market in Namibia until 1972. The distribution and structure of the Namibian labour market show manifestations of these historical developments.

¹⁴According to estimates the population of the Herero that stood at 80 000 before the war was reduced to only 15 000 while the Nama lost nearly a one third of their population, see Katjavivi, 1986; Wood, 1984.

¹⁵Germany's control was limited to the southern, eastern and central parts of the country, while they left the northern kingdoms under their traditional rulers. Hence, the Police Zone referred to the area under German control.

¹⁶ Ordinance No.82 of 1907 barred Namibians (in the Police Zone) from holding title to land, owning cattle or horses.

¹⁷SWANLA was formed in 1943 following the merger of the Southern Labour Organisation and the Northern Labour Organisation (formed in 1925), respectively to recruit for diamond mines and to recruit workers in the north.

Working conditions were deplorable. Because workers did not have the right to bargain for higher wages or protest the working conditions and other forms of discriminatory practices, the workers adopted illegal strikes, walkouts and go-slows (Ndandi, 1989) as a means to force some form of communication with their employers. The most notable strike by contract workers took place in 1971, which effectively paralysed the economy for nearly a month (December 1971 to January 1972) as all workers were sent back to their homes. The workers won limited concessions as the contract labour system was abolished, or perhaps its powers were significantly diminished (Herbstein and Evenson, 1989). Trade union activity was frustrated by several proclamations and acts (e.g. the Prohibition of Meetings Act of 1981)¹⁸. By 1990, nearly 40% of workers in the formal sector employment belonged to a union. In the mining sector nearly 100% of workers belonged to a union (see Appendix Table 2.3). However, organised labour remains the preserve of the modern employment sector, while the informal sector labour is virtually un-unionised. Some sections of the formal sector employment are also unorganised. These include farm workers, domestic workers and most workers in the services sector.

The labour market in Namibia is characterised by different segments, between modern (formal) and informal sectors, and more importantly between urban and rural areas. Generally, money wages seem unresponsive to shifts in demand in the formal employment sector, while in the informal sector returns to labour are highly flexible. The wage dualism may be the result of various institutional factors. For example, labour unions and the pay

¹⁸The Supreme Court ruling in Windhoek in 1986 absolving SWAPO (South West Africa Peoples Organisation) from the claims that it planned to overthrow the state made it easier for labour to organise.

policy for the public sector and mining companies offer wages that are higher than market clearing in the modern segment of the labour market.

The latest population census survey revealed that the population of Namibia was 1.4 million in 1991, increasing at a rate of 3.1% per annum. Projections of the population and the labour force for the period 1988-95 are provided in Table 2.4. The size of the labour force is a product of the working age population and the activity rate (the ratio of the economically active persons in a specific age group to its size of the population). The economically active population was defined as the total number of persons aged ten years and above. The Household Survey 1993/94 estimated a labour force of 435 000, which is close to my projections, especially taking into consideration that their labour force does not include the age group 10-14, which in the rural areas constitute a significant part of the labour force.

Table 2.4: Population, Labour Force, Employment and Unemployment Projections('000)

	1988	1989	1990	1991	1992	1993	1994	1995
Population	1284.4	1324.9	1366.8	1410.0	1453.1	1499.1	1546.0	1593.9
Labour force	462.7	477.1	491.9	507.1	522.8	539.0	555.7	573.0
Employed	318.3	325.9	335.6	347.6	357.6	368.7	388.2	398.1
Formal	187.8	191.4	196.9	204.6	210.2	216.7	231.5	236.5
Informal	130.5	134.5	138.7	143.0	147.4	152.0	156.7	161.6
Unemployed	144.4	151.1	156.2	159.5	165.2	170.3	167.5	174.9
Unemployment (%)	31.2	31.7	31.8	31.4	31.6	31.6	30.1	30.5

Source: Population Census, Public Expenditure Review (1995) and own estimates

Notes: There is not yet a system for collecting employment data in Namibia on a regular basis. The employment data are projections from the 1991 population census data (this approach is also adopted in the Public Expenditure Review (1995). The population and labour force are projected to grow at a rate of 3%, while sectoral employment is assumed to grow at the rate of real GDP growth. Using this approach, the Expenditure Survey estimated an average rate of employment of about 20%. However, their definition of the labour force differs from mine. I define children from the age of 10 in the labour force to reflect the realities of the labour market in Namibia. In this respect, the rates of unemployment of 30% seem to be on the higher side.

The labour participation rate is higher for males than females in every age group (which is confirmed in both the population census and the household survey). This reflects the higher

female rate in secondary education, the higher proportion of homemakers in the rural areas, and the higher proportion of male labour in predominantly hard labour conditions such as mining and commercial farms. There are noticeable differences in activity rates between rural areas and urban areas. Activity rates in the rural areas are higher than those in urban areas in the age groups (10-19) and (50-65). Participation rates for the average working-age group (20-49) is 79 in urban areas slightly higher than in the rural areas. The 1991 population census recorded a total of about 394 341 employees in Namibia. Total formal sector employment was 219 391 against 187 800 recorded in the 1988 manpower survey, suggesting that over the three-year period nearly 32 000 jobs were created. About half the new jobs were generated by the public sector (with total employment rising to 72 500 in 1991 from 55 800 in 1988).

Following independence, the property market in Windhoek, which had stagnated for many years witnessed a revival. This is evidenced by the creation of 7 000 jobs in construction and real estate services. Except mining and retail trade, nearly all sectors experienced some increases in employment. The total job loss in the two sectors amounted to about 2 000. Following the closure of army bases in 1990, especially in the northern part of the country, there were huge job losses in the related activities (mainly retail trade).

As in many developing countries, the informal sector has always been the employer of last resort in Namibia. This is especially evident in the 1990s following the repatriation of about 40 000 Namibians from exile and the demobilisation of the SWATF¹⁹ and PLAN soldiers.

¹⁹ South West Africa Territorial Force (SWATF) and Peoples Army for the Liberation of Namibia (PLAN).

Because the modern sector can only absorb a small proportion of these large numbers, most of the incremental labour inflows sought employment in the informal sector. There are no estimates regarding the size and the extent of the informal sector. However, the population census data reveal that about 174 950 persons were employed in the informal sector in 1991, which represents about 44% of total employment. Informal sector employment consists largely of self-employment and unpaid family workers. As shown in Table 2.5 there are some similarities and differences in the employment structure of the two sectors. Subsistence agriculture generates nearly 85% of informal sector employment, while the government is the largest single employer in the formal sector. Other important sectors include micro-enterprises in manufacturing and retail trade (both accounting for about 12% of informal sector employment).

Table 2.5: Structure of Formal and Informal Sector Employment ('000)

	Formal	%	Informal	%
Agriculture	40.4	18.4	147.8	84.5
Mining	14.2	6.5	0.2	0.1
Manufacturing	11.9	5.4	10.5	6.0
Elec & gas	0.8	0.4	0.1	0.1
Construction	12.4	5.7	2.7	1.5
Retail trade	26.7	12.2	9.8	5.6
Transport	4.3	2.0	0.6	0.3
Finance	6.9	3.2	0.5	0.3
Services	29.2	13.3	2.8	1.6
Government	72.5	33.1		
Total	219.4	100.0	174.9	100.0

Source :Population Census 1991and Statistical Abstract, CSO, 1996

2.7. Summary and Conclusions

The Namibian economy is small, open and highly specialised in production. Minerals constitute at least 60% of total exports, while the bulk of imports consists of food, especially cereals for which the country is highly dependent on imports. Total trade, as measured by the ratio of exports and imports to GDP averages about 120%, suggesting an extreme high degree of openness in comparison to other countries of comparable size (in terms of GDP). The narrow production base, i.e. the dominance of mining, in terms of both GDP and exports, make Namibia vulnerable to external shocks, suggesting that the lack of nominal exchange rate as an instrument of adjustment may be costly. However, the high degree of openness may suggest that nominal devaluations may have limited effects on the real exchange rate adjustment. These issues are explored further in chapters 5 and 6. The review of the labour market highlighted some broad characteristics that could have some implications on pass-through. The formal sector constitutes a small proportion of the total labour force, yet it is highly unionised. The informal labour market consists largely of unskilled workers (the majority who could be described as migrant workers from the rural areas). This has implications on wage determination because, unlike job seekers who are normally resident in a certain area, migrant workers are likely to take the first job on offer, often at the lower end of the pay structure. Mining as the single largest private employer takes wage leadership. Because conditions in mining are conducive for unionisation of labour, wages in this sector are significantly higher than in the rest of the economy. The acute shortage of skilled labour and legal impediments in hiring expatriate labour contribute to a situation whereby wages in Namibia, especially for a small minority of skilled labour, are relatively higher than in other

comparator SADC countries, e.g. Botswana and Zimbabwe. In this context, we would expect evidence on wage pass-through to be more ambiguous as it will reflect these structural features.

Chapter 3

Choice of Exchange Rate Regime for Namibia: Lessons from the Theory of Optimum Currency Areas

3.1 Introduction

Regional integration continues to be a high priority in Europe, North America, Latin America, and Asia. Notwithstanding Africa's disappointing experience with regional integration, interest in such schemes on the continent continue to influence research agendas. This is due to the belief that the benefits of regional integration remain valid for Africa (see Elbadawi, 1995). The view is widely held that Southern Africa, with South Africa the dominating partner, could lead regional integration in Africa. South Africa's accession to the SADC²⁰ and recent initiatives to enlarge that agreement have implications for the role and functions of the CMA. It might well be the case, as the experience of the CFA-zone countries would suggest, that a monetary union be a necessary condition for the success of regional trade integration. However, in 1976 Botswana left the CMA, while more recently Swaziland considered opting out. The demands for national autonomy over monetary policy as well as closer regional integration and the stimulation of intra-regional trade in Southern Africa, may seem to be in conflict. The Namibian economy is an extreme case of an open economy with

²⁰Member countries include Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Swaziland, Tanzania, Zambia, and Zimbabwe. SADC was established in 1980 to promote cooperation in a wide range of areas, i.e. trade, politics and development among its members, and by so doing lessen their dependence on South Africa. However, South Africa joined SADC in 1994 and the organization has since shifted its focus to promoting stronger regional integration among its members.

a small nontradable sector. The country is thus particularly susceptible to external shocks, and might therefore be at a disadvantage without control over its nominal exchange rate. Furthermore, the economic theory of optimum currency areas has developed in new directions where policy credibility and time consistency are emphasised as necessary conditions to attract and stimulate investment and growth. This suggests that there might be a trade-off in a country's decision to join a monetary union, namely between short-term stabilisation and long-term growth. This is because when a country joins a currency union, it gives up the use of the nominal exchange rate as an instrument of adjustment. In light of the above, the chapter describes the operations of the two important regional integration schemes in Southern Africa: the CMA and SACU (sections 3.2 and 3.3). It also discusses relevant theoretical background on monetary integration, i.e. the theory of OCAs, including the recent discussion on the so-called new theory of OCAs (section 3.4). This will help develop a consistent framework for the empirical analysis in the next three chapters. The last section presents summary and conclusions.

3.2 The Southern Africa Customs Union (SACU)

SACU is one of the oldest regional integration schemes in Sub-Saharan Africa²¹. It provides for a duty-free flow of goods and services between member states, a uniform external tariff

²¹ SACU evolved from previous regional integration arrangements involving the Customs Union Convention between the Cape Colony and the Orange Free State Republic of 1889; which was expanded in 1906 to incorporate the Transvaal, Natal, Southern Rhodesia, North-Western Rhodesia, Bechuanaland, Basotholand and Swaziland. With the formation of the Union of South Africa in 1910, a new agreement, the Southern Africa Customs Union Agreement (SACUA) was signed between the Union of South Africa and the three High Commission territories. This agreement was renegotiated in 1969, following the independence of the former British protectorates (Hudson, 1981). By virtue of being ruled as part of South Africa, Namibia was a de facto member. Namibia's membership was formalized in 1992.

and a mechanism to distribute the tariff revenue arising from trade among themselves and with other countries. It also allows member countries to develop their own industries with protection against producers from the common customs area. Several costs and benefits of SACU membership for Namibia can be discerned. Possible costs are: (1) the abdication of the external tariff as an economic policy instrument; lack of transparency regarding external tariffs (South Africa sets the external tariffs, which have usually reflected industrial considerations of South Africa alone. Changes in policy are thus decided by South Africa, and the BLNS countries are merely informed rather than consulted); (2) the price-raising effect of the Common External Tariff (CET) on goods originating outside the customs area and (3) a possible polarisation of industry, since South Africa is industrially more developed than the BLNS countries²². The possible benefits are (1) less uncertainty and greater stability in receipts of revenues from the common customs revenue pool; (2) trade creation due to the enlargement of the market for locally produced goods and the exploitation of scale economies in order to stimulate technological change, investment and inter-industry linkages; and (3) welfare effects from the elimination of duties (akin to transactions costs in the case of a currency union) on goods and services between member states. The SACU arrangement also has features that are analogous to fiscal federalism. The revenue sharing formula provides for compensation of the BLNS countries for the possible price-raising effects of CET and as well for possible trade diversion effects²³. The revenue sharing formula is presented in

²²This is especially evidenced by the industrial policy pursued during the 1980s, which induced business to invest in the so-called homelands. The size of these subsidies was huge, such that if any of the BLNS countries tried to provide similar arrangements, the financial implications would have been serious.

²³A factor of 42 % is added to the BLNS share from the revenue pool. Further, a stabilization formula is also built in to ensure that revenues disbursed to the BLNS countries do not fluctuate significantly from year to year.

Appendix 3A. As a proportion of South Africa's total trade the shares of SACU member countries is estimated at 5% of total trade. However, SACU member countries purchase a large proportion (about 90% of imports) of their imports from South Africa.

3.3 The Common Monetary Area (CMA)

a) Monetary Arrangements in the CMA

The membership of the CMA consists of South Africa, Namibia, Lesotho, and Swaziland. Botswana was a member until 1976. In the CMA, the currency of the dominant country, South Africa, circulates in the smaller countries. The advantage to the other countries would be enhanced if that currency were the most stable in value terms of goods (the low inflation reputation of the Bundesbank in the case of the EMS is a prime example). Alternatively, the monetary policy of a currency union would be set by a supranational institution, for example, the CFA franc zone. Each area has a central bank that sets, or coordinates, monetary policy for the area (Masson and Taylor, 1993).

Monetary arrangements in the CMA mimic a currency board system. The functions of the Bank of Namibia are summarized in Table 3.1 (for details on distinction of functions of currency boards and central banks, see Hanke and Schuler, 1994). The following features of the Bank are associated with a currency board system: (1) 100% backing of national currency issuance by foreign assets; (2) limited or no provisions to finance fiscal deficits by money creation. However, unlike an orthodox currency board, the monetary system in Namibia is

administered by a central bank. The central bank, according to the constitution, has the mandate to perform the normal functions ordinarily performed by such institutions, including the possibility of extending loans to their respective governments. However, these additional functions remain practically frozen under the CMA arrangement.

Table 3.1: Functions of the Bank of Namibia that fall either under Currency Boards or Central Bank

Currency Board	Central Bank
-supplies notes and coins, backed 100% by foreign reserves -fixed exchange rate with the reserve currency -full convertibility -cannot create inflation by money creation -cannot finance spending by government	-provides limited lender of last resort services -regulates commercial banks -fully-fledged central bank in terms of staff compliment

Key aspects of the CMA Agreement are highlighted in Appendix 3B. The CMA Agreement can be divided into three subdivisions: (1) definitional, (2) operational, and (3) economic (D’Collings et al. (1978), Guma, 1985). The definitional category provides the legal interpretations of the agreement. The second set of articles outline operational procedures, such as the collection and exchange of monetary statistics (Article 7); provision of consultation on matters of common interest (Article 8); procedures for settling disputes (Article 9); and procedures for terminating or amending the agreement (Articles 10 and 11). The economic provisions of the agreement deal with issues such as legal tender, intra-CMA transfers of funds, access to capital markets, foreign exchange transactions and compensatory payments for seigniorage forgone by the LNS countries for using rand.

Swaziland introduced a national currency in 1974 and eliminated legal tender status of the rand in 1989 (although the rand still circulates in Swaziland). Lesotho and Namibia

introduced their national currencies in 1980 and 1993, respectively. The rand remains legal tender in both countries. In all these countries, since the introduction of national currencies, a fixed (1:1) parity with respect to the rand has been maintained, backed 100 per cent by foreign exchange reserves.

On the basis of the CMA Agreement, Namibia can impose limited capital controls, change the rate of exchange of the Namibia dollar, and alter the degree of foreign exchange reserve cover. Therefore, the fixed exchange between the rand and the Namibia dollar (based on this agreement) is not irrevocable.

The question that arises concerns whether the benefits derived from a common currency outweigh the costs of giving up the nominal exchange rate as an instrument of economic adjustment. This means that the country cannot use pro-cyclical monetary policy and exchange rate variation in response to shocks. The existence of sticky prices suggests that the economy would return to its equilibrium only gradually, after a long period of unemployment. In this case, a change in the nominal exchange rate can facilitate adjustment, thus mitigating the effects of output loss. Questions regarding circumstances when it is costly or beneficial for a country to forego the use of nominal exchange rate as an instrument of economic adjustment could be analysed using the theory of optimum currency areas.

Further, the recent literature's focus on credibility aspects of fixed exchange rate regimes has widened the scope to include other important considerations (besides the possibility of the economies being subject to asymmetric shocks) in choosing exchange rate regimes. For

example, recent moves towards tighter fixed exchange rate regimes by relatively large and closed economies, such as Argentina, show that anti-inflationary considerations may now play an important role in the authorities' decision to give up the use of the nominal exchange rate as an instrument of adjustment. In this context, stabilization and credibility in the choice of exchange rate regimes are intertwined (Cukierman et al. 1992).

b) Implications for Monetary and Fiscal Policy

Notably, the CMA arrangement exerts limits on fiscal policy, because government cannot finance its budget deficits by printing money²⁴. In addition, the free flow of capital between Namibia and the rest of the CMA ensures that interest rates in Namibia are determined in the larger money and capital markets of South Africa. Hence, interest rates are exogenously determined. Membership of the CMA, however, implies foremost that Namibia loses control over the nominal exchange rate as an instrument of economic policy. The question is thus frequently posed in Namibia whether or not it is in the interest of that country to remain within the CMA. This question has to be addressed within the framework of the nature and effects of external shocks that buffet the Namibian economy.

Announcing the introduction of the Namibia dollar in June 1992, the Minister of Finance stated that the "Namibia dollar will be effectively linked to the rand on one-for-one basis, until circumstances dictated otherwise" (Government of Namibia, Budget Speech 1992/93).

²⁴This stems from the fact that 100% of the Namibian currency issued must be fully backed by foreign exchange assets.

The inability to make a firm commitment is likely to generate uncertainty among economic agents, which may increase the susceptibility of the currency to speculative attacks. As Cuckierman et al. (1992) noted, “the assertion that the exchange rate is pegged to the dollar for the time being but will be re-examined shortly, constitutes a weak form of commitment”. Further, they argue that the costs of reneging increase proportionally with the degree of commitment. The stronger the commitment, the higher the costs of reneging. Therefore, other things being equal, the costs of reneging are smaller the weaker the commitment.

The failure to commit fully on the part of the Namibian authorities may indicate various considerations: (a) was it the realization that a monetary union with a larger partner was likely to be dominated by the interests of South Africa (which will not necessarily always coincide with the those of the partner countries); (b) the lack of the nominal exchange rate policy instrument becomes an important issue when the country is affected differently by external shocks than other members of the currency union²⁵.

Besides the symbolism of national identity, a currency that is fixed irrevocably to the rand, would have not justified the introduction of the Namibian dollar, in view of the fact that seigniorage revenue sharing arrangements were already in place in the CMA²⁶. In addition, a common currency has advantages because it ensures the highest cost-savings from the

²⁵As Cuckierman, et al. assert, if a country is subject to adverse external shocks, the policy makers may be reluctant to pre-commit themselves if they envisage that such a commitment cannot be maintained for prolonged periods. It is this concern that induces policy makers to maintain national currencies. When the economy is hit by a large shock it may be optimal to deviate from the rule, even for a policy maker that is serious about the rule.

²⁶Moreover, seigniorage revenue in low-inflation countries is small (not exceeding 1%), Fischer, 1982.

elimination of transactions costs. The higher the level of intra-union trade, the higher the cost-savings, which is the case between Namibia and South Africa. Krugman (1995) argues that “any system of national currencies is, potentially, one in which exchange rates could change”. Further, the existence of multiple currencies may generate uncertainties regarding the commitment to the fixed exchange rate regime. The exchange rate uncertainties, in turn, may prevent full realisation of the benefits such arrangements are supposed to bring about. There is a possibility that movements of intra-union physical capital can be deterred. The recent experiences of the ruble zone provide insights as to the enormity of problems posed by a system of common currency with decentralised control over monetary issue. Miller and Sutherland (1993) points out that, especially when combined with heavy fiscal pressures, such a system creates incentives for governments to attempt to export their inflation taxes to one another.

3.4 Criteria for Optimum Currency Areas

As mentioned in Section 3.1, the main purpose of the chapter is to identify and formulate the theoretical framework that will help set the empirical analysis in the next three chapters of the thesis. The theory of optimum currency areas appears an ideal analytical tool to analyse such issues. Therefore, this section reviews the relevant theoretical and empirical literature on OCAs. Specially, the current debate on monetary union in the European Community (EC) provides a relevant frame of reference, in terms of methodological approaches to measuring costs and benefits of monetary union. However, analysis based on the OCA approach fails to provide a conclusive set of criteria that can be used to assess the desirability or viability

of a currency union²⁷. This section starts by reviewing the OCA criteria, based on factor mobility, openness, and diversification of the economy.

3.4.1 The Mundellian-McKinnon-Kenen Contributions

The theory of optimum currency areas (Mundell, 1961; McKinnon, 1963; Kenen, 1969) and the literature on time consistency (Kydland and Prescott, 1977; Barro and Gordon, 1983) offer important considerations regarding the conditions under which the benefits of exchange rate variation are rendered ineffective and therefore it can be given up without much cost.

The old OCA literature distinguished between the single criterion approach and the cost-benefit approach, Ishiyama (1975). The single criterion approach sought to assess the suitability of the countries for a currency union in terms of the following criteria: factor mobility, openness, and the degree of diversification. An alternative approach attempted to identify and weigh the costs and benefits experienced by a country seeking to join a currency union. In the current literature, such a distinction is not necessary, and this will become clear in the later part of the text.

²⁷Eichengreen (1992) maintains that neither theory nor empirical work provides clear evidence on the balance of those costs and benefits. He disputes the notion that a single currency is necessary for a single market in the EU. Instead the pressure for a single currency stems from political considerations.

a) Factor Mobility

In Mundell's original analysis of this issue, the advantage of a common currency area is that if a country's trade is more concentrated with a group of countries, the formation of a monetary union can enhance the common currency's functions. Eichengreen (1995) states that "a currency ceases to function as a useful unit of account if you are the only one who denominates prices in it, or accepts it in settlements". It therefore enhances a currency's functions as a **means-of-payment** and **unit of account**. If the monetary union is also formed with a currency that exhibits greater price stability, the domestic currency's function as a **store-of-value** is enhanced as well. It would also reduce transactions costs and the unfavourable effects of exchange rate uncertainty on trade and investment. Financial instability owing to national currencies that have lost their principal functions (mainly unit of account, means of payment, and store-of-value), is not uncommon in war-torn economies, or where governments have manipulated the budget recklessly and irresponsibly.

However, Mundell shows that shifts in demand (perhaps as a result of asymmetric shocks) in one country relative to another may cause unemployment if the authorities do not have control over the nominal exchange rate to offset the effects of such negative shocks. In the absence of price and wage flexibility, this will be the case unless the factors of production (labour and capital) are fully mobile between countries. Thus, according to this criteria, countries between which there exists high mobility of labour are good candidates for a monetary union. Blanchard and Katz (1992) provide evidence that labour flows between the

US regions play a role in adjustment to disturbances within the US economic and monetary union.

Several criticisms have been levelled against Mundell's thesis. Principally, there is a need to distinguish between capital mobility and labour mobility. This observation, although made earlier, has important implications today in the era of more highly integrated capital markets than those which existed during the 1960s. The second criticism concerns the efficacy of labour mobility serving as a substitute for payments' adjustment.

b) Openness of the Economy

McKinnon's contribution to the OCA theory centred on the argument that a flexible exchange rate was incompatible with the objective of price stability in highly open economies. The more open an economy, the smaller the share of nontraded goods in output. For instance, to maintain external balance following a fall in the real demand for a country's exports, resources in a fully employed economy must be shifted towards production of traded goods and away from nontraded goods sectors. The smaller the nontraded goods sector the larger the exchange rate needed to transfer a given amount of resources, and the larger the required movement in relative prices. In this context, the nominal exchange rate may not be an effective instrument to bring about changes in relative prices.

Given the objective of price stability, therefore, very open economies are good candidates for fixed exchange rates against their trading partners. This includes the possibility of joining

with them in a currency union, provided the policies of their neighbours are consistent with price stability (see Masson and Taylor, 1993). Empirically, Goldstein, et al (1980), and Melitz (1993) demonstrated that in more open economies, import prices and wages respond more quickly to exchange rate changes²⁸. Therefore, in an extreme case of openness, exchange rate changes would induce proportional changes in costs, depriving the flexible exchange rate of all its corrective functions.

The foregoing implies that in very open economies, a devaluation can only work if workers suffer from money illusion. However, some observers²⁹ argue that there is no evidence to support such an assertion. In most cases, many economies display sufficient short run wage and price rigidities, which provide at least some scope for short run macroeconomic stabilization policy. This view is also supported by Corden (1993), who argues that even in open economies nominal exchange rate changes affect the real exchange rate, and hence if openness is associated with a decision to forsake monetary autonomy for currency unification, this must reflect the savings in transactions costs rather than any irrelevance of exchange rate changes for adjustment. The need for nominal exchange rate variation becomes apparent in a situation where there is wage and price stickiness and low labour mobility. In this case, exchange rate adjustments can reduce coordination problems and allow adjustment to take place with lower transitional unemployment costs than would be caused by domestic inflation. This suggests that the exchange rate adjustments lose their ability to have real effects only in extremely small open economies (although, the concept of small is not clearly

²⁸This suggests that the real income effect of exchange rate variations would be so obvious to workers that they would not accept wage changes tied to a price index excluding imports.

²⁹See Johnson, 1973; Ingram, 1973.

addressed in the literature), where there may be few nontraded goods and services so that the exchange rate may do little other than change the domestic price level.

c) Degree of diversification

Kenen's original thesis on the criteria for currency areas considered the structural features of an economy, especially as regards the composition of exports and production. In this context, Kenen's contribution considered the effects of asymmetry of shocks in a currency area. This argument is illustrated by an example. Consider two countries, A and B. Let's assume that country A was a highly specialized economy, producing a small variety of products and exporting only two products (e.g. diamonds and beef). In contrast, country B was a moderately diversified economy, producing several products (a wide variety of minerals, agricultural products and manufactures) which are also exported. Now let's, assume the demand for diamonds falls (exported by both A and B). For the highly specialized economy, a decline in export revenue (arising from a decline in demand for its major export commodity) would result in relatively higher unemployment than in a more diversified economy (Masson and Taylor, 1993)³⁰.

The example above shows clearly that the degree of diversification should be an important consideration in whether to surrender control over nominal exchange rates by joining a monetary union. It was in this context that Kenen suggested that a monetary union would

³⁰However, even in a well-diversified economy unemployment will only be avoided if there exists significant intersectoral factor mobility.

perhaps be better suited to diversified countries, where the need for flexible exchange rates would be less (Kenen, 1969). There is some contradiction between the criteria of diversification and size (Kenen). Normally, the less diversified an economy, the smaller it would be and the larger would be the proportion of tradables to nontradables. Thus, large adjustments in exchange rate will be required to alter relative prices. In turn, huge nominal devaluations that are immediately transmitted to domestic prices will have serious implications for price stability. Therefore, Kenen's observation needs another proviso that the speed of passthrough is sufficiently long enough to allow nominal devaluations to have real effects.

The criteria discussed above have been criticised on several fronts, mainly, that they fail to weigh the benefits a country derives from a monetary union against the sacrifice of foregoing the use of the exchange rate as an instrument of economic adjustment. Issues associated with the costs of adjustment have emerged as a central concept in the choice between alternative exchange rate regimes (see Bayoumi, 1994). The deficiency of the contributions can also be found in the lack of explicit and precise models.

Some economists, especially in the context of EU, have argued that a common market does not necessarily need a common currency (see Feldstein, 1992; Bean, 1992). This suggests that the quest for a single currency in the EU perhaps can be rationalised on political grounds. On this basis, it can be argued that political objectives may influence whether a country chooses a separate currency or opts to join a monetary union (see Eichengreen, 1995 and Goodhart, 1995).

According to the proponents of these criteria, several motives (heavily influenced by political considerations) may influence the decision whether to participate in a currency union. Motivations to keep a national currency may stem from the following considerations: (a) money as a symbol of national identity; (b) seigniorage as a revenue of last resort in situations of national disasters or wars; (c) protection offered to certain sectors or industries by exchange controls or variable exchange rates; (d) the need for political accountability of monetary policy at national level. The next section discusses the extension of the OCA theory in the context of rational expectations theory, which revolutionised economic thinking since the late 1970s.

3.4.2 New Theory of Optimum Currency Areas

The new theory of optimum currency areas recasts the traditional arguments in terms of new developments in expectations formation, time consistency and credibility problems, labour mobility under conditions of uncertainty, and exchange rate determination. In this section, some of the new contributions are highlighted in respect of how they strengthen or weaken some of the arguments presented earlier.

a) Permanent Trade Off Between Inflation and Employment

Harberler (1969) and Fleming (1971) raised the criterion of similar inflation rates, arguing that the source of balance of payments imbalance was likely to be a result of divergent trends in national inflation rates due to structural developments, differences in trade union

aggressiveness, or differences in national monetary policies. In this context, each country has its own Phillips curve, hence a currency union may worsen the unemployment-inflation relationships in terms of deviations from nationally desired positions in the Phillips curves. This was a popular belief in the 1960s, but had fallen victim to the Phillips curve³¹. Therefore, equal inflation rates (brought about by a currency union), do not give rise to any cost in terms of unemployment in the long run (Corden, 1994). Now the popular view is that although the inflation-unemployment relationship cannot be established in the long-run, convergence to a common inflation target involves adjustment costs, as illustrated by the French experience in the 1980s. Whereas earlier differential rates of inflation were used as an argument for sequencing of integration efforts, the current literature treats this as an outcome of integration.

b) Commitment to an Exchange Rate Rule

The realization that monetary policy can be used as an instrument to raise employment above its natural rate raises credibility problems in monetary policy design. What then lends credibility to pegging an exchange rate through the CMA? Credibility requires that the Namibian authorities incur a cost when failing to maintain the exchange rate peg (membership). The tighter or stronger the commitment, the larger the costs (especially

³¹The permanent trade-off between inflation and unemployment along its Phillips curve was undermined by several developments: (1) the Friedman-Phelps hypothesis that the steady state unemployment rate is not related to the steady inflation rate when the Phillips relationship is augmented by a variable representing the expected inflation rate (i.e. labour negotiates on the basis of the real, not nominal wages); (2) the Lucas observation that even in the short-run, perfectly anticipated changes in policy could undermine certain conditions, exert no impact upon real variables; and (3) the experience of many countries during the 1970s and 1980s of rising unemployment in association with rising inflation (see De Grauwe, 1994; Corden, 1994).

political costs) of reneging from it. Cukierman et al. (1992) discuss the factors that determine the strength of commitment that policy makers choose to back a fixed exchange rate system. Policy-makers decide how much to commit under uncertainty. The benefits from making a strong commitment must be weighed against the potential costs of being forced to renege on the fixed exchange rate commitment. However, as the proceeding discussion demonstrated, in the case of Namibia, a flexible exchange rate is not likely to alleviate these problems. Because reneging on weaker commitments has smaller costs (Kiguel and Laviatan, 1991; Cukierman et al.), and the Namibian government worried about asymmetric effects of shocks, its commitment to the fixed exchange rate was not strong.

For African countries, a monetary union formed along the lines of CFA zone which has a supranational central bank has a clear advantage in terms of reputation and credibility. This is because there are no national banks (outside South Africa) in the region that either have the reputation or independence to provide a strong and stable anchor (Cobham and Robson, 1994). The fact that even strong commitments can be broken suggests that stabilization and credibility in the choice of exchange rate regimes are intertwined.

c) Models of Credibility in Exchange Rate Policy Management

A significant literature on rules, reputation and dynamic inconsistency has since been generated (Barro and Gordon, 1983, Taylor, 1983 and Rogoff, 1997). These models show that the degree of commitment depends on the costs of reneging, the distribution of the shock, the aversion to inflation, and the prior knowledge that the public has regarding

whether the government is dependable or weak. Moreover, the models indicate that the costs of reneging increase with the strength of the commitment³².

The moral of the story is that the cost of reneging is a key reason that holds policy makers from making strong commitments on their exchange rate policy. The stronger the commitment to an exchange rate rule, the more difficult it is to deviate from it. The ability to stick to rules depends not only on the intentions of policy makers but also on the type and size of shocks which affect the economy. When the economy is hit by a large shock it may be optimal to deviate from the rule, even for a policy maker that is serious about the rule. This may also explain why a multiple currency union may be considered as a second-best option because it provides a leeway for the authorities to engage in stabilization policy in the face of large external shocks.

The key results of the Kydland and Prescott (1977) model can be summarised as follows: when output deviates from its natural level due to imperfect competition or a distortionary tax system, and when monetary policy can affect real output, policy-makers have an incentive to attempt to create surprise inflation. But the policy cannot be more expansionary than what price and wage setters' expect. Consequently, the result of a one-time game without binding precommitment is that the equilibrium rate of inflation is inefficiently high, while output remains at its natural level (Romer, 1993). To solve the problem of dynamic inconsistency

³²Regarding weaker forms of commitment, a study of stabilization programs in Latin America by Kiguel and Laviatan (1991) showed that the failure of the successive plans did not produce large costs in terms of output losses. Whereas the failure to bring down inflation for long periods increased nominal instability, eventually leading to hyperinflation. Therefore, other things equal, they conclude that reneging on weaker commitments has smaller costs.

in monetary policy, a range of mechanisms have been suggested, e.g. contractual arrangements for central bank governors; legislation that gives autonomy to central banks; or some other forms of legislation that reduce the direct influence of politicians from the monetary policy-making process.

Romer (1993) tests the predictions of these models that the absence of precommitment in monetary policy leads to inefficiently high inflation. In the open economy setting, a surprise monetary expansion causes the real exchange rate to depreciate, which limits the effectiveness of the expansion³³. Intuitively, the more open the economy, the less the incentive to expand, because of the higher resultant inflation engendered by depreciation³⁴. Thus, the higher degree of openness reduces the benefits of increases in output above its natural rate. Romer builds on this to test the relationship between openness and inflation. Openness also affects the output-inflation trade-off. This process occurs through imported goods prices and costs of imported raw materials (therefore raising the cost of domestic firms³⁵). As a result, increased openness causes monetary expansion to produce a larger increase in domestic prices for a given increase in output.

In this context, openness affects both the determinants of inflation under discretionary policy: the output-inflation trade-off, and the benefit of higher output relative to the cost of higher

³³Rogoff, 1985 as quoted in Romer (1993).

³⁴The larger the fraction of goods that are purchased from abroad, the greater is the cost of this real depreciation.

³⁵Similarly, if wages were flexible, the rise in the CPI is inevitably factored into wage negotiations, and hence wages also go up.

inflation. Therefore, policy-makers' incentives to expand are limited in more open economies, and equilibrium inflation under discretionary policy is lower. Romer's results corroborate these assertions. Of interest, Romer estimated several regressions, first considering the whole sample, and then distinguishing those countries whose monetary policies are closely tied to those of other countries (i.e. CFA countries, members of EMS, Panama and Liberia). Disaggregation did not change the results significantly, and the coefficient for openness remained virtually unchanged, suggesting that the results may as well hold even for those countries that do not have independent monetary policy. Romer considers other explanations for the observed negative relationship between openness and inflation. First, he considers openness as an endogenous variable, and as such it is an outcome of protectionist policies, which benefit particular interest groups. Second, these policies lead to large budget deficits and hence the high rates of inflation to generate seigniorage revenues. In both cases, the estimation results are rejected.

To conclude this section, the fixed exchange rate required of Namibia by the CMA has been criticised for preventing efficient adjustment to external shocks. However, there are other considerations which suggest that this disadvantage might be outweighed by the benefits of belonging to the CMA. These are static benefits. However, if the CMA has a beneficial effect on investment and thus growth, then questions pertaining to long-term growth become pertinent. Seen in such a light, the criticisms against the CMA ignore an important trade off between short and long run efficiency.

3.5 Summary and Conclusions

Most importantly, the analysis suggests that the CMA may lend time consistency and credibility to economic policy management in Namibia. In this context, the extent to which monetary integration offers price stability, enhances reputation of economic policy management in Namibia and hence promotes macroeconomic stability, and thus it is in the long-term interest of Namibia to trade short-term gains for long-term growth. Another issue that arises in discussions of monetary cooperation concerns the anchor country becoming the source of shocks. Related to this is the hegemonic position of South Africa in setting monetary policy for the CMA. In view of these, there has been a move towards acquiring some instruments of monetary policy by the central banks of the LNS countries. Likewise, the exchange rate policy in Botswana, once a member of the RMA, has been used to mitigate imported inflation from South Africa. The Estonian monetary system, where the currency board operates a hard currency peg rather than the ruble because of the economic instability in Russia, offers useful lessons for the LNS countries. Therefore, if the South African Reserve Bank does not deliver the low inflation, the LNS countries can explore other alternatives such as the peg to the European Central Bank. However, it should be pointed out that converging to low inflation target of the ECB could have growth implications. Sarel (1996) points out that lowering inflation to lower figures than 8% does not have any significant improvement on growth, while rates of above 20% are considered harmful to growth.

Chapter 4

Is the CMA an Optimal Currency Area?

4.1 Some Empirical Evidence for Namibia

The preceding chapter identified cases, on the one hand, where a currency union might yield benefits for a small, open economy like Namibia. This bridging chapter starts the empirical analysis by examining whether the CMA is an optimal currency area in accordance with the basic criteria of OCA criteria such as the degree of factor mobility, similarity of inflation and other considerations.

According to Krugman and Obstfeld (1994), an optimum currency area refers to groups of countries or regions with economies closely linked by trade in goods and services and by factor mobility. In the earlier treatment of these issues, emphasis was placed on the regions being an optimal currency area in order to minimize the costs implied by a currency union (i.e. if shocks were asymmetric). Accordingly, a desirable feature is for countries in the currency area to have similar production structures so that they are affected similarly by exogenous shocks. In the case where countries experienced asymmetric shocks, labour mobility between the two areas must be high to mitigate the effects of unemployment and inflation in the two respective areas³⁶. Recent developments (already alluded to), however, suggest that the failure to satisfy these criteria (i.e. regions being an OCA) may not hinder

³⁶Labour mobility is necessary when one area experienced a boom, while the other was experiencing a slump.

countries from forming a currency union. In the analysis that follows, it will become apparent that the CMA may not be an optimal currency area. Considerations, such as the ability to gain credibility may carry a higher weight than the costs of the loss of the exchange rate policy instrument (specially in the context of small, open, and highly specialized economies).

We start by assessing labour mobility in the BLNS countries. Labour movements between South Africa and its neighbouring countries have been extensive, but rather more so in mining. As shown in Table 4.1, total migrant labour from South Africa's neighbouring countries amounted to about 40% of total labour employed in the gold and coal mines in South Africa. For Lesotho, employment in South African gold and coal mines is important, and it accounted for 14.4% of its labour force in 1990. Similarly, 3% and 7% of the labour force of Botswana and Swaziland found employment in South Africa. Labour movement of this type between Namibia and South Africa has been very small, owing to the fact that mining is itself a dominating activity in the Namibian economy. It should be noted that the actual numbers of workers from the BLNS countries and other neighbouring countries could be far higher than those given in Table 4.1, when all sectors are accounted for.

Table 4.1: Total Migrant Labour from South Africa's Neighbouring Countries

	Botswana	Lesotho	Swaziland	Mozambique	Malawi	Other ³⁷
1982-87	17727 (3.5)	108312 (21.4)	12852 (2.5)	48315 (9.5)	16096 (3.2)	476 (0.1)
1988-92	14602 (3.4)	99082 (22.9)	16354 (3.8)	44093 (10.2)	3123 (0.7)	74 (0.0)

Source: Chamber of Mines of South Africa, various reports. Note: the figure in brackets denotes the country’s share of the total labour employed in South African gold and coal mines.

³⁷Includes, Namibia, Zimbabwe and others.

In recent years, following the normalisation of the political situation in South Africa, migrant workers now include a significant number of highly skilled workers attracted by relatively higher wages to South Africa. Meanwhile, rising unemployment in South Africa, especially among unskilled workers, makes it difficult for the mines to continue the traditional recruitment of labour from neighbouring countries. Underlying these developments is the fact that mining employment in South Africa has also been on the decline. The South African labour market perhaps now suits those who possess skills, which could be detrimental to the long-term development needs of the BLNS countries. To retain their skilled labour, the BLNS countries must somewhat match the wages paid by South Africa.

The situation in Namibia reflects this type of scenario because workers (skilled, mainly white at the time) could easily move across jobs between the two countries. Hence, the variation in wages and salaries between Namibia and South Africa, only reflected regional dimension, as certain wages will differ between Cape Town and Johannesburg. These issues are not raised in the traditional OCA literature, and neither are they are discussed in the context of the European Union, because there the situation is slightly different. In the developing countries, the concerns raised above are real.

The observations expressed above suggest that labour mobility within the CMA is not sufficient to act as an effective instrument of adjustment. Furthermore, significant rates of unemployment, especially among unskilled workers in the CMA, suggest there is limited capacity for this instrument. Under these circumstances, the presence of migrant workers is likely to heighten local sentiments against foreign workers. There are also several barriers

to inter-CMA migration (e.g. immigration restrictions, excessive red-tape in granting work permits, language and cultural differences) which place doubts on the efficacy of labour mobility as compared with conventional mechanisms of payments disequilibria.

In the theoretical literature, an assertion was made that a more diversified economy was well equipped to absorb negative shocks, stemming from a deterioration in the price of one of the country's major export products. In comparison to the BLNS countries, the South African economy is well diversified in terms of its industrial composition of output, exports, and many other respects. In this context, the structural features of the BLNS countries can be said to be different from that of their large neighbour. However, further analysis of the structure of the South African economy reveals that in comparison with OECD countries, South Africa is not significantly different from the BLNS countries in terms of its vulnerability to shocks. The industrial sector is heavily linked to the primary sectors, so that a shock to mining, for instance, would have more far-reaching consequences than it would initially appear. It will be demonstrated in Chapter 7 that shocks to SACU are likely to be symmetric. However, the effects of such shocks are likely to be distributed differently, with the highly specialised economies feeling the brunt of the negative shock. Table 4.2 presents data on the structural features of SACU countries. The data reveals that the economies of Botswana and Namibia are more alike, as they are dominated by mining (mainly diamonds). Meanwhile, in South Africa and Swaziland manufacturing contributes a larger share to total GDP. From the table, it can be deduced that, compared with South Africa, the BLNS economies are highly open and are small (with about 5.5 million inhabitants against 39 million in South Africa).

Table 4.2: Some Comparative Statistics for SACU Countries

	BOT	LES	NAM	RSA	SWA
Industrial composition					
Agriculture	7.2	19.2	11.2	5.6	16.3
Industry	51.2	35.6	36.4	40.6	37.1
of which mining	41.6	--	20.5	9.2	1.5
manufacturing	5.0	13.1	6.4	24.2	28.2
Services	41.3	44.9	53.5	55.1	46.8
(of which government)	18.6	-	25.1	14.1	18.1
Openness					
Total trade	122.8	145.8	122.6	50.0	147.5
Exports ³⁸	62.2	14.9	55.0	27.2	73.9
Imports	60.6	130.9	63.9	22.8	84.5
Financial deepening (M2/GDP)	26.9	38.8	31.5	52.2	29.7
Incidence of droughts (1992)	Yes	Yes	Yes	Yes	Yes

Sources: African Development Indicators, World Bank (1996) and Imani Development Ltd, 1997.

According to the trade-off between inflation and unemployment hypothesis, which was popular during the height of the debate on OCAs, countries should sequence their integration efforts, lest the high-inflation ones experience higher unemployment as they converge to lower inflation. In the case of the LNS countries this has been already achieved as the common monetary policy ensures that inflation in the peripheral countries does not diverge significantly from that in South Africa.

Botswana’s experiences outside the CMA are of interest to the LNS countries. Since its introduction, the pula has shadowed the rand (although fixed to a basket of currencies, the rand has a weight of at least 60%). This ensures that the pula does not diverge significantly from the rand, while the balance of other currencies in the basket evens out the effects of changes in the rand on Botswana’s currency. The authorities have allowed small upward adjustments in the pula to dampen imported inflation from South Africa. Accordingly,

³⁸See also Appendix Table 3.1 for composition of Namibian and South African exports.

Botswana's inflation was relatively lower than the CMA countries' in the 1980s. This was the case despite the fact that all the small SACU countries are heavily dependent on South Africa for the bulk of their imports. Since the Botswana authorities abandoned the policy of using the exchange rate to dampen imported inflation, the country's rate of inflation has started to creep above that of the CMA countries. These experiences are very interesting to policy-makers in the LNS countries, but it should be noted that Botswana is a special case. The conditions they experienced allowed them ample room to make experiments³⁹. Thus, it is difficult to generalise these experiences to many developing countries, including the LNS.

4. 2 Summary and Conclusions

The preceding analysis showed that on the basis of labour mobility and structural characteristics of the economies of the member countries, the CMA may not be an optimal currency area in the Mundellian context. However, this question will only be conclusive with further evidence on whether shocks to the CMA countries are symmetric.

³⁹The opening up of a rich diamond pipeline in Jwaneng in 1983 transformed the economy from dependence on aid and beef exports for foreign exchange. In the subsequent years, the diamonds would generate huge foreign exchange inflows, that were transformed into huge government surpluses and huge foreign exchange reserves (equivalent to 30 months of import cover) in 1990.

Chapter 5

Estimating Equilibrium Real Exchange Rates for Namibia

5.1 Introduction

The objectives of this chapter are to estimate equilibrium real exchange rates for Namibia; to estimate the extent of real exchange rate misalignments; and to assess the impact of such misalignments on some selected indicators of economic performance, such as GDP, per capita GDP, investment, export sector and the agricultural sector. Analysis of how changes in the real exchange rate fundamentals (structural factors) affect the equilibrium real exchange rate can provide some additional guidance to the prevailing exchange rate regime policy, by comparing the extent of actual real depreciation or appreciation with the magnitudes suggested by the empirical estimation. This in turn will help to draw inferences about the type of exchange rate regime for Namibia. The structure of the chapter is as follows: Section 5.1 covers the introduction; Section 5.2 calculates Namibia's bilateral real exchange rate with South Africa and decomposes the CPI to establish the effects of different weights applied to the CPI baskets on the measurement of bilateral real exchange rates. Section 5.3 introduces the model of real exchange rate determination based on fundamentals. Its application to Namibia is also discussed extensively. Section 5.4 looks at the developments of RER fundamentals in Namibia, and their time series characteristics are presented in the following section. Section 5.6 discusses the estimation results, while the following section computes the equilibrium real exchange and RER misalignments. The

subsequent section assesses the relationship between RER misalignments and some selected macroeconomic indicators. Section 5.8 draws the conclusions and policy implications.

The exchange rate is an important price because it affects many key variables in an economy. Changes in the country's exchange rate directly affect the local currency equivalent of prices which domestic producers of given goods and services receive, and therefore their incentives to supply those products. In other words, the exchange rate affects resource allocation between traded and nontraded goods (an important issue in the analysis of real exchange rates). Depending on the type of product and the country's position in the world market for that product, exchange rate shifts may also affect foreign demand. However, in a small open economy (and provided the country does not have a commodity in which it is a major world producer), the prices for its exports and imports are determined in world markets. In this context, the exchange rate affects the output of goods and services and demands for foreign products, but does not affect foreign demand for the country's products.

The exchange rate also affects the decision to save and invest, while changes in the exchange rate may have direct effects on the distribution of income and wealth, especially between urban consumers and rural producers of exports. The exchange rate is a key determinant of the balance of payments, and it can serve as a nominal anchor for the price level. Therefore, movement of exchange rates in response to balance of payments shocks affects output and price stability.

Like any price, the real exchange rate is expected to provide signals to economic agents in the economy. For this, information on the extent to which the real exchange rate diverges from its equilibrium level serves as a guide to policy-makers to ensure that the RER does not send wrong signals to economic agents. Such wrong signals can result in inefficient resource allocation, and therefore lead to the reduction of the country's welfare. Edwards (1994) showed that a misaligned exchange rate might increase economic instability and distort investment decisions.

However, the problem that is often encountered in these analyses is that of determining by how much the real exchange rate is out of line with its long-run value. Measuring the RER misalignment⁴⁰ requires information about both the real effective exchange rate (REER) and the equilibrium real exchange rate (ERER), which are not directly observable like the nominal exchange rates. Essentially, the ERER must be estimated, while the REER also must be computed. The methodologies of RER determination can be distinguished between ppp-based and non-ppp based (see Devarajan, 1996, for detailed discussion).

The non-ppp based models include the fundamentals approach which is used in this chapter. The latter models the real exchange rate as a function of the fundamentals (terms of trade, income, etc.). Using time-series data, the responsiveness of the RER to various disturbances in the short-and long-run is estimated. In this context, this approach rejects the view that the equilibrium RER is an immutable number, which cannot change over time, as postulated by the PPP theory. The advantage of this approach is that it permits a distinction between

⁴⁰Edwards (1988) defines the real exchange rate misalignment as a sustained departure of the actual real exchange rate from its equilibrium value.

equilibrium RER and the transition to the new equilibrium. However, this method needs time-series data to estimate the model. In a recent study of the subject, Williamson (1994) attempted to consolidate the varying strands of literature on this approach. The main variants of the fundamental approach include the fundamental equilibrium real exchange (Williamson, 1985), the equilibrium real exchange rate (Edwards, 1988, 1989, 1994; Elbadawi, 1994), and the desirable equilibrium real exchange rate (Bayoumi et al. 1994). The fundamental equilibrium real exchange rate and the desirable real exchange rate calculations are derived from large macroeconomic models, mainly for industrial countries, while Edwards' model is small and purpose-built to analyse real exchange rate determination in developing countries (Williamson, 1994).

5.2 Computations of the Real Exchange Rates for Namibia

The real effective exchange rate can be measured in many different ways. Hinkle and Nsengiyumva (1995) provided a detailed discussion of the principal versions of formulas and conventions that are commonly used in the calculation of different versions of real exchange rates. They distinguish four principal versions of RER based on: (1) the traditional PPP RER; (2) the Mundell-Fleming one-composite good model or competitiveness in aggregate production; (3) the law of one price and competitiveness in production of traded goods; and (4) relative labour costs expressed in foreign currency. The RER in this thesis is defined as the ratio of domestic consumer price (P) to the foreign price level (P*), converted into domestic currency terms by the official nominal exchange rate (E), i.e. ($RER = P/EP^*$).

5.2.1 Common Problems in Empirical Measurements of REERs

Measuring real exchange rates poses several problems, i.e. the selection and choice of foreign prices. In reality the rest of the world comprises most countries which need to be aggregated in some way. The solution consists in computing P^* as a weighted average of prices in many trading partner countries and E as a corresponding weighted average of the nominal exchange rate of the reference country vis-a-vis each of them⁴¹. The weights assigned to each country are chosen to represent its importance in trade to the reference country. Deciding which prices to use for comparison poses a major concern in the measurement of REER, which typically is a relative cost of the common reference basket of goods and services. The baskets' costs for the home country and its trading partners are compared after conversion into a common numeraire (usually, the domestic currency)⁴².

Other set of problems that arise in comparison of international prices are highlighted in the latter part of this section (5.2.3). Typically, the composition of commodity baskets and the weighting schemes for each commodity or commodity groups differ across countries. Therefore, a market basket that was constructed to ensure a comparable commodity composition, should provide a better measure of relative prices (P/P^*) than when published

⁴¹However, the existence of parallel exchange markets in many developing countries suggests that there could be an array of nominal exchange rates to chose from.

⁴²The possible existence of many baskets suggests that a corresponding array of REERs can be computed.

aggregate price levels were used, as the latter usually differ markedly in terms of commodity composition. Before we examine international relative prices between Namibia and South Africa, the following section presents the REER for Namibia.

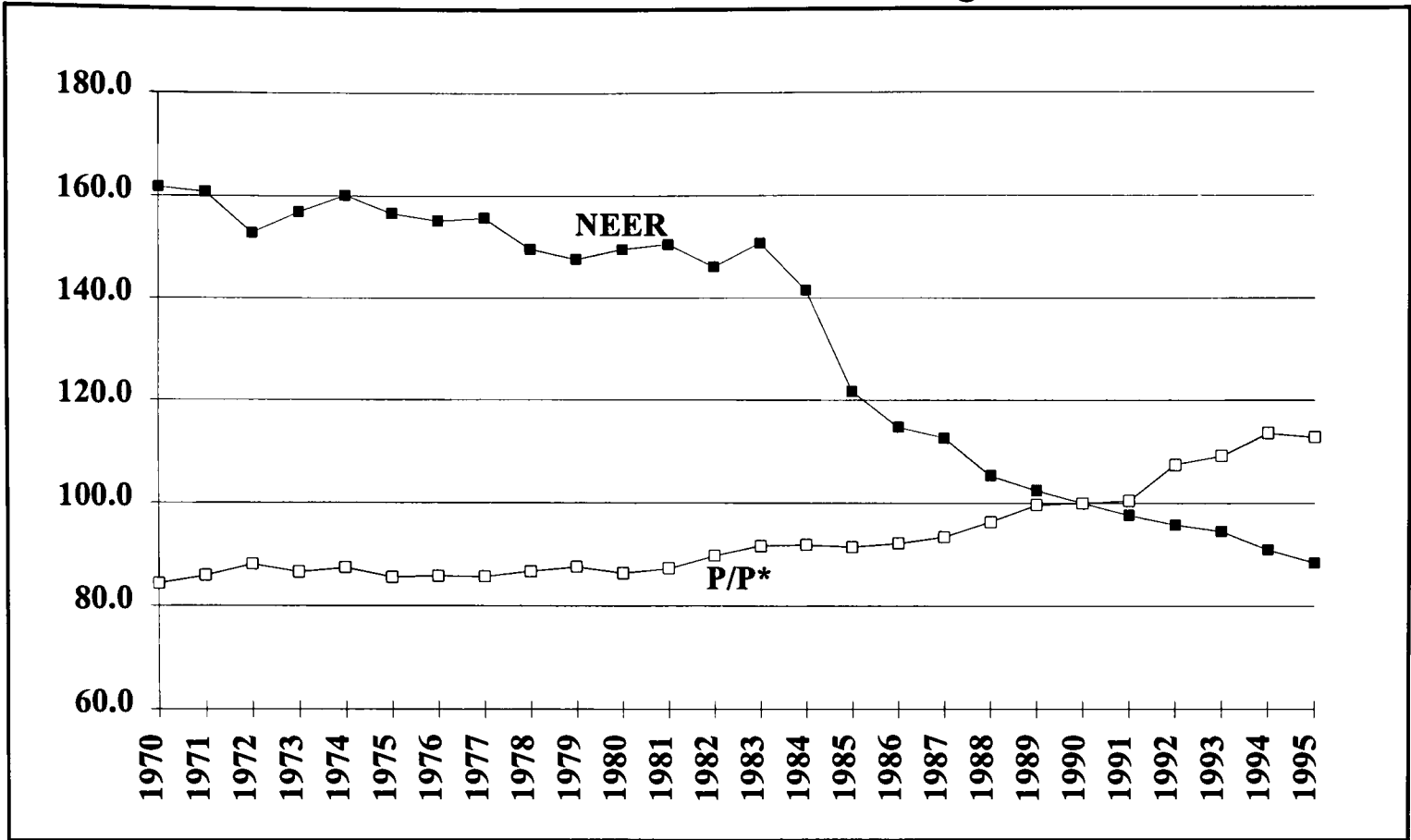
5.2.2 Computation of Namibia's Real Effective Exchange Rates

The real exchange rate in this exercise is defined as a ratio of domestic CPI to foreign CPIs, converted to domestic prices, so that an increase in the REER index reflects a real appreciation, whereas a decline corresponds to a real depreciation. The term real appreciation/depreciation here is used to suggest the direction of movement of the REER index (i.e. a rise/decline relative to the base year, which is 1990⁴³). Figure 5.1 displays the time profiles of the nominal effective exchange rate and the relative price (P/P^*), elements that are used in the computation of the REER.

Increases in P/P^* can be traced to major world and local events: e.g. the oil crisis from late 1973 and 1978-79; the depreciation of the rand during 1985; and drought during 1989 and 1994. However, the nominal effective exchange rate does not follow the same pattern as the P/P^* . The series shows a trend depreciation from 1985, following the nominal depreciation of the rand against major currencies.

⁴³The base year does not necessarily suggest that the REER was in equilibrium in that year.

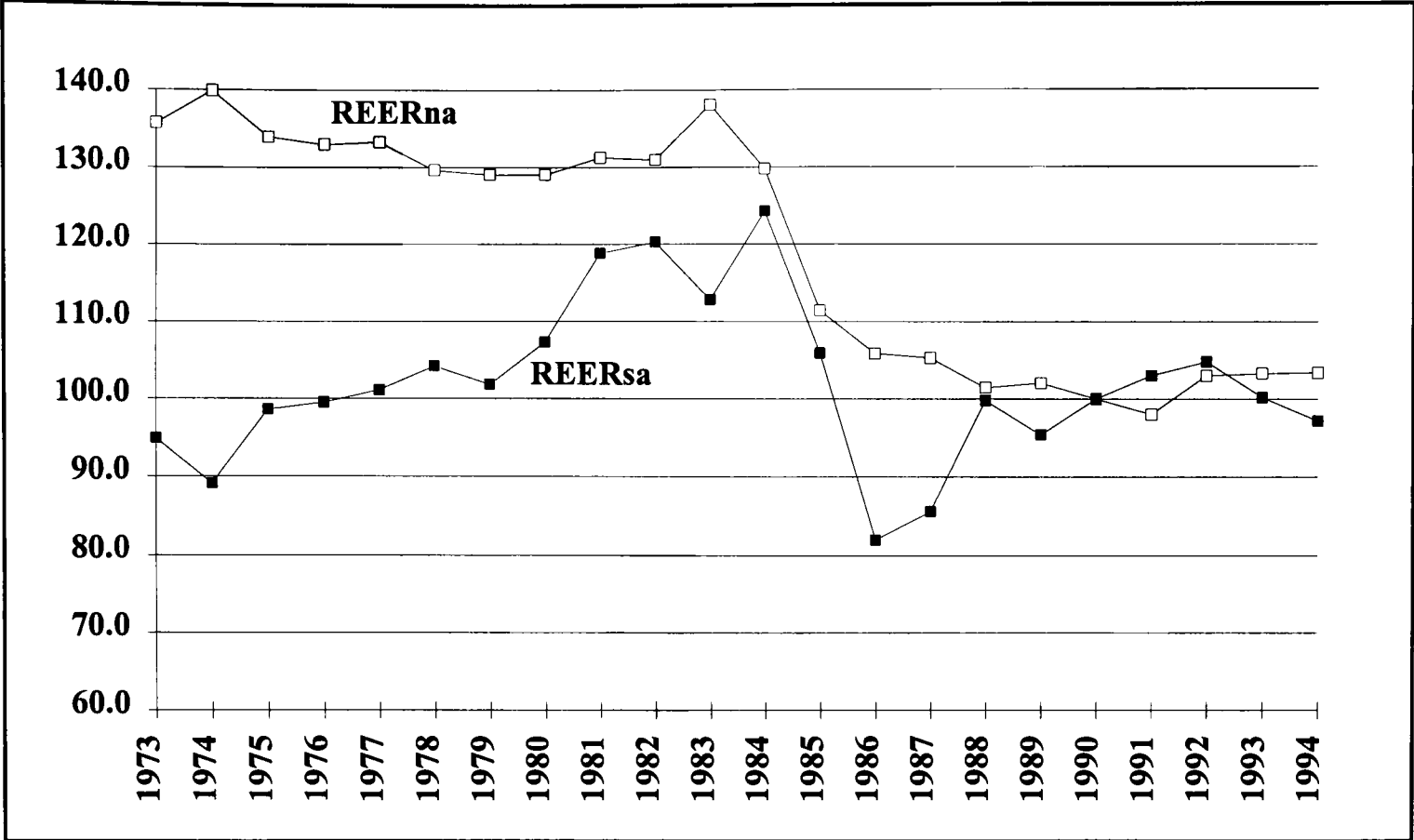
Figure 5.1: Time Profiles of the Nominal Effective Exchange Rate and Relative Prices



Source: Statistical Abstract, 1996, CSO; SARB Quarterly Bulletin, various years; IFS, various years.
Note: Unless specified, the source for most charts and tables are the Central Statistics Office (Windhoek) and Central Statistical Services (Pretoria), and IFS, various issues.

Figure 5.2 shows the real effective exchange rate indexes for Namibia and South Africa, respectively. Namibia's REER tracks that of South Africa somewhat. However, there were periods when the two indexes showed sustained divergence from one another, specifically during 1972-81 and 1985-87. The divergences, however, seem to narrow in the later period, perhaps reflecting an improvement in the statistical calculation of the Namibian CPI, which was revised in 1992. During 1991-92, Namibia's REER continued on its downward path, while that of South Africa shows some appreciation. During the period 1972-79 the mean value of REER was 133.7 against a figure of 105.8 during 1980-95. In contrast, the period during which the South African exchange rate regime was fixed (1972-79) yielded the most stable real exchange rate, whereas in the later period the REER was highly volatile. However, the rate of appreciation decelerated from 1985 following a sharp devaluation of the nominal exchange rate.

Figure 5.2: Real Effective Exchange Rates for Namibia and South Africa



Source: Statistical Abstract, 1996, CSO; SARB Quarterly Bulletin, various years; IFS, various years.

However, it is important to note that the sustained divergence observed between the real exchange rates for Namibia and South Africa is surprising in view of the high pass-through (discussed in the next chapter). This is especially so given that Namibian and South African inflation does not diverge significantly, and also given that the nominal exchange rate is fixed at unity between the two currencies. In addition, South Africa accounts for about 63% of the weight in Namibia’s total trade. These factors would imply that the real exchange rates should be close together. To explain this disparity, several reasons are put forward: a) changes in relative prices between the two countries; b) composition and weighting schemes used in the construction of the CPI baskets; and c) the direction of trade. The following example illustrates how relative price changes can affect the price level indexes between the two countries. A rise in food prices may have a significant impact on overall inflation for Namibia (other things being equal), with the CPI weighting of nearly 30% for food (in

contrast to 18% for South Africa). The following subsection decomposes the CPI to gauge whether the differences between the Namibian and South African CPIs is due to the application of different weights or due to relative prices moving in different directions.

5.2.3 International Comparisons of the Consumer Price Indexes (CPI)

Many factors complicate international comparison of CPIs: e.g. price level indexes can differ according to both the basket used to define them and the item used as a numeraire. There is the problem of terminology with respect to assembling goods and services into subgroups and groups⁴⁴; the weighting system and the frequency of surveys to update the weights; and the differences in the base year. Obstfeld and Rogoff (1997) suggest that it is important to define a reference basket representing a bundle of typical consumer purchases, with a weighting scheme that is rationalised in terms of underlying utility maximization problem.

The RER for Namibia discussed in the preceding section showed that there are times when it diverged (or moved in opposite direction) from that of South Africa. Such divergences may have serious implications on the costs of adjustment for the Namibian economy. However, we argue that the actual differences between the two RERs are smaller than shown in Figure 5.2. In this section we decompose the sources of those differences. The differences are likely to arise from the following sources: (1) compositional effects; (2) relative price effects; (3) the direction of trade effects. The first term reflects divergences in (P-Ps) that may arise from

⁴⁴For international comparisons, the ILO generally classifies the CPI into eight main groups: (1) food, beverages & tobacco; (2) clothing and footwear; (3) rent, fuel and light; (4) furniture, household appliances, & other goods; (5) medical care & health expenses; (6) transport & communication; (7) education, entertainment & recreation; and (8) other goods & services.

the differences in the composition of the CPI baskets between Namibia and South Africa⁴⁵. Therefore, using the overall CPI without taking into account the effects of the differences that arise from the fact that the CPI baskets are not synchronised, will overstate/understate the P/P^* variable that we looked at in Figure 5.1. Therefore, adjusting for these compositional effects minimizes the differences referred to earlier. Even though the nominal exchange rate used in the analysis is the same as that for South Africa, there could still be some differences in the computation of the effective nominal exchange rate (NEER) because the direction of trade with respect to W (the rest of the world may differ).

The rest of the section seeks to show why Namibian and South African price levels may differ. Specifically, it is argued that differences in weighting and unsynchronised price movements across borders can account for differences in national price levels. The exercise attempts to show that differences in weights applied in the calculation of the respective price indexes and relative price changes (i.e. prices moving differently) can account for differences in national price levels. This may be so even when the commodity composition of goods and services in the basket may be similar, if the weights assigned to items or groups of commodities within the baskets differed significantly between the two countries. The discussion that follows will therefore concentrate on the methodology to determine whether the observed price differences between the corresponding subgroups of the published CPI (for Namibia and South Africa) are due mainly to compositional effects or relative price effects, or both.

⁴⁵The weights applied to each sub-index may influence the level of overall CPI differently. For example, food has a weighting of 28.4% in the Namibian CPI, in contrast to 18.6% for South Africa. If food prices were rising faster than the rest of prices in the economy, the impact of these on the respective CPIs will be different.

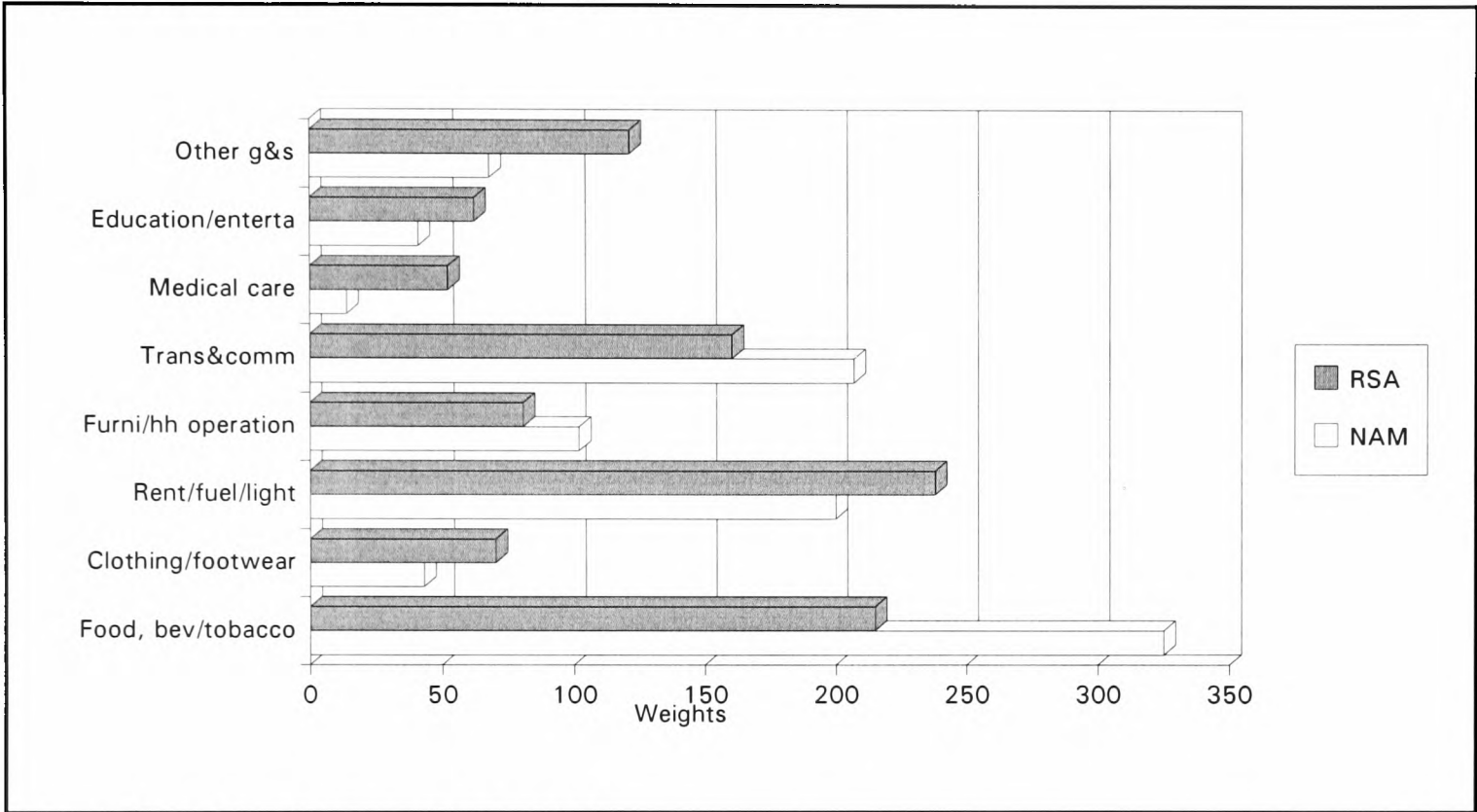
The 2-digit disaggregation of the CPI gives an opportunity to reconstruct reference baskets of purchases that can contain comparable items. This avoids the arbitrary comparison that arises when using aggregates or subgroups of the CPI (which typically involve somewhat different baskets of commodities across countries, Obstfeld and Rogoff).

Weighting is very important in the construction of the consumer price index. Weights are based either on expenditure surveys or consumption data. Teekens (1989) maintains that expenditure-based weights are not suitable for international comparisons because national policies and practices heavily influence expenditures (e.g. health services may be free in one country, while not so in another country). So, for international comparisons, weights based on the consumption concept are preferred. The computation of the CPI for both Namibia and South Africa is based on a standard Laspeyres price index, computed using fixed weights. They retain the market basket for several years. The current weighting system is based on the survey of expenditure patterns of households conducted in 1985 for Namibia and 1990 for South Africa. The data used for weighting are obtained from samples of family budgets.

Figure 5.3 presents CPI weights for different groups of goods and services for Namibia and South Africa, respectively. Notably, it can be seen that goods account for about two-thirds of Namibia's CPI, which is 7 percentage points higher than that for South Africa. Generally, the prices of goods, especially traded ones, are not expected to deviate significantly from one another between the two markets. However, the prices for services are expected to be determined by demand and supply factors in each country. Although feedback effects

between the prices of traded and nontraded goods, could shorten the speed within which the prices of nontraded goods respond to disturbances between supply and demand factors.

Figure 5.3: Weight of Main Groups in the CPI



Source: Statistical Abstract, CSO, 1996

Notes: other goods and services; education and entertainment; medical care; transport and communications; furniture and household operation; rent, fuel and lighting; clothing and footwear; food, beverages and tobacco.

To simplify comparisons the disaggregated CPI data were rearranged to correspond with an 8-main group classification displayed in Figure 5.3. The differences in the weighting patterns, which reflect budget shares, can be attributed to three main factors: country characteristics (i.e. average household income levels and tastes); lack of uniformity in the coverage of goods and services included in the market basket; and lack of uniformity in the index population (Teekens, 1989). The differences caused by country characteristics will remain if income inequality between the two countries persists, whereas regrouping and weighting can correct the patterns due to lack of uniformity.

Even with the regrouping, it can be seen that differences in the weighting patterns do persist. The budget shares for food, beverages and tobacco show the largest disparity between the two countries. From Engel's Law it can be implied that the food share is a decreasing function of income. Accordingly, Namibians spend a large share of their income on necessities compared with the relatively affluent South Africans. Similarly, reflecting the low population density and the fact that the population is spread through a wider geographical area, transport and communications weigh heavily in the expenditure patterns of Namibians. Reflecting perhaps the differences in the level of economic development, the expenditure patterns suggest that South Africans spend more on services and leisure and other luxurious items than their counterparts in Namibia. This is manifested in the sub indexes for medical care and services, housing, and clothing and others, which includes personal care.

In the next chapter, it will be demonstrated that although the pass-through may be very high and fast, prices for certain consumption items may not respond as quickly, leading to relative prices moving differently between the two countries. However, the challenge is to assess the extent to which these prices can influence the overall price level and its changes in Namibia.

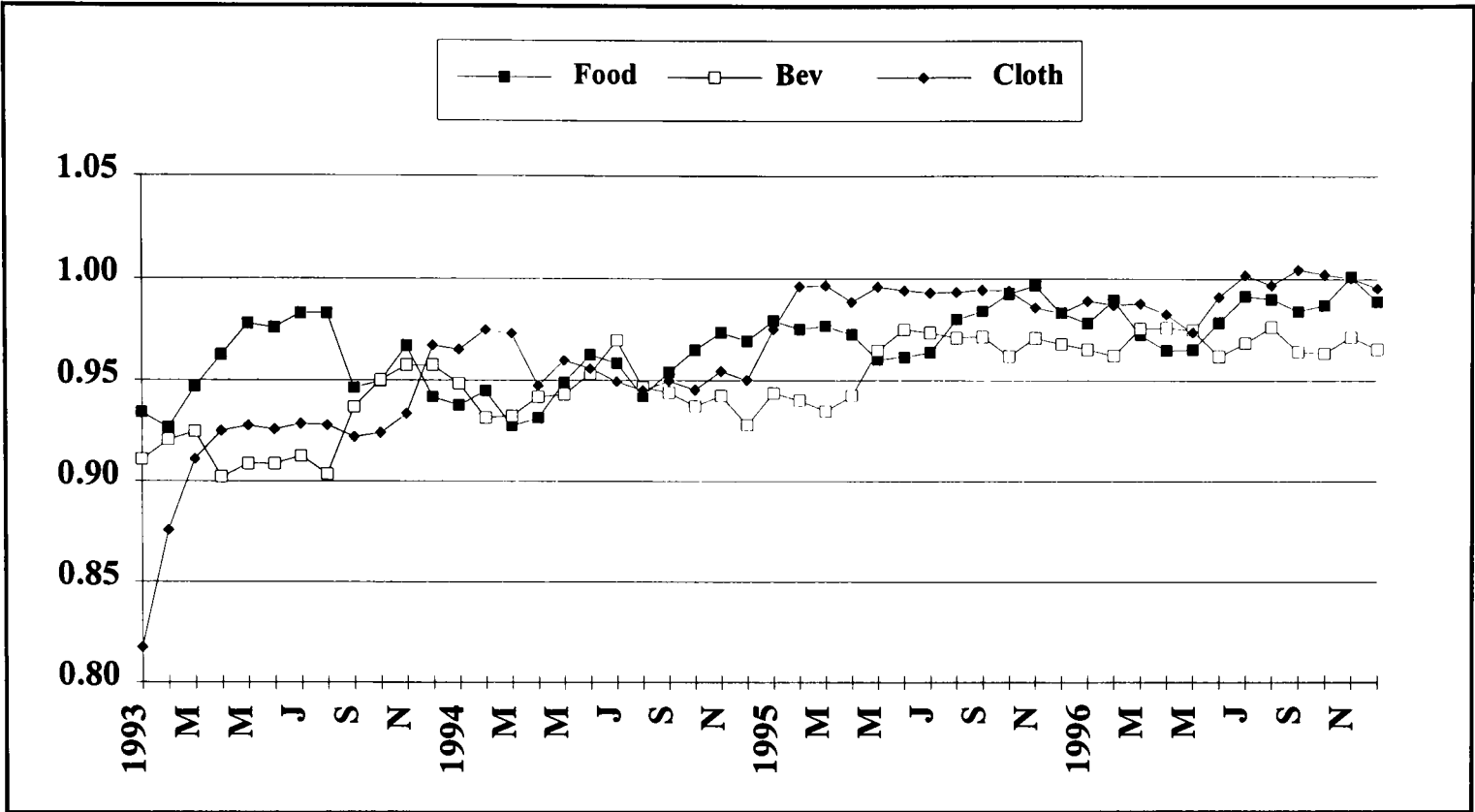
The final observation regards the groupings of the CPI subindexes, the composition of the goods and services in the respective subindexes and the coverage of the CPI data. Regarding the composition of the market basket and coverage, Namibia's CPI has a narrow base, and it only reflects the prices for Windhoek (capital city). According to the IMF (1995), the Namibian inflation is said to be two percentage points higher than South Africa due to the difference in the composition of the basket and the narrow sample base in Namibia.

(a) Decomposition of CPI

According to Teekens, movements in relative prices can moderate output fluctuations. However, relative price adjustment is expected to be a less important part of adjustment in regions with highly integrated goods and factor markets. In that case, demand and supply curves may be flat so that relative price changes in response to disturbances are small. In a single currency region, because nominal exchange rate adjustment is ruled out, such relative price movements must occur through inflation differentials. Because domestic prices are less flexible than exchange rates, relative prices changes may be more difficult to achieve in a currency union.

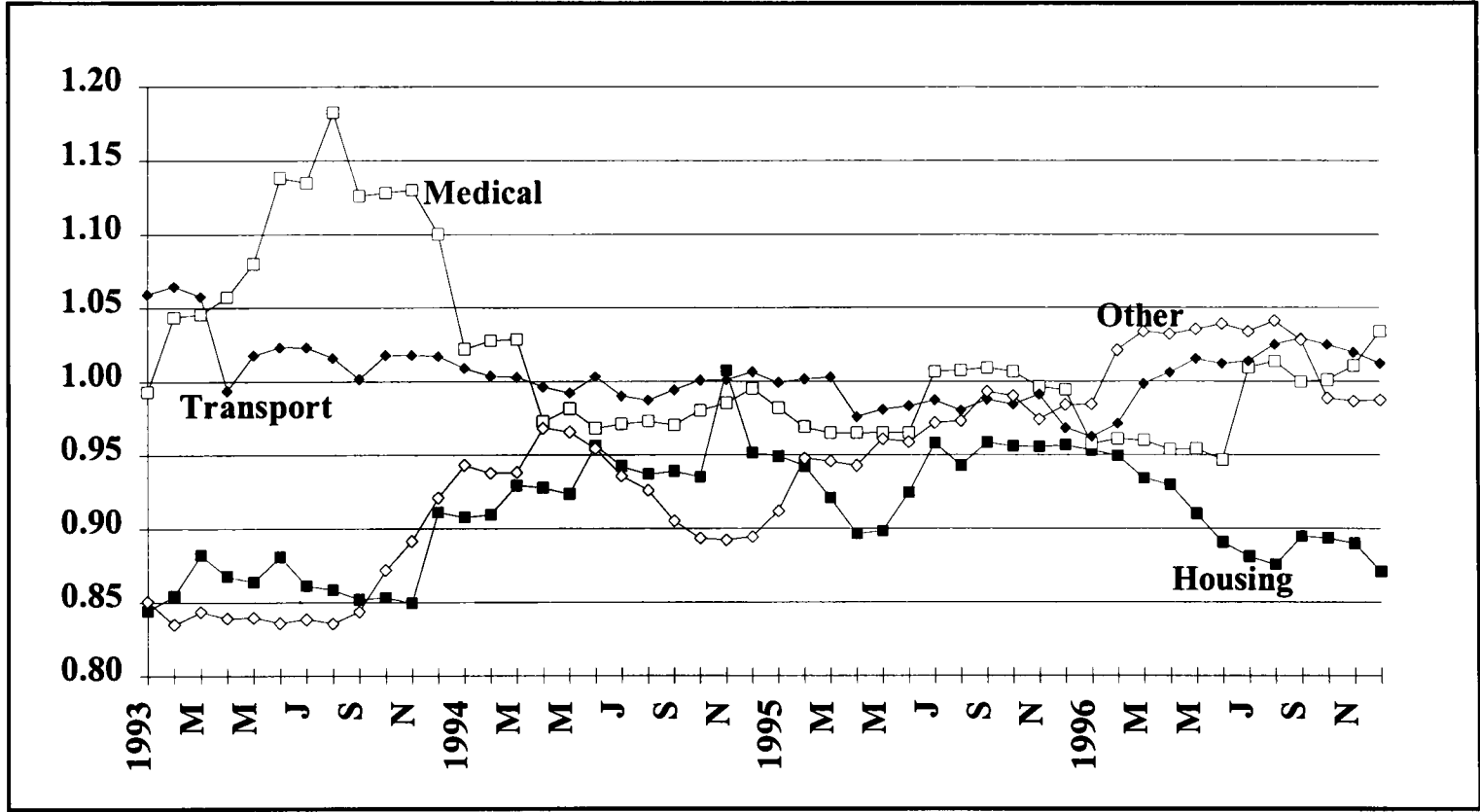
This section attempts to decompose the prices between Namibia and South Africa to examine whether the price variability is due to different weights applied to the consumers' baskets in the two countries or due to movements in relative prices. However, before we go further, we present the time profiles of relative prices (P_{in}/P_{is}) for several CPI sub indexes in Figures 5.4a and 5.4b. The ratio (P_{in}/P_{is}) for most tradable items (food, beverages, clothing, footwear and furniture) is generally around unity, as shown in Figure 5.4a. However, the pattern of relative price movements for nontradables is different (see Figure 5.4b). Here, there is a significant degree of price divergence between P_{in} and P_{is} . This may suggest that while tradable prices may be completely arbitrated between the markets, nontradable prices may behave differently.

Figure 5.4a: Relative Price Movements between Namibia and South Africa



Source: Statistical Abstract, CSO, 1996; SARB Quartely Bullein, various years; IFS, various years.

Figure 5.4b: Relative Price Movements between Namibia and South Africa



Source: Statistical Abstract, CSO, 1996; SARB Quartely Bullein, various years; IFS, various years.

Table 5.1 presents the means and standard deviations of inflation rates (π_{in} and π_{is}) for the period 1993 (1)-1996 (12). Generally, Namibian prices are higher and more volatile than in South Africa. This is evident from the means in the first two columns and the standard deviations (the last two columns of the table).

Table 5.1: Change in Consumer Prices and Relative Prices (year-on-year) Monthly 1993-96)

	Mean		Standard deviation	
	P _{iN}	P _{iS}	P _{iN}	P _{iS}
Food	10.62	9.66	7.33	6.86
Beverages	12.07	10.32	2.86	2.73
Clothing&footwear	7.67	4.21	11.75	0.78
Clothing	5.84	4.07	5.44	0.78
Footwear	10.51	4.96	4.24	1.13
Housing	11.12	9.42	4.51	4.55
Household goods	5.54	3.96	1.73	1.33
Medical services	5.86	9.55	6.53	1.96
Transport &commu.	6.88	7.52	2.53	2.39
Transport	7.15	7.22	2.64	2.25
Recreation	12.31	5.31	3.7	1.38
Miscellneous goods	14.63	8.07	4.3	2.69

Source:Central Statistics Office (Windhoek) and Central Statistical Services (Pretoria), various issues

In international price comparisons, differences in tastes are ignored within countries. Both the Namibian and South African consumer price indexes are a type of Laspeyres price index system, and therefore the CPI measures the cost of buying a base period basket of goods and services at the current prices. Both CPIs are computed using fixed weights.

The fixed weight index is a ratio of weighted sums of prices. According to Pollak (1990), dividing the price index by the fixed weight index yields an index that is equivalent to a ratio of weighted averages of prices. The weights are interpreted as quantities of goods in a market basket, so that the index is the ratio of the cost of that market basket at prices P_a compared with its cost at prices P_b . Using this concept, the indexes of average prices derived above were re-weighted using South African weights for corresponding goods and services to derive a new index, that was comparable to that of South Africa in terms of weights. The

difference between the two indexes (the actual and South African-weighted index) measures how much price diversions between the two countries due to compositional effects.

(b) computational Steps

The steps carried out in deriving the compositional effects and relative price effects are as follows:

Step 1: recalculating the all items and subindexes as computed by the CSO in Namibia. Doing so allows flexibility in terms of regrouping the data to facilitate international comparison. The CPI is computed according to the following formula:

$$P_{Ik} = \frac{1}{\omega_k} \sum \omega_{k_0} \frac{P_{km}}{P_{k0}} \tag{1}$$

where P_{Ik} is the index; ω_{k_0} is the base period weight for item k ; P_{km} and P_{k0} are prices in period m and the base period, respectively. We have data on P_{Ik} and w_k . To simplify the algebra we set $w_{k0}/P_{k0}=1$, so that we can re-write equation [1] as follows.

$$P_{Ik} = \frac{1}{\omega_k} \sum P_{km} \tag{2}$$

Step 2: since we had data on the sub indexes and weights, using equation [2] we derived P_{km} , which represented the non-weighted sub indexes. This was computed according to the following formula:

$$P_{km_{adj}} = \omega_k \sum P_{Ik} \tag{3}$$

Step 3: derive the new Namibian sub indexes weighted by South African weights:

$$P_{Iadj} = \frac{1}{\omega_{ks}} \sum P_{Ikadj} \quad [4]$$

Step 4: the difference between P_{Ik} and P_{Ikadj} can be attributed to compositional effects between Namibian and South African prices. In Step 5 we compute the actual price difference between Namibian and South African prices from published CPI data ($P_I^n - P_I^s$). This is followed by decomposing the actual price changes into two components: compositional effects and the relative price effects, which is derived as a residual.

The results of this decomposition are presented in Table 5.2. The actual difference is decomposed into two components: compositional effects and relative price effects. For example, the average food price index in Namibia was about 13 percentage points higher than that in South Africa. Nevertheless, this was because of Namibian prices rising more faster than South Africa's prices. The movement in relative prices thus further reinforced the higher weighting accorded this sub-index to produce an overall higher price level than that in South Africa.

The decomposition of the CPI has raised concerns regarding the estimation of the real exchange rates. The choice of foreign prices poses more problems than is probably acknowledged in the literature. The exercise has highlighted that if an all-item CPI was taken without consideration for the differences in the CPI, that may be due to different weights being applied by different countries, this is likely to introduce a bias in the estimated real exchange rate. For comparison, a wide range of REERs using adjusted prices, that is, using a three-digit relative price (P/P^*) instead of the all-item CPI data can be calculated. For

example, it is possible to compute REERs representing a broad group of sub indexes and sub groups within the sub indexes. This has the advantage of assessing sectoral competitiveness, for example. The real effective exchange rate was recalculated using the disaggregated CPI (in this case, the sub-index for food)⁴⁶. As can be seen in Figure 5.5 the divergence between the Namibian and South African real exchange rates is substantially moderated.

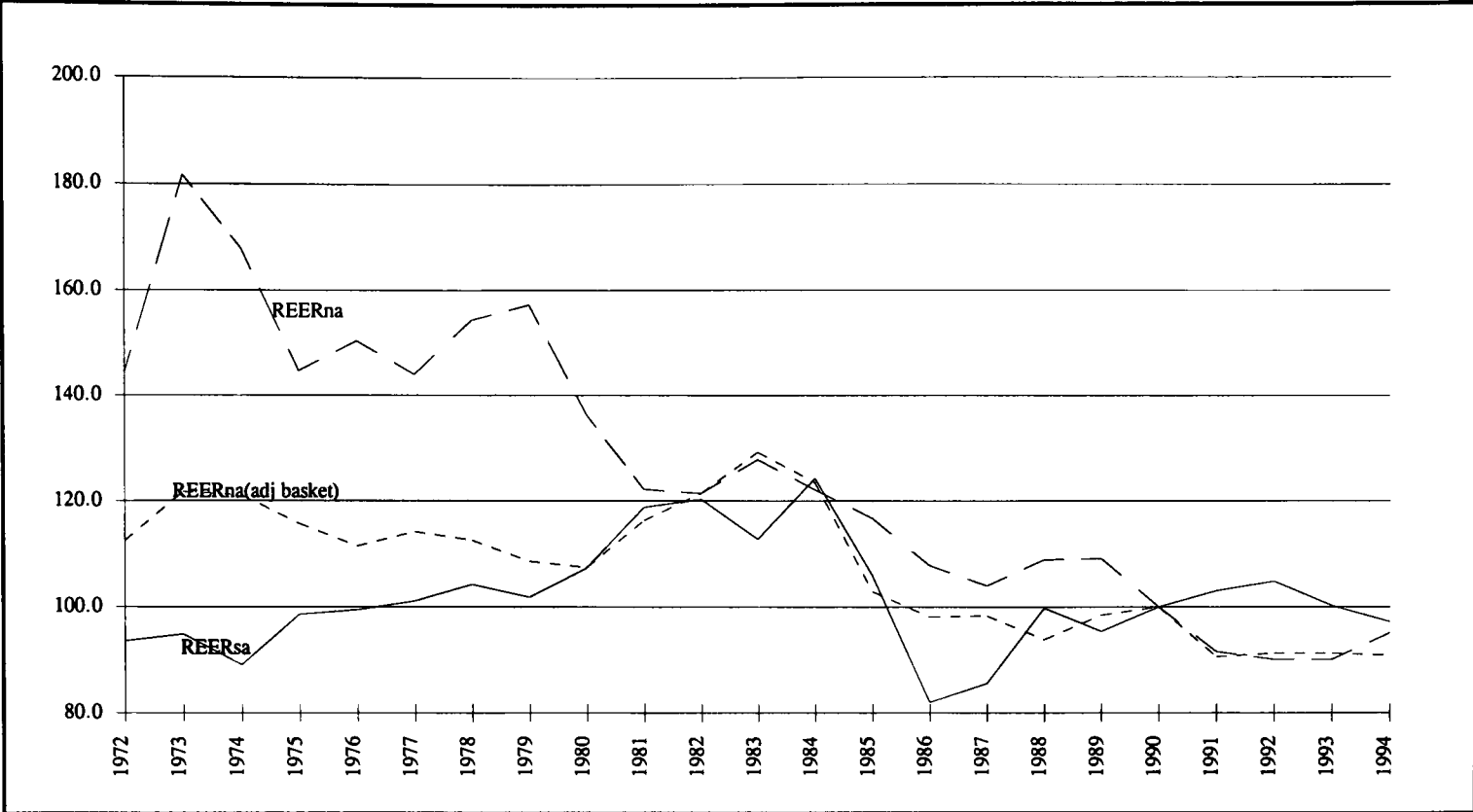
Table 5.2: Decomposition of Price Variation between Nam and RSA: 1993-1996(%)

	P _{IN} (%) (1)	P _{IN} Swt (%) (2)	P _{IS} (%) (3)	Price diff (1-3)	Compositional effect (1-2)	Relative price effect (4-5)
Food	10.62	10.02	9.66	0.96	0.60	0.36
Bevarages/ tobacco	12.07	12.35	10.32	1.75	-0.28	2.03
Clothing/Foot wear	7.67	5.18	4.21	3.46	2.49	0.97
-clothing	5.84	4.50	4.07	1.78	1.34	0.44
-footwear	10.51	9.19	4.95	5.55	1.31	4.24
H/hold goods	11.12	11.23	9.43	1.70	-0.10	1.80
Furniture	5.54	6.32	3.96	1.58	-0.78	2.36
Medical	5.86	4.91	9.55	-3.70	0.95	-4.65
Transport/Co mmunications	6.88	7.78	7.52	-0.64	-0.90	0.26
-transport	7.15	8.11	7.22	-0.06	-0.96	0.90
Recreation	12.31	12.07	5.32	6.99	0.23	6.76
Other	14.63	10.40	8.07	6.56	4.23	2.33

Source:Central Statistics Office (Windhoek) and Central Statistical Services (Pretoria), various issues

⁴⁶Like the overall CPI, the sub index for food contains both tradable and nontradable items.

Figure 5.5: Real Effective Exchange Rates (weight-effects)



Source: Central Statistics Office (Windhoek) and Central Statistical Services (Pretoria), various issues

This section shows that the real exchange rates for Namibia and South Africa, despite the high passthrough of South African prices to Namibian prices, will diverge to reflect differences in relative prices and the direction of trade. Concerning prices, it is also important to take into account the influence of the prices of nontradables between home and the foreign country. While the law of one price can be assumed for tradables, the prices for nontradables can differ significantly. The relative weights of the nontradables in the overall price level could also contribute to the differences in the real exchange rates. Thus, in addition to changes in the nominal exchange rate, there are other sources equally important in contributing to changes in the real exchange rates.

5.3 The Model of Real Exchange Rate Determination

This section introduces the model of RER determination based on fundamentals. The first part of the section highlights some of the problems that one is likely to encounter applying this analytical framework to Namibia, given the structural features of the Namibian economy (one of the basic assumptions of the model is the tradable/nontradable structure).

5.3.1 Application of Fundamental RER Model to Namibia

Experiences with pegged currencies have shown that movements in economic fundamentals may become inconsistent with the fixed exchange rate. Tensions in exchange rate policy may result, which may even force the abandonment of the peg. Evidence abounds, dating back from the collapse of Bretton Woods, and recently, the experiences of the EMS and the CFA zone have highlighted the problems.

In the context of the CFA Franc Zone, recent studies showed that RER misalignments in the zone were disproportionally distributed (Devarajan, 1996). Countries whose exports are dominated by primary products experienced the largest RER misalignments. Another study by Baffes et al. (1997) shows that smaller countries in the CFA are more likely to adapt to shocks than larger ones. These results suggest that the costs of RER misalignments for countries participating in a currency union may be unevenly distributed, especially if the countries' production structures differ. Bayoumi et al. (1994), suggests that examining trends over time in the indicators of a country's external competitiveness and developments in its

misalignment and the performance indicators. Therefore, a misaligned RER will have adverse impact on economic performance, other things being equal.

Table 5.8: Correlation matrix

	RGDP	PCGDP	PCRGDP	RGDFI	XS	AG
RER MIS	-0.1553	-0.3112	-0.1752	-0.03904	-0.2188	-0.2363
RERMISx	-0.1648	-0.3756	-0.1974	-0.05244	-0.2355	-0.2140
RER MISm	-0.1403	-0.1189	-0.1261	-0.01809	-0.1701	-0.2656

Notes:RERMIS-RER misalignment. The letters x, m identify whether REER is export or import-weighted.

Following Cottani, the relationship between RER misalignment and economic performance can be modelled as:

$$X_{it}=\alpha_0+\alpha_1RERMIS_t+\varepsilon_t$$

where X_{it} is an indicator of economic performance at time t and RERMIS is the degree of real exchange rate misalignment. The results confirm the relationships established above for indicators of economic performance. The regression results show that RER misalignment negatively impinges on growth of real agricultural growth.

Regressions of Performance Indicators on RER Instability and Misalignment (1974-95)

$$\Delta AG = -0.26575 - 0.56957 \Delta RERMISx$$

t-values (-0.12) (-1.71)

R²= 0.133; DW=1.51

5.8 Summary, Conclusions and Policy Implications

The objectives of this chapter were to estimate equilibrium real exchange rates for Namibia; to measure the extent of real exchange rate misalignments; and to assess the impact of such misalignments on some selected indicators of economic performance. The analysis of how changes in the real exchange rate fundamentals (structural factors) affect the equilibrium real exchange rate can provide some additional guidance to the prevailing exchange rate regime by comparing the extent of actual real depreciation or appreciation with the magnitudes suggested by the empirical estimation. One way of identifying whether the CMA imposes costs on Namibia is to identify the extent of RER misalignments.

The results identified some patterns in RER misalignments, starting with huge undervaluation in the early period, followed by over-valuation until 1980-85 when a depreciation of the nominal exchange rate resulted in RER depreciation. The RER overvaluation is more consistent with what both the economic performance indicators and the RER fundamentals would have dictated, i.e. a depreciated real exchange rate, than the rate that prevailed during 1981-85. Following the nominal depreciation of the rand during 1985 and 1986, the degree of RER misalignments diminished substantially. The indicators of RER misalignments⁵⁸ put the peak overvaluation at less than 20%, which is far lower than estimates for the CFA zone countries (primary products exporters), e.g. Cameroon 78%; Congo 58%; Togo 52%; Mali 39%; Cote d'Ivoire 36% (see results from Devarajan, 1996). The results show that countries in a currency union can also experience some RER

⁵⁸It should be noted that since the estimation of the RER model did not decompose between policy and non-policy variables, it is not implied that the computed misalignments are due to the CMA.

misalignments, sometimes of even greater size than those operating a flexible exchange rate regime, independently (i.e. Kenya 29%; Ghana 134% being the exception).

What are the implications of these observations for exchange rate management and the choice of the exchange rate regime for Namibia? Edwards (1988) emphasized that maintaining the real exchange rate at a wrong level, that is, at a level different from the long-run equilibrium value, significantly reduces a country's welfare. In this context, the study examined the impact of RER misalignments on some selected indicators of economic performance. Simple correlation results suggest a negative correlation between REER misalignment and the performance indicators. The regression results showed that RER misalignments did not have any significant effects on several macroeconomic indicators (except for agriculture where a negative relationship between the growth of real agricultural growth and RERMIS was marginally established). In summary, the results showed that RER misalignments have been relatively small, especially following the nominal devaluation of the rand during 1985 and 1986. The recent nominal depreciation of the rand in 1996 is also expected to have substantially lowered the RER appreciation that has been apparent since 1991.

Chapter 6

Exchange Rate, Import Prices and Wages in Namibia:

Estimating Exchange Rate Pass-Through

6.1 Introduction

Studies analysing the movements and interactions among exchange rates, prices, and external adjustment have attracted attention of economists, ever since Cassel's (1922) purchasing power parity thesis. The PPP postulate implies that there is a rate towards which the nominal exchange rate would tend, in the absence of trade imbalances, speculation, central bank intervention, and other impediments to trade. A derivative of this is the law of one price, which implies that under conditions of perfect commodity arbitrage and substitution in production and consumption, prices of homogeneous traded goods will be the same in all locations when quoted in the same currency, in terms of absolute levels (Kraves and Lipsey, 1977). The implication of the absolute purchasing power parity is that whatever monetary or real disturbances in the economy, because of instantaneous, costless arbitrage, the prices of a common market basket of goods in the two countries, measured in a common currency will be the same, or $P/EP^*=1$ at all times. However, the existence of transport costs, differences in tastes and obstacles to trade (tariffs, quotas) should imply that the price of close substitutes, or even identical goods, could diverge across space at any point in time. In addition, marketing and distribution costs can account for the differences in prices across space.

In contrast, Dornbusch (1988) argues that these impediments do not preclude that the common currency prices of any given goods in different locations should be closely related and, indeed be arbitrated. Therefore, persistent and often large deviations from purchasing power parity need to be explained. These can arise from divergent speeds of adjustment of the exchange rate⁵⁹ compared with wages and prices. Sluggishness in wages (for contract reasons) and the fact that prices are not equalised at any point in time, suggest that changes in nominal exchange rates will be reflected in real exchange rates. So, nominal devaluation becomes effective the more sticky the wages and the smaller the connection between wages, prices, and the exchange rate.

In a seminal article on the theory of optimum currency areas, McKinnon (1963) argued that an exchange rate instrument cannot operate successfully in an open economy because of its potential to destabilise prices. The intuition behind this assertion is that net domestic prices will shift one-for-one to offset movements in the nominal exchange rate so that devaluations of the domestic currency would raise prices in the same proportion. In other words, the pass-through of imported inflation to domestic prices is expected to be complete and immediate, so that gains from nominal devaluations will only have temporary effects on the real exchange rate.

This so-called pass-through from the exchange rate and foreign prices to domestic prices therefore has attracted a great deal of interest. Empirically, it has been found that the pass-

⁵⁹Particularly when flexible exchange rates behave like asset prices while wages are determined by long-term contracts, there is room for relative prices to show relatively persistent deviations from purchasing power parity.

through relationship is not equal to one and it is not constant over time (casting doubts on the absolute version of the law of one price (Isard, 1977, Kravis and Lipsey, Hooper and Mann, 1989). That is, exchange rate and foreign price changes are not reflected one-for-one in domestic prices of imports. Evidence that changes in certain variables are passed on incompletely into domestic prices, abounds (Herguera, 1993). The literature explains these empirical observations as reflecting the pervasiveness of imperfect competition in international trade⁶⁰.

The purpose of this chapter is to assess the extent to which movements in exchange rates and foreign prices influence wages and domestic prices in Namibia. Namibia being a highly open economy, the influence of import prices on the overall domestic price level comes in through several channels. One such channel is through intermediate goods, which are then transmitted to final goods. The second, and probably the most important in the context of Namibia, is the effect on final imported consumer goods, including food prices, which represent about a third of the country's imports. The third channel is through wages, through the influence of the imported goods prices on the overall price level, which is usually used as the basis for wage negotiations. The degree to which exchange rate movements are transmitted to domestic prices and wages, has important implications for the management of the exchange rate policy. Information on pass-through helps in determining the impact of devaluations, particularly on the length of time for which real exchange rate depreciation will be sustained following a devaluation (Atta, et al. 1996). The outline of the chapter is as follows: Section 6.1 covers

⁶⁰Fast growth in international trade during the era of flexible exchange rates is said to have been dominated by intra-industry trade (i.e. international trade in imperfectly competitive markets where the interactions among firms influence the behaviour of prices and quantities traded).

the introduction and the definition of exchange rate pass-through and the roles for nominal exchange rates; Section 6.2 reviews the literature on exchange rate pass-through, highlighting the innovations in the analysis of pass-through issues that emphasize imperfect competition and so the microeconomic foundations of pricing to market, in contrast to the perfect competition and the law of one price; Section 6.3 entails a brief descriptive analysis of wage determination in Namibia. Because of lack of data on wages, employment and unemployment rates, this section attempts to describe relevant aspects of the labour market to gauge wage-resistance, which might affect the responsiveness of the economy to adjust to shocks; Section 6.4 discusses the analytical framework employed to measure pass-through. Section 6.5 presents the empirical results; and the last section draws conclusions.

6.1.1 Roles of the Nominal Exchange Rate in Adjustment

Namibia's loss of nominal exchange rate requires that wages be less sluggish in order to facilitate adjustment following a shock. In Namibia wages typically lag behind the price level and in most cases, wages are fixed by contract. These practices may lead to some nominal wage resistance in the economy, which is likely to exacerbate economic instability by reducing the responsiveness of the economy to disturbances that require real wage changes. This may suggest that wages behave more like a typical Keynesian type than a neoclassical case, which assumes flexible wages. Under these circumstances, the nominal exchange devaluation may be necessary to speed up the process of adjustment following a shock.

The effects of changes in the nominal exchange rate differ, depending on whether we assume price flexibility or price rigidity. The degree of wage rigidity in the economy may determine whether a nominal devaluation can bring about real devaluation or not. The literature identifies three cases, under which a nominal devaluation will achieve different results (Corden, 1995). First, in the case of real wage rigidity, owing to some form of indexation of wages with very short lags, nominal devaluation would not lead to real devaluation. So, there would be no point to devalue in response to an adverse shock. The second case is that of complete flexibility of wages, which is of little interest because the exchange rate is not needed as an instrument of adjustment.

The third case is that of real wage flexibility and nominal wage rigidity. In this case, a reduction of demand would not lead to a decline in nominal wages (or speedy decline). So, a real devaluation would not come about automatically when demand falls. In addition, a rise in prices would not lead to an increase in nominal wages sufficiently to prevent a fall in real wages. Under the circumstances, a nominal devaluation can reduce the real wage, at least for a significant period of time. Nominal devaluation leads to real devaluation. Assuming downward inflexibility in the price of nontradable goods and the nominal wage rate ensures that a devaluation now determines both the real wage in terms of tradable goods and the relative price of nontradable goods in terms of traded goods. In this context, devaluation becomes an instrument for achieving full employment. Given money wages and money prices of nontradable goods, a devaluation lowers the real wage in terms of tradable goods and the relative price of nontradable goods. The lowering of real wages encourages employment and production in the tradable goods industry, while lowering the relative price

of nontradable goods invites substitution on the demand side towards nontradable goods so that full equilibrium can be attained in the long-run. Thus, corresponding to the equilibrium is the reduction in the real wage in terms of tradable goods and an increase in the real wage in terms of nontradable goods, so that money wages rise compared with the price of nontradable goods.

Exchange rate depreciation is thus more effective and more lasting the more sticky the wages and the smaller the connection between wages, prices and the exchange rate. In contrast, in an economy that is strongly indexed and, in particular, with exchange rate influences on indexation an attempt at creating employment via easy money would be frustrated as exchange depreciation precipitates offsetting wage and price inflation (Dornbusch, 1994).

6.2 Exchange Rate Pass-Through

Exchange rate pass-through is defined as the extent to which a change in the nominal exchange rate induces a change in the domestic price of importables (Hooper and Mann, 1989; Hooper and Marquez, 1995). This is best illustrated with an example. The domestic price of importables (P_m) is derived as a product of the foreign price of importables (P_m^*) and the nominal exchange rate (E). In log form, this can be represented as:

$$\log(P_m) = \log(P_m^*) - \log(E) \quad [1]$$

The nominal exchange rate (E) is expressed in units of foreign currency per unit of domestic currency (so that a decline in E represents a depreciation). The exchange rate pass-through (ϕ) is defined as the partial differential of equation [1] with respect to E .

$$\phi = \partial \log(P_m) / \partial \log(E) < 0 \tag{2}$$

According to this formulation, if a 10% depreciation of the nominal exchange rate raises the domestic import price by 7%, then 70% of the depreciation is said to have passed through. That is, $\phi = -0.7$, and pass-through is said to be incomplete (full pass-through implies that $\phi = -1$). When pass-through is complete, total fluctuations in the exchange rate are reflected in the domestic import prices. However, if domestic import prices remain stable, it is the foreign price or markup that has to adjust to exchange rate movements. Cases of incomplete pass-through suggest that some of the depreciation is absorbed by P_m^* to the extent that it is not fully passed onto higher domestic prices of imports. Differentiating equation [1], dividing through by $\partial \log(E)$ and rearranging the terms, this effect becomes clear.

$$\log(P_m^*) / \partial \log(E) = \partial \log(P_m) / \partial \log(E) + 1 = \phi + 1 \tag{3}$$

Accordingly, a 10% depreciation is apportioned as follows: 70% increase in the domestic price of importables and a 30% decline in the markup (or foreign price).

In broad terms, pass-through measures the amount to which imported inflation or changes in exchange rates are transmitted to domestic prices of either tradable or nontradable goods and services. Following Chhibber (1992) a simple econometric model is developed to measure the extent and speed of pass-through of foreign price and exchange rate changes to

Namibian domestic prices. The model allows for decomposition of important sources of inflation in the African context, including, cost-push factors (imported inflation, devaluations, wages) and demand-pull factors (excess money demand).

Having defined pass-through, the next section reviews theoretical and empirical developments in the literature on pass-through. Interest in studies of how movements in exchange rates affect domestic prices of importables go back, starting with the seminal work of Cassell (1922). Therefore, the literature on the subject is broad, and the discussion that follows is deliberately selective, highlighting only the work that is relevant to the questions being addressed in this study. Mainly, the discussion centres on the recent models (Dornbusch, 1987; Krugman, 1987) which emphasize microfoundations in explaining why cases of incomplete pass-through tend to be a dominant feature of international trade. This has implications for the predictions of perfect competition and its associated law of one price model. The factors that may impede complete pass-through or rather slow its speed are discussed. These include practices such as pricing under imperfect competition, or pricing to markets, the operations of subsidiaries abroad, price discrimination, maintaining production facilities abroad, and trading practices. These practices have implications for pass-through estimates.

6.2.1 Approaches to Calculating Exchange Rate Pass-Through and Empirical Evidence

Studies have employed various approaches in estimating pass-through⁶¹. Overall, estimates of pass-through vary across industries. For pass-through to be completed, the length of time ranges from several months to several years. The general conclusion is that while international prices for commodities are likely to observe the law of one price, markets for manufactured goods were more likely to exhibit different characteristics (see Hooper and Mann, 1989; Dornbusch, 1987). Earlier studies (by Craves and Lipsey, 1977 and Isard, 1977) which examined the relationship between domestic and export prices showed that export and domestic prices of the same product in a given country and the export prices of the same product from different countries can differ and can move differently. Therefore, traded goods, though serving as a transmission channel for inflation, will not necessarily transmit the full amount of inflation. Dornbusch introduced models of imperfect competition to explain pricing behaviour in international markets. Recent studies reveal that foreign firms do not cut their prices when a currency appreciates, and that they maintain pricing to market as currency depreciates (see Krugman, 1987). These studies generally analyse the extent to which US import prices (in aggregate and disaggregated form) failed to fall by as much as the value of foreign currencies, when the dollar appreciated against major currencies during 1979-85. Similarly, these studies also show that after 1985, when the dollar started depreciating, import prices did not rise as much, suggesting that foreign profit margins were being squeezed.

⁶¹These studies include, Woo (1984), Mann (1986), Dornbusch (1987), Krugman and Baldwin (1987), Hooper and Mann (1989) and Feenstra (1989).

6.2.2 Factors that Contribute to Incomplete Pass-Through

The literature offers various explanations for incomplete pass-through. Studies that appeal to microeconomic foundations of pricing behaviour of firms suggest the following reasons for incomplete pass-through.

The theoretical underpinnings of limited exchange rate pass-through literature emphasize microeconomic models of imperfect competition, product differentiation, and price discrimination to explain the empirical evidence noted above. Dornbusch (1987) observed that market organisation (i.e. dominance of price-setters in the market, possibilities of substitution between domestic and foreign variants of a product) and barriers to spatial arbitrage can influence the size and speed of pass-through. According to Hooper and Mann (1989), markets for manufactured goods were more likely to exhibit these characteristics than those for basic commodities. The theory of intra industry trade (Krugman, 1979, Lancaster, 1980, and Helpman, 1981), in which all traded goods are imperfectly substitutable, further lends support to the question of microeconomic price linkages across national markets. From this standpoint, the law of one price should not usually be expected to hold between domestic production and imports, but might hold between the same goods produced for domestic markets and for export markets (Dornbusch, 1989). The theory of intra-industry trade draws attention to two interesting aspects of the fluctuations of prices in a given industry compared with the rest of the world. One is the determination of relative prices of domestically produced goods and imports in the same industry; the other aspect is the pricing policies of

firms selling both domestically and abroad. They assume that prices are set before the realization of variables affecting demand and cost: thus prices are predetermined.

The phenomenon of incomplete pass-through due to pricing to market refers to the behaviour of exporters, who, in an attempt to maintain their foreign currency prices at optimal level, absorb at least some portion of change in the exchange rate in their profit margins (Rangan and Lawrence, 1993). Firms achieve this by taking a rise (fall) in profit margins on its foreign sales when the exchange rate depreciates (appreciates) (Feenstra, 1989).

Extreme cases of price discrimination occur when a single firm sells a commodity for different prices in different markets (Krugman and Obstfeld, 1994). This is best illustrated by the article which appeared on the Financial Times, October 5, 1992, "Why Buyers in Tokyo Spend \$5 000 Less for UK-Built Nissan". This referred to Nissan cars built at Sunderland, UK, being sold for less in Japan than what UK customers were paying for the same cars in the early 1990s. The customer in the UK paid £16 215, compared with his counterpart in Japan who paid £13 375 for the same model.

The sunk costs model due to Krugman (the so-called beachhead effect) refers to the tendency for sunk costs to deter firms from abandoning established markets or entering new ones. That is, firms incur considerable sunk costs in penetrating a foreign market (or establishing a beachhead abroad). These costs involve advertising and other costs to introduce a product to potential customers in the new market. The costs may be incurred even before any substantial overseas transactions are undertaken profitably. Such considerations suggest that firms may

delay their responses to changes in trade flows to exchange rate changes. Because abandoning a market just after having incurred so many costs, in response to what could be transitory fluctuations in exchange rates, could prove to be more costly, if the firm were to re-renter the market.

Lack of knowledge, uncertainty regarding the reliability of new suppliers, the reluctance to give up a satisfactory relationship with customary suppliers and commitments to a given type of equipment because of previous stocks of spare parts may all explain the failure of buyers to respond immediately to price differences. They actually explain why differences in prices may exist and persist over protracted periods for sellers to overcome the inertia of buyers in patronising customary sources.

6.2.3 Implications for Exchange Rate Pass-Through

The pricing behaviour discussed above has both short-term and longer-term implications on the exchange rate pass-through. In the short-run, the pricing to market literature implies that small, temporary shifts in exchange rates are likely to be reflected in the firms' margins, thus to some extent slowing the speed and size of pass-through. In the long-term, the literature suggests that fluctuations in exchange rates cannot only induce firms to shift sales and distribution networks, but also may affect the firm's choice of location of production facilities. The evidence of incomplete pass-through due to the existence of pricing behaviour

of firms has implied the weakening of the traditional link between exchange rates and trade volumes. However, it should be pointed out that several of these studies involved three of the largest industrial economies in the world (United States, Germany and Japan). The relevance of the literature is no doubt useful in terms of identifying the relevant issues in pass-through estimation. However, the empirical findings cannot be readily generalised as stylised effects, especially for open economies. Despite these caveats, it should be noted that the literature introduces important microeconomic foundations into macro analysis of exchange rate pass-through.

Do these observations invalidate McKinnon's hypothesis that domestic prices of traded goods will change proportionately with changes in the exchange rates, for small open economies? In view of overwhelming evidence that exchange rate changes are less than fully passed through in some markets, it is of interest to test this hypothesis for Namibia. If this evidence holds for Namibia, a devaluation of the Namibian currency will be less effective in changing the real exchange rate, hence competitiveness. Similarly, a revaluation of the nominal exchange rate is also less likely to dampen imported inflation.

The relevance of this analysis for Namibia is apparent. Namibia's exports are largely basic commodities (diamonds, uranium, fish, beef). Imports are dominated by foods (also basic commodities), capital equipment and manufactures. These factors allow for variable size and speed of pass-through for various commodities and industries. Large foreign firms dominate domestic firms in the domestic market. One of the shortcomings of the literature reviewed is its omission of the discussion on how the structure of the labour market could influence

the size and speed of pass-through. The speed of pass-through will to a great extent be determined by the degree of interrelationships between wages, prices and the exchange rate, especially in the context of an open economy. Therefore, the next section presents analysis of the labour market and wage determination in Namibia.

6.3 Wage determination in Namibia

The section is divided into four parts: the first outlines a brief review of theoretical literature relevant to labour markets in developing countries. This section advances the view that the wage-setting equations, based on the assumption that the wage rate is determined for a given period by the expected price, may not be relevant for large sections of labour in developing countries. In developing countries, labour is often hired for short periods at the firm's gate. The worker's main concern is to be selected for a job that offers him at least better than what he can get in alternative employment (of which chances are almost nil for many). Azam (1994) argues that under the circumstances, workers do not have to make complicated decisions based on expectations, since the wage rate is a spot price determined by supply and demand on a daily basis. Then, it is reasonable to assume that the labour supply depends on the observed real wage rate.

Chapter 2 outlined the characteristics of the labour market in Namibia. Especially, it highlighted the differences between formal and informal labour markets, which may suggest that the wage determination in the informal sector is likely to follow the route described above. However, this cannot be generalised to the formal sector, which is highly organised

and has enough political backing. In this context, wage-setting behaviour may be different between these two markets, and therefore, it is important to treat them separately in the analysis. Therefore, the second part of the section presents the wage-setting process in the two leading sectors, mining and government. We will also argue that higher wages in the leading sectors, especially mining, are transmitted to the rest of the economy, which effectively make Namibia a high-wage economy, than the situation that would prevail without the dominance of an enclave sector, like mining. The last part of the section examines the implications of the issues raised for pass-through. Is there significant nominal wage rigidity, and how does that affect the speed of pass-through?

Before examining wage-setting processes in Namibia, the next section presents a survey of theoretical literature on labour markets in developing countries.

6.3.1 Theoretical Aspects of Labour Markets in Developing Countries

The structure and behaviour of the labour market determine, to the great extent, the way in which the entire economic system will respond to policy changes and incentives (through labour mobility, wage flexibility, and productivity gains). Meanwhile, the extent of imperfections in the labour market will determine whether a cut in demand will result in increased unemployment, and whether nominal instruments like devaluation of the nominal exchange rate can be used to effect changes in relative prices. The dependent economy model postulates that the price of traded goods is determined in the world market and its domestic price is simply its world price multiplied by the exchange rate. However, the price of

nontradable goods is determined by the forces of supply and demand in the domestic economy. For the price of tradable goods two hypotheses are posited, i.e. that the price is flexible, and that it is sticky in the short-run. The analysis of wage determination and the structure of the labour market is therefore important in assessing the degree of wage-flexibility and wage-rigidity in the economy.

The Keynesian synthesis posited that nominal variables (level of money and exchange rate) could have real effects. Consequently, nominal variables could be used for macroeconomic policy, especially to maintain full employment. By the same token, contractionary policies, as entailed in stabilisation policies, are bound to result in increased unemployment. Further, contractionary policies can be used to fight inflation and balance of payments' deficits without fears of undesirable real consequences (see Azam, 1994).

Keynes' challenge to the classical synthesis of how the labour markets operated opened flood gates of literature on how wages are determined in the labour market. The classical synthesis assumed that the wage rate adjusts quickly to maintain equilibrium, so that changes in macroeconomic policy, or nominal shocks, will have no real effects, but instead will be passed onto the wage rate. Accordingly, the level of employment is determined where the marginal product of labour is equal to the real wage rate, so that the equilibrium wage rate varies with its demand. In contrast, Keynes assumed that the wage rate is exogenously given and that the demand for labour depends on the price level and the wage rate (that is, the real wage). The nominal rigidity implied by the given wage rate was later replaced by a wage-setting rule based on expectations. The next innovation in the wage-setting process was the

Phillips (1958) empirical result, which specified the wage rate as a function of excess supply of labour (i.e. unemployment plays a role, instead of expectations). However, the shortcoming of this approach was the underlying assumption that workers suffer from money illusion as the wage rate is determined without taking account of its purchasing power as influenced by the price level. Friedman (1968) and Phelps (1968) corrected this point by introducing a wage equation that incorporated expectations (yielding the expectations-augmented Phillips Curve). Then nominal shocks have real effects only if they are unanticipated. A contrasting view was presented by the disequilibrium approach, which posited that both the nominal wage and the nominal price of output are rigid in the short-run, so that firms can be held off their labour demand curve when they are constrained by insufficient outlets on the goods market. In this state of excess supply, the demand for labour depends on the demand for goods and is different from that postulated above (Pantikin, 1965; Clower, 1965; Barro and Grossman, 1971, 1976; Malinvaud, 1977).

The final step in the wage-setting process is the rational expectations due to Lucas (1972, 1973). The basic element of rational expectations is that agents optimally use any information they have to form expectations. Accordingly, the levels of employment and the wage rate are assumed to have an element of expectation error or nominal surprise. Therefore, any positive nominal surprise (an unanticipated hike in inflation or unanticipated devaluation) entails a reduction in the real costs of labour and an increase in the level of employment and output. Still, this result cannot be used systematically in macroeconomic policy since expectation error is a random variable not under the control of government. In this case, only random

policy shocks have real effects, while systematic macroeconomic policy has only nominal effects.

Azam noted some shortcomings of the models in the wage-setting process summarised above, especially as they apply to labour markets in less developed countries (LDCs). Notably, he took issue with the notion that the wage is determined for a given period and by the expected price level may not be relevant to LDC markets, where the wage is determined as a spot price. Siting the role of agriculture in production and national incomes in LDCs, he argued that hiring decisions are based on the price of the product that is expected to prevail at the end of the season, rather than based on the observed price. In this context, the expectation error remains the fundamental determinant of employment and output. However, unanticipated inflation now leads to contraction of activity and to an expansion as in the developed country models. These two instances show that real effects of nominal variables are as important for developing countries as they are for developed countries, although they may lead to different conclusions.

Examples of models that emphasize microeconomic foundations⁶² seeking to explain different circumstances under which surplus labour, such as that which exists in the LDCs can co-exist with higher wages, abounds in the literature (for detailed discussion, see Azam). This literature has important implications for wage determination, and may be very important in the analysis of wages in the discussion of the labour market in Namibia in the next section. The efficiency wages story states that the wage is only one element of an overall package that

⁶²Such as efficiency wages, implicit contracts, adverse selection, the monopoly power of collective labour-trade unions, labour turn-over and nutritional models.

a job offers, a chief element being job security. The view that firms in a recession prefer to cut back on labour than wages (as advocated in the adverse selection model) in case they risk losing their best workers, has important implications for wage determination. In many developing countries, the power of trade unions may be manifested in disruptive work stoppages and strike action, which will tend to push the wage upwards. Another strand of literature argues that in developing countries, food consumption partly determines the productivity of the worker rather than just wages. For rural people with land, consumption depends not only on wage income, but also on the product of own farms. The proponents of the nutritional model argue therefore that a firm would prefer a well-fed, and hence productive, worker to a landless one, whose nutritional status depends on his unobservable recent work history. The existence of landed labourers creates a form of downward flexibility of the wage rate that may squeeze landless labourers out of the market. Landed labourers can remain productive even if wages drop below what is required for buying the amount of food necessary for maintaining productivity since they can get some food from their own farms. Landless labourers become unproductive at such low wages. Inequality of land then sometimes explains rural unemployment with a flexible real wage.

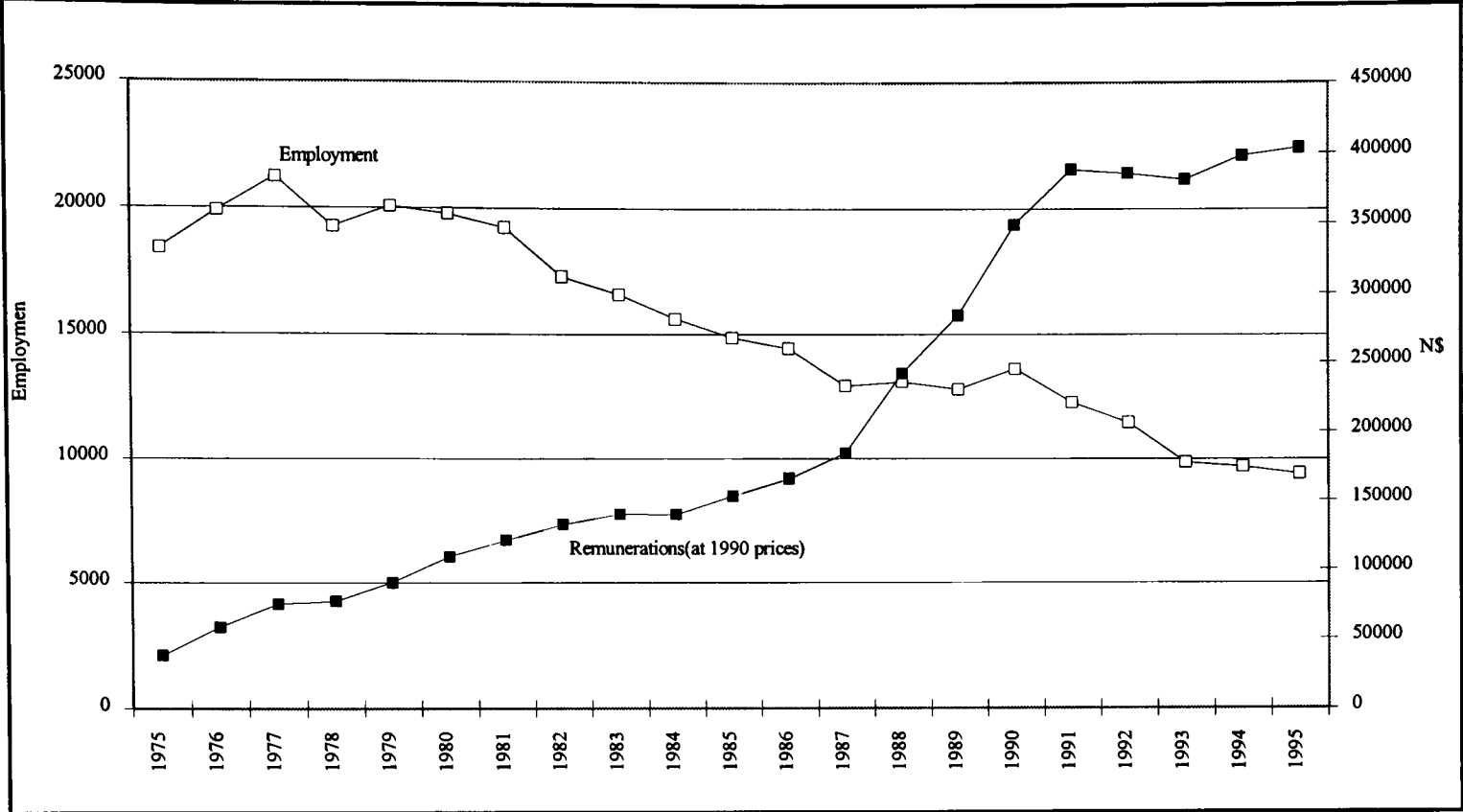
These preceding sections conclude the theoretical background on the relevant aspects of the issues, pass-through and wage determination (of which key points were highlighted at the beginning of the section).

6.3.2 Wages in the Mining Sector

Wages and salaries in the mining industry in Namibia are higher than in other sectors of the economy. Several factors can be rationalised for the premium in mining work: (1) the need to compensate workers for the dangerous working conditions associated with mining⁶³; (2) because of capital-intensive nature of mining, high skill levels are required; (3) higher wages may simply be a reflection of the higher capital-labour ratio in that sector; (4) the degree of unionisation of the labour force, which tends to be high because the labour force is confined to well-defined localities, and often in company accommodation, makes unionisation relatively easy. These factors suggest those mining companies are likely to pay a premium for the collective reliability of the workforce. Wage determination in circumstances where the resultant wage rates exceed those which the supply and demand conditions in the labour market would dictate, are called efficiency wages. Figure 6.1 shows that employment in the mining industry has declined to 9 600 in 1994 from a peak of more than 20 000 in 1976. In contrast, total remunerations rose from N\$58 million in 1976 to over N\$400 million in 1994.

⁶³While mining work is fraught with danger (strenuous, high risk of accidents, possible exposure to toxic materials that could have long-term disastrous effects on health, i.e. in lead and uranium mines), also mines may be found in remote areas with limited social activities and for many workers no opportunity to be with their families, Daniel (1985).

Figure 6.1: Employment and Labour Income in Mining



Source: Chamber of Mines, Annual Report, various years

Table 6.1 shows that capital per worker in mining⁶⁴ has risen sharply, especially during the mid-1980s. During the same period a rising trend in total remunerations is also evident. The same period also witnessed a significant recovery in the growth rate of domestic fixed investment, associated with the developments of two new diamond mines and a gold mine in the early 1990s. While the rising trend in labour income may be consistent with the trends in capital per worker, this cannot be attributed to increased productivity per worker alone. There was a marked increase in union activity during the time (the Mineworkers Union of Namibia came into existence in 1986 and gained recognition from major mining companies).

⁶⁴Measured as a ratio of gross domestic fixed investment in mining to employment in mining.

Table 6. 1: Growth Rates of Gross Domestic Fixed Investment and Labour in Mining

	ΔLabour	ΔLabour income	ΔCapital	Capital per worker (N\$'000)	Output per worker (N\$'000)
1981-85	-5.7	-5.1	-36.6	6.4	60.7
1986-90	-1.8	4.1	34.1	17.2	91.1
1991-95	-7.4	-8.2	-13.3	17.4	123

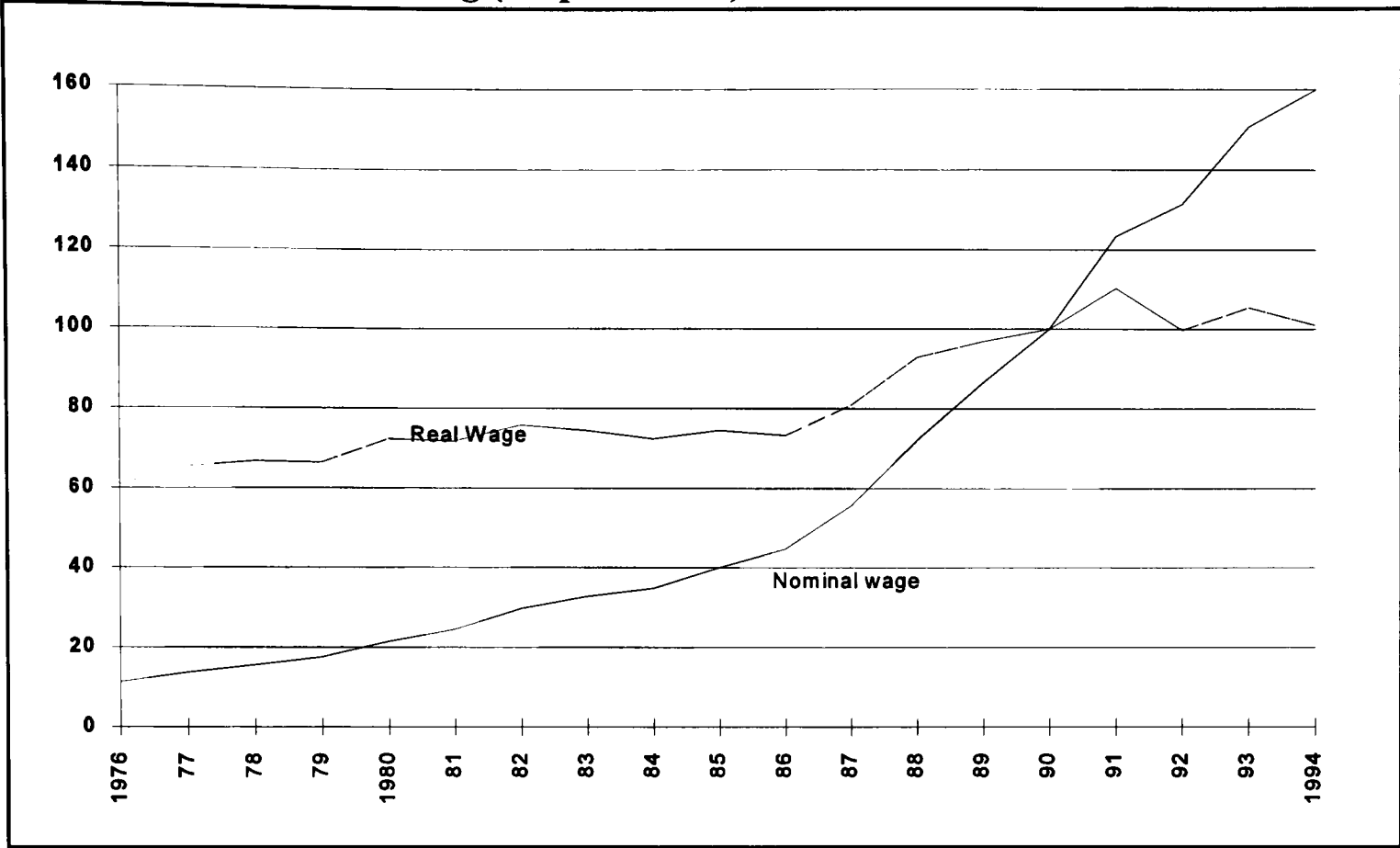
Source: Statistical Abstract, CSO, 1996

6.3.3 Wages in the Government Sector

Nominal wages in the public sector rose sharply (Figure 6.2) by nearly 40% from 1980 to 1994, despite the lacklustre performance of the economy during the 1980s. In contrast, real wages remained nearly unchanged for most of the period, rising slightly during 1986-89 in response to the sharp depreciation of the rand. However, government wages show some flexibility in real terms during the 1990s.

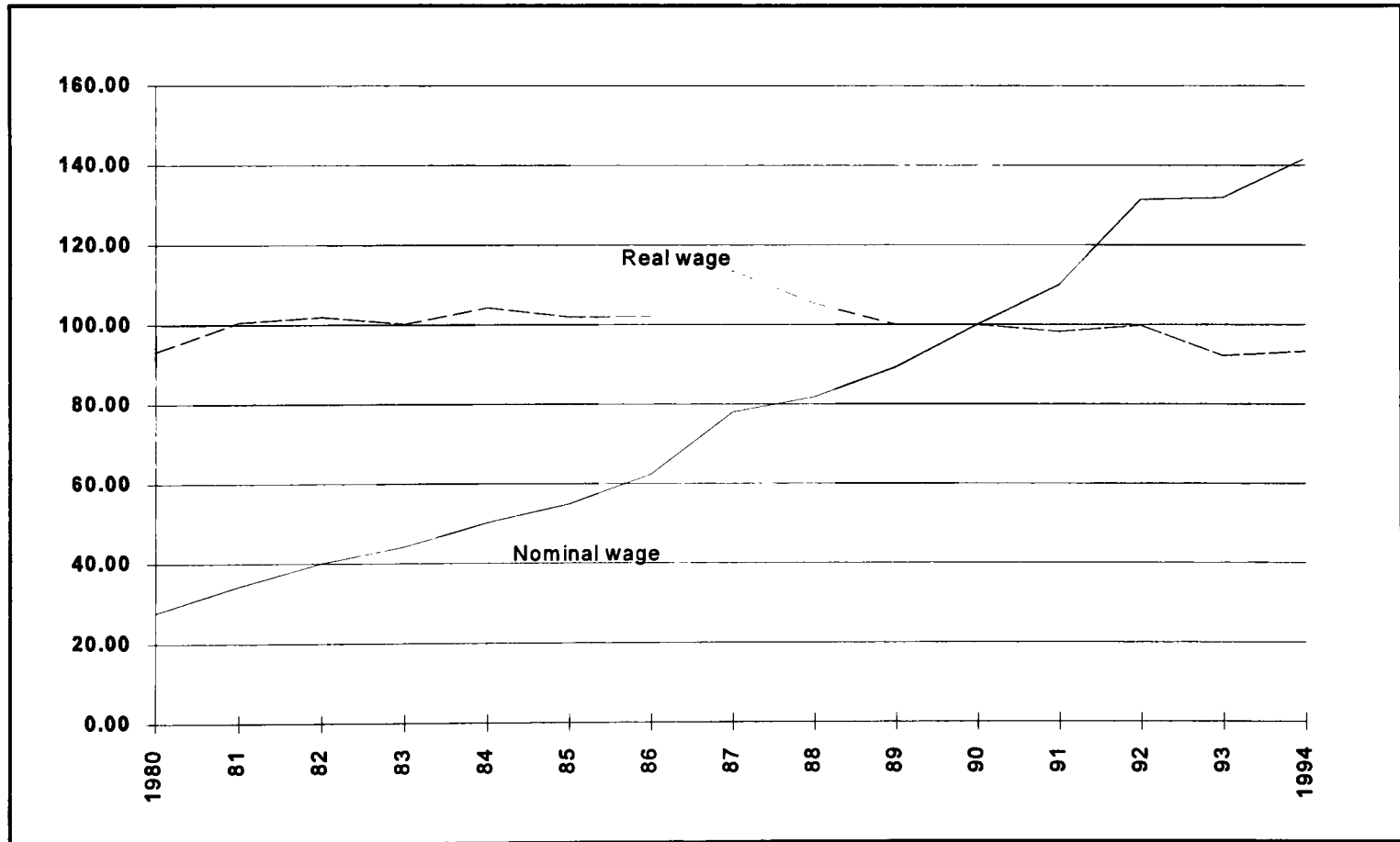
The extent to which mine workers' pay influences other sectors, depends on the institutional structure for wage determination. Mine workers are unionised and wage demands are settled through the bargaining process. Unlike the government, which announces wage and salary increases at one time, the bargaining process in the private sector is not synchronised. However, wage levels and wage changes in mining can be taken as targets and precedents for settlements in other industries. This is especially so when increases in mine wages are regarded as increases in comparable basic wage payments in other industries. Thus, the extent to which mine workers are wage-leaders, and the extent to which efficiency wages paid in mining will raise labour costs elsewhere in the economy depends on the availability of mechanisms for transmission of mine wage changes.

Figure 6.2: Wages in Mining (N\$ per month)



Source: Chamber of Mines of Namibia/South West Africa, various years

Figure 6.3: Wages in the Government Sector



Source: Namibia: Public Expenditure Review, The World Bank, 1995

balance of payments to assess whether its real exchange rate is likely to be consistent with a sustainable external account is important.

Against this background, this section introduces a model of RER determination to estimate an equilibrium real exchange rate for Namibia. Given the institutional setting, it is important to assess whether the fixed exchange rate is consistent with Namibian economic fundamentals. The equilibrium real exchange rates for Namibia will be estimated using a model developed by Edwards (1988), which has been widely applied to many developing countries (see, Edwards, 1994, Elbadawi, 1994, Baffes et al.).

The Edwards model, or the so-called fundamental approach to the equilibrium real exchange rate makes several assumptions that need to be specified clearly. The real exchange rate is determined by real factors, that is, the so-called fundamentals. However, nominal factors such as the nominal exchange rate and monetary variables (credit expansion) may have a role to play in the short-run.

One of the model's motivations lies in the realization that in a system of pegged exchange rates, expansionary fiscal and monetary policy can be a cause of persistent real exchange rate overvaluation. Therefore, one of the strategies in modelling RER is to allow for the influence of short-to medium-term macroeconomic and exchange rate policy on the real exchange rate. The definition of the equilibrium real exchange rate, as the rate that prevails when the internal and external are in balance⁴⁷, subsumes an intertemporal adjustment process.

⁴⁷With respect to internal balance, it was stated that the nontradable sector clears ($Y_N=A_N$), that is, supply equals absorption. The external balance requires that the long-run current account be consistent with

Therefore, it highlights the roles played by relative prices (that is, the prices of nontradables relative to tradable prices or internal terms of trade or the real exchange rate) and capital and aid flows in the adjustment process. The real exchange rate is essentially based on a traded/nontraded structure, which solves for the equilibrium condition in the domestic goods market under static expectations and assuming a given level of capital flows.

How do we reconcile these basic assumptions to the Namibian case where the pass-through from South African to Namibian prices is very high⁴⁸? Is there a clearly definitive nontradable/tradable structure in the Namibian economy? Second, given access to money and capital markets in the CMA, how elastic is the external budget constraint for Namibia? We outline cases why the application of the model may still be relevant, notwithstanding these caveats.

In view of these, the application of the Edwards' model to Namibia must be justified, if not modified. First, on the basis of tradable/nontradable dichotomy, it was found that the two nontradable sectors behaved differently in both countries. Despite being small, there was a clearly definable nontraded sector in the Namibian economy. Second, there is a compelling case to suggest that there is a significant proportion of the Namibian economy that is not

the nation's budget constraint. Because the current account is a flow variable, representing the rate of international lending or borrowing of an economy, one needs to examine whether a given current account position is likely to lead to an unsustainable debt buildup in the medium-term (Williamson, 1994). That is, the ERER requires that the current account match the net asset position, inclusive of interest payments $-(1+r)F_1$.

⁴⁸ This will be demonstrated in Chapter 6.

aligned to South Africa. The informal sector in the north may have fewer attachments to the formal sector in the south⁴⁹.

The opportunities offered by the CMA create conditions for capital mobility such that shocks to Namibia could be accommodated by capital inflows from the CMA. Given the institutional setting, and the relative sizes of Namibia and South Africa, we can consider Namibia as a region within South Africa. When Namibia experiences a decline in its terms of trade, therefore, a decline in income ensues. In the short-run, Namibians can maintain current consumption levels by borrowing from the CMA. However, if the slump in incomes continues for long, and such short-term flows from the CMA become unsustainable, then Namibians have to adjust to the new regime. This is so, because even under the circumstances, no region can afford to live beyond its means forever. Thus, Namibians will have to cut consumption and/or investment to levels that are consistent with the sustainable levels of capital and aid flows. In that case, the external balance constraint becomes binding. It should be noted that in reality borrowing from the CMA markets by the corporations and governments of the LNS countries is not as easy as it looks. The CMA agreement specifies conditions under which that access is granted. Therefore, in the long-run, there are limits to which capital flows from the CMA can postpone adjustment in Namibia.

⁴⁹The north is where the majority of the population of Namibia lives (about 60%, according to the 1991 population census). However, the region is remote and has traditionally been seen as the source of labour for the mining industry in the south. Informally, it forms a large bloc with southern Angola, with trade within that block largely unrecorded. Owing to the fact that the liberation war was largely confined to that region, economic activity was largely run on informal basis. The national accounts data as well as the CPI do not as yet include the informal sector in the north.

Third, fiscal policy actions in Namibia may have an impact on the real exchange rate, as indicated in the model. Under these circumstances, the model may be a relevant tool to examine whether the evolution of RER fundamentals and short-term macroeconomic policy (credit expansion) are consistent with the real exchange rate that results in simultaneous attainment of internal and external equilibrium.

From this discussion, it is apparent that the adjustment that takes place in this economy is of two types. Adjustment could be brought about more by changes in quantities (that is, Namibians either consuming less of imports or increasing the supply of tradables, or both). However, in the long-run, adjustment in relative prices will have to take place, which may come through adjustment in the prices of nontradables, mainly wages. Since labour is not internationally mobile in this setup, the labour market will only clear if we assume some wage flexibility. If that were not the case, then Namibia will experience unemployment. In Chapter 2, it was argued that nominal wages in the formal sector are likely to exhibit some rigidities.

The RER fundamentals can be conveniently grouped into two categories: (1) external RER fundamentals (the terms of trade, capital and foreign aid flows and real world interest rates), (2) internal RER fundamentals (these are further divided into those policy-related fundamentals, such as import tariffs, import quotas, export taxes, exchange and capital controls, other taxes and subsidies, and level and composition of government expenditure; whereas technological progress represents a nonpolicy-related fundamental).

In terms of external RER fundamentals, the terms of trade are not likely to have the same effects as is the case in a relatively closed economy. The income effect of a favourable terms of trade on the price of nontradables is likely to be neutralised by the fact that a large part of it will be leaked to the external sector. The free movement of capital also makes it very unlikely that increased capital inflows or outflows will have the full effect that they would have under different circumstances. However, increased aid flows directed towards construction will have the effects the model predicts. On internal RER fundamentals, the only plausible policy instrument in the hands of the Namibian authorities is the level and composition of government expenditure directed towards nontradables. Due to SACU and CMA, import tariffs, import quotas, export taxes, exchange and capital controls may be regarded as exogenously determined. In this context, variables such as openness and the terms of trade that seem to drive the equilibrium RER in these models are not likely to be important in the case of Namibia. Although government expenditure directed to nontradables will be probably the only major driving force behind the ERER for Namibia.

5.3.2 The Structure of the Model

This section explains the structure of the model used to analyse how the equilibrium path of the real exchange rate responds to both policy-induced disturbances and exogenous shocks (Elbadawi, 1994). It is a general equilibrium model for a small open economy, in which optimising consumers, producers and government interact to maximise their objectives. The economy produces a set of three goods, exports, imports, and nontraded goods, using constant returns to scale technology under perfect competition. Factors of production include

capital, labour and natural resources. Residents can borrow or lend internationally. The country is assumed to be a price-taker in the world market for imports and exports. Therefore, terms of trade are determined exogenously. Namibia’s direction of trade is such that imports come from one source, South Africa, while exports go to the rest of the world. Hinkle and Nsengiyumva (1995) suggest that when the intercountry pattern of trade is significantly different for imports and exports, it may be preferable to calculate separate REERs for imports and exports, rather than total trade. The government consumes both traded and nontraded goods. Foreign trade is subject to taxation by the government, i.e. tariffs for imports and export duties for exports. Similarly, foreign borrowing is subject to a nonprohibitive tax.

The model starts with an identity for nominal domestic absorption A (consisting of private sector expenditure A_p and public sector expenditure, A_g , which is assumed to be a policy variable and is given as a fixed ratio to GDP (Y).

$$A = A_p + A_g \tag{1}$$

$$A_g = gY \tag{2}$$

The public sector’s purchases of nontraded goods (A_{gN}), is given as a ratio of total expenditure:

$$A_{gN} = g_N A_g = g_N gY \tag{3}$$

Meanwhile the ratio of private sector expenditure on nontraded goods relative to total private sector expenditure, A_{pN}/A_p is endogenously determined as a function of domestic prices of exports (P_x), imports (P_m) and nontraded goods (P_N).

$$A_{pN} = dp_N(P_x, P_m, P_N) A_p = dp_N(P_x, P_m, P_N) [A - gY] \quad [4]$$

Combining equations [3] and [4] the demand function for nontraded goods is derived as follows:

$$A_N = A_{pN} + A_{gN} = dp_N(P_x, P_m, P_N) [A - gY] + g_N gY \quad [5]$$

The supply of nontraded goods relative to GDP can be specified as follows:

$$S_N = S_N(P_x, P_m, P_N) Y \quad [6]$$

Combining equations [5] and [6] gives an equilibrium condition in the nontraded sector.

Assuming homogeneity of degree zero, we can divide all the arguments in S_N and dp_N by P_T and the equilibrium condition is represented as:

$$S_N\left(\frac{P_x}{P_T}, \frac{P_m}{P_T}, RER\right) = dp_N\left(\frac{P_x}{P_T}, \frac{P_m}{P_T}, RER\right) \left[\frac{A}{Y} - g\right] + g_N g \quad [7]$$

The international prices of exports and imports are modelled as follows:

$$\frac{P_x}{P_T} = P_x / (P_m^{1-\alpha} P_x^\alpha) = (P_x / P_m)^{1-\alpha} \quad [8]$$

$$\frac{P_m}{P_T} = P_m / (P_m^{1-\alpha} P_x^\alpha) = (P_m / P_x)^\alpha \quad [9]$$

Appealing to the small country assumption, Namibia's terms of trade are exogenously determined. Therefore, for a given set of exchange rate and commercial policies, the corresponding domestic prices P_x and P_m are determined by foreign prices (P_x^* and P_m^*) and the nominal exchange rate (E) expressed in units of domestic currency per foreign currency, so that we can now express S_N as:

$$S_N\left(\frac{P_m}{P_x}, RER\right) = dP_N\left(\frac{P_m}{P_x}, RER\right)\left[\frac{A}{Y} - g\right] + g_N g \quad [10]$$

Assuming a constant ratio of $(1-t_x)/(1+t_m)$, the formula for the real exchange rate is then expressed as:

$$RER = RER\left(\frac{P_m}{P_x}, \bar{a}, g_N, g\right) \quad [11]$$

where $\bar{a} = A/Y$ is the absorption as a ratio of total income, $g_N = A_{gN}/A_g$, and $g = A_g/Y$, t_x and t_m are export and import taxes. Equivalently, we can show that RER is:

$$RER = P_N / E(P_x^*)^\alpha (P_m^*)^{1-\alpha} (1-t_x)^\alpha (1+t_m)^{1-\alpha} = (P_N / P_m)^{1-\alpha} (P_N / P_x)^\alpha = P_N / (P_m^{1-\alpha} P_x^\alpha) = \frac{P_N}{P_T} \quad [12]$$

Note also that we can further decompose P_m/P_x to reflect terms of trade and commercial policy elements, so that:

$$\frac{P_m}{P_x} = (P_m^* / P_x^*) (1+t_m)/(1-t_x) = \frac{1}{TOT} (1+t_m)/(1-t_x) \quad [13]$$

where TOT is the terms of trade. Equations [1] through [13] can be solved for the level of RER that ensures simultaneous equilibrium in the nontraded goods market for given levels of some exogenous and policy fundamentals⁵⁰.

$$RER = RER(\bar{a}, TOT, t_x, t_m, g_N, g) \quad [14]$$

Accordingly, higher and sustainable levels of domestic absorption ratio and public expenditure on nontraded goods are consistent with the equilibrium RER appreciation. However, the effects of changes in the terms of trade and the level and composition of government expenditure relative to GDP cannot be signed *a priori*. The improved terms of trade and higher government expenditure tend to lead to RER appreciation because the income effect of terms of trade improvement usually dominates its substitution effect, and governments tend to have a higher propensity to spend on nontraded goods than does the private sector. Linearizing equation [14], we derive

$$\log(RER) = \alpha_1 \log(TOT) - \alpha_2 \log(OPEN) + \alpha_3 \log(\bar{a}) + \alpha_4 \log(g_N) + \alpha_5 \log(g) \quad [15]$$

where OPEN⁵¹ is used as a proxy for commercial policy (t_m, t_x). The time series for taxes on international trade (t_m, t_x) are usually not available, hence the use of OPEN, which also measures the extent of other trade barriers such as exchange controls. Equation [15] is assumed to hold now and in the future for sustainable values of fundamentals. To complete the model, A is endogenised as follows:

⁵⁰Also note that dP_N and S_N are assumed to be homogeneous of degree zero in prices, which implies that the nominal exchange rate E is not a fundamental.

⁵¹Commonly OPEN is defined as (exports + imports)/GDP

$$\bar{a} = \frac{A}{Y} = \varpi \left(\frac{L_F}{Y}, r^* - \eta [\log({}_t RER_{t+1}) - \log(RER_t)] \right) \quad [16]$$

where L_F is a measure of sustainable net capital inflows⁵², r^* is the world interest rate, η is the share of nontraded goods in consumption, and ${}_t (RER_{t+1})$ is the expectation of RER at time t . Sustainable net capital inflows imply that the trade deficit and interest payments on the stock of debt are at levels where they could be sustained from current levels of aid and capital inflows and changes in foreign exchange reserves ($-TB + r^* D_{t-1} = AID + L_F - \Delta RES$). A rise in capital inflows allows for a higher sustainable level of absorption, while in contrast, a rise in the real world interest rate (either through a rise in r^* or through a rise in expected rate of real depreciation relative to the current $\{-\log({}_t RER_{t+1}) - \log(RER_t) < 0\}$, increases the demand for saving and thus reduces absorption relative to income. The world rate of interest can be eliminated from equation [16] because usually it is not clear which is the relevant rate for any country. Equation [16] can be rewritten as follows:

$$\log(\bar{a}) = \delta_0 + \delta_1 \log\left(\frac{L_F}{Y}\right) - \delta_2 (\log({}_t RER_{t+1}) - \log(RER_t)) \quad [17]$$

Combining equations [15] and [17] we derive an equation for RER as follows:

$$RER = \log(RER_t) - z \log({}_t RER_{t+1}) = \psi_1 \log(TOT) - \psi_2 \log(OPEN) + \psi_3 \log\left(\frac{L_F}{Y}\right) + \psi_4 \log(g_N) + \psi_5 \log(g) \quad [18]$$

where $z = a_3 \delta_2 / (1 + a_3 \delta_2) < 1$, and ψ s are the corresponding coefficients on the right-hand side.

The equilibrium real exchange rate, RER , is that value of RER that satisfies equation [18] for

⁵²Sustainable net capital inflows imply that $(-TB + r^* D_{t-1}) = (AID + L_F - \Delta RES)$. That is, the trade deficit and interest payments on the stock of debt are met by aid and financial capital inflows from abroad and changes in foreign exchange reserves.

sustainable values of the right-hand side variables. Elbadawi shows that the value of $ERER_t$ can be solved forward by using a recursive substitution method by defining a parameter vector $\theta=(\psi_1,\psi_2,-\psi_3,\psi_4,\psi_5)'$ and the vector of fundamentals,

$$F=[1,\log(TOT),\log(OPEN),\log(\frac{L_F}{Y}),\log(g_N),\log(g)]' \quad [19]$$

From these two expressions the forward-looking RER_t for given sustainable values of the fundamentals vector (sustainable values of L_F) are denoted by

$$F:\log RER_t = \sum z^j \theta' F_{t-j} + u_t \quad [20]$$

If F is stationary in first difference, i.e. the series is $I(1)$, the following cointegration exists:

$$\log RER_t = [1/(1-z)]\theta' F_t + u_t \quad [21]$$

where $[1/(1-z)]\theta$ is the cointegration vector and u_t is a stationary disturbance term.

The long-run RER depends on real variables only, or the so-called RER fundamentals. Changes in the fundamentals elicit changes in the equilibrium real exchange rate. However, in the short-run changes in monetary variables, such as domestic credit and the appreciation of the nominal exchange rate will also affect the equilibrium real exchange rate.

The next section examines the evolution of the real exchange rate fundamentals, F_t , used to estimate the model of RER determination. Important fundamentals discussed below include terms of trade, openness, resource balance, government expenditure and short-term macroeconomic policy variables.

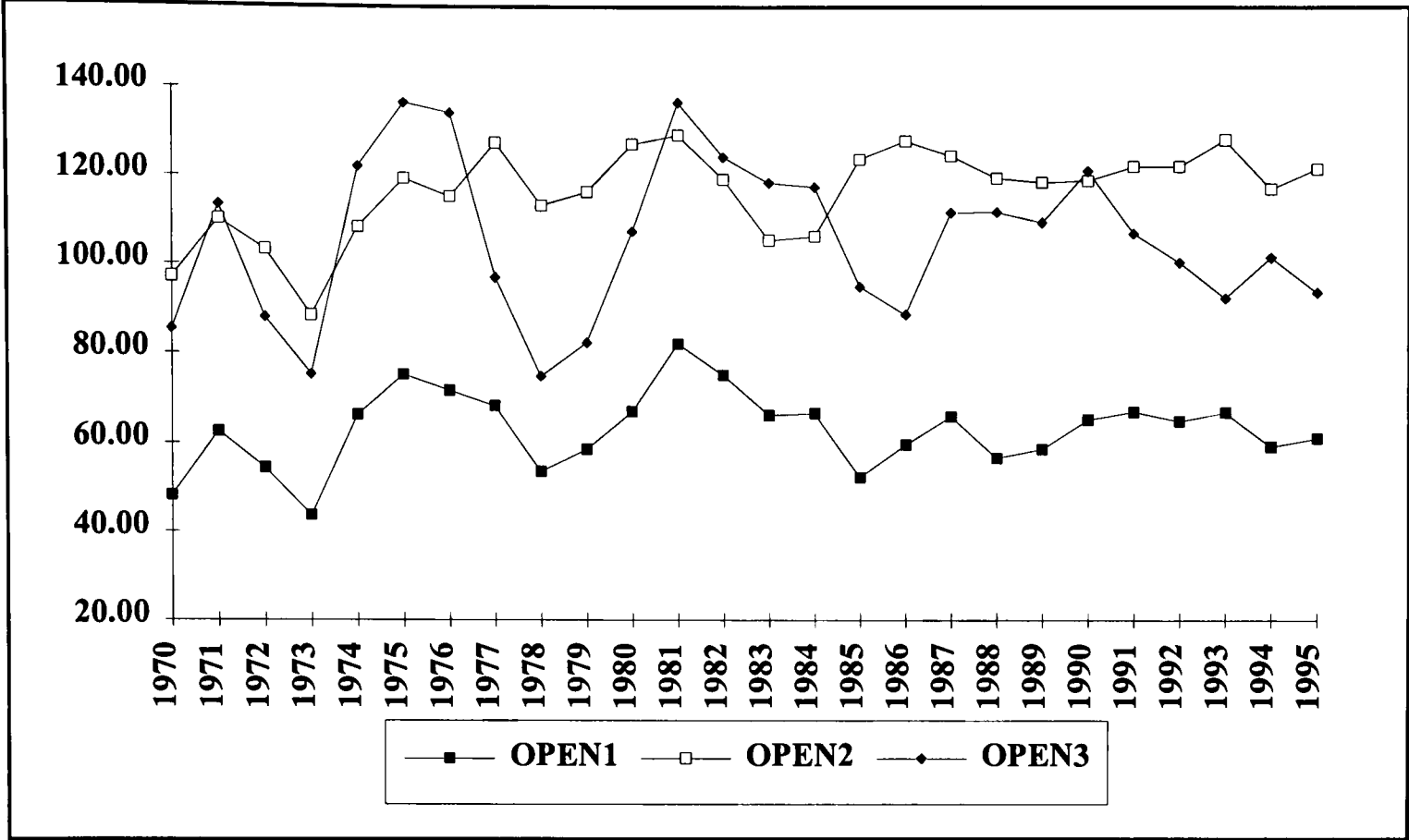
5.4: Developments in Namibia's RER fundamentals

This section gives a brief description of the RER fundamentals, for the period 1970-95. Chapter 2 described the development of the key macroeconomic variables, including changes in the terms of trade and the government sector. Here we will briefly describe openness, resource balance and short-term macroeconomic policy variables that were not emphasized in Chapter 2.

5.4.1 Openness

Openness measures (indirectly) not only trade restrictions (tariffs and quotas), but also the intensity of exchange controls. Following Baffes et al., measures of openness are defined as follows: $OPEN1 = \text{imports}/\text{GDP}$, all at current prices; $OPEN2 = (\text{exports} + \text{imports})/\text{GDP}$, all at constant 1990 prices; $OPEN3 = \text{imports}/\text{domestic absorption}$, all at constant 1990 prices (where domestic absorption is derived as $\text{GDP} \text{ minus net exports}$).

Figure 5.6: Indexes of Openness



Source: Statistical Abstract, CSO, 1996, Statistical/Economic Review, 1987, Department of Finance, Windhoek

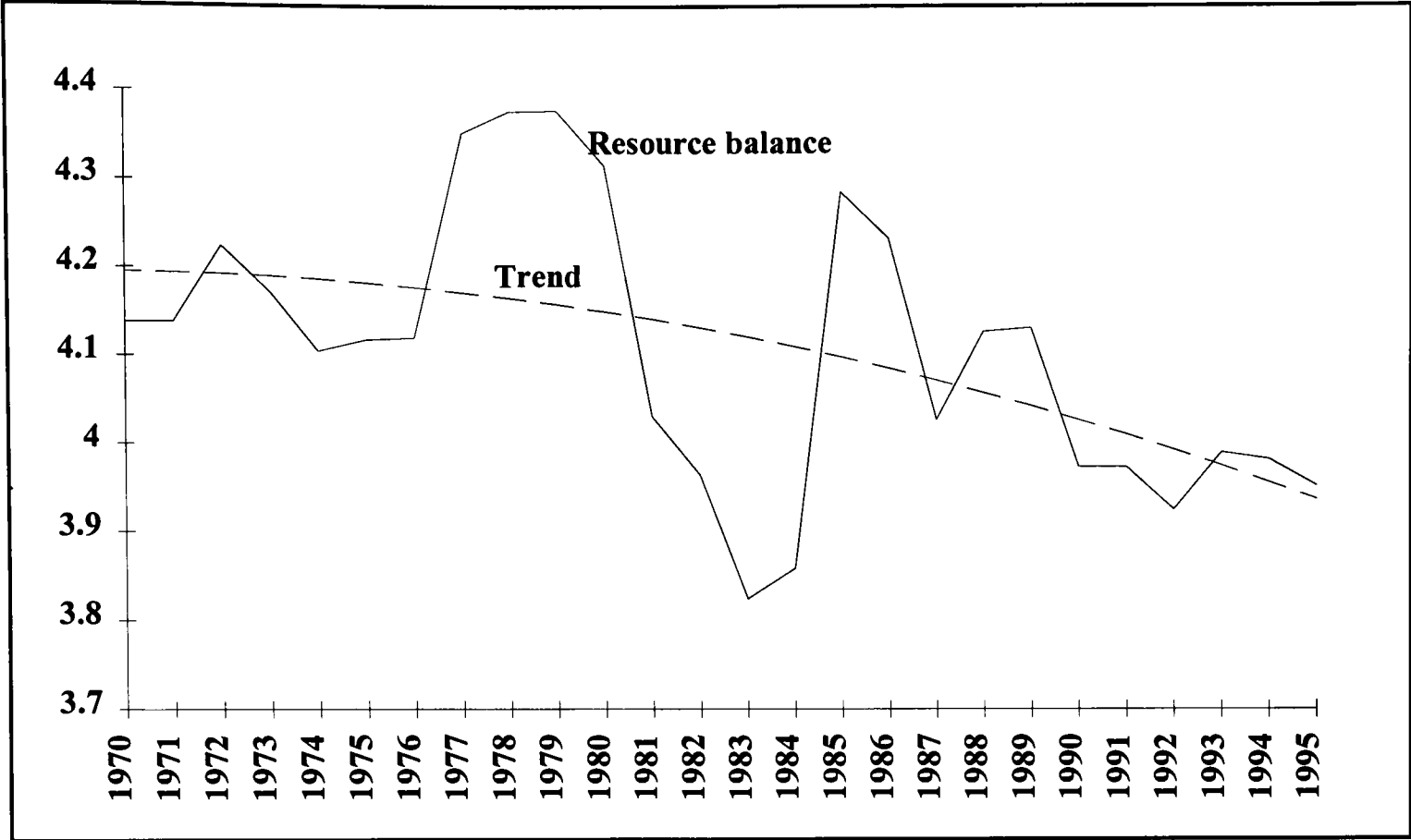
The imposition of an import quota reduces openness and usually leads to an appreciated RER. However, it should be noted that trade is not just an outcome of trade policies, but also of many other variables affecting imports and exports, including the real exchange rate itself (Cottani et al. 1990). Unfortunately good indicators of trade policy do not exist. The indexes of openness do vary from one another, therefore, it is important to specify which is the relevant index for the analysis. Notable differences can be observed between the index of openness measured by imports and exports. During 1980-84, OPEN1 fell on average by 6%, while OPEN2 rose nearly 3%. This pattern of unsynchronised movements is reversed during 1984-89, when the authorities introduced measures⁵³ to curtail the widening balance of payments deficit, as the effect of financial and trade sanctions began to be felt. Accordingly, OPEN2 fell 3% while OPEN1 rose modestly by 1%.

⁵³These included additional import quotas and a squeeze on monetary policy.

5.4.2 Resource Balance

If a country is a recipient of substantial capital flows, due to an investment boom generated by resource discoveries, changes in tax laws, or a rise in government deficits, capital flows will be spent domestically to some extent raising the demand for nontraded goods, and to the extent their prices rise. This reduces the country's international competitiveness as the RER tends to appreciate. Still, this will depend on the substitutability of traded to nontraded goods within the country. The resource balance is measured as the difference between exports of goods and nonfactor services and imports of goods and nonfactor services over GDP. Accordingly, shortfalls in export receipts can be covered by (1) a decumulation of foreign exchange reserves; (2) an increase in foreign liabilities; (3) an increase in aid inflows. Therefore, a positive sign depicts an inflow of capital from abroad, whereas a negative one represents an outflow. The graph depicting the time profile of capital flows shows significant fluctuations, especially between 1972-85.

Figure 5.7: Capital Flows



Source: Statistical Abstract, CSO, 1996, Statistical/Economic Review, 1987, Department of Finance, Windhoek

Positive gains in the resource balance during 1977-79 were reversed from 1980. The inflows in the late 1970s were associated with several events. In 1978 the United Nations passed Security Council Resolution 435, which proclaimed for UN supervised elections in Namibia leading to independence. In response, the South African regime stepped up its programme, leading to nominal independence for Namibia, which necessitated aid (fiscal transfers) from South Africa to sustain the homeland governments. Inflows were also associated with the development of the Rössing uranium mine, which started production in 1978. However, in response to problems experienced in the diamond sector, there is a decline in the early 1980s. Despite, the fluctuations, there was a discernible downward overall trend throughout the period.

5.4.3 Short-Run Macroeconomic Policy Variables

Real exchange rates can be derailed from their long-run equilibrium values by nominal shocks, such as monetary policy, or pegging the nominal exchange rate at levels that imply disequilibrium real exchange rates at current price levels. Under the CMA, Namibia follows the same exchange rate regime as South Africa. Edwards (1988) argues that to maintain sustainable economic equilibrium, monetary and fiscal policies must be consistent with the chosen nominal exchange rate. Therefore, the selection of an exchange rate regime imposes certain limitations on macroeconomic policies. If these limitations are violated, the result is a severe economic disequilibrium, which is usually reflected in the misalignment of the real exchange rate.

Excess credit, measured as the rate of credit expansion net of real GDP growth, accelerated throughout 1981-95 period. Reflecting this and other developments, the rate of domestic inflation also increased during 1981-92 averaging 12% compared with the earlier period when it was below double digits. The excess credit translates into excess demand for traded and nontraded goods and financial assets. While excess demand for traded goods is reflected in a higher trade deficit (or lower surplus), and a loss of reserves or an increase in foreign liabilities, excess demand for nontraded goods is reflected into higher prices for those goods and subsequently into a real exchange rate appreciation. Even if there are no changes in the fundamental determinants of RER, this appreciation induced by credit expansion will represent a departure of the actual RER from its equilibrium value.

The high growth of the money supply in the common monetary area during the 1980s also had an impact on the domestic inflation. There is overwhelming evidence that the link between the expansion of money supply and prices is based on an "excess supply" of money that leads to a price increase to clear the goods market. The nominal fixed regime, characterised by a free mobility of capital between Namibia and South Africa, implies that there can hardly be an excess supply of money. Therefore, the relevant quantity of money for the country is the quantity for the whole area.

The discount between the commercial rand and the financial rand, which was used as a barometer of (political) confidence in the South African economy, fluctuated greatly during the period, reaching a peak of 53% in 1985. Generally, the premium between the official and the parallel market rate will go up as exchange controls become pervasive and fewer transactions are effected through the official market. Sebastian Edwards (1989) suggests that to an extent the unofficial foreign exchange market is pervasive so that its rate becomes an important factor in trade, then this must be taken into account. The official rate for the Namibia dollar (rand) is the relevant marginal rate for most transactions. Although detecting it is difficult, nonetheless, the existence of unofficial foreign markets cannot be ruled out. Given the official sanction against holding foreign denominated accounts by domestic residents, there is a high possibility that those who did wish to emigrate or residents who wanted to diversify their portfolio holdings in favour of foreign denominated assets, could have resorted to a window of some sort to meet the excess demand for foreign exchange.

5.5: Time Series Analysis of the RER Fundamentals

In section 5.4 the equilibrium real exchange rate was specified as a function of real variables only, or the fundamentals (equation 15):

$$\log(RER) = \alpha_1 \log(TOT) - \alpha_2 \log(OPEN) + \alpha_3 \log(a) + \alpha_4 \log(g_N) + \alpha_5 \log(g)$$

Therefore, changes in the fundamentals will induce changes in the equilibrium real exchange rate. However, in the short-run changes in monetary variables, such as domestic credit and nominal appreciation, will also affect the equilibrium real exchange rate.

5.5.1 Tests for unit roots

The Dickey-Fuller (DF) and augmented Dickey-Fuller (ADF) tests are reported in the table below. The tests for stationarity show that the null hypothesis cannot be rejected for nearly all the variables (except OPEN1, OPEN2 and OPEN3 which are $I(0)$). All the other series appear to be $I[1]$ because they become stationary ($I[0]$) after being differenced once.

Table 5.3: Unit Root Tests

	Dickey Fuller test	Augmented Dickey Fuller test
REER	-1.936	-2.404
REERx	-2.067	-2.393
REERm	-2.136	-1.916
TOT	-2.46	-2.882
OPEN1	-3.806	-3.477
OPEN2	-3.165	-2.631
OPEN3	-3.316	-4.347
RESBAL	-2.181	-2.587
GE	-1.609	-2.725
PGOLD	-2.929	-3.482

Critical test statistics:DF test: 5%=-2.985; 1%=-3.72; ADF test:5%=-3.622; 1%=-4.417; Note: result for PGold of I(1) is suspect.

5.5.2: Cointegration Tests

The Engle-Granger procedure for testing cointegration has several problems. The test involves testing the residuals from an equilibrium regression for unit roots. In an equilibrium relationship involving two variables, any one of them can be placed on the left-hand-side of the equation. Therefore, the residuals from both equations should give similar results for cointegration. However, in practice, it is possible for one residual to confirm cointegration, while the other shows no cointegration. This is undesirable because the test for cointegration should be invariant to the choice of the variable selected for normalization (Enders, 1995). This problem becomes magnified in multivariate equations, since any of them can be selected as the left-hand-side variable. The two-step procedure is also likely to introduce bias, since the error introduced in step 1 is carried onto the second step. Therefore, tests for cointegration

that attempt to avoid the problems mentioned above have been introduced, Johansen (1988). The so-called maximum likelihood estimators can estimate and test for the presence of multiple cointegrating vectors. The Johansen procedure relies heavily on the relationship between the rank of a matrix and its characteristic roots.

Table 5.4 presents the cointegration results based on the Johansen procedure for the trade-weighted REER equation. The first column reports the rank order, the second column contains the estimated eigenvalues, the third column calculates the maximum eigenvalues, while the adjacent column adjusts the calculation for a small sample. The trace eigenvalue is reported in the fifth column, with its corresponding small sample adjustment in the last column. To test the general hypothesis that $r = 0$ against the general alternative $r = 1, 2, 3$, or 4, we use the λ_{trace}^* statistic. The null hypothesis is $r = 0$, and there are five variables ($n = 4$). Taking the calculated value of λ_{trace}^* of 76.75, we compare it to the critical values of λ_{trace}^* of 49.925, 53.347, and 60.054, corresponding to 10%, 5% and 1% significance levels, respectively. Therefore, the restrictions are binding even at 1% level of significance, and we conclude that the variables are cointegrated. We can also test whether $r \leq 1$ against the alternative $r = 2, 3$, or 4. Under this null hypothesis, the summation is from 2 to 4, so that the calculated value of λ_{trace}^* is 48.69. For $n-r = 3$, the critical values of λ_{trace}^* are 32.093, 35.068, and 40.198 at the 90%, 95% and 99% levels, respectively. Since, the calculated λ_{trace}^* exceeds the critical values, we still conclude that the variables are cointegrated.

We can use the $\lambda^*_{\max}$ statistic to test a specific hypothesis that $r = 0$ against the alternative that $r = 1, r = 2$. The calculated value of the $\lambda^*_{\max}(0,1)$ statistic is 28.06. For $n-r-4$, the critical values are 25.611, 28.167, 30.262 at the 90%, 95%, and 99% levels, respectively. Therefore, it is possible to reject the hypothesis of $r = 0$ at the 90% level (but not 95% level) and conclude that there is only one cointegrating vector ($r = 1$). The calculated value of the $\lambda^*_{\max}$ statistic for $r = 2$ is 12.60, and the critical value at the 90% level is 13.781, showing no evidence of more than one cointegrating vector.

Table 5.4: REER: Cointegration Tests (Estimates of Eigenvalues and Cointegrating Vectors)

Ho:rank=p	λ^*_I	$\lambda^*_{\max}=-T\ln(1-\lambda^*_I)$	T-nm	$\lambda^*_{\text{trace}}=-T\sum\ln(1-\lambda^*_I)$	T-nm
p==0	0.67451	28.060	22.45	76.75**	61.40
p<=1	0.64230	25.700	20.56	48.69*	38.95
p<=2	0.39258	12.460	9.971	22.990	18.39
p<=3	0.23464	6.685	5.348	10.530	8.42
p<=4	0.14242	3.841*	3.073	3.841*	3.07

Note: the cointegration is for the REER equation.

5.6 Empirical Estimation of the Model

The model of RER determination presented and discussed extensively in Section 5.3 was estimated for Namibia. Government expenditures are allocated between tradables and nontradables. The portion of government expenditure and investment allocated to tradables has a different effect on the real exchange rate from that which is allocated to the nontradables. An increase in government expenditure for nontradables will, other things being equal, lead to an appreciation of the real exchange rate. Several proxies were used to

approximate the portion of government expenditure allocated to nontradables (i.e. ISHARE⁵⁴ and the ratio of government consumption expenditure to GDP). To the extent that government expenditures are allocated to tradables, we expect that the increase in this variable will result in a depreciation of the real exchange rate.

The direction of trade for Namibia is such that the bulk of imports come from South Africa, while exports are destined to the rest of the world. To capture the differences in the direction of trade, we used three regressors: a trade-weighted RER, import-weighted RER and an export-weighted RER. The results are expected to show GE having a strong influence on RER, while other fundamentals are likely to be less or non-significant. The result is peculiar to Namibia and reflects the institutional setting discussed earlier.

5.6.1 Long-Run Equation for RER

The results are reported in Table 5.5 for the three versions of the model (REER, REERx, and REERm). The variable proxying government allocation of expenditure to nontradables turned out to be the most significant fundamental driving the equilibrium real exchange rate for Namibia. GE is strongly significant in all the three models and it is negatively signed suggesting that government expenditure is predominantly allocated to tradables. This is an expected result in the case of Namibia because of the high degree of openness.

⁵⁴Computed as gross domestic fixed investment as a ratio of private consumption plus government consumption plus gross domestic fixed investment, all at constant prices.

Table 5.5: Long-Run REER Equations (1974-1995)

REER = 8.845 + 0.029Log(TOT) - 2.633 log(GE) - 0.776 log(RESBAL) -0.094log(OEN3)					
t-values	(1.8)	(0.1)	(-2.6)	(-1.5)	(-0.2)
Unit roots test of residuals: DF=-3.920*; ADF=-3.628*					
R ² =94.6; DW=1.66; Wald test Chi ² =9.6*					
REERx = 11.67 + 0.014Log(TOT) - 3.579 log(GE) - 1.136 log(RESBAL) -0.2808 log(OEN3)					
t-values	(1.8)	(0.2)	(-2.9)	(-1.7)	(-0.5)
Unit roots test of residuals: DF=-3.8073*; ADF=-3.8746*					
R ² =94.5; DW=1.82; Wald test Chi ² =21.8*.					
REERm = 6.76 + 0.013Log(TOT) - 1.706 log(GE) - 0.4203 log(RESBAL)					
t-values	(5.1)	(0.1)	(-2.7)	(-1.3)	
Unit roots test of residuals: ADF=-4.413*					
R ² =94.6; DW=1.98; Wald test Chi ² =19.981**.					

Note: the choice is of each regression was guided by several criteria. Especially, we sought to minimise the Schwartz Criterion.

5.6.2 Error Correction Model

Having obtained an estimate of the long-run relationship, the second stage of the Engle-Granger procedure comprises estimating the short-run error correction model using the estimates of disequilibrium ($\hat{\epsilon}_1$) to obtain information on the speed of adjustment to equilibrium. Engle and Granger (1987) prove that if two variables are cointegrated (i.e. if an equilibrium relationship exists) then the short-run disequilibrium relationship between the two variables can always be represented by an ECM. The ECM formulation has many advantages, especially in situations where the data are non-stationary, and hence using standard regression techniques will yield spurious results. Secondly, unlike first-differencing, the ECM formulation makes use of long-term information about the levels of variables contained in the data. Moreover, the ECM distinguishes between short-run and long-run effects. The ECM formulation also fits in well with the Hendry-type of general-to-specific approach, which allows the analyst to drop variables on the basis of t-test. The short-run dynamic equation was estimated following the Hendry-type general-to-specific procedure to reduce the model to its parsimonious form. The results are presented in Table 5.6.

Table 5.6: Error-Correction Model Estimations

EQ(1) Modelling DREER by OLS:The present sample is: 1971 to 1995						
Variable	Coefficient	Std.Error	t-value	t-prob	PartR²	Instab
Constant	0.00097	0.00715	0.137	0.8928	0.0009	0.06
DISHARE	-0.23099	0.18666	-1.237	0.2302	0.0711	0.24
DGE	-0.74564	0.32473	-2.296	0.0326	0.2086	0.11
DRESBAL	-0.28245	0.05249	-5.381	0.0000	0.5915	0.09
ECM_1	-0.18525	0.06861	-2.700	0.0138	0.2671	0.08
R² = 0.623248 F(4, 20) = 8.2713 [0.0004] σ = 0.0273303 DW = 1.79						
RSS = 0.0149389253 for 5 variables and 25 observations						
Variance instability test: 0.269399;Joint instability test: 1.3101						
Information Criteria: SC = -6.77889; HQ = -6.95505; FPE = 0.0009						
Seasonal means of differences are -0.00195						
R² relative to difference+seasonals = 0.75560						
AR 1- 2F(2, 18) = 1.4706 [0.2561]						
ARCH 1 F(1, 18) = 0.2213 [0.6437]						
Normality Chi²(2)= 4.4775 [0.1066]						
Xi² F(8, 11) = 0.87629 [0.5635]						
Xi*Xj F(14, 5) = 0.47606 [0.8741]						
RESET F(1, 19) = 0.96905 [0.3373]						
EQ(2) Modelling DREERx by OLS:The present sample is: 1971 to 1995						
Variable	Coefficient	Std.Error	t-value	t-prob	PartR²	
Constant	1.8425e-012	0.01209	0.000	1.0000	0.0000	
DTOT	-0.12237	0.08120	-1.507	0.1483	0.1068	
DOPEN3	-0.14267	0.07323	-1.948	0.0663	0.1665	
DGE	-1.0115	0.47942	-2.110	0.0484	0.1898	
DRESBAL	-0.50303	0.08931	-5.632	0.0000	0.6254	
ECM_1	-0.18860	0.09149	-2.061	0.0532	0.1828	
R² = 0.688128 F(5, 19) = 8.3845 [0.0003] σ = 0.0412327 DW = 1.82						
RSS = 0.03230259377 for 6 variables and 25 observations						
AR 1- 2F(2, 17) = 0.99562 [0.3900]						
ARCH 1 F(1, 17) = 1.6373 [0.2179]						
Normality Chi²(2)= 0.36156 [0.8346]						
Xi² F(10, 8) = 0.48715 [0.8579]						
RESET F(1, 18) = 0.44278 [0.5142]						
EQ(3) Modelling DREERm by OLS:The present sample is: 1971 to 1995						
Variable	Coefficient	Std.Error	t-value	t-prob	PartR²	Instab
Constant	-2.0823e-005	0.00395	-0.005	0.9958	0.0000	0.06
DGE	-0.34652	0.19147	-1.810	0.0847	0.1349	0.44
DRESBAL	-0.09696	0.03377	-2.871	0.0091	0.2819	0.12
ECMreerm_1	-0.17016	0.05106	-3.332	0.0032	0.3459	0.11
R² = 0.445133 F(3, 21) = 5.6156 [0.0055] σ = 0.0178665 DW = 1.85						
RSS = 0.006703445792 for 4 variables and 25 observations						
Variance instability test: 0.218172; Joint instability test: 1.41238						
Information Criteria: SC = -7.70899; HQ = -7.84992; FPE = 0.000370286						
Seasonal means of differences are -0.00232						
R² relative to difference+seasonals= 0.60446						
AR 1- 2F(2, 19) = 0.038802 [0.9620]						
ARCH 1 F(1, 19) = 0.64321 [0.4325]						
Normality Chi²(2)= 0.20797 [0.9012]						
Xi² F(6, 14) = 0.45835 [0.8275]						
Xi*Xj F(9, 11) = 0.33639 [0.9436]						
RESET F(1, 20) = 1.9094 [0.1823]						

Diagnostic tests of the residuals show that the models have desired properties for OLS estimation. The short-run elasticities represent the impact effect of changes in the fundamentals on the equilibrium real exchange rate. In the short-run, increases in capital outflows and government expenditure will lead to real depreciation of the equilibrium real exchange rate. Changes in the terms of trade will affect the path of the real exchange rate through three channels: income effect and substitution effect (relating to resource allocation and consumption decisions) and because of capital mobility, the redistribution of consumption across time periods by altering the discounting factor. The two effects move in opposite directions, and depending on which is dominant, the total effect of the terms of trade changes on the real exchange rate is therefore an empirical issue (Edwards, 1989). For example, in the case where the terms of trade improve, there will be a tendency to produce less and consume more imports, and hence easing the pressure on the nontradables market. However, the increase in income resulting from the improvement in the terms of trade, will exert pressure on the prices of nontradables. Therefore, these effects are likely to generate a disequilibrium in the nontradables market, which requires a change in the equilibrium real exchange rate. In the REERx model the impact effect of the terms of trade change on the equilibrium real exchange rate has a negative sign. This suggests that substitution into imports is stronger than the income effect, or the reallocation of expenditure to nontradables. However, the long-run coefficient for this variable is not statistically significant.

The ECM coefficient for REER shows that about 19% of the previous year's disequilibrium from the equilibrium real exchange rate is eliminated in the next period. The strong significance of the error correction term gives further evidence of cointegration between the

REER and at least one of the right-hand-side variables. In addition, the error correction specification can be used to derive corresponding adjustment speed in terms of the length of period needed to dissipate a given percentage of shock to the real exchange rate⁵⁵.

To eliminate 50%, 75% and 90% of the discrepancy between REER and its equilibrium value requires 3, 7 and 11 years, respectively. The import-weighted REER shows the longest time of adjustment, requiring at least a year longer than the adjustment in the export-weighted REER. The relatively higher speed of adjustment in the export-weighted REER reflects the effect of the nominal exchange rate on REER adjustment. The adjustment between REERm and its equilibrium value is effected mainly through changes in relative prices and/or quantities, which take longer to adjust than exchange rates. In comparison to other studies, the speeds of adjustment estimated here are closer to the estimates obtained by Edwards (1989) whose average speed of adjustment for developing countries was -0.19. However, in recent studies, e.g. Baffes et al. and Elbadawi, the estimates are far much higher. Baffes et al. found the speed of adjustment for smaller CFA countries was slightly higher than for larger ones in the zone, suggesting that the smaller countries are more adaptive to shocks. As a consequence, the larger countries experienced a relatively higher degree of overvaluation during 1986-94.

⁵⁵The length of the period, T , required to clear a per cent of the disequilibrium through automatic adjustment alone can be computed accordingly: $T = \log(1-a) / \log(1-ECM_1)$, where ECM_1 is the estimated coefficient of the error correction term.

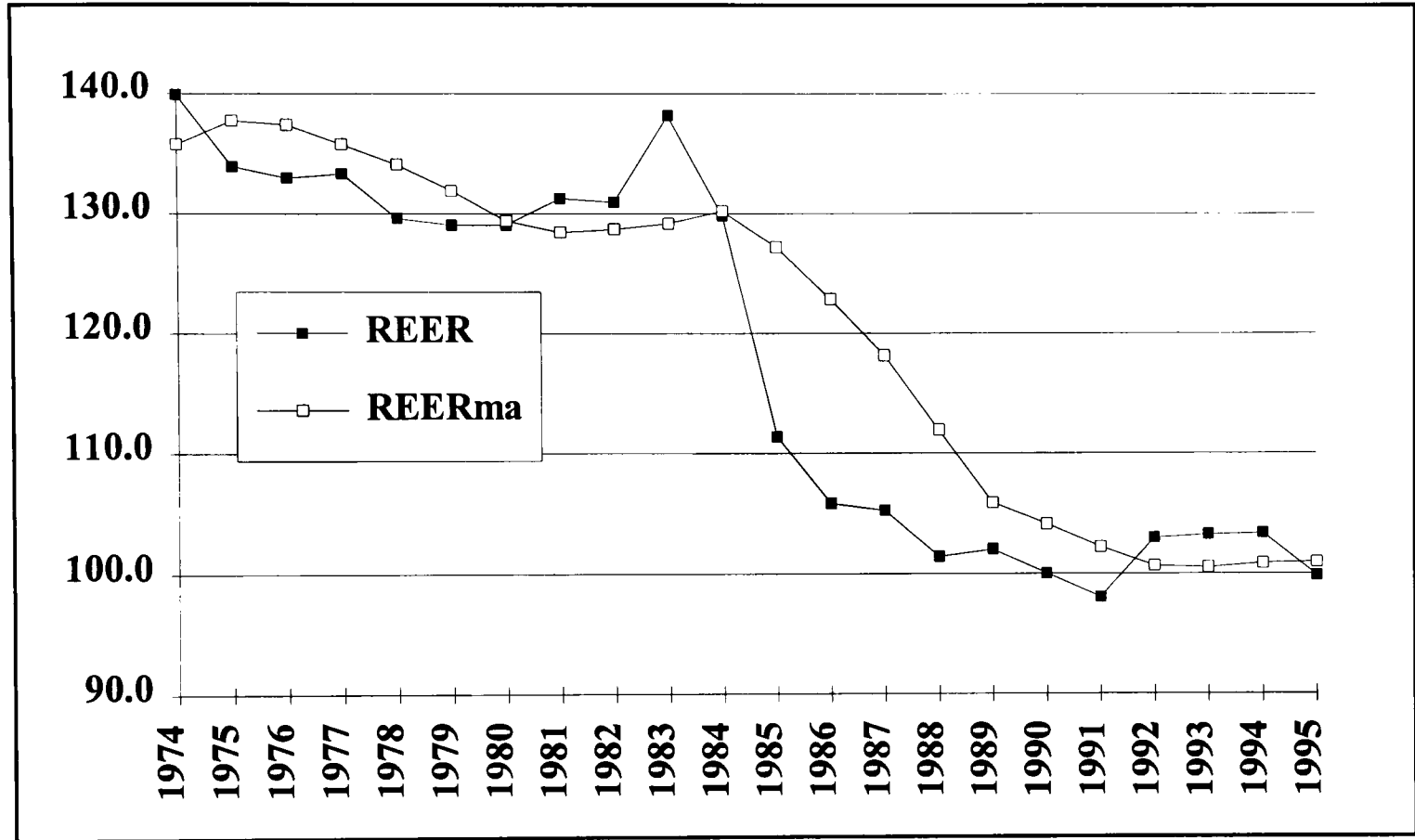
5.7 The Equilibrium Real Exchange Rate

The equilibrium real exchange rate is defined as the rate that prevails when the economy is internal and external balance for sustainable values of policy and exogenous variables (Baffes et al.). However, it is clear that the fundamentals F_t are likely to consist of both transitory and permanent components (F_t^T and F_t^P), as exemplified by the nonstationary series presented in Appendix Table 5.3. Calculation of the EREER therefore requires a decomposition of the fundamentals to extract the permanent components, F_t^P . Studies using this methodology have used the Beveridge and Nelson (1981) decomposition process (see Elbadawi and Soto, 1995). As Baffes et al. noted, the B-N methodology assumes that the fundamentals follow a univariate ARIMA (p,1,q) process, with autoregressive and moving average parts generating stationary fluctuations around an underlying random walk. Movements generating the unit root part are permanent and are extracted to construct F_t^P , from which the EREER is derived. However, the B-N methodology may not be suitable in small samples. Because the results depend on the underlying ARIMA specification, the process can exacerbate turning points in economically implausible ways. Further, there is an increasing chance that stationary series are misidentified as nonstationary (Baffes, et al).

An alternative and simpler way is to use centred moving averages of the fundamentals. The MA smoothes the data to a greater degree the number of periods used. Following this procedure, we used a 5-year moving average of the fitted REERs (ERER) from long-run regressions. These were compared with the actual REER values to obtain the degree of misalignment. Figure 5.8 displays the time profiles of REER and EREER indexes, for the

trade-weighted real exchange rate. Appendix Table 5.2 shows REER, EREr and RER misalignments (with respect to trade, import and export-weighted real exchange rates) for the period 1974-95.

Figure 5.8: RER and EREr Indexes (1974-1995)



From the chart it can be discerned that the two indexes did not move in opposite directions, although there were times when they deviated from one another significantly. The derived EREr is consistent with those of Edwards (1987) and Elbadawi (1994) in that the EREr shows some variability, suggesting that at least part of the observed RER variability is related to equilibrium behaviour and that the analysis of RER misalignment based on historical comparisons of observed RER levels (i.e. the PPP approach) may lead to wrong conclusions.

5.7.1 The Real Exchange Rate Misalignments

Information of the equilibrium real exchange rate permits computation of the RER misalignments. Misalignment was computed as deviations of the equilibrium real exchange rate (proxied by the fitted 5-year moving average from the static regressions) from the actual REER⁵⁶. Ideally, we can decompose the degree of misalignment into two components: (a) misalignment due to the error-term that captures the deviation of the exchange rate from the fitted real exchange rate from the static long-run regression; and (b) a component that captures the deviation of the current fundamentals from sustainable values. Algebraically, this can be expressed as:

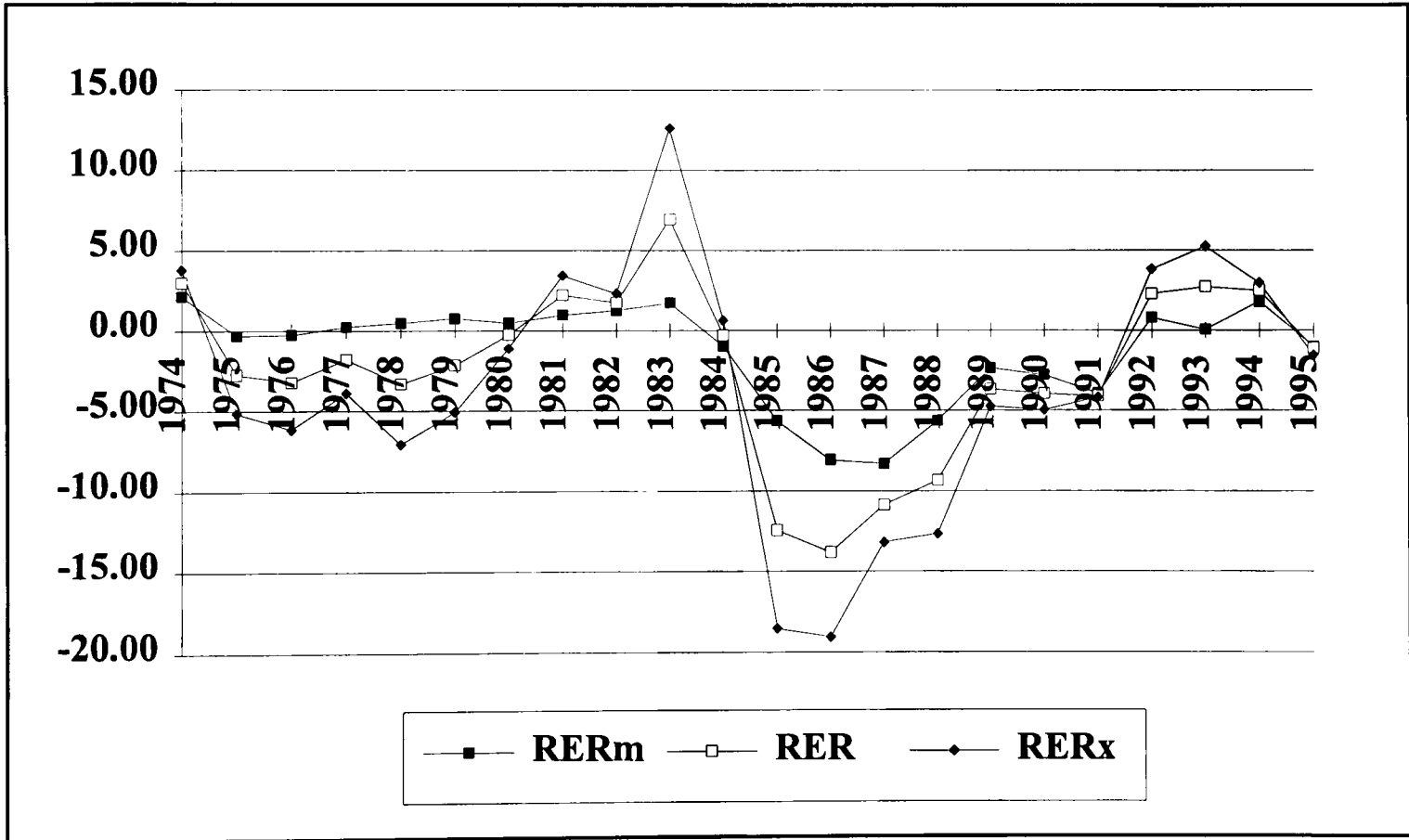
$$RERMIS_t = [\ln(REER_t) - \beta'(F_t^P)] - \beta'(F_t - F_t^P)$$

The observed REER, 5-year moving average REER and the rates of misalignments decomposed according to the above equation are presented in Appendix Table 5.3. In Figure 5.9, the rates of misalignments corresponding to REER, REERx and REERm are presented. It is discernible that the three rates moved in the same direction. From the graphs, it now becomes apparent why it was necessary to compute the REERx and REERm, separately. The REERm is relatively flatter, reflecting the strong weighting of South Africa. Therefore, this rate does not deviate very much from its equilibrium value and as a consequence, it is relatively flatter than the rates of misalignment for REER and REERx.

⁵⁶It should be noted that the misalignment so-computed does not take account of the sources of RER variations that are due to nonpolicy factors.

The plot of RER misalignments as shown in Figure 5.9 makes it easier to identify the timing and magnitudes of RER misalignments. Four episodes of RER misalignments can be identified: (I) 1975-80; (II) 1981-85; (III) 1986-90; and (IV) 1991-95. Notably, the results identify roughly a 5-year cyclical pattern of RER misalignments, i.e. RER undervaluation (I and III) followed by overvaluation (II and IV). The RER overvaluation is consistent with what both the performance economic indicators and the RER fundamentals would have dictated, that is, a substantially depreciated real exchange rate, than the rate that has prevailed.

Figure 5.9: RER Misalignment



5.7.2 Economic Performance and RER misalignment

The analytical framework used in this section is drawn from a study on real exchange rate behaviour and economic performance by Cottani et al. (1990). Using data from a large select

groups of developing countries (in Latin America, Asia and Africa) the authors show evidence that there is a strong negative correlation between performance indicators and real exchange rate misalignment.

According to Cottani, policy can affect economic performance through different mechanisms, including the real exchange rate. The effects through the real exchange rate are transmitted via the domestic price level, the nominal exchange rate, or both. Therefore, the link between the real exchange rate and economic performance is not a direct one.

There are stylised effects of what should be expected when the real exchange rate is misaligned, but the magnitude and direction of such effects (in every situation) can only be established empirically. Generally, large fluctuations in the real exchange rate are associated with greater uncertainty in relative prices. The stylised effects of this include greater risks, shorter investment horizons, higher adjustment costs as production moves back and forth between traded and nontraded goods, and financial instability as expectations of exchange rate changes lead to interest rate volatility. In addition, a misaligned real exchange rate implies lower profitability in the industries in which relative prices are reduced. Overvaluation hurts the traded activities, which in turn affects growth performance adversely because productivity improvements tend to be concentrated in export and import-competing industries.

Table 5.7 shows growth rates of some selected indicators of economic performance over the period 1972-95. The sample period is divided into intervals to highlight the patterns of

economic performance that coincide with significant economic events in the economy during the period. Essentially, three sub-periods can be distinguished: the first sub-period, 1972-79, is marked by relatively good performance; the second sub-period, 1980-87, represents the worst economic performance, while the last period, 1988-95, can be described as a period of consolidation.

Table 5.7: Growth Performance of Selected Economic Indicators

	GDP	Per capita GDP	GDFI	GDFIp	GDFIg	Export sector	Agric.
1972-79	2.56	-0.16	-0.59	0.63	-1.41	2.2	-4.17
1980-89	-2.47	0.67	-5.48	-1.24	-10.31	-1.44	0.91
1990-95	3.96	0.56	7.33	7.44	7.33	2.88	0.03

Having established that there are occasions when the RER is significantly misaligned, it is important to examine what effects those misalignments have on the overall performance of the economy. As a first step, a simple relationship between the RER misalignment and some indicators of economic performance will be established. Second, this relationship is formalised by running regressions of economic performance indicators⁵⁷ as explained variables against indicators of RER misalignment. The explanatory variables include rates of RER misalignment (RERMIS). Table 5.8 presents the correlation between indicators of RER misalignment against economic performance indicators. Although no causal relationship is implied, the results suggest a negative correlation between indicators of RER

⁵⁷RGDP-real GDP growth, PCGDP- per capita GDP, PRGDP-real per capita GDP growth, RGDFI-real gross domestic fixed investment growth, XS-real export sector growth, and AG-real agricultural sector growth.

6.3.4 Wage Level and Structure

The mining industry, which is dominated by the largest enterprises (Namdep, Rossing, and Tsumeb Corporation) is by far the highest payer, with monthly wages ranging from N\$1 094 for unskilled labour to N\$10 728 for the management cadres. The public sector wages for the same categories range from N\$638 to about N\$6 100 per month. The lowest remunerations are found in the agricultural sector, where minimum monthly wages average N\$366. On a tradable and nontradable basis, there is no discernible pattern in terms of sectoral wage structure. The higher wages in the mining and financial services sectors seem to be consistent with the capital/labour ratios in those sectors. However, the energy sector, which is largely nontradable, seems to offer relatively lower wages, in comparison to its high capital/labour ratio.

Table 6.2: Sectoral Monthly Wages (1994/95)

	Industry average	Unskilled	Managerial	Capital/labour ratio
Tradable sectors	N\$	N\$	N\$	N\$
Agriculture	641	366	4401	1674
Mining	2972	1094	10728	18043
Manufacturing	1265	789	4829	6169
Finance	2538	791	5545	35868
Nontradable				
Construction	2208	870	5546	4428
Water/electricity	986	621	4065	14127
Retail trade	1178	540	3693	6334
Transport	1779	904	4892	6347
Government	1860	638	6099	-----

Source: Jobs Unlimited, Ltd. (1994/95 Salary Survey); Central Statistics Office, 1996

6.3.5 The Structure of the Labour Market and Implications for Pass-Through

In concluding this section, it is worth summarising the key points highlighted. It was pointed out that in view of acute shortages of skilled labour, wage-setting in the formal sector may reflect elements of efficiency wages, implicit contracts and adverse selection considerations. It was noted that wages in certain sectors of the economy, (e.g. mining, the financial sector and to the great extent, the government) have been historically linked to South Africa. The combinations of these factors suggest that wages, especially for these sectors, would not deviate significantly for long periods from their South African counterparts. If this hypothesis holds, then the two sets of wages should move closely together. These factors will have an important bearing on pass-through. It is expected that the pass-through will be complete in tradables and also that it will be faster. However, this is an empirical issue, and will be examined in the next section.

6.4 Analytical Framework

This section utilises the information presented in the preceeding discussion to construct an analytical framework to quantify the size and speed of pass-through. First, we motivate the model, with an attempt to incorporate the relevant structural features that may impinge on the measurement of pass-through in Namibia. Namibia is a small open economy, which imports and exports the bulk of what it consumes and produces, respectively. Namibia's merchandise trade as a share of world trade is very small (exports and imports average about 0.04%, each). Similarly, there is no single commodity for which Namibia is considered a

major world producer. Namibia's major export commodities (diamonds and uranium) represent only 3% and 9%, respectively of the world production. In this case, Namibia is a typical price-taker. How are prices formed in this economy? For expository purposes, we distinguish three sectors: exportables, importables, and nontradables. Consistent with the small country assumption, tradable prices are determined in the world markets. Namibia's exports are destined to markets in the rest of world, while the bulk of imports come from South Africa (about 90%).

Regarding the pricing mechanism, it is assumed that, for the most part, firms operating in both markets would not use any element of price discrimination between the two countries. Therefore, prices of importables in Namibia would differ from those in South Africa by transport costs and by additional duties that the government of Namibia may levy on certain imports. Further, depending on how competitive the Namibian retail market is, the mark up could also account for the difference in prices. It is also important to note that since 1990 there has been a growing diversification of import sources, and consequently a small, but rising proportion of imports comes from sources other than South Africa. In view of the 1:1 parity between the rand and the Namibian dollar, changes in the nominal exchange rate of the rand are expected to be transmitted to domestic prices in Namibia with a lag.

Owing largely to the historical linkage with South Africa, it is reasonable to assume that price formation in the nontradable sector is not entirely determined by forces of demand and supply in Namibia, notwithstanding a few services, such as medical care, education, housing and energy, for which there is an element of price control by the government. The

relationship between the prices of nontradables and the prices of tradables is further strengthened because the small size of the nontradable sector compared with the tradable sector would imply that prices and wages in the nontradable sectors are likely to be influenced by those of the tradable sectors. Wages are assumed to be settled each year. Often the preceding year's rate of inflation is used as a yard stick, and consequently some element of backward indexing of wages, $\Delta w_t = f(\Pi_{t-1})$ can be assumed.

6.4.1 Long-Run Price Equation

Owing to the free flow of capital within the CMA, domestic credit policy is not likely to have any lasting effects on money supply (Chhibber, 1992). There is full convertibility of the currencies both for current and capital transactions. Applying the interest parity theory, Namibia's interest rate can be represented as follows: $r_n = r_s + \mu$, where μ is the expected rate of depreciation of the Namibian dollar. If the exchange rate is credible μ can be set at zero, so that the two rates are equalised.

The foregoing suggests that the underlying inflation in Namibia should not deviate significantly from that of South Africa. Although, temporary deviations around this base rate can come from several factors such as droughts, wage-push, or because of differences in pass-through of imported inflation to nontradable goods prices. Still, over the long-run, inflation in Namibia should converge to the South African rate. The exchange rate, although fixed with respect to South Africa, fluctuates regarding currencies of third countries. Therefore, exchange rate changes can still be an important source of inflation to the

Namibian economy. There are selective price controls, applied to staple foods, such as maize-meal, millet, brown bread and a few others to protect the poor, but controls are not widespread.

From the preceding discussion, a general framework to analyse price formation in the Namibian economy can be developed. The framework follows closely that of Chhibber, in which he identifies the various sources of inflation in Africa as: (1) imported inflation (P^*_T); (2) inflation due to cost-push effect of devaluation (E); (3) wage-push inflation (W); (4) demand-pull inflation (caused by spending levels that exceed the economy's productive capacity, which can be represented by excess money balances, EMB); and (5) inflation arising from control and subsequent decontrol of prices (P^c)⁶⁵.

The model starts by specifying the determination of aggregate domestic prices in the open economy tradition, where overall inflation is a weighted average of inflation in traded goods (P_T) and nontradable goods (P_N). Prices of tradable goods are determined by arbitrage so that $P_T = EP^*_T$. The CMA implies that the nominal exchange rate of the Namibia dollar can be set at zero with respect to South African prices, $E^s = 0$. In this respect, P^*_T can be decomposed into two components: $P_T = (E^s P^{*s})^\alpha (E^w P^{*w})^\gamma$, where P^{*s} and P^{*w} denote prices in foreign currencies for South Africa and Namibia's other trading partners (or the rest of the world), respectively. α and γ are weights assigned to South African and the rest of the world prices, respectively. E^w is the corresponding exchange rate at which P^* is converted into domestic currency

⁶⁵There are no significant price controls in Namibia, hence controlled goods' price is not included in our model.

terms. The nominal exchange rate is quoted in units of domestic currency per unit of foreign currency (so that a rise corresponds to a depreciation of the domestic currency).

If P_N , P^s , and P^w have weights α , β and γ respectively in the price index (P), the overall rate of inflation can be specified as follows (note that to avoid messy notation, t denoting time is dropped for now):

$$P = (P_N)^\alpha (E^s P^s)^\beta (E^w P^w)^\gamma \quad [1]$$

and $\alpha + \beta + \gamma = 1$. By disaggregating P^* , equation [1] seeks to capture the sources of imported inflation from South Africa, and the rest of the world, as well as the influences of the nominal exchange devaluations on the domestic price level.

Equation [1] posits a long-run relationship between the overall domestic prices, tradable prices, the nominal exchange rate and nontradable prices. This formulation also suggests that wages (as subsumed in the price of nontradables) and the exchange rate policies combine to yield a gradually declining inflation rate that ultimately converges on the price (P^*) of tradables. The smaller the weight of nontradable price (wages) and the larger the weight of international prices in determining the domestic price, the more rapid is the convergence (Dornbusch, 1986). Therefore equation [1] bears out the view that the exchange rate policy can be used for disinflation and the openness of the economy speeds up and reinforces this disinflation strategy.

Following Chhibber, a standard mark up is used to model the price of nontradable goods⁶⁶.

The mark up (μ) is applied to unit labour costs (W) and the cost of imported inputs (P_T):

$$P_N=(1+\mu)[PT,W,EMB] \tag{2}$$

The mark up is assumed to vary with excess demand in the system, which is not directly observable. According to Chhibber, a good proxy for excess demand in economies where substitution between money and other financial assets is small, is the excess real money demand (EMB)⁶⁷.

Money markets in Namibia are expected to operate close to equilibrium because of the free flow of capital within the CMA. Of the banks in Namibia, the two largest (accounting for two-thirds of total assets of commercial banks in Namibia) are subsidiaries of banks in South Africa. They transmit any excess liquidity to and borrow reserves from their head-offices in South Africa. Under these circumstances, excess money balances are likely to be small (hence, EMB is not included in the model). Therefore, using a quadratic cost function a mark up equation is specified as:

$$P_N=(1+\mu)[PT,W] \tag{3}$$

⁶⁶ Nontraded goods are defined as those goods that are not feasible to trade, such as land, and goods that are de facto nontradables, such as those subject to non-tariff barriers (Chhibber).

⁶⁷ Excess money demand is assumed to be zero. A fixed exchange rate (as represented by the 1:1 parity) fully and automatically eliminates any real effects of money demand shocks. The fixed exchange rate requires the monetary authority to instantly satisfy all money demand shifts through (non-sterilized) foreign exchange intervention (see Obstfeld and Rogoff (1997)).

Import costs are the sum of foreign prices and the exchange rate as stated earlier for tradables.

$$P_N=(1+\mu)[P^{*s},E^{-w}P^{*w},W] \tag{4}$$

Equation [4] requires further decomposition with respect to wage W. It is generally acknowledged that wage setters care about the real wage, not the nominal wage, so that they must form forecasts of next period’s inflation to know what nominal wages to commit to today. If the forecasts turn out to be wrong, real wages deviate from their market clearing levels. If firms always operate on their demand curves for labour when inflation is higher than expected, employment rises, and when inflation is unexpectedly low, employment falls. Therefore, employment is determined entirely by the firms’ demand for labour. In this respect, the firms’ output can be represented as a function of natural output (y-bar), the real wage (w-p), and supply shocks (ε) in log-linear form:

$$y=\bar{y}+(w-p)+\epsilon \tag{5}$$

Assuming workers always commit to a wage that sets expected output at its natural level, then the nominal wage today set in period t-1 satisfies

$$w=E_{t-1}P \tag{6}$$

To avoid an elaborate modelling of expectations, a simple autoregressive price expectations model is assumed, where the previous period inflation rate is used as a basis for wage negotiations, so that $w=P_{t-1}$ [7]

Substituting equations [4 and 7] into equation [1] and re-arranging terms, a general equation that includes basic sources of inflation in Namibia is specified as (in log-linear form):

$$p_t = \beta_1 e^w_t + \beta_2 p^{*w}_t + \beta_3 p^{*s}_t + \beta_4 p_{t-1} + \epsilon_t \quad [8]$$

A general short-run model with lagged adjustment is specified as:

$$p_t = \beta_1 e^w_t + \beta_2 p^{*w}_t + \beta_3 p^{*s}_t + \beta_4 p_{t-1} + \{a p_{t-1} + \delta_1 e^w_{t-1} + \delta_2 p^{*w}_{t-1} + \delta_3 p^{*s}_{t-1}\} + v_t \quad [9]$$

Various factors could be put forward in support of the distributed lag model, i.e. the equilibrium arising from commodity arbitrage may not be instantaneous; overlapping pricing decisions in goods markets generally result in considerable price inertia; and there may be a disequilibrium that persists for a considerable period while adjustment is occurring.

6.4.2 The Error Correction Mechanism

A key assumption relating to the estimation of a theoretical model as stated in equation [8] is that the residual $\{\epsilon_t\}$ sequence must be stationary. Engle and Granger (1987) define a set of nonstationary series, integrated of the same order, to be cointegrated when some linear combination of them produces a series that is stationary. They considered economic variables in long-run equilibrium so that equation [8] can be represented as:

$$\epsilon_t = p_t - (b_1 e^w_t + b_2 p^{*w}_t + b_3 p^{*s}_t + \beta_4 p_{t-1}) \quad [10]$$

Because $\{\epsilon_t\}$ must be stationary, it follows that the linear combination of integrated variables given by the right-hand side must be stationary. Thus, theory requires that the time-paths of the variables of $\{p_t, e_t, p_t^w, p_t^s, p_{t-1}\}$ must be linked⁶⁸.

Cointegration between variables confirms existence of a long-run equilibrium relationship between the regressant and at least one of the right-hand-side variables. However, in the short-run, there can be disequilibrium, which is treated as an equilibrium error⁶⁹. The error correction mechanism (ECM) corrects for this disequilibrium. The ECM approach is due to Sargan, and was later popularised by Granger. It involves a two-step estimation, which provides information on both the short-run and the long-run equilibrium relationship⁷⁰. The error correction model not only provides information on the short-run dynamics, but also on the adjustment toward the long-run equilibrium, by specifying the proportion of the disequilibrium in one period corrected in the next period. For instance, the change in the price in one period may depend on the excess demand in the previous period. The error correction process is thus a means to reconcile short-run and long-run behaviour. In this section, an econometric framework for error correction is developed and tested on empirical data. The error correction mechanism is derived below.

⁶⁸Equilibrium theories involving nonstationary variables require the existence of a combination of the variables that is stationary (Enders, 1997). The commodity market arbitrage and the purchasing power parity theory of spatial competition (as embodied in this model) suggest that in the short-run, prices of similar products in varied markets might differ. However, arbitrage prevents prices from moving too far apart even if the prices are nonstationary.

⁶⁹Because two integrated series will not drift too far apart over the long-run, one can treat the error term as an equilibrium error, which can be used to tie the short-run behaviour of domestic prices (p) to their long-run values. If the series are cointegrated then the exchange rate and the domestic and foreign price series bear a stable relationship over time.

⁷⁰It should be emphasized that the error correction is useful only when there is evidence of cointegration in the residuals from the regression such as equation [4]. In other words, the ECM representation necessitates the two variables to be cointegrated of order $CI(1,1)$.

Differencing each of the variables in equation [10] and subtracting those terms on both sides of the equation, equation [10] can be reparameterised as follows:

$$\Delta p_t = \beta_1 \Delta e_t + \beta_2 \Delta p_t^w + \beta_3 \Delta p_t^s + \beta_4 \Delta p_{t-2} - (1-\alpha)[p_{t-1} - \kappa_1 e_t^w - \kappa_2 p_{t-1}^w - \kappa_3 p_{t-1}^s] + \mu_t \quad [11]$$

where $\kappa_i = (\beta_i + \delta_i) / (1-\alpha)$

The terms inside the brackets denote the error correction mechanism (ECM). Simplifying we have

$$\Delta p_t = +\phi_1 \Delta e_t + \phi_2 \Delta p_t^w + \phi_3 \Delta p_t^s + \phi_4 \Delta p_{t-2} + \lambda \text{ECM}_1 + \epsilon_t \quad [12]$$

where Δ denotes first difference; ECM_1 is the one period lagged value of the residual from equation [10] and ϵ is the error term with usual properties.

Thus equation [12] represents a simple structure of an error correction model. The error correction mechanism relates the change in the Namibian price to the change in tradable prices and the exchange rate plus the gap between these variables in the previous period. Therefore, the equation captures the short-run adjustment, while guided by long-run theory. The term $[p_{t-1} - \kappa_1 e_{t-1}^w - \kappa_2 p_{t-1}^w - \kappa_3 p_{t-1}^s]$ provides the short-run disequilibrium error from the last period, which implies that P is being corrected for the previous error (hence, the term error correction). Starting from an initial situation of disequilibrium, the self-correcting mechanism that calls for future adjustment of the domestic price will be set in motion. This effect is captured by the negative error correction term. The parameter λ (which falls within

the interval (0,1)) measures the speed of adjustment. The larger the value of λ the greater the response of p_t to the previous period's deviation from long-run equilibrium (while smaller values suggest slower rates of adjustment). Short-run changes in the foreign prices (p^w , p^s), wages and nominal devaluation are captured by ϕ_2 , ϕ_3 , ϕ_4 and ϕ_1 , respectively.

6.6 Pass-Through Empirics

The data and tests for unit roots and cointegration are presented in Appendix Table 6.1. The following section presents the result of estimation of the model.

6.6.1 Estimation Results

The results are reported in the following order: (1) the overall price index based on quarterly data for the period 1972-1995; (2) the food price sub-indexes based on monthly data from 1993(1)-1996(12) and the overall food price index based on data for the period 1973 (I)-1996(IV); and wages based on annual data for the period 1975-95. Pass-through estimates for nontradable items, such as housing, transport and services were not significant.

a) Overall Consumer Price Index

Solved Static Long-Run Equation

$$LCPI_n = -0.538 + 0.8618 LCPI_s + 0.2729 LP_{us} + 0.1256 \$ + 0.001247 \text{ Seasonal}$$

(SE)	(0.2257)	(0.03553)	(0.06162)	(0.06601)	(0.03755)
------	----------	-----------	-----------	-----------	-----------

WALD test $\chi^2(4) = 13902$ [0.0000] **

The static long-run relationship (standard errors in brackets) was adequately satisfied and shows that p^s , p^w and e have a significant influence on Namibian prices as posited earlier in the long-run price equation [4]. The long-run pass-through coefficient of 0.86 for p^s suggests that in the long-run, Namibia's inflation converges to that of its major trading partner, South Africa. This result is consistent with that of the CFA countries, where inflation tends to converge to that of France (Chhibber). However, temporary deviations around this base rate can come from several factors such as droughts, wage-push, or because of differences in pass-through of imported inflation to nontradable goods prices. The results also show that the sizes of pass-through of foreign prices onto domestic prices differ markedly by trading partners. Reflecting the overwhelming trade concentration between Namibia and South Africa, the pass-through coefficient for the rest of the world prices (as proxied by US prices) appear to be lower than that for South Africa. Nominal exchange rate changes also have a significant effect on Namibian prices. The exchange rate is stated in terms of domestic currency per unit of foreign currency (US\$). Hence, a positive coefficient indicates that a 10% devaluation will result in a 1.3% increase in the price level.

The results of the short-run dynamic specification of Namibia's domestic price determination are presented Table 6.3. The regression results allow for interpretation of the dynamic process. In the short-run, foreign prices affect Namibian prices as expected, however, the changes in the sign of the price variable shows some instability and sensitivity of the price variables in the equation. A nominal devaluation of the exchange rate increases prices on impact. The error correction term is significant and shows 13% of the previous quarter's disequilibrium from the long-run purchasing power parity. The strong significance of the

error correction term gives further evidence of cointegration between the Namibian CPI and at least one independent variable. The coefficient -0.13 also conveys the idea that the greater the excess of imported inflation or devaluation, over domestic inflation (in logarithms) for the corresponding quarter one year ago, the higher the domestic price now. That is, as foreign prices and/or devaluation raise tradable prices, a corresponding rise in domestic prices becomes inevitable. It takes 5 quarters to clear 50% of the discrepancy between domestic prices and foreign prices, whereas 75% and 90% of the discrepancy are eliminated in 10 quarters and 16.5 quarters, respectively. The relatively shorter length of period to eliminate the disequilibrium between domestic prices and foreign prices is consistent with complete long-run pass-through of foreign prices. This can be explained in various ways. With the high pass-through the discrepancy that exists between domestic prices and foreign prices at any particular time may be too small to matter. In other words, Namibian prices do not deviate significantly from South African prices.

Table 6.3: Modelling ΔLP by OLS:1973 (3) to 1996 (4)

ΔLP = 0.00597 + 0.07086 ΔLPs + 0.00724 ΔLPus + 0.02641Δ\$ - 0.13411 ECM_1				
t-values (1.3)	(3.1)	(0.1)	(1.2)	(-4.9)
R² = 0.219652 F(4, 94) = 6.6148 [0.0001] σ = 0.0093469 DW = 1.85				
RSS = 0.00821226803 for 5 variables and 99 observations				
Variance instability test: 0.06027; Joint instability test: 0.4647;				
Information Criteria: SC = -9.16517; HQ = -9.24321; FPE = 0.0000917				

b) Food Prices

Estimates of pass-through for food price sub indexes are presented in Table 6.4. The disaggregation allows one to assess the extent of pass-through among the subcategories of

the food sub index. For all the food sub groups the long-run pass-through is about unity, suggesting that South African food prices are wholly transmitted to Namibian food prices in the long-run. For some food categories, the short-run pass-through was not significant, and these include grains, fish, oils, dairy products and sugar. The prices and markets for these products differ somewhat. Dairy products also have a large domestic production component, while prices for grains are subject to controls by the Agronomy Board. Similarly, oils and sugar are packaged within Namibia, even though nearly all the raw materials are imported from South Africa. It is also important to note that the short-run pass-through is lower than the long-run one. For example, the pass-through for food prices is unity in the long-run, compared with the short-run coefficient of 67%.

Table 6.4: Estimated Pass-through for Food Prices (1993(1)-1996(12))

	Meat	Fish	Oils	Vegs	Fruit	Sugar
LR passthrough	1.000 (14.7)	1.000 (36.4)	0.826 (8.7)	0.990 (9.7)	1.000 (8.1)	1.000 (3.1)
SR passthrough	0.840 (4.6)	----	----	0.936 (6.7)	0.765 (6.6)	---
ECM	-0.306 (-2.6)	-0.074 (-1.2)	-0.701 (-4.9)	-0.634 (-3.8)	-0.298 (-2.3)	-0.398 (-3.5)

The solved long-run equation like the one for overall food price is well explained as suggested by the Wald test statistic.

Solved Static Long Run Equation

$$\begin{aligned}
 L_{pf} = & -2.293 + 0.857 LCPIs + 0.630 LPus + 0.323 \$ \\
 (SE) \quad & (0.628) \quad (0.092) \quad (0.173) \quad (0.173) \\
 \text{WALD test } & Chi^2(3) = 2434.6 [0.0000] **
 \end{aligned}$$

The long-run regression shows that all the right-hand-side variables (p^s , p^w , and e) have significant effects on Namibia's food prices. The coefficients for imported inflation were 86% and 63% for South African and international prices, respectively, whereas the transmission from exchange rate changes to domestic food prices was 32%. The results also confirm that South African prices are passed onto Namibian prices faster than prices of Namibia's other trading partner countries. This could be explained in terms of the overall protection that shields the food industry in SACU and within South Africa itself. The common external tariffs and other additional protection measures that apply to the food industry suggest that the influence of international prices on the overall food prices is small. The nominal exchange rate was marginally (statistically) significant, and this may reflect the influence of agricultural exports, which in recent years have been destined to markets outside SACU.

Regarding the error correction model, the results show that in the short-run changes in South African prices and exchange rates have significant positive effects on food prices in Namibia (Table 6.5). Thus, a rise in South African prices and/or devaluation of the nominal exchange rate would cause domestic prices to rise. The ECM coefficient was statistically significant. It shows that about 75% of the discrepancy between the actual and the long-run or equilibrium value of food prices is eliminated or corrected each period. This would suggest that half of the discrepancy between Namibian food prices and their equilibrium value will be eliminated in 6 weeks. This is relatively shorter than the automatic adjustment time required for the overall CPI. Food has the single highest weighting in the Namibian consumer price index of 28%. Therefore, the higher pass-through and the higher speed of adjustment in this sub index have important implications for the overall price index and wage demands.

Table 6.5: Error Correction Model for Food Prices:1973 (3) to 1996 (4)

$\Delta p_{\text{food}} =$	-0.12104	+ 0.30304 ΔP_s	+ 0.47291 $\Delta \$$	- 0.75314 ECM_1
t-values	(-9.3)	(2.4)	(3.4)	(-15.9)
$R^2 = 0.767$ $F(3, 92) = 101.05$ [0.0000] $\sigma = 0.057$ DW = 0.390; RSS = 0.299 for 4 variables and 96 observations;				
Variance instability test: 0.664379*; Joint instability test: 3.32523**; Information Criteria: SC = -5.5811;				
HQ = -5.64476; FPE = 0.00338671				

c) Pass-through in Factors

Because import prices make a significant part of Namibia’s domestic price, it is expected that the wage rates in Namibia respond to prices of imports. In this context, changes in the nominal exchange rate and foreign prices would induce changes in the wage rates. However, the extent and the speed of foreign price and exchange rate pass-through to wages would depend on several factors, including the degree of unionisation of the labour force, the militancy of the labour unions, and the structure of the economy (whether the economy is dominated by agriculture or mining). For mining wages, the long-run pass-through with respect to foreign price (here, South African price) exceeds unity, while a devaluation of the nominal exchange rate would have a significant positive effect. However, government wages display different characteristics in comparison with mining. The exchange rate pass-through coefficient is not significant in the government wage equation. Though South African prices still exert a positive effect, the amount of pass-through is relatively low, in comparison to a value of unity for mining wages. In recent years, government wages have shown some

flexibility in real terms, suggesting that the traditional link to South African wages has been weakening since independence.

The cointegration results for pairs of wages and foreign prices confirm the existence of a long-run relationship between imported inflation and wages in Namibia. Real wages in the mining sector are affected by imported inflation from South Africa and the rest of the world. It is noteworthy to draw attention to the results of real wage pass-through. Ideally, because nominal wage pass-through is 1, the coefficient for the real wage should be zero: i.e. nominal prices feed through one-for-one onto wages and hence w/p is unchanged, which is not the case with wages in the mining sector. Moreover, the coefficient of 0.25 in mining suggests that miners are overcompensated beyond the rate implied by changes in South African prices, implicit in the 100% nominal wage pass-through. This could be due to several factors. Mining wages in Namibia are linked to those of South Africa, so that price rises in South Africa are factored into Namibian mining wages. However, there seems an element of further adjustment in the Namibian wages that takes into consideration the purchasing power of wages in Namibia. The differences in the composition of CPI, which was discussed in Chapter 5, suggest that price rises for certain elements, e.g. food, may not be synchronised between the two countries. Therefore, this could be a contributory factor to the peculiar results in real wages for mining. In this case, it looks like increases in South African prices are factored into Namibia not only through factors of production but also through the CPI as well. Therefore, this double factorization has the effect of overcompensating mine wages. The questions that arise from this are whether this is likely to be temporary or permanent phenomenon. Therefore, it is important to note that we looked at the consumption real wage

not the product real wage. It may be the case that real product wages have full nominal pass-through.

Table 6.6: Cointegration Tests (factors): 1975-95

	Real wage (mining)		Nominal wage (mining)		Real wage (gov)		Nominal wage (gov)	
	LPs	LEPus	LPs	LEPus	LPs	LEPus	LPs	LEPus
LR coefficient	0.2515 (12.0)	0.2200 (9.6)	1.166 (50.5)	1.034 (20.8)	0.097 (3.1)	0.0927 (3.5)	1.011 (28.5)	0.9066 (23.1)
R ²	0.88	0.83	0.99	0.96	0.35	0.38	0.98	0.97
SBDW	0.8538	0.5955	0.7165	0.4916	0.341	0.425	0.341	1.056
Residual ADF	-2.263*	-2.578*	-2.323*	-1.717	-1.661	-1.646	-1.965*	-2.522*

Notes: (1) SWDW test: critical values for a sample size of 50:5%=0.72
(2) Critical values used in ADF test: 5%=-1.961 and 1%=-2.706

The error correction model for Wm shows that about 70% of the discrepancy between actual mining wage and its equilibrium value is corrected within the next year. In terms of duration, it takes 6 months to eliminate 50% of the discrepancy between Wm and its equilibrium value, if normal adjustment was allowed to take its course.

Error Correction Model for LWm by OLS: 1977 to 1994

$$\Delta LWm = -0.065509 + 1.1274 \Delta LPs + 1.0721 \Delta LPs_{-1} - 0.75599 ECM_{-1}$$

t-values (-1.143) (1.904) (1.929) (-4.382)

The implications for these findings are that wages in Namibia as hypothesised are influenced by foreign prices, mainly South African prices. The results also showed that for the mining sector, which is nearly 100% unionised and for which labour disruptions have greater operational costs, the pass-through of imported inflation was higher and faster than in the government sector, and probably for the economy-wide wages.

6.6.2 Implications of the Results

The results, however, show that at least some elements of the domestic prices will not change instantaneously in response to changes in exchange rate and foreign prices. In addition, the size and speed of pass-through differ significantly among traded goods, allowing hysteresis in relative prices. From the review of the labour markets and the wage pass-through results, it was established that real wages in Namibia exhibit some rigidity, although in nominal terms they are highly flexible. The pass-through of imported inflation (P_s) to wages in mining was respectively, 22% and 100% for real and nominal wages. The results for real wages were somewhat surprising. The long-run pass-through was not only low, but for government wages, the pass-through was not significant. However, the pass-through of imported inflation to nominal wages, in both mining and government sectors, was near unity. In view of the degree of wage-resistance in the economy, the nominal exchange variation could be a useful instrument in adjustment.

What are the implications of these findings for the exchange rate management and, more importantly, on the efficacy of nominal exchange rate devaluation to have real effects? Krugman (1995) argues that to the extent that prices and wages adjust slowly, there would be a temporary period that nominal exchange rate adjustment can have desirable effects on output and external balance. The statement thus acknowledges that nominal exchange rate changes can facilitate necessary real exchange rate adjustment. However, the key point in this statement is the duration that these desirable effects from devaluations can last.

6.6 Conclusions and Policy Implications

The purpose of this chapter was to assess the extent to which movements in exchange rates and foreign prices influence wages and domestic prices. This information may have important implications for the management of the exchange rate policy, and influence the exchange rate regime adopted. The results showed that there are classes of goods whose prices are determined by demand and supply factors within Namibia. In other words, not all elements of P are tradable, and especially even within tradable goods, the size and speed of pass-through vary significantly. It was observed that real wages exhibited less sluggishness, while nominal wages seemed to be inflexible, downwards. We have a case where the nominal wage rigidities in the market suggest some role for the nominal exchange rate as a policy instrument. This is opposed to a situation of a neo-classical type, where wages are flexible and as a consequence adjustment is achieved automatically. Neither does the situation in Namibia approximate a case of wage indexation with short lags, to rule out nominal devaluation. An important question to ask is how long can gains from devaluations be sustained to yield real effects? In the short run, the results envisage a role for the nominal exchange rate as an instrument of adjustment because the speed of adjustment towards long-run equilibrium allows for some flexibility in exchange rate policy. However, in the long-run, that role is limited, as changes in foreign prices almost completely feed back to domestic prices. The implication of this is that any initial gains in competitiveness are soon offset by price changes. The speed of pass-through of imported inflation to domestic prices (ranging from 6 weeks to 15 months) is too short to permit reasonable adjustment of relative prices or some reallocation of resources from nontradable to tradable sectors.

Chapter 7

Further Costs and Benefits of CMA for Namibia

7.1 Introduction

The previous two chapters discussed the exchange rate dimension of the CMA. This chapter looks at other costs and benefits of Namibia's participation in the CMA. The CMA had moved from the highest form of monetary integration to a half-way system that bears characteristics that are associated with a currency board system and a currency union. When will greater monetary integration of Namibia and South Africa be mutually beneficial? This chapter attempts to examine the positive and negative aspects of optimum currency areas for Namibia. The structure of the chapter is as follows. Section 7.2 identifies and measures the costs and benefits associated with the CMA. The discussion will distinguish between static and dynamic costs and benefits. The benefits estimated include efficiency gains from elimination of transactions costs involved in converting currencies and savings on foreign exchange reserves. These may be described as static. The dynamic benefits, such as credibility and price stability, are also discussed. In Section 7.3 the costs are estimated. These include estimates of seigniorage revenue for Namibia and SADC countries and estimates of shocks to the Namibian economy and symmetry of shocks to the SADC region. The last section presents the summary and conclusions.

7.2. Benefits

Benefits of participating in a currency union relevant to the CMA include efficiency gains from elimination of transactions costs; welfare gains from price stability; less uncertainty in exchange rate movements between the national currencies and that of their major trading partner, South Africa; resource savings from foreign exchange reserves; fiscal discipline, credibility, and macroeconomic stability; less political intervention; and insulation from monetary disturbances and speculative bubbles. The net benefits from elimination of transaction costs are estimated to be equivalent to 3.8% of GDP, while the resource savings from the reduced need to hold foreign exchange reserves amount to 2.4% of GDP.

7.2.1 Efficiency Gains from Elimination of Transactions Costs

The following section presents the costs involved in foreign exchange transactions. These include the buy/sell spread, computed as the difference between the rates banks buy foreign currency and the rates they charge for sales of foreign currency. The spread varies from 5-10 cents per unit of the domestic currency, depending on the foreign currency involved. For non-convertible currencies, the spread could even be higher, reflecting the higher costs to the banks. Other costs involve the commission charges for engaging in foreign exchange transactions. The commission generally varies with the size of transactions, and there are usually different rates for various forms of foreign currency transfers (i.e. travellers' cheques, inward transfers and outward transfers).

a) Foreign Exchange Transactions Costs

This section describes and measures the costs of foreign currency transmissions. The major costs arise from the spread between selling rates and buying rates for foreign currencies (or bid-ask spread). The spread is calculated as the difference between the buying rate and the selling rate divided by the average of the selling and buying rates multiplied by 100. Spreads reflect profit margins of the banks or foreign exchange dealers. From the data collected from the deposit money banks (DMBs) in Namibia, Botswana and the UK, the following characteristics can be discerned: hard currencies attract a relatively lower spread than nonconvertible currencies; the size of the spread is determined by the degree of competitiveness in the foreign exchange market⁷¹; trade between countries has little effect on the bid-ask spread, especially in the context of nonconvertible currencies. The bid-ask spread for the Botswana and Zimbabwe currencies with respect to the rand is larger compared with the major currencies, such as the US dollar, the German mark and the pound sterling. This is so, despite the fact that trade with South Africa is quite significant for the two countries. In this context, the spread between the Namibia dollar and the rand is not expected to be lower simply because the two countries trade intensively with each other.

Acknowledging that the current spreads for Namibia might change once the Namibia dollar is de-linked from the rand, counterfactual spreads were considered. Based on the currencies of importance to Namibia in terms of trade and regional comparator countries, several rates

⁷¹For example, the size of spread for US dollar is highest for Botswana with a relatively thinner market, followed by South Africa and is lowest in the UK.

of spreads were taken as counterfactuals: the average spreads for the Namibia dollar against the US dollar, the Botswana pula, and the British pound sterling. Another set of counterfactuals was added to the list above, and includes the spread of the Pula against the rand, the US dollar, the pound sterling and the Zimbabwe dollar. Therefore, 10 different numbers for the spread were derived, varying from 1.7% to 11.4%. The commission charges applicable to different instruments (inward and outward transfers and travellers' cheques) are described in Table 7.1.

Table 7.1: Commission Applicable to Foreign Exchange Transactions

Inward transfers These are charged at 0.3% plus the applicable rate of general sales tax (GST) currently at 11%. Minimum: the minimum charge is N\$30 plus GST; Maximum: N\$180 + GST. Outward transfers These are charged at 0.3% plus the applicable rate of general sales tax (GST) Minimum: the minimum charge is N\$22 plus GST; Maximum: N\$195 + GST Purchase of cheques These are charged at 0.3% plus the applicable rate of general sales tax (GST) Minimum: the minimum charge is N\$22 plus GST; Maximum: N\$180 + GST
--

Source: DMBs in Namibia, various years

To derive the commission charged, we present a simple formula:

$$Co=(T_f * E) *(c) *(1 +gst)$$

[1]

where T_f is the transactions in foreign currency, E is the nominal exchange rate (for inward transmission, a buying rate is applicable, and vice versa), c is the rate of commission (0.3%), and gst is the general sales tax, set at 11%. It should be noted that there are limits to which the total commission cannot exceed or fall below. Incorporating these minimum and maximum bounds on our formula, the total commission charges for inward transfers are:

$$(1 + gst) * N\$180 \geq Co \geq N\$30 * (1 + gst) \quad [2]$$

Suppose a Namibian resident receives US\$5000 from abroad on 5 September 1997. First, the bank buys the foreign exchange at the going rate of N\$4.65 per dollar, so that the total amount of receipts in domestic currency is N\$23250. The bank charges the customer for these services. The commission charged is 0.3% (3 cents per N\$). Since these services are also taxed, the bank augments the commission by the rate of GST. The commission amounts to N\$69.75 (N\$23250*0.003), while the GST is N\$7.67 (N\$69.75*0.11). Therefore, the total costs to the customer for engaging in foreign exchange transactions are N\$77.42, or about 0.33% of his total receipts.

The system of setting minimum and maximum charges penalises small transactions, while subsidising large ones. To illustrate this point, suppose we have two customers. For ease of exposition let's call them B and C, respectively. They receive foreign exchange payments on 5 September 1997 of \$100 and \$15000, respectively. Working through the same steps as in the earlier example reveals that the commission charges to the two customers, B and C are N\$1.55 and N\$232.27, respectively. However, the minimum and maximum charges are applicable to both customers, so that B pays N\$33.30 (that is, N\$30 + N\$3.30 for GST) and C pays N\$199.80 (N\$180 + N\$19.80 for GST). B pays a penalty of N\$31.75, while C receives a subsidy amounting to N\$32.47. The calculations are shown in Table 7.2, including the first example, which we denote as Customer A.

Table 7.2: Some Illustrations of Transactions Costs

	Receipts (\$)	Receipts (N\$)	Commission	GST	Total costs	Net costs as % of receipts
A	5000	23250	69.75	7.67	77.42	-
B	100	465	1.39	0.15	1.55	-6.8
C	15000	69750	209.25	23.02	232.27	0.5

The commission charges may thus be largely distributive, as they involve transfers from one economic agent to another. But nonetheless, the overall charges, especially for small transactions remain substantial. These costs are specially significant in the sense that South Africa accounts for at least 60% of Namibia’s trade. For example, residents of the BLNS, especially those close to the border, would often go shopping at month end to the nearest city in South Africa. Second, residents of the BLNS also buy directly from South Africa through mail order. Perhaps, the most important aspect of this, concerns remittances from mine workers (including those working illegally) in South Africa. This structure of trade exists in Botswana even after the introduction of the pula in 1976, therefore, costs of this nature are likely to continue to be important even if the Namibia dollar were de-linked from the rand. Because of the CMA membership, Namibians save on these charges as their transactions with South Africa are done in the domestic currency (in the sense that converting Namibia dollar into rand is free, since both currencies have legal tender status in Namibia).

b) Computations of Gains from Elimination of Transactions Costs

Now that we have demonstrated the potential savings for an individual household or firm, I complete the analysis by estimating the costs for Namibia. The gains from elimination of transactions costs are a function of trade flows between members of a currency union. With high volumes of trade, the gains are substantial, and vice versa. Therefore, the degree of openness should be an important factor in this regard (the efficiency gains from eliminating transactions costs should be higher in an open economy compared with a closed economy). Further, if the country's direction of trade was highly diversified, fixing the exchange rate against the currency of only one of the trading partners will not eliminate all the transactions costs. In the case of Namibia, trade is very important, and it is less diversified. Therefore, the welfare gains to the society as a whole from elimination of transactions costs is probably substantial⁷².

Currently, all transactions involving intra-CMA trade are not subject to these costs. Therefore, the gains from elimination of transactions costs can be measured in terms of transactions costs that Namibians would have paid for the CMA trade. Transactions costs can be divided into two components: (a) the commission charged for engaging in foreign exchange transactions (to simplify the computations, we consider inward and outward transfers); (b) the spread between the rates charged for sales and purchases of foreign currency (that is, the buy/sell rates). Information on the latter is posted on daily basis by different commercial banks. Similarly, the rates charged for commissions were obtained from

⁷²90% of Namibia's imports, and 27% of its exports, are effected through the rand.

the five commercial banks in Namibia. The Transactions costs (TC^s) due to the buy/sell spread were computed using the following formula:

$$TC^s = s * [M + X]_{cma} \tag{3}$$

where s denotes the spread between buying and selling rates, M and X denote imports from and exports to the CMA. The second component of the costs relates to the commission charges on foreign currency transactions (TC^{co}), derived as follows:

$$TC^{co} = (M + X)_{cma} * (c) \tag{4}$$

Combining equations [3] and [4] yields the total transactions costs associated with foreign exchange transactions, TC:

$$TC = TC^{co} + TC^s = (M + X)_{cma} [s + c] \tag{5}$$

Utilizing equation [5], transactions costs were computed based on average figures for the period 1990-95 (these are shown in Table 7.3). The costs arising from the spread between buying and selling rates constitute the largest proportion of the costs. In contrast, commission charges are relatively small and do not vary substantially. However, this may reflect the current exchange rate regime, whereby imports from South Africa are handled in the same currency. The net benefits from elimination of transactions costs could be estimated to be between 1.5-8.7% of GDP. However, an average figure of 3.8% is a reasonable estimate based on the spread between the rand and the Botswana pula (as shown in rows C and I in Table 7.3). Savings of this magnitude are substantially higher than calculations for the EU, where estimates only amount to less than one percentage point. However, in comparison

with Namibia the EU countries are closed, and the pattern of trade is also significantly different.

Table 7.3: Benefits from Elimination of Transactions Costs

	Xcma	Mcma	Total CMAT rade	com	spread	Tc com	Tc spread	Total Tc	Total Tc as % of GDP	GDP
A	1433	4819	6252	0	0.02	19	106	125	1.48	8424
B	1433	4819	6252	0	0.02	19	144	163	1.93	8424
C	1433	4819	6252	0	0.07	19	463	482	5.72	8424
D	1433	4819	6252	0	0.09	19	563	582	6.91	8424
E	1433	4819	6252	0	0.02	19	119	138	1.64	8424
F	1433	4819	6252	0	0.02	19	112	131	1.56	8424
G	1433	4819	6252	0	0.03	19	200	219	2.6	8424
H	1433	4819	6252	0	0.02	19	112	131	1.56	8424
I	1433	4819	6252	0	0.08	19	481	500	5.93	8424
J	1433	4819	6252	0	0.114	19	713	732	8.69	8424

Source: Bank of Namibia, Annual Reports, various issues

Notes: Xcma denotes Namibian exports (imports) to (from) the CMA; com-commission, Tccom-transactions costs due to commission charges; Tcspread-transactions costs due to spread; The Tcspread calculations are based on average spreads of the Namibia dollar against the following currencies: US dollar (A), Pound sterling (B), Botswana pula (C), and the Zimbabwe dollar (D). From row E-H, the Tc-spread is calculated on the basis of average spreads for Botswana against the following currencies: US dollar (E), pound sterling (F), pound sterling cash transactions (G), rand (H), rand cash transactions (I) and the Zimbabwe dollar (J).

7.2.2 Resource Savings on Foreign Exchange Reserves

There are several reasons why countries hold international reserves. Reserves provide a buffer against the possibility of future crises; they help maintain confidence in a country’s financial management; they facilitate access to trade (and other) financing; they enable the country to protect its current consumption from transitory declines in export earnings, or sudden increases in import prices; and they help support the exchange rate policy. In this

context, higher reserves are associated with stability and vice versa. However, holding reserves entail costs. As Landell-Mills (1989) argued, the scarce financial assets (hard currencies) could be used for other purposes. Besides the wider array of costs represented by the opportunity costs of holding reserves, Bird (1982) also discussed the costs that arise because of the constraints placed on the authorities to invest in short-term rather than long-term assets which yield higher returns.

It was mentioned earlier that one of the benefits of a currency union, like the CMA, is that it reduces the need to hold large international reserves. How should we measure such gains? Ideally, these gains can be measured in terms of the reduction in the opportunity cost of holding reserves. To the extent that a large part of external transactions is effected in the domestic currency (union-wide currency), there is less need to hold large reserves. Therefore, we need to identify the opportunity cost of holding reserves and the measure of returns on international reserves. Returns on international reserves are often represented by 3-month or 6-month LIBOR (London Inter-bank Offer Rate), government long-term bonds or 3-month Treasury Bill rates (of a reserve currency). Several measures of the opportunity cost of holding reserves have been suggested. Edwards (1985) suggested using the cost at which a country borrows from international financial markets to represent the gross income lost from holding reserves. This was justified on the basis that countries will borrow until returns on domestic investment matched the cost of borrowing. Therefore, he used the difference between the country's external borrowing rate and LIBOR to represent the opportunity cost of holding reserves. However, this measure of opportunity cost may seem inappropriate,

given that access to the world financial market for many developing countries has become limited, especially since 1982.

Reflecting these circumstances, Landell-Mills suggested an alternative measure of the opportunity cost to holding reserves. She argues that the motivation for holding reserves is to maintain creditworthiness so that a country can borrow at favourable terms in the world financial markets. Under this formulation, the opportunity cost of holding reserves should be measured by the difference between 3-month (or 6-month LIBOR rates) and the US Treasury Bill rate. Other researchers have used the difference between the US Government long-term bond yield and the 3-month Treasury Bill rate (François, 1991).

This chapter follows closely the latter approach, except that the reference country here is the United Kingdom, reflecting the fact that most fund managers for Namibia are based in the city of London. Therefore, the opportunity cost of holding international reserves for Namibia is proxied by the difference between returns on reserves on UK long-term Government bond yields⁷³ and the Eurodollar rate for London. Benefits are estimated as the opportunity costs of holding net foreign assets multiplied by additional amount of longer-term assets which can be accumulated. Designating Government bond yield and LIBOR rate as r_b and r_l , respectively, the opportunity cost of holding reserves is derived as $(r_b - r_l)$. The value of intra-union imports for Namibia is represented by M_{cma} . Then the benefits are calculated as $(M_{cma}) * (r_b - r_l)$. It is assumed that all the reserves that would have been allocated to the intra-union imports are made available to be invested in longer-term assets. Namibia would

⁷³Because intra-union trade does not require foreign reserves, the monetary authorities can invest a larger proportion of reserves in longer-term assets.

maintain some rand in its foreign exchange reserve portfolio (reflecting South Africa’s importance in Namibia’s trade). However, the rand has been unstable, and it is not likely that the Bank of Namibia will hold any substantial reserves in rand-denominated assets⁷⁴.

The results are presented in Table 7.4, where it is shown that savings arising from reduced need to hold foreign exchange reserves amount to 2.4% of GDP on average. For example, the savings of \$54 million in 1993 would have been equivalent to the government’s expenditure allocation to social security and welfare (which was 2.7% of GDP in 1993/94). These benefits are further enhanced if member countries do not simultaneously incur a balance of payments deficit, and if economic shocks do not simultaneously affect them. In that case, a smaller pool of foreign reserves to support extra-union transactions may be required than if they managed their foreign exchange reserves individually, which reduces the costs associated with management of reserves.

Table 7.4: Namibia's Foreign Exchange Reserves Savings From Intra-CMA Trade

	1991	1992	1993	1994
LIBOR	8.21	5.89	3.77	3.25
Govt bond yield	11.08	9.92	9.15	7.87
Imports from CMA (£m)	862	943	1001	1129
GDP (£m)	1429	1613	1663	2116
Forex savings (£m)	25	38	54	52
Forex savings/GDP (%)	1.7	2.4	3.2	2.5

Source: Bank of Namibia, Annual Reports, various years

⁷⁴The rand has lost value against major currencies (for example, the rand’s loss against the US dollar from February 1996 to January 1997 was 25%).

The next section discusses the benefits of the dynamic nature attributed to the use of a common currency, such as fiscal discipline, increased credibility in economic policy management, price stability, reduced uncertainty in exchange rates and prices and stability in the macroeconomic environment.

7.2.3 Fiscal Discipline, Credibility, and Macroeconomic Stability

According to Corden (1995), in a situation of high capital mobility, exchange rate and monetary policies are linked so that fixing the exchange rate against a dominant currency means adopting monetary policies that are consistent with those of the country issuing the dominant currency. If this country's low-inflation policy is credible and the fixed rate also perceived as firm, the nominal anchor achieves two objectives: discipline and credibility. The exchange rate commitment disciplines the monetary authority as it allows little discretion over domestic credit creation, which in turn should condition the government's budgetary process. For this reason, pegging alone, without the support of other policy measures, will not help in gaining credibility. Credibility of the exchange rate commitment depends on the perception by economic agents that discipline will be maintained. It can be argued that this discipline, and the macroeconomic stability it engenders, should be highly beneficial for stimulating investment and attracting direct foreign investment in particular.

The loss of monetary control, however, strengthens fiscal policy, which remains in the hands of national policy makers. However, reckless fiscal policy actions by one member country may have serious union-wide implications. For these reasons, most monetary unions place

some restrictions on how far fiscal policy can be used. McKinnon (1995) argues that the mistake that the literature on international monetary cooperation makes is to treat monetary and fiscal policies as if they were separable. By so doing, the literature ignores the fiscal constraints on monetary policies and the way the nature of the monetary regime limits what fiscal authorities can do.

The restrictions on fiscal policy due to participation in a currency union are exemplified by the Maastricht Treaty. It sets reference values of 3% for fiscal deficits and 60% for the stock of government debt as entry criteria. The treaty also outlines steps to monitor member governments' fiscal performance, and sets out steps to be taken against offending governments. The justification for these measures are two-fold: to promote policy coordination and prevent excessive government borrowing which will engender inflationary pressure on the European Central Bank⁷⁵. Bailouts are possible when the central bank has the capacity to provide "lender of last resort" services. There are cases when national interests dictate use of such services⁷⁶. Proponents of the "lender of last resort" facility, argue that it encourages a government to internalise the bailout risk. In fact, they go further to suggest that external restraints on fiscal borrowing may indeed impede efforts to coordinate policies (Eichengreen and Hagen, 1996).

⁷⁵Excessive government debt will ultimately require bailing out by the ECB, thus threatening the stability of the currency union. The bail-out can be done ex post by monetizing the deficit or ex ante by maintaining policies that keep interest rates artificially low.

⁷⁶For example, suppose a government faces the prospect of defaulting on its debt service. Investors, realising this, will sell their holdings of government's debt instruments. Inevitably, interest rates on these instruments must be higher to induce the private agents to continue to hold them, as the government must roll-over the maturing debt. Higher interest rates depress equity prices and corporate profits. These may affect the performance of outstanding loans, which can destabilise the banking system. Under the circumstances the government may resort to printing money, by pressuring the central bank to purchase debt sold by private investors to prevent bond prices from falling. Such actions will prevent the collapse of equity and the banking system.

But how much capacity does government possess to undertake this function (over-borrowing)? Generally, the government can still build up substantial debt from other sources, but due to problems of moral hazard and others, the government can find themselves rationed out when its debt to GDP ratios reach alarming levels. For instance, Bayoumi, Goldstein and Woglom (1994) show that state governments in the US are rationed out of the market when their debt-to-state-product ratio exceeds 9%. Further, because of mobility of factors of production, as soon as the authorities increase the marginal tax rates, there is a possibility that the tax base will shrink as the factors shift to other jurisdictions. Also, given the union's quest to maintain the overall external payments equilibrium, which requires some degree of coordination of goals and policies, including fiscal policy, on the participating countries, it is not clear how autonomous national fiscal policy should be performed in a currency union (Ishiyama, 1975).

Notwithstanding the disadvantages associated with monetary unions, fiscal policy remains the most important instrument to deal with asymmetric shocks and regional developments within a currency union. Therefore, a prudent fiscal policy can be a potent instrument for adjusting to asymmetric shocks. As pointed out earlier, the problems of moral hazard and lack of information, which may still limit households' access to financial markets, create a role for government to arrange capital flows that private markets fail to mobilize (Atkeson and Bayoumi, 1992). Under these circumstances, the government can increase transfers to residents by running budget deficits financed externally.

According to the CMA arrangement, the Bank of Namibia can use its overdraft facility with the South African Reserve Bank to borrow reserves. The amount borrowed carry interest at market rates. Although, technically, the borrowed reserves can be availed to the government, there are strict limits on how much government deficits can be accommodated by the central bank⁷⁷. The Bank of Namibia Act of 1990 specifies that government borrowing cannot exceed 25% of its average total revenue achieved in the past three years. All these factors thus limit the financing of fiscal deficits by printing money in Namibia. Under the arrangements, the government must maintain better credit ratings, in order for it to continue to raise funds either domestically or abroad.

Reflecting these concerns and opportunities for fiscal policy, there is a need first to develop an optimal borrowing and foreign exchange reserve management strategy; and second to develop a system of intergovernmental transfers in a monetary union. The latter therefore incorporates some elements of fiscal federalism. There is no explicit mechanism for fiscal transfers within the CMA. In addition, there is no provision for policy surveillance in the member countries. That is, all the fiscal restraints, especially on the LNS countries are imposed at the discretion of each member country. Therefore, each country sets its own policy criteria that reflect their own circumstances to satisfy the fixed parity requirement. For instance, according to its statutes, the Bank of Namibia can allow some limited borrowing by the government. However, any “unbacked issues of Namibia dollar” cannot exceed the

⁷⁷BoN operates a discount window or overnight credit facility for its customers (i.e. commercial banks and the government). At the time of its inception, the maximum amount was limited to N\$20 million at a time, apportioned equally between the banks and the government. The interest charged on these loans will have to be at market rates or higher and indeed BoN overdraft rates were maintained at 2.5 percentage points above the South African Reserve Bank' lowest rediscount rate on Treasury Bills. Further, commercial banks in Namibia have so far used the credit facility for clearing purposes only, while borrowing through their parent banks in South Africa.

level of free reserves (that is, the total reserves minus Namibia dollar issued). The link between reserve management, government borrowing and adjustment to asymmetric shocks now becomes apparent. Under these circumstances, the management of reserves should incorporate a norm for dealing with external shocks. Such a strategy should give a leeway for fiscal policy to act as an instrument for adjustment.

The SACU Agreement contains elements which, if revised, could amount to fiscal transfers. According to the agreement, customs revenues collected at the port of entry into SACU area, plus excise duties and import surcharges, are paid into a common pool administered by the South African Reserve Bank. The revenues from the pool are then allocated to each member country according to a set of complicated formulae, which is supposed to reflect the member's share of imports plus the value of the production and consumption of dutiable goods. South Africa contributes about 80 per cent of the total revenue pool. However, the payouts to the BLNS countries has averaged about 32% (Imani Development, 1997). The share of revenue from the pool is computed using a set of complex formula, which is described in Appendix 3A. The BLNS share of the revenue are augmented by 42%, which is supposed to compensate the smaller countries for participating in a customs union with South Africa, which is more industrialised. In addition, the computation of revenues makes some allowances that effectively help augment the share of the BLNS countries from the revenue pool. The formula has another important feature which was designed to ensure that the share of revenues received by the BLNS countries did not fluctuate significantly. Meanwhile, the inclusion of excise duties in the formula suggests some degree of fiscal harmonisation. As shown in Table 7.5 the customs revenue contributes the major share of

total government revenue for the small SACU members (Lesotho and Swaziland). The table also highlights some indicators of fiscal conditions in the SACU area. The data show more convergence than divergence of fiscal policy within the area. The deficits are contained within single digits, and apart from Lesotho, the countries are less indebted.

Table 7.5: Fiscal Conditions in SACU Countries (averages for 1990-94) as % of GDP

	BOT	LES	NAM	RSA	SWA
Budget deficits, incl. grants	11.8	3.3	-3.5	-7.4	-3.4
Budget deficits, excl. grants	10.4	-4.1	-4.6	-7.8	-4.3
Govt expenditure	47.3	49.9	39.3	34.6	36.1
Interest payments	0.9	3.2	0.5	5.1	1.6
Govt revenue	57.7	45.7	34.7	26.8	31.9
Grants	1.4	7.4	1.1	0.4	0.9
Foreign financing	3	6.4	1.6	0.1	-0.1
SACU transfers as a share of total revenue (1994)	21.6	58.5	25	-	48.4
Debt exposure (central govt debt/total revenue)	0.25	2.15	0.46	1.77	0.76

Source: IFS, various years

7.1.4 Other Benefits

A further benefit of the CMA is the elimination of uncertainty facing producers and consumers. Intra-CMA trade patterns reveal that the LNS countries are net importers of goods and services from South Africa. With separate currencies, uncertainties faced by both South African producers as well as Namibian producers and consumers will increase. These uncertainties could, in principle, be hedged through use of appropriate financial instruments. But for these markets to develop greater regional integration is in any case required to lend

depth to the market and pool the risks involved. Furthermore, one of the primary reasons for the failure of regional integration schemes in Africa is limited trade between member countries. The primary reason for this is that usually the countries produce similar products, and even where opportunities exist for trade between the countries, they are often hampered by uncertainty of payments owing to foreign exchange scarcity. In the CMA this uncertainty is avoided since payments imbalances are all settled in the same currency. A CMA appears to be, at least in the African context, a necessary condition for greater regional integration. However, an important issue with respect to the CMA arrangement concerns the diversity of LNS countries from South Africa.

Exchange rate uncertainty introduces uncertainty about future prices of goods and services. Price uncertainty is likely to lead to an increase in risk, which will generally increase the real interest rate. Higher interest rates lead to increased problems of selecting investment projects, i.e. the problems of **moral hazard** and **adverse selection** (De Grauwe, 1994; Stiglitz and Weiss, 1981), which lead to the selection of more risky investment projects, thereby increasing the systemic risk⁷⁸. A currency union eliminates this exchange rate uncertainty so that the price mechanism serves as a better guide to make informed economic decisions.

⁷⁸Wihlborg (1994), argues that if there were a common source of increases in both the exchange rate and interest rate, then no conclusion about the contribution of exchange rate risk to total risk can be drawn. Therefore, in the long run exchange rate flexibility would not contribute to an increase in macroeconomic risk. But short-term unhedged positions would be subject to more risk under floating exchange rates.

7.3 Costs

Participation in a currency union involves some costs, associated with loss of autonomy over monetary and exchange rate policy. The costs may be higher, especially in high inflation-prone countries where seigniorage constitutes a significant source of government revenue (see Dornbusch, 1992). The nature of shocks a country experiences may also determine the degree to which a nominal exchange rate policy is used as an instrument of adjustment. Besides economic considerations, political objectives may influence a decision either to participate in a currency union or to maintain an independent currency.

7.3.1 Potential Loss of Seigniorage

Seigniorage and inflation tax make a sizable contribution to government's revenue in developing countries. This source is especially important in countries where the tax system is undeveloped (Artis, 1991) because the costs of raising revenues by taxation are far greater than the costs of raising revenues through inflation tax. By joining a currency union, the country hopes to converge to a lower inflation target. Because a lower rate of inflation reduces the demand for money, other things being equal, the country therefore, forgoes some revenue as a result of membership of the currency union.

In view of this, this section estimates potential seigniorage revenue generated in the CMA and selected comparator countries. Broadly defined, seigniorage consists of the amount of real resources appropriated by the government by means of base money creation. The

pionering work by Fisher (1982) showed that seingiorage revenue on average amounted to an equivalent of 0.5% of GDP for industrial countries. Since then, estimates of seigniorage revenue have become a routine exercise (e.g. the World Bank Development Indicators (1996) reports seigniorage revenue, measured as $\Delta M2/GDP$). Such measures based on a broader measure of money supply tend to overstate the magnitude of revenues generated through seigniorage (Adam, 1992a, 1996). The mistake that is commonly found in the literature is to treat seigniorage revenue as it is equivalent to inflation tax. Now it has become conventional to decompose seigniorage revenue into its constituent parts, namely inflation tax⁷⁹ and the real balance effect (see Adam), unless we assume steady state where changes in real money balances are zero, so that seigniorage will be equal to inflation tax. This is another reason why several of the estimates for seigniorage are not comparable because some studies tend to measure only the inflation tax. Seigniorage revenue (S), is calculated according to the following formula (from Cagan's model of money demand, see Fischer, Adam, and Obstfeld and Rogoff, 1997):

$$S = \frac{\dot{M}}{P} = \frac{\dot{M}}{M} \frac{M}{P} = \hat{M}m \tag{1}$$

where a dot (.) denotes a time derivative of the variable (such that $\dot{M} = dM/dt$) and a carat (^) denotes the rate of growth of a variable. M denotes the stock of base money, consisting of currency in the hands of the public, and the DMBs' deposits with the central bank and vault cash. P is the price level, which converts this nominal change into a flow of real

⁷⁹Inflation tax represents the capital loss that inflation inflicts on holders of real money balances.

resources to the government. $\hat{M}$ and m denote the rate of growth of base money and real money balances (M/P), respectively.

In line with public finance literature, real balances (m) represent the tax base, while $\hat{M}$ denotes the change in the rate of tax. Before we decompose the total seigniorage revenue into inflation tax ($Itax$) and the real balance effect (RBE), we show simple identities that help to simplify the presentation latter. It can be noted that $\hat{M} = (\pi + \hat{m})$ where π is the rate of inflation and $\hat{m}$ is the rate of growth in real money balances (m). By the same token, we can express $\hat{m} * m = \dot{m}$, so that the total seigniorage revenue equation [1] can be specified as:

$$S = \pi m + \dot{m} \tag{2}$$

Equation [2] shows that total seigniorage revenue now has two componets, inflation tax (πm) plus the change in the economy's real money balances ($\dot{m}$), or the real balance effect. In a growing economy, seigniorage revenue can exceed inflation tax as the government prints money to accommodate a rising demand for real transactions balances without generating inflation. Because seigniorage revenue increases as holdings of real money balances increase, which in turn, decreases with inflation, suggests that there are limits to the real resources that the government can raise through printing money (Obstfeld and Rogoff). High rates of inflation shrink the tax base as agents reduce their holdings of real money balances. Therefore, the revenue-maximising net rate of money growth depends inversely on the semi-elasticity of real balances with respect to inflation.

The reliance on issuing money as a means of financing government expenditure varies considerably across the CMA countries and the non-CMA countries (Botswana, Zimbabwe and Zambia). Estimates of total seigniorage as a percentage of GDP are shown in Table 7.6. It is noteworthy to point to the pattern of inflation across the countries. The seven countries' inflation experiences differ. The CMA countries experienced relatively similar inflation during 1980-95. Inflation in South Africa remained relatively higher throughout the 1980s, however, from 1990 the rate has been falling. This pattern is also discernible within the CMA countries. The experiences for the non-CMA countries have somewhat diverged from those of the CMA, especially from 1983. In Botswana, inflation was in single digits during 1984-88, and then assumed an upward trend in the early 1990s. In contrast, the rates of inflation for Zambia and Zimbabwe were substantially higher and more variable than for the CMA countries.

Examining the two columns containing the two components of total seigniorage in Tables 7.6a and 7.6b⁸⁰, a pattern can be established. Consistent with other studies (Adam, et al 1996), the two rates moved in opposite directions. Reflecting the rising inflation rates in the mid-1980s, the resource balance effect was generally negative, suggesting a flight from money. This is particularly evident in the case of Zambia, where the rise in inflation is reflected in huge decline in revenues generated from base money holdings. It is also interesting to observe characteristics of the decomposed components of seigniorage revenue. Generally, inflation tax rises with inflation, while the reserve balance effect moves in the

⁸⁰ For Namibia and SADC countries, respectively.

opposite direction (compare the averages for the two sub-periods 1980-87 and 1988-95 in Table 7.6).

However, for Botswana, Zambia and Zimbabwe, where inflation was still rising in the second sub-period, revenues from reserves also increased. This perhaps reflects other factors such as exchange controls. On the whole, estimates of seigniorage revenue expressed as a ratio of GDP for the seven countries are consistent with those found for comparable countries (e.g. Adam, et al. (1996). The average seigniorage revenues as a share of GDP for the period 1988-95 were as follows: Botswana (1.5%); Lesotho (1.0%); Namibia (0.69%); South Africa (0.60%); Swaziland (0.49%); Zambia (1.97%); and Zimbabwe (1.7%).

Total seigniorage revenue (as a per cent of GDP) in the CMA was significantly lower than for CMA countries. In the non-CMA countries, seigniorage revenue originated mainly from inflation tax, with the resource balance recording negative values as agents reduced their money holdings. Botswana was the odd case where both inflation tax and resource balance effects contributed nearly equal shares to total seigniorage, perhaps reflecting liquidity overhang from the diamond boom in the early 1990s.

For Namibia the introduction of the national currency in September 1993 is reflected in a huge jump in seigniorage revenue from about N\$13 million in the second quarter to N\$102 million. This jump represents a permanent shift in the mean, and it did not arise from policy actions that resulted in the increase in money supply. It represents a change in the recipient of seigniorage revenue because of substitution of Namibia dollar for rand.

Table 7.6a: Namibia: Seigniorage Revenue , Inflation Tax, and Reserve Balance Effect

	CPI	P	R	C	M	%M	m	Itax	RBE	Seig
1990-Q4	100.0	10.1	81.3	0.0	81.3	0.0	81.3	8.2		
1991-Q1	101.7	9.6	52.4	0.0	52.4	-35.5	51.5	5.0	-29.8	-24.8
1991-Q2	104.3	9.6	55.6	0.0	55.6	6.1	53.3	5.1	1.8	6.9
1991-Q3	108.5	12.1	65.3	0.0	65.3	17.4	60.2	7.3	6.9	14.1
1991-Q4	115.6	16.3	84.7	0.0	84.7	29.7	73.2	11.9	13.0	25.0
1992-Q1	121.4	19.4	69.2	0.0	69.2	-18.3	57.0	11.0	-16.2	-5.2
1992-Q2	125.6	20.4	69.8	0.0	69.8	0.9	55.6	11.4	-1.4	9.9
1992-Q3	128.6	18.5	66.5	0.0	66.5	-4.7	51.8	9.6	-3.8	5.8
1992-Q4	130.9	13.2	83.4	0.0	83.4	25.3	63.7	8.4	12.0	20.4
1993-Q1	132.6	9.3	72.1	0.0	72.1	-13.5	54.4	5.0	-9.4	-4.3
1993-Q2	136.5	8.7	84.2	0.0	84.2	16.8	61.7	5.4	7.3	12.7
1993-Q3	138.6	7.9	106.5	104.3	210.8	150.3	152.1	11.9	90.4	102.3
1993-Q4	141.8	8.4	99.5	133.8	233.3	10.6	164.5	13.8	12.4	26.2
1994-Q1	145.7	9.8	98.7	172.2	270.8	16.1	185.9	18.3	21.4	39.7
1994-Q2	149.4	9.4	98.5	193.3	291.9	7.8	195.4	18.4	9.5	27.9
1994-Q3	155.0	11.8	117.1	239.2	356.2	22.0	229.8	27.1	34.5	61.6
1994-Q4	158.6	11.9	156.2	217.4	373.6	4.9	235.5	28.0	5.7	33.6
1995-Q1	163.0	11.9	114.8	218.6	333.4	-10.8	204.5	24.3	-31.0	-6.7
1995-Q2	165.1	10.6	122.2	238.5	360.7	8.2	218.4	23.1	13.9	37.0
1995-Q3	169.5	9.4	120.5	252.3	372.8	3.4	220.0	20.6	1.5	22.1
1995-Q4	172.0	8.4	175.4	240.2	415.6	11.5	241.6	20.3	21.7	42.0

Notes:	Variable names: CPI is the consumer price index; P is the rate of inflation
	R is the commercial banks' reserves (i.e. deposits at the Bank of Namibia and vault cash)
	C is currency outside the banking system; $R+C=M$ which is the money base
	$\%M$ is the rate of growth in M ; m is the real money balances derived as $m=(M/P)*100$
	$Itax$ is inflation tax derived as $Itax=P*m$; RBE is the reserve balance effect derived as $(mt-mt-1)$.
	$Srev$ is total seigniorage revenue which is the sum of $Itax$ and RBE .

Table 7.6b: Total Seigniorage Revenue, Inflation Tax, and Reserve Balance Effect

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Average 1980-87
Botswana																	
P	13.66	16.67	11.01	10.55	8.59	8.08	9.92	9.91	8.34	11.55	11.36	11.80	16.10	14.33	10.58	10.48	11.05
Itax	0.97	0.80	0.83	0.70	0.53	0.56	0.59	0.81	0.83	1.03	0.76	0.87	1.04	0.94	0.70	0.87	0.72
RBE	-0.43	-1.67	3.05	0.17	0.18	1.21	-0.55	2.72	2.93	0.70	-1.78	1.25	-0.50	0.12	0.27	1.93	0.58
Srev	0.54	-0.87	3.88	0.87	0.71	1.77	0.04	3.53	3.76	1.73	-1.02	2.12	0.53	1.06	0.97	2.81	1.31
Lesotho																	
P	15.38	12.63	11.84	17.55	11.14	13.22	18.08	11.80	11.41	14.72	11.61	17.70	17.16	13.13	8.27	9.24	13.96
Itax	6.14	3.65	2.97	5.26	2.73	3.36	4.49	2.57	2.46	2.13	1.23	1.44	0.81	0.63	0.36	-	3.13
RBE	32.18	-4.14	1.30	7.33	-0.73	3.74	1.58	0.89	5.80	-3.39	-2.36	-0.15	-2.40	0.52	-0.16	-	1.25
Srev	38.31	-0.49	4.27	12.59	2.00	7.10	6.07	3.46	8.25	-1.26	-1.13	1.29	-1.59	1.15	0.20	-	4.37
Namibia																	
P	12.21	15.61	14.81	9.62	9.82	15.22	11.92	11.16	15.53	13.87	10.14	18.10	10.82	9.74	11.26	7.91	12.55
Itax	-	-	-	-	-	-	-	-	-	-	-	0.21	0.10	0.24	0.37	0.26	-
RBE	-	-	-	-	-	-	-	-	-	-	-	-0.15	-0.12	1.47	1.00	0.10	-
Srev	-	-	-	-	-	-	-	-	-	-	-	0.05	-0.02	1.71	1.37	0.35	-
South Africa																	
P	13.84	15.29	14.63	12.17	11.64	16.11	18.78	15.98	12.89	14.70	14.42	15.30	13.88	9.75	9.02	8.53	14.80
Itax	1.01	1.09	0.90	0.71	0.64	0.87	1.02	0.86	0.65	0.78	0.70	0.69	0.62	0.38	0.39	0.43	0.89
RBE	2.21	0.14	-1.00	-0.37	-0.11	-0.14	0.06	0.01	-0.10	0.40	-0.46	-0.39	-0.18	-0.49	0.50	0.87	0.10
Srev	3.22	1.23	-0.10	0.34	0.52	0.73	1.09	0.87	0.55	1.18	0.24	0.30	0.44	-0.11	0.89	1.30	0.99
Swaziland																	
P	18.33	20.07	10.85	11.64	13.03	20.34	13.76	13.32	12.43	8.29	10.99	10.80	8.21	17.01	14.33	14.71	15.17
Itax	3.26	2.29	1.34	1.66	2.15	2.88	2.54	1.96	1.36	0.91	0.89	0.77	0.81	1.33	1.08	0.99	2.26
RBE	1.62	-5.26	1.11	2.07	3.02	-1.71	5.88	-1.44	-2.81	0.98	-2.00	-0.84	2.90	-1.78	-0.03	-0.60	0.66
Srev	4.88	-2.98	2.45	3.73	5.17	1.17	8.42	0.52	-1.44	1.89	-1.11	-0.08	3.71	-0.46	1.05	0.39	2.92
Zambia																	
P	33.33	12.50	11.11	20.00	22.22	40.91	56.45	47.42	51.05	123.61	107.04	93.20	168.74	188.41	53.63	34.19	30.49
Itax	8.15	3.03	3.16	4.48	8.02	6.26	8.47	7.48	7.61	7.13	5.89	5.93	2.26	3.31	2.13	0.89	6.13
RBE	0.00	-3.41	3.51	-5.37	17.16	-21.85	2.05	0.40	0.65	-9.86	-1.59	0.90	-8.91	1.70	0.55	-2.87	-0.94
Srev	8.15	-0.38	6.68	-0.90	25.19	-15.59	10.52	7.88	8.27	-2.72	4.30	6.83	-6.65	5.01	2.68	-1.98	5.19
Zimbabwe																	
P	5.43	13.24	10.39	23.24	20.29	8.33	14.47	12.48	7.40	12.85	17.37	23.30	42.09	27.63	22.23	22.61	13.48
Itax	0.45	1.14	0.96	1.75	1.43	0.63	0.89	0.80	0.53	0.89	1.28	1.91	3.00	1.85	1.69	1.51	1.01
RBE	2.18	1.20	0.83	-1.58	-0.64	0.94	-1.34	0.70	1.23	0.57	0.38	0.61	-1.66	-0.15	1.26	-1.16	0.29
Srev	2.64	2.34	1.79	0.17	0.78	1.57	-0.45	1.50	1.76	1.46	1.66	2.52	1.34	1.69	2.95	0.35	1.29

Notes:	Variable names: CPI is the consumer price index; P is the rate of inflation
	R is the commercial banks' reserves (i.e. deposits at the Bank of Namibia and vault cash)

To the extent that integration forces some countries to converge to lower rates of inflation than the optimal rates that maximize their revenues, there are costs. The implications of these are that countries may increase their debt more than would otherwise be the case. Alternatively, they may be forced to cut back on expenditure. Because investment expenditure is generally the easiest to obtain a compromise on cuts, then it is logical to argue that the reduction in inflation tax may negatively affect public investment. For these reasons, the potential losses entailed by converging to lower inflation must be taken seriously. In the case of those countries, intending to join a currency union, alternative means of financing have to be arranged to help them adjust to the new regime. Potential resources foregone from seigniorage revenue can be put in terms of a counterfactual. The underlying message from both theoretical literature and empirical evidence is that open economies like Namibia have limited prospects in exploiting this resource. For example, Romer (1993) has shown that in open economies equilibrium inflation is lower (see Chapter 3). Further, the issues of credibility and time consistency in monetary policy suggest that irrespective of the potential resources that can be obtained by instituting inflation surprises, the authorities cannot cheat the public forever.

7.3.2 External Shocks to the Namibian Economy

The purpose of this section is to assess the nature, frequency and size of external shocks to the Namibian economy and to assess whether the shocks are symmetric or asymmetric with respect to South Africa, in particular and the Southern African sub-region in general. The

larger the shocks that affect Namibia, and the extent to which the shocks are asymmetric to the region may suggest that membership of the CMA may be costly. It is especially important in the context of an irrevocably fixed exchange rate to assess the costs arising from not adjusting the nominal exchange rate in response to external shocks.

The Namibian economy is highly open, which renders the country particularly susceptible to external shocks. The role of external shocks, and particularly how much of a country's economic performance is affected by these shocks and to what extent such effects dominate policy formulation, have occupied a central place in policy debates in recent years (McCarthy et al. 1994). The main issue is how a country can reduce its vulnerability to such shocks, especially regarding appropriate policy responses, and the timeliness and form of such responses. In Africa, the possible role of exchange rate policy, and the consequences of its loss as an instrument, might be explained concerning the experiences of the CFA-zone countries.

Devarajan et al. (1987) found that before 1980 the CFA-zone countries grew faster than the rest of Africa. However, during the 1980s, in the face of increasing shocks, their performance worsened. In addition, using a gravity model, Elbadawi (1995) found that trade diversion resulted since mid-1986 due to the monetary union of these countries. Fielding (1994a) points to asymmetric shocks and the resulting fiscal responses as a possible cause for this.

a) Taxonomy of External Shocks

The major adverse developments affecting the Namibian economy during 1980-1995 include: (1) recession in industrial countries affecting the demand for Namibian exports; (2) adverse weather conditions; and (3) the volatile situation in South Africa. Export receipts in real terms for diamonds, uranium, other minerals and livestock had witnessed significant declines in the early 1980s. Export receipts from diamonds, especially, showed a dramatic fall from a peak of \$1777 million in 1980 to \$327 million in 1994. Droughts also affected the performance of the agricultural sector during 1981-85 and 1991-92. As a result agricultural incomes and exports declined during the period.

The impact of trade and financial sanctions imposed on South Africa in 1986 negatively affected sales contracts for Namibia's uranium. During 1980-84, uranium partially offset the fall in diamonds, but since 1986 its significance has diminished. Owing largely to sanctions, Namibia could not renew its long-term sales contracts for uranium. In 1990 when the sanctions were lifted on Namibia, uranium spot prices were depressed due to the glut in the market caused by sales of uranium from the former Eastern Bloc. The effects of the above described external shocks can be decomposed into their effects on the terms of trade, export prices, import prices, and export volumes. This will be the subject of the next section.

b) Measurement of External Shocks: Choice of Methodology

Small open economies (SOEs) like Namibia experience serious macroeconomic adjustment problems due to their exposure to the world economy. Despite repeated occurrence of shocks, however, sometimes institutional constraints make it difficult for SOEs to mitigate the effects of such shocks. In some cases the policy responses may themselves become a source of disturbances (FitzGerald, 1996). In this respect, any attempt to examine the determinants of changes in the current account balances should distinguish between external shocks and domestic policy responses to the shocks.

The Namibian economy suffered a series of shocks during 1980-95. In the context of CMA and SACU, important policy instruments (such as exchange rate and commercial policy) are not readily available to the Namibian authorities. The reason to exercise discretion over the use of these policy instruments is to mitigate the effects of external shocks. Following a negative shock, for example, a real exchange rate is required to restore internal and external balance. However, the required real depreciation could also be achieved through a contraction of aggregate demand, which eventually results in the decline of nominal wages and prices of non-tradables. But this may prolong the process of adjustment. It is the concern about the slow speed of the adjustment process (i.e. if the economy were left to its own devices) or doubts about the efficacy of other deflationary instruments to engender the real exchange rate depreciation, that bring to the fore the issue of the nominal exchange rate as an instrument of adjustment. In the long-run the two policies lead to the same effect on output and trade balance. But the short-run dynamics are, however, different. With a nominal devaluation, the country avoids the severe deflationary effects on domestic output during the transition, although inevitably with higher inflation. Whereas with expenditure-reducing policies,

inflation is avoided but output declines during the transition. Because of the assumption of downward rigidity in nominal wages, nominal devaluation helps the system to move to a new wage structure that is acceptable in the labour market. But when there is real wage rigidity, the nominal wage rises so that the desired devaluation is not achieved, instead it generates more inflation (see De Grauwe, 1994).

To the extent there is some rigidity in the domestic economy, the nominal exchange rate is needed to speed up the process of adjustment and therefore lessen the costs of external shocks on the economy. It is in this context, that the nominal exchange rate is needed to speed up the process of adjustment and therefore lessen the costs of external shocks on the economy. However, the issue is whether devaluation will succeed in changing relative prices more than it generates domestic inflation (the speed of pass-through was the subject of the last chapter).

To assess the costs to Namibia of foregoing the discretion to use the exchange rate as a policy instrument, it is important to measure the size and frequency of external shocks to the Namibian economy. In this context, this section will seek not only to measure the size of external shocks to the Namibian economy, but (in line with the OCA criteria) will also assess whether the shocks are symmetric or asymmetric with respect to South Africa.

The literature is replete with models that measure and decompose external shocks, ranging from those using few variables to more sophisticated CGE models. The standard method that attempts to measure external shocks and to assess the pattern of domestic responses to the shocks was originally established by Balassa (1981). The Balassa method distinguishes

several elements of exogenous shocks: (1) deterioration in the terms of trade; (2) retardation of world trade⁸¹; (3) a rise in interest rates; and (4) cumulative debt arising from the need to finance the balance of payments deficit in response to external shocks and changes in direct investment income, remittances and unrequited transfers. In the context of SOEs, domestic policy reactions include substitution measures to reduce the effects of external shocks on the balance of payments and reduction of consumption and investment. Whereas policies designed to increase the production capacity of exports could be best regarded as long-run measures. The Balassa methodology⁸² is essentially an accounting procedure that centres on the balance of payments identity (see Appendix 7A).

Following this approach the effects of external shocks and performance measures on the balance of payments were estimated for Namibia. The measurements provide an opportunity to assess the magnitude of the effects of external shocks, and the policy response measures to them, on the economy. The external shocks were decomposed to assess the effect of the quantity and price components, separately. Import and export values gained or lost by the country as a consequence of deterioration in the terms of trade were derived.

⁸¹Although the world volume effect is inconsistent with the assumption of a small country, whereby the external terms of trade are exogenous, Balassa assumed a counterfactual, whereby a small country maintains its share of world export markets. In other words, he considers the situation that will prevail in the absence of external shocks.

⁸²Although there have been several revisions to the original Balassa methodology (see Helleiner and FitzGerald, 1997), an attempt to link it to conventional international trade theory is provided by McCarthy et al. (1994). The theoretical model is provided in Neary (1993), which draws on the theory of distortions and welfare, and in particular on its applications to the Dutch Disease.

c) Total Shocks

In the period from 1981 to 1994, the cumulative net loss in income due to total shocks amounted to an average of 2.1% of GDP. Table 7.7 presents results for four sub-periods (1981-83; 1984-86; 1987-89; and 1990-94). The results reveal that Namibia experienced unfavourable external shocks during 1981-83. The total effect of these shocks on the current account amounted to an equivalent of 8% of the country’s GDP. However, in the subsequent three periods, the external environment improved significantly (as indicated by a favourable outturn of the country’s external position). Notably, there was a marked improvement during the 1987-89 period as the recovery in diamond prices consolidated. However, the momentum witnessed in the period 1985-89 was somewhat dampened in the 1990s by low spot prices for uranium and other base metals, and an imposition of a quota on diamonds.

Table 7.7: External Shocks and Response Measures (as % of GDP)

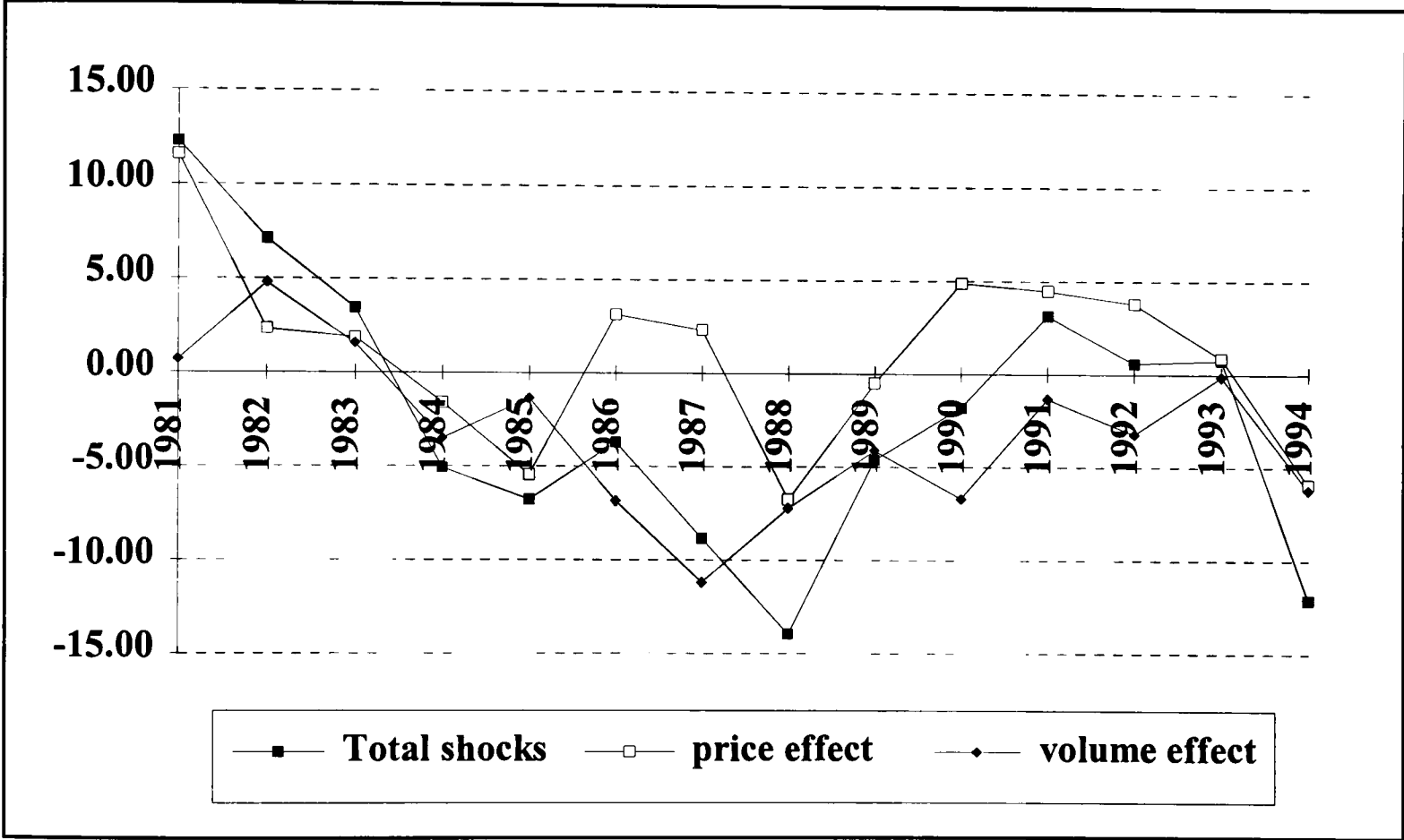
	1981-83	1984-86	1987-89	1990-94
External Shocks⁸³				
Total shocks due to:	7.6	-5.2	-9.1	-3.1
Deterioration of terms of trade	5.3	-1.3	-1.6	2.7
Export price	-5.5	-4.8	5.2	0.2
Import price	-0.2	-6.1	3.6	2.9
Retardation in world trade	2.3	-3.9	-7.5	-5.8
Performance Measures				
Export quantity response	-13.1	-12.9	-6.9	-2.8
Reduction in imports due to:				
Import replacement	1.0	-1.2	-0.8	0.9
Economic compression	10.7	18.0	2.2	1.5

Sources: Bank of Namibia Annual Reports, and Statistical Abstract, CSO, 1996

⁸³A positive value for total shocks represents an unfavourable shock, and vice versa.

During 1981-83 the loss in export values due to export volume shortfalls amounted to 2.3% of GDP. Overall, the variation in export volumes owing to fluctuations in world demand resulted in a gain of income equivalent to 4%, 8% and 6% of GDP, in the three subsequent respective periods (as shown in Table 7.7). As the result of the improvement in the world economic activity the sales quota on diamonds was lifted in 1986. Over the 14-year period the total external shocks fluctuated significantly as shown in Figure 7.1.

Figure 7.1: Total Shocks as % of GDP



d) Export and Import Prices

After a slump in 1981, export earnings recovered remarkably, rising by an average of 5% of GDP from 1986 to 1987. The income loss owing to the deterioration in export unit price amounted to 5.5% and 4.8% of GDP during 1981-83 and 1984-86, respectively. Export unit values fell in 1990 and 1992 in response to the decline in uranium prices, other minerals and karakul pelts. A

combination of factors contributed to a rise in import unit prices: the drought leading to higher import prices; and the imposition of import surcharges and the upward revision of import quotas in 1988 and 1989 by the South African authorities. Accordingly, the income loss due to unfavourable import prices amounted to 3.6% and 2.9% of GDP during 1987-89 and 1990-94, respectively. The sharp depreciation of the rand in 1985 further aggravated the inflationary impulses in South Africa, and import prices rose sharply from 1986 to 1991. Inflation in South Africa as measured by the consumer price index peaked at 18.5% in 1985, after having averaged 13.4% in 1981-84. However, since 1992 inflation in South Africa has moderated significantly, with the CPI standing at 9.7% in 1993.

e) Performance Response Measures

When an economy experiences a disturbance leading to a disequilibrium (more so if the shock is judged to be permanent) in the balance of payments, policy makers may react in many ways. At their disposal, policy makers can employ any of the following policy instruments: fiscal policy; monetary policy or the exchange rate policy; and trade policy. In this exercise, policy instruments are not analysed directly, but rather the evolution of performance measures undertaken in response to the adverse external shocks is examined. The performance measures analysed include: i) increase in export quantities; ii) import substitution measures, resulting in import replacement; iii) and lower GDP growth due to the contraction in imports of capital.

An important issue regarding adjustment to external shocks is whether Namibia faces a soft external budget constraint because of capital flows within the CMA. To an extent that imports

are denominated in rand, which is regarded as both a domestic and foreign currency, the foreign exchange constraint needs to be put into context. Further, the fact that Namibia has access to the South African money and capital markets also suggest that Namibia probably faces a somewhat soft external budget constraint. However, in practice, the situation is not clear cut. The CMA specifies conditions under which borrowing by the government or the central bank of the BLNS countries could be permitted. In turn, the government of Namibia does not have access to the South African Treasury or the South African Reserve Bank (SARB). For technical purposes, the LNS central banks do have credit lines with SARB. Therefore, consolidating the accounts of the public sector, which includes the central bank, then it may be true that the government of Namibia through its central bank can have recourse to the SARB. However, the operations of the CMA are clearly different from that of the CFA zone, for which the anchor country provides access to the two regional central banks.

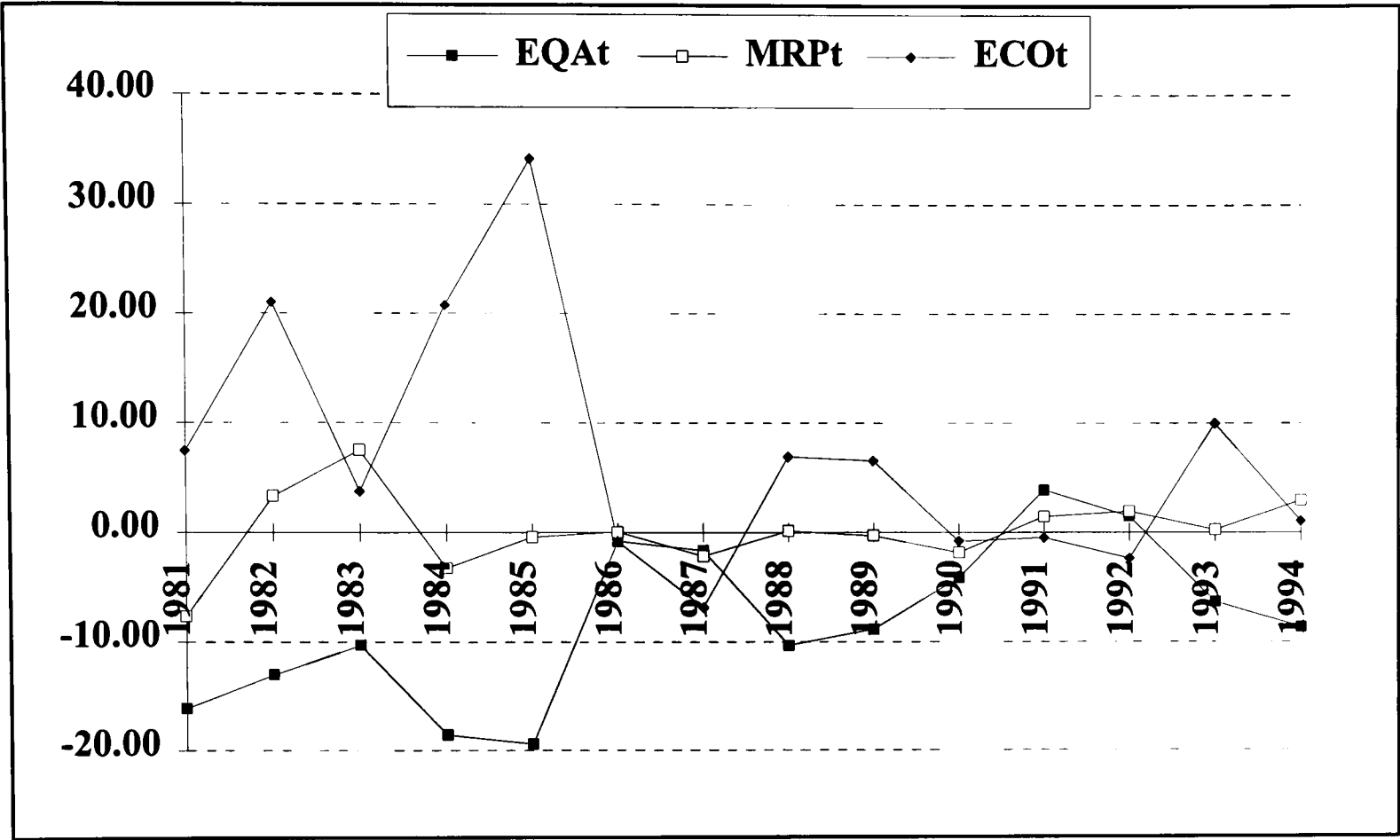
i) Export Quantity Adjustment (EQA)

From the SOE's point of view, this indicator provides a measure of export adjustment by a country, assuming that prices had not changed from the previous year's. Faced with disequilibrium in external balance owing to the slump in commodity prices, one of the responses is to expand sales or exports to the world markets in order to maintain the same levels of export revenues. Thus, a positive value for EQA as shown in Figure 7.2 indicates a gain in Namibia's exports. According to this index, Namibia's export quantity adjustment was slow, as evidenced by the negative value of EQA during 1981-1994, which amounted to an average loss of 8% of

GDP. However, it is important to make note of the extent to which the imposition of the quota on diamonds influenced the adjustment.

The loss due to failure to adjust export quantities occurred largely in major export commodities. As reflected earlier, Namibia's capacity to expand exports of its principal commodities was hampered by the several factors, mainly the quota constraints on diamonds sales, the drought, and to some extent the loss of market for Namibian products due to sanctions. The momentum in export gains recorded during 1986 and 1987 following the lifting of the diamond quota, the end of the drought and the sharp exchange rate depreciation was offset by the loss of uranium market share from 1988. Meanwhile, the increasing difficulties in penetrating foreign markets frustrated the efforts to increase exports of manufactured exports which reacted positively to the exchange rate depreciation. Also because of the prolonged period of slack in investment in mining technology and exploration, internal production shocks aggravated the external shocks, thus having adverse consequences on economic growth in the latter part of the decade. The increased diamond sales raised the value of EQA, but this could not be sustained due to the imposition of a sales quota on diamonds in 1993.

Figure 7.2: Performance Response Measures



(ii) Import Intensity (Replacement)

The import intensity index measures the change in imports due to the change in import elasticity, assuming no change in the GDP growth rate. Effectively, the import intensity indicator measures the savings in imports associated with a decrease in the income elasticity of imports as compared with a trend growth of imports. If import intensity takes place, the country's imports would be higher than expected, and therefore, the import intensity measure will be negative. The rising trend in imports owing to import of capital equipments, associated with the windfall gains in exports (diamonds and uranium) of the late 1970s, was reversed in the early 1980s. As exports lost momentum import absorption was curtailed significantly, as witnessed by positive MRP values in Figure 7.2. Responding to the high growth in exports and a pick-up in economic activity in 1986, 1987 and 1990, import use intensified, as witnessed by negative import substitution equivalent to 3.3%, 2.2% and 1.8% of GDP, respectively. The trade and financial

sanctions which put further constraints on foreign exchange reserves, prompted the authorities to apply additional policy measures to suppress import demand. This, in turn, led to the intensification of import substitution, further aggravating the adverse effects of protection on the efficiency of investments. The policy of import substitution further contributed to substitution of high value imports of machinery and equipment for consumption goods.

(iii) Economic Compression

Economic compression measures the effect on imports due to a slowdown or contraction in the domestic economic activity. The elasticity of imports with respect to GDP is assumed to remain unchanged. Specially, this indicator shows that the combined effects of global recession in the early part of the decade, droughts and sanctions may have contributed to the contraction in economic activity from 1981 through 1985. Reflecting the expansion in economic activity in 1987 and from 1990-92, the economic compression indicator improves as indicated in Figure 7.2⁸⁴.

f) Policy Responses

There were no immediate policy measures undertaken in response to the series of shocks discussed in the text. There was evidently a lack of coherent strategy to gain access to new export markets, while imports, especially of plant and machinery were curtailed as demonstrated by the performance of the MRP and ECO in Figure 7.2. Specially, the decline in gross fixed

⁸⁴When economic compression intensifies, the ECO value will be positive, suggesting that the economy is performing below its long-term trend growth.

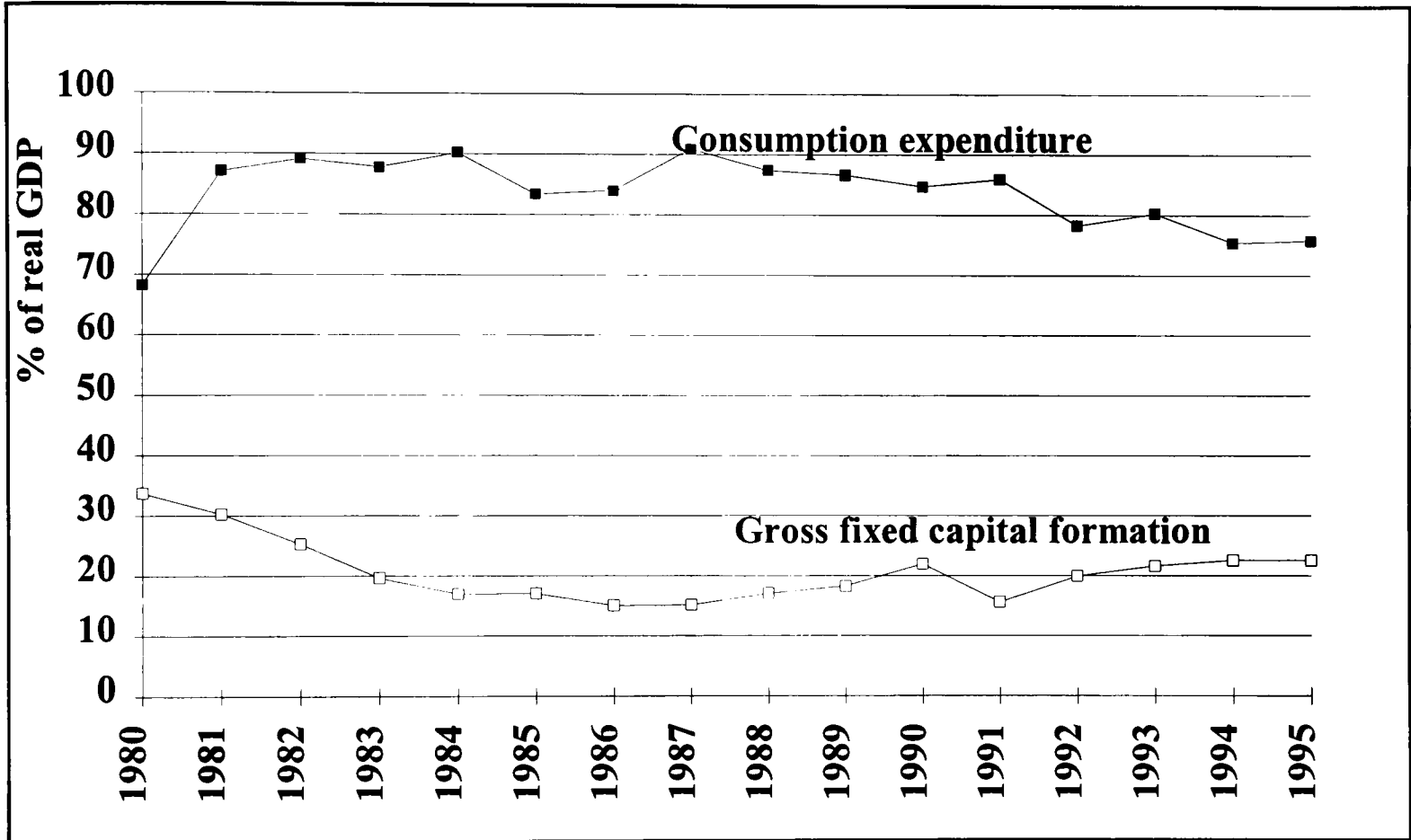
investment may have contributed significantly to the gradual decline in economic activity during the 1980s.

Following the debt crisis in 1985 and the subsequent imposition of trade and financial sanctions in 1986, several policy measures were taken by the South African authorities. These included the reintroduction of the financial rand in 1985, the tightening of domestic credit conditions, import surcharges and further increases in import quotas in 1988 and 1989. However, by then economic conditions in Namibia necessitated different policy responses. Diamond market conditions had improved and the sales quota was lifted, while the agricultural sector recovery was strengthening. The excessive restraints as necessitated by the policy stance in South Africa were not appropriate in aiding the nascent economic recovery in Namibia. Thus the tight monetary and fiscal policy stance was not the appropriate policy response to the problems that the Namibian economy was facing at the time.

Across the CMA, the experiences of Lesotho and Swaziland in 1985 demonstrate the potential problems inherent in a hegemonic monetary system. The two countries incurred capital losses in their holdings of foreign exchange reserves, which were then tied up in rand, and also saw their extra-union foreign debt, in terms of local currency, soaring. Thus, the two countries suffered the consequences of policies in South Africa. However, lessons from these episodes were soon translated into policy measures to ensure that small countries are somewhat shielded from such spill-over effects originating from the anchor country.

The preceding section presented the taxonomy of shocks that affect the Namibian economy; and measured the magnitude of those shocks by decomposing the terms of trade; measured and discussed the effects of policy responses to mitigate the effects of shocks. Unfavourable terms of trade shocks amounting to a loss of 8% of GDP were recorded during 1981-83. It appears that the responses included cuts in absorption, mainly investment, whose share in GDP in real terms fell from 34% in 1980 to 15% in 1986 (as shown in Figure 7.3).

Figure 7.3: Gross Domestic Expenditure at Constant 1990 Prices



Source: Statistical Abstract, 1996

The identification and quantification of the effects of favourable and unfavourable terms of trade was useful in highlighting the desirability of the exchange rate policy as an instrument of adjustment, for example. However, to contemplate the analysis of whether the lack of the exchange rate policy instrument hampered adjustment, it is important to enquire as to whether those disturbances were specific to Namibia or affected the region as a whole. The following

section examines the symmetry of disturbances to the SADC countries. Namibia participates in several regional integration schemes, including CMA, SACU and SADC.

g) Symmetry of Shocks to the Region

One of the key tenets of the OCA theory is that adjustment costs are a function of the symmetry of disturbances. Therefore, assessing the degree to which disturbances to the region are symmetric, the costs of CMA to Namibia can be known. If shocks to the region were asymmetric, the costs of adjustment may be high, especially in the absence of labour mobility and fiscal transfers⁸⁵. Regional integration in the Southern African context implicitly implies convergence to the dominant economy in the region, that is, South Africa. Therefore, it may be useful to test the bilateral symmetry of each of the countries with South Africa. The South African economy also experienced a series of shocks emanating from the following sources during the 1980s: gold price shocks; political instability and the imposition of trade and financial sanctions in 1986; and droughts.

The literature distinguishes at least two approaches for identifying disturbances to the economy and to assess how those disturbances are correlated across countries. The common approach examines the correlations across countries of output movements. Countries whose GDPs tended to move together are said to experience relatively symmetrical disturbances, and vice versa (Cohen and Wyplosz, 1989). A related approach employs a simple VAR model by regressing the variable on its lagged values and then comparing the correlations of the residuals (see Caporale,

⁸⁵Such effects may deter deeper integration as the countries seek to regain some policy instruments, and it is now recognised that policy responses may themselves be a source of shocks.

1993). However, there are caveats with these approaches. According to Bayoumi (1996), the observed output movements may reflect the influence of both disturbances and responses. In this case, even though two countries' disturbances may be highly correlated, their output may show lower correlation as a result of different responses. Bayoumi also takes issue with the latter approach arguing that the estimated residuals do not disentangle aggregate demand disturbances from aggregate supply disturbances, which have permanent output effects. The former, which may be associated with policy, have only temporary effects on output. Therefore, it is important to distinguish the two types of disturbances. To distinguish between the two sources of disturbances, the popular approach has been the Nelson-Beveridge decomposition (1980) or the Blanchard and Quah (1989) decomposition exercise (see Bayoumi and Eichengreen, 1993, 1994 and 1996).

Despite several approaches being used to identify the symmetry of shocks, especially in the context of the EMU, the models yield conflicting results with respect to identifying the same core EU countries suited for monetary integration (Bayoumi elaborates on the results). However, irrespective of the sophistication of the model, many studies are able to identify the core-periphery within the EU in general.

The last part of the section develops simple autoregressive (AR) and autoregressive distributed lag (ADL) models to test the symmetry of shocks in the Southern African region. To measure the symmetry of shocks, we use a three-step process. First, AR and ADL models were developed

and estimated to derive residuals⁸⁶. The AR(k) model for the rate of GDP growth denoted by Δy_t is specified below:

$$\Delta y_t = \alpha + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \dots + \beta_k \Delta y_{t-k} + \epsilon_t \tag{1}$$

The second specification seeks to test the impact of changes in real exports on real GDP growth. The ADL model is specified as follows:

$$\Delta y_t = \alpha + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \dots + \beta_k \Delta y_{t-k} + \gamma_1 \Delta x_t + \gamma_2 \Delta x_{t-1} + \gamma_3 \Delta y_{x-2} + \dots + \gamma_k \Delta y_{x-k} + \epsilon_t \tag{2}$$

where Δx_t is the rate of growth of exports. The residuals from equations [1] and [2], ϵ_1 and ϵ_2 , are interpreted as “shocks” to GDP growth, i.e. the unanticipated component of the change in GDP. The third step performs correlation tests to measure the degree of association among the shocks. Unit root tests showed that the growth rates of real GDP and real exports (Δy_t and Δx_t) are $I(0)$. The results of the estimation of the univariate and bivariate models are presented in Table 7.8. Tests for mis-specification and goodness of fit are also presented. The F-tests show that the level of significance for the models ranges from 5% to 25%, while the R^2 shows that the models account for at least 30 per cent of the variation in the left-hand-side variables. The Schwartz criterion (SC) test is reported, and minimising this was the basis on which the lag length was chosen. The results include only a selected estimations, which were significant.

⁸⁶Ideally, we could use a SURE estimator, but we decided not to do so, as the objective was simply to see if there is correlation between equation residuals rather than to use this correlation to produce most efficient estimates of parameters of the AR/ADL models.

Table 7.8: AR and ADL models

Botswana DY=-2.702 - 0.406 DY_1 - 0.418 DY_2 - 0.124 DX_1 - 0.106 DX_2 :R ² = 0.34; F(4, 15) = 1.95 [0.1552]; SC = 6.50 (-0.6) (-1.6) (-1.6) (-0.6) (-0.5)
Lesotho DY= 4.1 - 0.28DY_1 - 0.54DY_2 + 0.09DY_3 -0.06X_1 + 0.10X_2 -0.39X_3 :R ² = 0.54; F(6, 13) = 2.6 [0.07]; SC = 6.3 (0.9) (-1.0) (-2.4) (0.4) (-0.4) (0.7) (-3.1)
Namibia DY=-0.01 - 0.54 DY_1 - 1.20 DY_2 - 0.44 DY_3 + 0.29 DX_1 + 0.48 DX_2 + 0.56 DX_3 (-0.01) (-1.8) (-4.2) (-1.6) (1.5) (2.2) (3.2) R ² = 0.66; F(6, 14) = 4.57 [0.009]; SC = 5.9
South Africa DY=-1.118 - 0.175 DY_1 - 0.599 DY_2 - 0.063 DX_1 + 0.107 DX_2 :R ² = 0.34; F(4, 17) =2.33 [0.09]; SC = 6.1 (-0.3) (-0.7) (-2.3) (-0.2) (0.4)
Swaziland DY=-1.012 -+0.001 DY_1 - 0.630 DY_2 - 0.086 DX_1 + 0.170 DX_2 :R ² = 0.42; F(4, 17) =3.08 [0.04]; SC = 6.1 (-0.3) (0.004) (-2.2) (-0.4) (0.9)
Mauritius DY= 4..002 - 0.307 DY_1 - 0.285 DX_1 :R ² = 0.26; F(2, 20) = 3.4342 [0.0522];SC = 5.6 (1.2) (-1.6) (-2.1)
Mozambique DY= -4.514 - 0.007 DY_1 - 0.851 DX_1 :R ² = 0.26; F(2, 12) = 2.1133 [0.1636]; SC = 7.2 (-0.6) (-0.03) (-2.0)
Zambia DY= -6.509 - 0.425 DY_1 - 0.582 DY_2 - 0.143 DY_3 - 0.377 DY_4 :R ² = 0.32; F(4, 15) = 1.7 [0.19]; SC = 8.2 (-0.6) (-1.7) (-2.1) (-0.4) (-1.2)
Zimbabwe DY=-2.602 + 0.027 DY_1 + 0.039 DY_2 + 0.248 DX_1 - 0.318 DX_2 :R ² = 0.48; F(4, 13) = 2.9 [0.0616]; SC = 6.2 (-0.6) (0.9) (2.0) (1.4) (-1.7)

The data covers the period 1970-95, and the source is the IFS (exports and real GDP, all expressed in US dollar). Table 7.9 shows the correlations of the residuals from each country’s regression using equations [1] and [2] and that for South Africa and country j. The hypothesis is $\rho_{sj}=0$, that is, the sample residual correlation coefficient between country j and South Africa is zero. The alternative hypothesis is $\rho_{sj}\neq 0$. Acceptance of the test (when $F_c\leq F$ -tabulated), shows that the two residuals are not correlated.

Table 7.9: Correlations of Real GDP “Shocks” Between South Africa and SADC Countries

	From equation 2		From equation 1	
	ρ	F_c	ρ	F_c
Botswana	0.75	21.9	0.74	20.6
Lesotho	0.67	13.8	0.88	58.4
Namibia	0.71	18.3	0.94	136.6
Swaziland	0.65	13.9	0.73	21.7
Non-SACU				
Mauritius	0.35	4.3	0.42	4.3
Mozambique	0.23	0.7	---	0.0
Zambia	0.21	0.8	0.19	0.6
Zimbabwe	0.31	1.6	0.37	2.4

Data sources: IFS, various years. Notes: $F_{(1,28)}$: 1%=7.64; 5%=4.2; $F_c=(n-2)\rho^2/(1-\rho^2)$

The calculated F-tests are also provided to measure the significance of that correlation. The results reveal strong positive correlations between real GDP “shocks” in South Africa and SACU countries. For non-SACU countries, the results show that Mauritius is closely associated with developments in South Africa. In contrast, the results show that real GDP shocks in South Africa are not correlated with those of Mozambique, Zambia and Zimbabwe.

The implication of the results is that the economies of the SACU countries experience symmetric shocks, as evidenced by the strong correlation of real GDP “shocks” with that of South Africa. Similarly, it can be said that their exports also experience symmetric shocks, even though the magnitude of those shocks may differ somewhat. On the basis of the results, it is possible to rank the SACU countries in order of integration with the South African economy (that is, the degree to which the pairs of variables considered are correlated with those of South Africa). The order, from highest to the lowest is as follows: Namibia, Lesotho, Swaziland and Botswana. The results are not surprising, given the historical and institutional set-up of the region. Namibia became a de facto fifth province of South Africa from 1915, and integration between the countries deepened.

7.3.3 Other costs

Another cost associated with a currency union is the possible deterioration of regional economies. It is argued that because of the relative ease of capital compared with labour migration, monetary integration is likely to result in acceleration of economic distress and stagnation of certain regions or countries. This stems from the fact that fast-growing regions tend to attract capital because of their lower unit costs relative to the slow-growth regions (see Kaldor, 1971). Taking cognisance of this, most regional integration schemes have mechanisms to address regional disparities. By this token, Masson and Taylor (1993) maintain that economic development of poorer countries and regions is a desirable feature of any monetary system, and it is thus important to question whether a currency union assists in the convergence of per capita income among the constituent parts. A supranational fiscal transfer system may be desirable in the CMA to mitigate regional distress. However, such schemes already exist within SACU, e.g. transfers from South Africa to other members under enhanced customs revenue formulae (see, Jenkins and Thomas, 1997).

It is important to quantify the long-term effects in the current context specifically to determine the degree of convergence between economic growth in South Africa and Namibia. Such considerations are important because income levels in the LNS countries lag far behind that in South Africa. Jenkins and Thomas performed estimates of convergence/divergence between members of SADC. Their findings show significant per capita income disparities across SADC countries. The possible reasons for this could be that initially there was little trade between the

member countries, except for a small bloc, which includes SACU. Evidently, the results for a sample that includes only SACU countries show that there has been a degree of convergence between the countries. Poorer members of the group (Lesotho and Botswana) at the start of the period (1960) posted substantially higher growth performance (4.8% and 5.5%, respectively) than the relatively richer members at the time (Namibia, South Africa and Swaziland). As a group, the SACU countries have been diverging from the rest of the SADC countries (Mauritius, which opened its trade in the 1970s, being the only exception).

Other studies for the EC countries also reach similar conclusions that freer trade enhances per capita growth rates. Loewy and Papell (1996) presents evidence to show that reducing trade barriers can raise steady-state growth rates of participating countries. They look at per capita income growth performance of the six original members of the EEC between 1870 and the post WWII periods. The latter period is characterised by a significant reduction in income disparities between the countries⁸⁷. They attribute this result to the increase in trade between the member countries. Free trade increases diffusion of knowledge accumulated by each country. Further, they argue that the extent to which domestic goods are exposed to foreign trade affects the extent of knowledge spillovers across countries.

7.4 Summary and Conclusions

The chapter provided empirical evidence consistent with the issues raised in the review of OCA theory. Empirical tests were performed to measure the benefits arising from savings on

⁸⁷Trade reforms allow the countries that are relatively poor to overtake and surpass the wealthier ones.

transactions costs of currency conversion and savings arising from the need to hold foreign exchange reserves in short-term instruments with lower yields. In terms of costs of the CMA, empirical tests included estimates of seigniorage revenue, the income loss arising from terms of trade shocks and symmetry of shocks. The net benefits from elimination of transactions costs was estimated to amount to about 3.8% of GDP. The savings of these magnitude obtained here are substantially higher than the calculations done for the EU, where estimates only amount to about less than a percentage point. However, in comparison with Namibia, the EU countries are closed, and the pattern of trade is also significantly different. The results showed that savings arising from a reduced need to hold foreign exchange reserves amount to 2.4% of GDP on average. For example, the savings of \$54 million in 1993 would have been equivalent to the government's expenditure allocation to social security and welfare (which was 2.7% of GDP in 1993/94).

The chapter showed that potential revenues from inflation tax differ markedly between CMA and non-CMA countries. The contribution of inflation tax to government revenue is of less significance in the CMA countries. The last part of the chapter dealt with the description of external shocks that affect the Namibian economy. In the period from 1981 to 1994, the cumulative net loss in income due to terms of trade shocks amounted to an average of 2.1% of GDP. The results reveal that Namibia experienced unfavourable external shocks during 1981-83. The response to the fall in export earnings was somewhat mirrored by the declines in gross domestic fixed investment. Partly as a consequence of the increased capital inflows from South Africa, consumption expenditure thus did not change in response to the shocks in income. But as the declines in export receipts protracted, the brunt of adjustment fell on investment.

Estimating AR/ADL models, the symmetry of shocks for the SADC countries was examined. The results revealed strong positive correlations between South Africa and SACU countries. In the regional integration parlance, the results identify a core-SADC region, consisting of SACU countries, and countries such as Mauritius described as near periphery, and the rest of SADC lying in the periphery. The implication of the results is that the economies of SACU experience symmetric shocks.

Chapter 8

Conclusions and Policy Implications

The thesis adopted an eclectic methodological approach, and each chapter was discussed as a unit, analysing a specific issue. Therefore, I will not repeat the summary of each chapter here. Instead, I highlight the key findings of the thesis and discuss the policy implications in the context of the choice of an exchange rate regime for Namibia. However, it is instructive to repeat what the objectives of the thesis were. The main objective was to assess the costs and benefits of Namibia's continued membership of the CMA to determine whether the CMA is an optimal currency area at least from the perspective of Namibia. The thesis examined this issue from main two perspectives: (a) whether the real exchange rate adjustment is frustrated by the inability to use the nominal exchange rate as an instrument of adjustment; (b) whether the nominal exchange rate can be effective in changing relative prices, given Namibia's structural features, such as the high degree of openness and the small nontradable sector.

A key result of the thesis is the finding that there were no long periods of sustained real exchange rate misalignments. On average real exchange rate misalignments were 20% during 1974-95. This is significantly lower than the rates of misalignments estimated for some countries in the CFA zone and those under floating exchange rate systems, like Kenya and Ghana (which averaged 29% and 134%, respectively). Thus, despite the loss of nominal exchange rate, the real exchange rate has moved in accordance with the movement in the Namibian fundamentals. The smoothening of RER misalignments seen from 1985 onwards can be attributed to several factors, but mostly to the continued depreciation of the rand since 1985. Further, the decoupling of the

South African exchange rate policy from the gold price in the late 1980s also had important implications for the rand. The financial liberalization process in South Africa also continued to have an impact on the rand. The fundamentals in South Africa in the late 1990s were such that the rand needed depreciating, a situation that also favoured the Namibia dollar.

Another most significant result of the thesis is the estimates of the pass-through of foreign prices to Namibia. The results showed explicitly how Namibian prices are influenced by prices in South Africa. For tradable items the long-run pass-through coefficient was unity, suggesting that price changes in South Africa are transmitted one-for-one to their Namibian counterparts. The speed of pass-through ranges from 3 months to 15 months. The result has important implications for the choice of the exchange rate regime adopted for Namibia. Mainly, it suggests that while there could be a desire by the Namibian authorities to de-link from the rand, the use of the nominal exchange rate as an instrument of adjustment will have limited effects. Under the circumstances devaluations are not likely to be sustained because the benefits of nominal exchange rate changes will be negated by price changes.

The analysis were extended by considering other costs and benefits of the optimum currency areas which do not rely exclusively on the ability to change relative prices. Here, we distinguished between costs and benefits of static and dynamic nature. In terms of dynamic benefits, the financial discipline engendered by the CMA lends credibility in economic policy management in Namibia. This is very important in the case of Namibia because as a newly independent country, the government needed to gain the confidence of the private sector and foreign investors in particular that it was committed to following prudent economic policies. As

pointed out in Chapter 2, the important export sectors are mining and fishing, for which foreign capital is very important. In this context, the Namibian authorities are keen to foster a conducive environment for investment. Therefore, the spin-offs of price stability and lower exchange rate uncertainty between Namibia and its major investor and trading partner, South Africa, should act to promote investment.

Benefits, that can be described as mainly of static nature were also estimated. It was intimated that using a common currency as a medium of exchange reduces transactions costs associated with converting one currency to another, gathering and processing information regarding forecasting future exchange rate developments. Further benefits also arise from the fact that Namibians use the domestic currency (this is so, because the rand has legal tender status in Namibia) to pay for imports from South Africa. Effectively, this serves to confer benefits to Namibia because the country does not need to hold a substantial amount of its foreign exchange reserves in short-term assets. If Namibia were not in the CMA, the country's reserves would be invested in such a way that they could be readily made available on short notice to satisfy short-term demands for foreign exchange for imports from South Africa. The same argument can be advanced in respect of remittances from South Africa. Official statistics do not show the numbers of the so-called illegal immigrants from the BLNS working in South Africa. Historically, men from these countries have always worked legally and illegally in South Africa. The deteriorating farming conditions, due to the increase in the frequency of droughts, has meant an increase in the numbers seeking jobs in the cities and eventually in South Africa. The remittances from South Africa continue to be an important source of income, especially in the rural areas. In the early 1990s, when Botswana's exchange rate policy was mainly used to mitigate the effects of

imported inflation from South Africa, one of the considerations against a strong pula was its effects on remittances and nontraditional exports to South Africa and Zimbabwe. Therefore, the savings arising from lower transactions costs and the absence of exchange rate uncertainties extend beyond trade issues in the case of the BLNS countries.

While we cannot provide an empirical measure of all the benefits, the thesis also assessed the nature and magnitude of costs. Applying the same criteria as we did in the classification of benefits, the costs can be described as either dynamic or static. Costs of dynamic nature are very difficult to measure, and these include such issues as whether by the virtue of being in a currency union with a more developed country, Namibia's development efforts are adversely affected. Does capital flow mainly to the developed parts of the union to the detriment of the periphery, therefore creating a permanent centre-periphery axis? However, to answer such questions, one needs to compare the development paths of Namibia, against comparator countries outside the CMA or SACU. A recent study by Jenkins and Thomas (1997) analysing whether SADC was ready for monetary integration revealed that during 1960-89 incomes of SACU countries have converged to South Africa's. In contrast, the incomes of non-SACU countries have diverged from those of South Africa, with the exception of Mauritius. In this respect, it is clear that SACU or CMA did not hamper economic development in the smaller member countries.

Consistent with the literature, we estimated the resources owing to seigniorage revenue, including inflation tax. There are potential revenue losses to the extent that membership of the CMA forces Namibia to converge to a lower rate of inflation than the optimal rate that maximizes its revenues from inflation tax. That is, the net reduction in seigniorage revenue

relative to the Namibian optimum is a cost. The seigniorage revenue estimates for the region revealed that resources generated through inflation tax differ markedly among countries, and it is lower in the CMA than in non-CMA countries. Estimates of the optimal inflation rates for Namibia of 13.7 per cent do not differ significantly from an average rate of inflation of 15 percent during 1970-96. It is important to draw attention to the results of the empirical evidence presented in Chapter 3 from Romer's study on the link between openness and effectiveness of surprises in monetary policy to expand output. He concludes that policy-makers' incentives to expand are limited in more open economies, and equilibrium inflation under discretionary policy is lower.

An important issue regarding the costs of the CMA concerns the nature and magnitude of external shocks to the Namibian economy. More important, we needed to ascertain whether these shocks were symmetric or asymmetric to the region, particularly with respect to South Africa. The results from AR/ADL models show interesting results regarding regional distribution of shocks. Shocks in the SACU countries are highly correlated with those of South Africa, while those of non-SACU countries are not correlated with those of SACU. This has implications for SADC's objectives of achieving a common market by the year 2005.

Against this background, what can be said about the costs and benefits of the CMA? In conclusion, the costs due to CMA membership are small in comparison to the benefits. Most significantly, the pass-through and the RER misalignments results have important policy implications regarding the choice of the exchange regime for Namibia, or its continued

participation in the CMA. The results suggest that the CMA is an optimal exchange regime for Namibia. Under these circumstances, the decision to quit the CMA will not be motivated by economic considerations.

References

- Adam, C. (1992a), "The Demand for Money, Asset Substitution and Inflation Tax in a Liberalizing Economy: An Econometric Analysis for Kenya", DPhil thesis, Oxford University.
- (1992b), "Recent Developments in Econometric Methods: An Application to the Demand for Money in Kenya", African Economic Research Consortium Special Paper No.15, Nairobi.
- , Ndulu, B. and N.K. Sowa (1996), "Liberalization and Seigniorage Revenue in Kenya, Ghana and Tanzania", *The Journal of Development Studies*, Vol. 32, No. 4, pp 531-553.
- African Development Bank (1993), "Economic Integration in Southern Africa", II, Biddles, Ltd, Oxford.
- Agènor, P. and P. Montiel (1996), *Development Macroeconomics*, Princeton University Press.
- Aghevli Bijan, B. and Peter J. Montiel (1991), "Exchange Rate Policies in Developing Countries: Some Analytical Issues", IMF Occasional Papers No. 78.
- Ahlers, T.O. and L.E. Hinkle (1995), "Estimating the Equilibrium Real Exchange Rate: An Updated Resource Balance/ Trade Elasticities Approach", The World Bank.
- Allen, R.G.D (1975), *Index Numbers in Theory and Practice*, The Macmillan Press Ltd., London.
- Argy, V. (1992), "Choice of Exchange Rate Regime for a Smaller Country: A Survey of Some Key Issues", in Argy, V. and P. De Grauwe (eds), "*Choosing an Exchange Rate Regime: The Challenge for Smaller Industrial Countries*", The IMF.
- Aron, J., Elbadawi, I.A. and M. Holden (1995), "Real and Monetary Determinants of Real Exchange Equilibrium Rate in South Africa", AERC.
- Artis, M.J. (1991), "One Market, One Money: An Evaluation of the Potential Benefits and Costs of Forming an Economic and Monetary Union", *Open Economies Review*, 2:315-21.
- Atta, J.K., K.R. Jefferis and I. Mannathoko (1996), "Small Country Experiences with Exchange Rates and Inflation: the Case of Botswana", *Journal of African Economies*, 5: 2, pp. 293-326.
- Atkeson, A. and T. Bayoumi (1992), "Do Capital Markets Insure Regional Risk? Evidence from the United States and Europe", *Open Economies Review*, 4:303-24.
- Azam, Jean-Paul (1994), "Recent Developments in the Developed Country Literature on Labour Markets and the Implications for Developing Countries", in Horton, S., Kanbur, S.M.R., and D. Mazumdar (eds), *Labour Markets in an Era of Adjustment*: EDI Developments Studies. The World Bank, Washington, DC

Azariadis, C. (1975), "Implicit Contracts and Underemployment Equilibria", *Journal of Political Economy*, 83: 1183-1202.

Baffes, J., Elbadawi, I.A., and S.A. O'Connell (1997, "Single-Equation Estimation of the Equilibrium Real Exchange Rate", Policy Research Working Paper, No. 1800, The World Bank.

Baily, M.N. (1974), "Wages and Unemployment Under Uncertain Demand", *Review of Economic Studies*, 41: 37-50.

Baldwin, R.E. (1988), "Hysteresis in Import Prices: The Beachhead Effect", *American Economic Review*, 78: 773-785.

Balassa, B. (1981), "The Newly-Industrialising Developing Countries after the Oil Crisis", *Weltwirtschaftliches Archiv*, Vol. 117, pp. 142-194.

----- (1983), "Policy Responses to external Shocks in Sub-Saharan African Countries", *Journal of Policy Modelling* 5(1): 75-105.

----- (1984a), "Adjusting to External Shocks: The Newly-Industrialising Developing Countries in 1974-76 and 1979-81", Discussion Paper, Report No. DRD89, The World Bank.

----- (1984b), "The Newly-Industrialising Developing Countries after the Oil Crisis: A Reply", *Weltwirtschaftliches Archiv*, Vol. 120, p. 594.

Banerjee, A., Dolado, J., Galbraith, J.W., and D.F. Hendry (1993), *Co-Integration, Error Correction, and the Econometric Analysis of Non-Stationary Data*, Oxford University Press.

Bank of Botswana, Annual Reports, Quarterly Bulletins, various years.

Bank of Lesotho, Annual Reports, Quarterly Bulletins, various years.

Bank of Namibia, Annual Reports, Quarterly Bulletins, various years.

Barro, R.J. and H.I. Grossman (1971), "A General Disequilibrium Model of Income and Employment", *American Economic Review*, 61: 82-93.

----- and D. Gordon (1983), "Rules, Discretion and Reputation in a Model of Monetary Policy", *Journal of Monetary Economics*, No. 12.

Bayoumi, Tamim (1994), "A Formal Model of Optimum Currency Areas", *IMF Staff Papers*, 41: 537-54.

----- and Barry Eichengreen (1993), "Shocking Aspects of European Monetary Integration", in Francisco Torres and Francesco Giavazzi, eds., *Adjustment and Growth in the European Monetary Union*, Cambridge University Press, Cambridge.

------(1994), "One Money or Many? Analyzing the Prospects for Monetary Unification in Various Parts of the World ", Princeton Studies in International Economics No. 76.

------(1996), "Operationalizing the Theory of Optimum Currency Areas", the paper presented at the Centre for Economic Policy and Research Conference on Regional Integration, La Coruna, Spain, April.

-----and Goldstein, M. and Woglom(1994), "Do Credit Markets Discipline Sovereign Borrowers? Evidence from the US States", Centre for Economic Policy Research, No. 1088.

Bean, C.R. (1992), "Economic and Monetary Union in Europe", *Journal of Economic Perspectives*, 6: 4: 31-52

Ben-David, D. (1994), "Convergence Clubs and Diverging Economies", Centre for Economic policy Research, Discussion Paper No. 922.

Bertola, G. (1993) Models of Economic Integration and Localised Growth', in Torres, F. and F. Giavazzi (eds), *Adjustment and Growth in the European Monetary Union*, Cambridge: Cambridge University Press.

Bevan, D., Collier, P. and Jan W. Gunning (1990a), *Controlled Open Economies: A Neoclassical Approach to Structuralism*, Oxford University Press.

------(1990b), "African Trade Shocks: Consequences and Policy Responses", Centre for the Study of African Economies, Institute of Economic and Statistics, Oxford University.

------(1990c), "Macroeconomics of External shocks", Centre for the Study of African Economies, Institute of Economic and Statistics, Oxford University Press.

Beverage, S. and C. Nelson (1981), "A New Approach to Decomposition of Economic Time Series into Permanent and Transitory Components with Particular Attention to Measurement of Business Cycles", *Journal of Monetary Economics* 7:151-74.

Bird, G. (1982), *The International Monetary System and the Less Developed Countries*, Second Edition, MacMallan Press, London.

Blanchard, O.J. and S. Fischer (1989), *Lectures in Macroeconomics*, MIT Press, Cambridge, Massachusetts.

----- and Lawrence Katz (1992), "Regional Evolutions", *Brookings Papers on Economic Activity*, No.1:pp 1-16.

-----and D. Quah (1989), "The Dynamic Effects of Aggregate Demand and Supply Disturbances", *American Economic Review*, 79:pp.655-673.

Boughton, J.M. (1991), "The CFA Franc Zone: Currency Union and Monetary Standard", IMF Working Paper No. 91/133, The International Monetary Fund, Washington, D.C.

Breuer, J.B. (1994), "An Assessment of the Evidence on Purchasing Power Parity", in Williamson, J. (Ed), *Estimating Equilibrium Exchange Rates*, Institute for International Economics, Washington, D.C.

Browne, F.X. (1984), "The International Transmission of Inflation to a Small Open Economy Under Fixed Exchange Rates and Highly Interest-Sensitive Capital Flows", *Journal of International Economics*,

Bryant, R.C., et al. (1989), *Macroeconomic Policies in an Interdependent World*, The IMF, Washington, D.C.

Burda and Wyplosz (1997), *Macroeconomics: a European Text*, Oxford University Press.
Canzoneri, M., and Rogers, C.A. (1990) 'Is the European Community an Optimal Currency Area? Optimal Taxation Versus the Cost of Multiple Currencies', *American Economic Review*, 80:419-33.

Caporale, G.M. (1993), "Is Europe an Optimum Currency Area? Symmetric versus Asymmetric Shocks in the EC", *National Institute Economic Review*, May, pp 95-103.

Casella, A. (1990), "Participation in a Currency Union", Centre for Economic Policy Research, Discussion Paper No. 395.

Central Statistics Office (1996), "Statistical Abstract, No. 5", CSO, National Planning Commission, Windhoek.

----- (1995), "National Accounts 1980-1995", CSO, National Planning Commission, Windhoek.

----- (1994), "Living Conditions in Namibia 1993/94: An Economic and Social Indicators From Namibia Household Income and Expenditure Survey", CSO, National Planning Commission, Windhoek.

----- (1992), "1991 Population and Housing Census: Preliminary Report", CSO, National Planning Commission, Windhoek.

----- (monthly), "Consumer Price Index", CSO, National Planning Commission, Windhoek.

Chamber of Mines of Namibia, Annual Reports, various years.

Chamie, N., DeSerres, A. and R. Lalonde (1994), "Optimum Currency Areas and Shock Asymmetry: A Comparison of Europe and the United States", Working Paper 94-1, Bank of Canada.

Chhibber, Ajay (1992), "Exchange Rate Reforms, Supply Response, and Inflation in Africa", in Goldin, I.A. and L.A. Winters (eds), *Open Economies: Structural Adjustment and Agriculture*, Cambridge University Press.

Clower, R.W. (1965), "The Keynesian Counterrevolution: A Theoretical Appraisal", in Hahn, F. and F. Brechling, (eds.), *The Theory of Interest Rates*, London: Macmillan.

Cobham, D. and Peter Robson (1994), "Economic Integration in Africa: A Deliberately European Perspective", *World Development*, Vol.22 No. 3. pp 285-299.

Cohen, D. and C. Wyplosz (1989), "The European Monetary Union: An Agnostic Evolution", in R. Bryant, D. Currie, J. Frankel, P. Masson and R. Portes (eds.), *Macroeconomic Policies in an Interdependent World*, Washington, D.C.

Collier, Paul (1993), *Macroeconomic Policies: An Analytic Review Based on African experience*, Oxford University Press

Collier, P. and W. Gunning (1995), "Trade Policy and Regional Integration: Implications for the Relations Between Europe and Africa", *World Economy*, volume 8 (1):

Corden, W. Max. (1994), *Economic Policy, Exchange Rates and the International System*, Oxford University Press.

----- (1992), "Trade Policy and Exchange Rate Issues in the Former Soviet Union", The World Bank WPS No. 915, Washington, D.C.

----- (1972), *Monetary Integration, Essays in International Finance* No.93, Princeton, NJ: International Finance Section, Princeton University Press.

----- (1973) 'The Adjustment Problem', in Krause, L. and W.S. Salant (eds), *European Monetary Unification and its Meaning for the United States*, The Brookings Institution.

Cottani, J.A., Cavallo, D.F. and M.S. Khan (1990), "Real Exchange Rate Behaviour and Economic Performance in LDCs", *Economic Development and Cultural Change*.

Cuckierman, A., Kiguel, M.A. and N. Laviatan (1992a), "How Much to Commit to an Exchange Rate Rule", World Bank WPS 931.

----- Edwards, S. and Tabellini (1992b), "Seigniorage and Political Instability", *American Economic Review*, 82:537-555.

D'A. Collings, F. et al. (1978), "The Rand and the Monetary Systems of Botswana, Lesotho and Swaziland", *The Journal of Modern African Studies*, Vol. 16. No.1, pp. 97-121.

Daniel, P. (1984), "Mining Wages and National Wage Policy: International Experience and Prospect for Namibia" Institute of Development Studies, Sussex, Discussion Paper No. 191.

De Grauwe, P. (1994), *The Economics of Monetary Integration*, Oxford University Press.

----- (1996), *International Money: Postwar Trends and Theories*, Oxford University Press.

-----and W. Vanhaverbeke (1993), "Is Europe an Optimum Currency Area?: Evidence from Regional Data", in Masson P. and M. Taylor (eds.), *Policy Issues in the Operation of Currency Unions*, Cambridge University Press.

Delors Report (1989), *Report on Economic and Monetary Union in the European Community*, Brussels: Commission of the European Communities.

Devanne, O. (1984), "The Newly-Industrialising Developing Countries after the Oil Crisis: A Comment", *Weltwirtschaftliches Archiv*, Vol. 120, pp. 591-93.

Deverajan, S. (1996), "Estimates of Real exchange Rate Misalignment with a Simple General Equilibrium Model: The CFA Franc Zone", The World Bank.

----- (1990), "Membership in the CFA Zone: Odyssean Journey or Trojan Horse?", WPS No. 482, The World Bank, Washington, D.C., U.S.A.

----- and Jaime de Melo (1987), "Adjustment with a Fixed Exchanged Rate: Cameroon, Cote d'Ivoire and Senegal", The World Bank.

Dickey, D.A., Jansen, D.W. and D.L. Thornton (1994), "A Primer on Cointegration with an Application to Money and Income", in Rao, B.B. (ed), *Cointegration for the Applied Economist*, The Macmillan Press, Ltd.

Diewert, E.W. (1996), "Axiomatic and Economic Approaches to International Comparisons", NBER, Working Papers No. 5559.

----- (ed) (1990), *Price Level Measurement*, North-Holland.

Dixit, A. (1989), "Entry and Exit Decisions Under Uncertainty", *Journal of Political Economy* 97: 620-638.

Dooley, M., Frankel and Mathieson (1987), "International Capital Mobility, What Do the Saving Investment Correlations Tell Us?", *IMF Staff Papers*, Vol. , pp. 503-530.

Dornbusch, R. (1980), *Open Economy Macroeconomics*, Basic Books, Inc. Harper International Edition.

----- (1987), "Exchange Rates and Prices", *American Economic Review*, 77:93-106.

----- (1992), "Lessons from Experiences with High Inflation", *World Bank Economic Review* 6:13-31.

----- (1988), *Exchange Rates and Inflation*, Cambridge, Massacusetts, MIT Press.

----- (1989), "Real exchange Rates and Macroeconomics: A Selective Survey", *Scandinavian Journal of Economics* 91(2):401-32.

----- (1994), "Mexico: Stabilization, Reform and Growth", *Brookings Papers on Economic Activity* O(1):253-97.

----- and F.L.C.H. Helmers (1991), *The Open Economy: Tools for Policy Makers in Developing Countries*, EDI Series in Economic Development, Oxford University Press.

Duesenberry, J.S., Gray, C.S., McPherson, M.F. and S.D. Younger (1994), "Improving Exchange Rate Management in Sub-Saharan Africa". Harvard Institute for International Development, Cambridge, Massacusetts.

Dunn, R.M. (1970), "Flexible Exchange Rates and Oligopoly Pricing: A Study of Canadian Markets", *Journal of Political Economy* 78: 14051.

Edwards, Sebastian (1988), *Real Exchange Misalignment in Developing Countries*, The World Bank, Washington, D.C., U.S.A.

----- (1989), *Real Exchange Rates, Devaluation and Adjustment: Exchange Rate Policy in Developing Countries*, Cambridge, Mass. IMT Press.

----- (1993a), "Exchange Rates, Inflation and Disinflation: Latin American Experiences", NBER Working Paper No. 4320.

----- (1993b), "Exchange Rates as Nominal Anchors", *Weltwirtschaftliches Archive*, Vol. 129, No. 1.

----- (1994), "Real and Monetary Determinants of Real Exchange Behaviour: Theory and Evidence from Developing Countries", in Williamson, J (ed), *Estimating Equilibrium Exchange Rates*, Institute for International Economics, Washington, D.C.

----- (1984), "Demand for International Reserves and Monetary Equilibrium: Some Evidence from Developing Countries", *Review of Economics and Statistics* 66 (3):495-500.

----- and L.J. Fernando (1994), "Fixed Exchange Rates, Inflation and Macroeconomic Discipline", NBER Working Paper No. 4661.

----- and S. van Wijnbergen (1987), "Tariffs, Real Exchange Rates and the Terms of Trade: On Two Popular Propositions in International Economics", *Oxford Economic Papers* 39:458-64.

Eichengreen, B. (1992), "European Monetary Union", *Journal of Economic Literature*, Vol.XXX1 (Sept. 1993), pp. 1321-1357

----- (1995), *International Monetary Arrangements for the 21st Century*, The Brookings Institution, Washington, D.C.

----- and Hagen (1996), "

El-Agraa, A.M. (1990), *Economics of the European Community*, Phillip Allan.

Elbadawi, I.A. (1995), "The Impact of Regional Trade/Monetary Schemes on Intra-Sub-Saharan Africa Trade", A Paper Presented at an AERC Research Workshop on Regional Integration and Trade Liberalization in SSA, Harare, Zimbabwe, March, 1995,

----- (1994), "Estimating Long-run Equilibrium Exchange Rates", in Williamson, J. (ed), *Estimating Equilibrium Exchange Rates*, Institute for International Economics, Washington, D.C.

----- and R. Soto (1995), "Real Exchange Rate and Macroeconomic Adjustment in Sub-Saharan Africa and Other Developing Countries", in Elbadawi and Soto, eds., *Foreign Exchange Market and Exchange Rate Policies in Sub-Saharan Africa*, a special issue of the *Journal of African Economies*.

Emerson, M., D. Gros, A. Itlianer, J. Pissani-Ferry, and H. Reichnback (1992), "One Market, One Money", Oxford University Press.

Enders, W. (1995), *Applied Econometric Time Series*, John Wiley and Sons, Inc.

Engel, C. and J.H. Rogers (1995), "Regional Patterns in the Law of One Price: The Roles of Geography vs Currencies", NBER Working Paper 5395.

Feenstra, R.C. (1989), "Symmetric Pass-through of Tariffs and Exchange Rates Under Imperfect Competition: An Empirical Test", *Journal of International Economics*, 27: 25-45.

Feldstein, Martin (1992), "The Case Against EMU", *The Economist*, June 13th.

----- and C.Horioka (1980), "Domestic Saving and International Capital Flows", *Economic Journal*, 90:314-329.

Fielding, David (1994a), "Price Instability and Investment: Evidence from Africa", CREDIT Research Paper No.94/8, University of Nottingham.

----- (1994b), "Asymmetries in the Behaviour of Members of a Monetary Union: A Game-Theoretic Model with an Application to West Africa", CREDIT Research Paper No.94/11, University of Nottingham.

Fischer, S. (1982), "Seigniorage and the Case for National Money", *Journal of Political Economy*, Vol. 90, pp 295-313.

- Fisher, E. (1989), "A Model of Exchange Rate Pass-through", *Journal of International Economics*, 26:119-137.
- FitzGerald, E.V.K. (1995), "Measuring External Shock and Domestic Response in LDCs: Completing Balassa's Decomposition Method", Centro Studi Luca D'Angliano, WP N.80, Finance and Trade Policy Research Centre, University of Oxford.
- Fleming, J.M. (1971) 'On Exchange Rate Unification', *Economic Journal*, Vol.81, pp. 467-88.
- François, E.B. (1991), "The Benefits and Costs of Monetary Integration: The Case of the East Caribbean Monetary Union", The National Centre for Development Studies, Australian National University, Working Paper No. 91/10.
- Friedman, M. (1968), "The Role of Monetary Policy", *American Economic Review*, 58:1-17.
- Gensberg, H. (1989), "Exchange Rate Management and Macroeconomic Policy: A National Perspective", *Scandinavian Journal of Economics*, 91(2), pp 439-469.
- Ghei, N. and L.E. Hinkle (1995), "Devaluations, Inflation, and the Real Exchange Rate: The Stylised Facts and a Simple Consistency Model", The World Bank.
- Ghosh, A.R. and H.C. Wolf (1994), "Pricing in International Markets: Lessons from the Economist", NBER Working Paper No. 4806.
- Giavazzi, F. and M. Pogano (1988), "The Advantage of Tying One's Hands: EMS Discipline and Central Bank Credibility", *European Economic Review* 32:1055-74.
- Giovannini, A. (1988), "Exchange Rates and Goods Prices", *Journal of International Economics*, 24:45-68.
- Goldberg, L.S. and Ickes, B.W. and R. Ryterman (1994), "Departures from the Ruble Zone: Implications of Adopting Independent Currencies", *World Economy*, Vol. 17. No.3.
- Goldstein, M., Khan, M. and L. Officer (1980), "Prices of Tradable and Nontradable Goods in the Demand for Total Imports", *Review of Economics and Statistics*, 62: 190-199
- Goodhart, C. (1995), 'The Political Economy of Monetary Union' in Kenen (ed), *Understanding Interdependence: The Macroeconomics of the Open Economy*, Princeton, NJ: Princeton University Press.
- Government of Botswana (1975), "A Monetary Policy for Botswana", Government Printers, Gaborone, Botswana.
- Gregorio, de Jose, Giovannini, A. and H.C. Wolf (1993), "International Evidence of Tradables and Nontradables Inflation", NBER Working Paper No. 4438.

- Grotppeter, John, J. (1994), *Historical Dictionary of Namibia*, The Scarecrow Press, Inc. Metuchen, N.J. and London.
- Guma, X. (1985), "The Rand Monetary Area Agreement", *The South African Journal of Economics*, 53(2):166-183.
- Haque, N. And P. Montiel (1996), "Long-Run Real Exchange Rate Changes in Developing Countries: Simulations from an Econometric Model", IMF.
- Harberler, (1969), "The Market for Foreign Exchange and the Stability of Balance of Payments", in Cooper, R.(ed) *International Finance: Selected Readings*, London, Penguin.
- Harris, R.(1995), *Cointegration Analysis in Econometric Modelling*, Prentice Hall/Harvester Wheatsheaf
- Hanke, S.H. and K. Schuler (1994), *Currency Boards for Developing Countries: A Handbook*, Institute for Contemporary Studies, San Francisco, California.
- Hartmann, P. (1987), "A Statistical Presentation of the National Accounts of South West Africa/Namibia for the Period 1920 to 1987", *Statistical/Economic Review*, Department of Finance, Windhoek.
- Harvey, Charles (1995), "Botswana's Exchange Controls: Abolition or Liberalization?", Institute of Development Studies.
- and D. Hudson (1990), *Post-Apartheid Regional Financial and Monetary Cooperation*,
- Helleiner, G. and E.V.K. FitzGerald (1997), "Measuring External Shock and Domestic Response in LDCs: Completing Balassa's Decomposition Method", *Journal of International Development* 9(5):697-93.
- Helpman, E (1984), "Increasing Returns, Imperfect Markets and Trade Theory" in Jones, R. and P. Kenen (eds) (1984), *Handbook of International Economics*, Vol 1, Amsterdam, Holland.
- Herbstein, D. And J. Evenson (1989), *The Devils is Among Us: The War for Namibia*, Zed Books Ltd. London.
- Herguera, I. (1993), "Exchange Rate Fluctuations, Market Structure and the Pass-through Relationship", European University Institute, Firenze, Italy.
- Hinkle, L.E. and F. Nsengiyumva (1995), "External Real Exchange Rate Indexes: User's Guide to Concepts, Measurement, and Interpretation", Draft, The World Bank.
- (1995), "Internal Real Exchange Rates: A User's Guide to Concepts, Measurement, and Interpretation", Draft, The World Bank.

------(1996), "The Relationship Between the External and Internal Real Exchange Rates: Competitiveness, Productivity, and the Terms of Trade", Draft, The World Bank.

Hooper, P. (1989), " Exchange Rates and U.S. External Adjustment in the Short Run and the Long Run", International Finance Discussion Paper No.345, Washington, D.C., Board of Governors of the Federal Reserve Bank System.

-----and J.Marquez (1995), "Exchange Rates, Prices, and External Adjustment in the United States and Japan", in Kenen, P.(ed), *Understanding Interdependence: The Macroeconomics of the Open Economy*, Princeton University Press.

-----and C.L. Mann (1989), "Exchange Rate Pass-through in the 1980s: The Case of US Manufactures", *Brookings Papers on Economic Activity* 1: 1-55

Hudson, R. (1981), "Botswana Membership of the Southern African Customs Union", in C.Harvey, *Papers on the Economy of Botswana*, London, Heinemann.

Imani Development (International) Ltd. (1997), *Study on the Economic Impact of the Proposed EU-SA Free Trade Agreement on Botswana, Lesotho, Namibia and Swaziland*, Harare, Zimbabwe.

IMF(1995), "Namibia: Recent Economic Developments and Selected Economic Issues", IMF, Washington, D.C.

Ingram, C. (1973), "The Exchange Rate Question for a United Europe:Internal Flexibility and External Rigidity versus External Flexibility and Internal Rigidity", in Swoboda, A., *Europe and the Evolution of the International Monetary System*, Graduate Institute of International Studies (Geneva), International Economics Series, No. 1, pp. 81-92.

Isard, P. (1977), "How far Can We Push the 'Law of One Price'?", *American Economic Review*, 67:940-48.

----- (1995), *Exchange Rate Economics*, Cambridge:Cambridge University Press.

Ishiyama, Y. (1975), "The Optimum Currency Areas: A Survey", *IMF Staff Papers*, Vol. xxii, No.2, pp. 344-78.

Jenkins, C. and L. Thomas (1995), "Is Southern Africa Ready for Regional Monetary Integration?", Centre for Research into Economics and Finance in Southern Africa, London School of Economics, Research Paper No. 10.

Johansen, S. (1988), "Statistical Analysis of Cointegration Vectors", *Journal of Economic Dynamics and Control*, 12:231-254.

Johnson, H.G.(1971), "Problems of European Monetary Union", *Journal of World trade and Law*, 5:377-87.

------(1973), "The Exchange Rate Question for a United Europe: Internal Flexibility and External Rigidity versus External flexibility and Internal Rigidity", in Swoboda, A. *Europe and Evolution of International Monetary System*, Graduate Institute of International Studies (Geneva), International Series, 1:81-92.

Kaldor, N. (1970), "The Case for Regional Policies", *The Scottish Journal of Political Economy*, 17:337-48.

Katjavivi, Peter H. (1986), "The Rise of Nationalism in Namibia and its International Dimensions", University of Oxford, Faculty of Anthropology and Geography, Unpublished DPhil. Thesis.

------(1989), *A History of Resistance in Namibia*, UNESCO, Paris.

Kenen, P. (1995), *Understanding Interdependence: The Macroeconomics of the Open Economy*, Princeton University Press.

------(1969), "The Theory of Optimum Currency Areas: An Eclectic View", in Mundell, R. and A. Swoboda (eds), *Monetary Problems in International Economy*, Chicago, University of Chicago.

Khan, M.S. and M.D. Knight (1986), "Import Compression and Export Performance in Developing Countries", Research Department Discussion Paper No.197, The World Bank.

Kiguel, M.A. (1992), "When do Heterodox Stabilization Programs Work", Lessons from Experience", *World Bank Research Observer* 7:35-57.

-----and N. Laviatan (1991), "The Inflation Stabilization Cycles in Argentina and Brasil", in Bruno, M., S. Fischer, E. Helpman and N. Laviatan (eds), *Lessons from Stabilization and Its Aftermath*, Cambridge, Massacussets.

----- and Liviatan, N., Corbo, V., Fischer, S., and S. Webb ((eds) (1992), "Nominal Anchors, Stabilization and Growth: Some Thoughts on High-Inflation Econmies", in Adjustment Revisited. Policies to Promote Growth. A World Bank Symposium, Washington, D.C.

Knight, J. And C. Hill (1991), "The Diamond Boom, Expectations and Economic Management in Botswana", in P. Collier and W. Gunning (eds), *Trade Shocks in Developing Countries*, Oxford University Press.

Kraves, I.B. and R.E. Lipsey (1977), "Export Prices and the Transmission of Inflation", *American Economic Review* 67:155-163.

- Krogh, Desmond (1958), "The National Accounting Framework for South West Africa: A Study in Applied Economics and Statistics", University of Cape Town.
- Krugman, Paul (1995), *Currencies and Crises*, MIT Press, Massachussets.
- (1992), "Integration, Specialization and Regional Growth: Notes on 1992, EMU and Stabilization", in Torres, F. and F.Giavazzi (eds), *Adjustment and Growth in the European Monetary Union*, Cambridge University Press.
- .
- (1991a), "External shocks and Domestic Policy Response" in Dornbusch, R. and F.L.C.H. Helmers (eds), *The Open Economy: Tools for Policy Makers in Developing Countries*, EDI Series in Economic Development, Oxford University Press.
- (1991b), "Increasing Returns and Economic Geography", *Journal of Political Economy*, June.
- (1989), "The Case of Stabilizing Exchange Rates", *Oxford Review of Economic Policy*, Vol. 5:61-72.
- (1979), "A Model of Balance of Payments Crises", *Journal of Money, Credit and Banking*, 11:311-325.
- (1987), "Increasing Returns, Monopolistic Competition and International Trade", *Journal of International Economics*, 9:469-79.
- and R.E. Baldwin (1987), "Persistence of the US Trade Deficit", *Brookings Papers on Economic Activity*.
- and Obstfeld, M. (1994), *International Economics: Theory and Policy*, (third edition) HarperCollins College Publishers.
- Krumm, K.L. (1993), "A Medium-Term Framework for Analysing the Real Exchange Rate, with Applications to the Phillippines and Tanzania", *The World Bank Economic Review*: 7:2.
- Kydland, F. and E.C. Prescott (1977), "Rules Rather than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, Vol. 85(3):473-492.
- Lancaster, K. (1980), "Intra-Industry Trade Under Perfect Monopolistic Competition", *Journal of International Economics*, 10:151-76.
- Leith, J.C. (1991), "Exchange Rate and Price Level in Botswana", *Journal of Policy Modelling* 13 (2): 309-315.
- Landell-Mills, J. (1989), "The Financial Costs of Holding Reserves", *Finance and Development*, Vol. 26(4):717-26.

- Loewy, M. and Papell, D. (1996), "Are U.S. Regional Incomes Converging? Some FURTHER Evidence" *Journal of Monetary Economics* 38(3):587-98.
- Lucas, R.E. Jr (1972), "Expectations and the Neutrality of Money", *Journal of Economic Theory*, 4: 103-104.
- (1973), "Some International Evidence on Output-Inflation Trade-offs", *American Economic Review*, 63:326-334.
- Lunn, J. (1991), "Namibia: Recent History", in *Africa South of the Sahara 1992*, Europa Publications, Ltd.
- Malinvaud, E.(1977), *The Theory of Unemployment Reconsidered*, Oxford: Basil Blackwell.
- Mann, C. (1986), "The Effects of Aggregate Demand and Exchange Rate Shocks on the Profit Margins of Internationally Traded Goods", paper presented at the Conference on Monetary Uncertainty, Financial Futures, and Economic Activity at the International Futures and Commodity Institute, Geneva, November.
- Masera, Rainer S. (1994), "Single Market, Exchange Rates and Monetary Unification", *World Development*, Vol.17, No.3.
- Masson P. and M. Taylor (eds.) (1993), *Policy Issues in the Operation of Currency Unions*, Cambridge University Press.
- McCarthy, F.D., Neary, P.J., and Giovanni Zanalda (1994), "Measuring the Effect of External Shocks and the Policy Response to Them", mimeo, World Bank
- and A. Dharehwar (1992), "Economic Shocks and the Global Environment", WPS 870, The World Bank.
- McKinnon, R. (1963), "The Theory of Optimum Currency Areas", *American Economic Review*, 53: 717-25
- (1995), "Panel: One Money for How Many?", in Kenen, P. (Ed), *Understanding Interdependence: The Macroeconomics of the Open Economy*, Princeton University Press.
- Melitz, J (1991), "Brussels on a Single Money", *Open Economies Review*, 2, 323-36.
- (1993), "The Theory of Optimal Currency Areas, Adjustment and Trade", Centre for Economic Policy Research, No. 847.
- Miller, M. and A. Sutherland (1993), "Contracts, Credibility and Common Knowledge: Their Impact on Inflation Convergence", in Torres, F. and F. Giavazzi (eds), *Adjustment and Growth in the European Monetary Union*, Cambridge University Press.

Ministry of Labour and Human Resources Development (1994), *Employment Structure and Wage Levels in Namibia: A Report Based on Establishment Survey 1992/93*, MLHRD, Windhoek.

----- (1994), *Namibian Labour Force-Its Size and Structure: A Report Based on Population and Housing Census 1991*, MLHRD, Windhoek.

Mundell, R.A. (1961), "The Theory of Optimum Currency Areas", *American Economic Review*, 51: 645-65

Ndandi, V.H. and Mercer, D. (1989), *Breaking Contract: The Story of Vinnia Ndadi*, London: IDAF Publications.

Neary, P. (1993), "External Shocks, Policy Responses and Economic Performance: A Theoretical Framework", mimeo, World Bank.

Obstfeld, M. and K. Rogoff (1997), *Foundations of International Macroeconomics*, MIT Press.

Odedokun, M.O. (1995), "An Econometric Explanation of Inflation in Sub-Saharan Africa", *Journal of African Economies* 4: 436-51.

Ohno, K. (1989), "Export Pricing Behaviour of Manufacturing: A U.S.-Japan Comparison", *IMF Staff Papers*, 36: 550-79.

Osband, K. and D. Villanueva, (1993), "Independent Currency Areas", *IMF Staff Papers*, Vol. 40 (1):202-217.

Pantin, D. (1965), *Money, Interest and Prices: an Integration of Monetary and Value Theory*, New York: Harper and Row.

Phelps, E.S. (1968), "Money Wage Dynamics and Labour Market Equilibrium", *Journal of Political Economy*, 76: 687-711.

Phillips, A.W. (1958). "The Relation Between Unemployment and the Rate of Change of Money Wage rates in the United Kingdom, 1861-1957". *Economica* 25:283-299.

Pollak, R.A. (1990), "The Theory of Cost-of-Living Index and the Measurement of Welfare Change", in Diewert, E.W. (ed), *Price Level Measurement*, North-Holland.

Qian, Y and P. Varangis (1992), "Does Exchange Rate Volatility Hinder Export Growth: Additional Evidence", World Bank WPS 911.

Rangan, S. and R. Lawrence (1993), "The Response of U.S. Firms to Exchange Rate Fluctuations: Piercing the Corporate Veil", *Brookings Papers on Economic Activity* O(2):341-69.

Rogoff, K.C. (1985), "Can International Monetary Policy Coordination be Counterproductive?", *Journal of International Economics*, 8: 199-217.

Romer, David (1993), "Openness and Inflation", *Quarterly Journal of Economics*, November pp 869-903.

Sarantis, N.C. (1984), "Foreign Influences, Exchange Rates, Expectations and Price Inflation in a Developing Economy: The Case of Greece", *Journal of Development Economics*, 14: 1-18.

Sarel, M. (1996), "Nonlinear Effects of Inflation on Economic Growth", *IMF Staff Papers*, Vol.43 (1):199-215.

Spitaller, E. (1980), "Short-run Effects of Exchange Rate Changes on Terms of Trade and Trade balance", *IMF Staff Papers*, 27: 320-348.

Stiglitz, J. and A. Weiss(1981), "Credit Rationing in Markets with Imperfect Information", *American Economic Review*, 71:393-410.

Swartz, A.J. (1992), "Do Currency Boards Have a Future?", The Institute of Economic Affairs, Occasional Paper No. 68.

Tavlas, George S. (1993), "The 'New' Theory of Optimum Currency Areas", *World Economy*, Vol. 15.

Taylor, J. (1983), "Union Wage Settlements during Disinflation", *American Economic Review* 73: 981-93.

Teekens, R.(1989), "Consumer Price Indexes in the European Community: Similarities, Differences and Proposals for Harmonization", Statistical Office of the European Communities.

Tower, E., and Willet, T. (1970), "Currency Areas and Exchange Rate Flexibility", *Weltwirtschaftliches Archiv*, 105:48-65.

Wicham, Peter (1985), "The Choice of Exchange Rates in Developing Countries: A Survey of the Literature", IMF.

Wihlborg, C. (1990), "EMU-Economic Substance or Political Symbolism?", *The World Economy*, 17:5, pp. 651-661.

Williamson, J. (1994), *Estimating Equilibrium Exchange Rates*, Institute for International Economics, Washington, D.C.

----- (1985), *The Exchange Rate System*, revised edition, Washington: Institute for International Economics.

-----and C. Milner (1991), *The World Economy: A Textbook in International Economics*, Harvester Wheatsheaf.

Woo, W. (1984), "Exchange Rates and the Prices of Nonfood, Nonfuel Products", *Brookings Papers on Economic Activity* O(2): 511-30.

Wood, Brian, (1988), *Namibia 1884-1984: Readings on Namibia's History and Society*, Namibia's Support Committee, London.

The World Bank (1995), "Namibia: Public Expenditure Review", Macro, Industry and Finance Division, Southern Africa Department, Africa Department.

----- (1993), "Namibia: Poverty Alleviation with Sustainable Growth", Southern African Department.

Wyplosz, C. (1991), "Monetary Union and Fiscal Policy Discipline, in the Economics of EMU", *European Economy*, Special Edition 1, Brussels: European Communities.

Appendix Tables

Appendix Table 2.1: GDP by Industry (1980=100)

	Agric	Min	Man	E&W	Con	Trad	T&C	Fin	serv	gov	GDP
1980	100	100	100	100	100	100	100	100	100	100	100
1981	103	88	111	106	94	105	92	97	119	127	101
1982	100	80	120	110	78	107	86	98	121	148	100
1983	94	79	122	116	60	98	92	101	128	155	97
1984	89	76	123	119	48	98	101	103	133	160	97
1985	97	75	127	123	49	97	101	105	135	164	97
1986	98	82	140	126	39	100	107	108	137	169	103
1987	109	84	158	130	36	106	109	111	140	174	107
1988	108	83	153	145	45	112	109	113	142	177	107
1989	118	78	155	151	46	117	120	114	144	181	109
1990	116	71	180	154	43	112	125	114	149	195	110
1991	124	85	159	143	39	114	132	118	153	224	118
1992	120	95	187	197	53	120	137	121	153	244	127
1993	137	74	212	95	57	121	140	126	154	252	125
1994	156	82	231	117	63	128	158	127	155	255	133
1995	159	87	223	147	68	135	172	135	156	258	139

Source: National Accounts, CSO, Namibia, 1995

Notes: Agric-agriculture; Mine-mining and quarrying; Man-manufacturing; Con-construction,water & energy; Trd-wholesale & retail trade; Trp-transport & communications; Fin-finance, real estate and business services; Ser-other services; and Gov-government services.

Appendix Table 2.2: Merchandise Exports at Constant 1990 prices (NS'000)

	Diamonds	Uranium	Other minerals	Livestock	Fish	Other	Total
1980	1383	806	351	430	191	144	3304
1981	1108	732	336	467	210	168	3021
1982	985	796	447	351	295	160	3034
1983	877	686	381	267	305	148	2665
1984	886	740	386	280	238	143	2673
1985	1026	720	545	331	275	125	3022
1986	1458	704	540	324	281	115	3422
1987	1101	653	513	357	360	105	3089
1988	985	603	554	342	342	104	2929
1989	989	602	543	392	325	126	2976
1990	849	440	509	418	423	153	2793
1991	1236	428	452	472	611	151	3350
1992	1447	371	520	501	740	236	3815
1993	1429	514	482	488	805	169	3886
1994	1162	409	425	482	792	95	3365

Source: Central Statistics Office and Bank of Namibia Quarterly Bulletin, various years

Appendix Table 2.3: Trade Unions and Membership

Trade union federations and affiliated unions	Membership
National Union of Namibian Workers (1971)	48 500
-Metal & Allied Namibia Workers Union (1987)	5 500
-Mineworkers' Union of Namibia (1986)	12 500
-Namibia Food & Allied Workers' Union (1986)	12 000
-Namibia Public Workers' Union (1987)	11 000
-Namibia Transport & Allied Workers' Union (1988)	7 500
National Allied Unions (1987)	7 600
-Namibia Wholesale & Retail Workers' Union (1986)	6 000
-other	1 600
Namibia Trade Union (1985)	6 700
Association of Government Service Officials (1981)	9 000
Society for Officials of Financial Unions	1 050
South West Africa Municipal Association (1968)	3 000
Total Union Membership	76 900

Source: *Africa South of the Sahara 1992*, Europa Publications, Ltd.

Appendix 3A: SACU: Revenue Shares from the Customs Revenue Pool

Customs revenues collected at the port of entry into SACU area, plus excise duties and import surcharges are paid into a common pool administered at the Reserve Bank of South Africa. The revenues from the pool are then allocated to each member country according to a set of complicated formula. Before we present the formulas, we will define the relevant variables:

R = total revenue pool of customs, excise and sales duties

R_j = the amount payable to country j

A_j = CIF value at border of imports into country j from all sources

B_j = value of excisable and sales duties goods produced and consumed in country j

C_j = excise and sales duties paid on B

D = CIF value at border of imports into the common customs area from the rest of the world

E = customs and sales duties paid on D

F = value of excisable and sales duty goods produced and consumed in the customs area

Now let's define a variable M = (D+E+F), representing the total value of imports, customs and sales duties, and the value of all dutiable and excisable goods produced and consumed in the customs area (that is, Botswana, Lesotho, Namibia, South Africa and Swaziland). Similarly, the share of country in M is represented by m_j. Therefore, the revenue formula for country j can be specified as follows:

$$R_j = \frac{m_j}{M}(R) \tag{1}$$

The formula divides the common revenue pool among SACU countries in proportion to their annual imports and production and consumption of dutiable goods. An enhancement factor of 1.42 was added to equation [1] to compensate the BLNS countries for the perceived disadvantages of being in a customs union with a more developed neighbour, and also as a subsidy to the poor members of SACU. Hence, equation [1] can now be restated as:

$$R^*_j = \frac{m_j}{M}(R)(1.42) \quad \text{Evidently, } R^*_j > R_j. \tag{2}$$

The formula as presented above seems easy, in practice, the computations are more involved. The statistics are usually not readily available to enable the distribution of revenues due to a member country in a particular year. Therefore, an elaborate set of formulas are further devised to make payments in respect of any particular year over a two-year period in three instalments. The BLNS countries object to these delays as constituting an interest free loan to South Africa. While South Africa is unhappy with the enhancement factor, which unduly raises the share of the BLNS countries from the common revenue pool, which exceeds R_j. It should also be pointed out that the computation of M is slightly lower than it should be. South Africa's imports from BLNS countries are not included in M, which effectively reduces the weight of the denominator. Also the inclusion of excise duties suggests some degree of fiscal harmonisation.

The formula has another important feature which was designed to ensure that the share of revenues received by the BLNS countries did not fluctuate significantly. These reflected fluctuations in m_j. This amendment was introduced in 1976/77. Since, R_j formed a significant part of the BLS countries at the time, it was important for planning purposes that they had a rough idea of how much was due from this source for the preparation of their annual budgets. For these reasons, a stabilization formula came into effect. Without going into details, the formula set bounds for which R*_j should fluctuate (minimum of 17 per cent and maximum of 23 per cent). Therefore, the computed R*_j is 12 per cent, then the applicable rate is 17 per cent, while if R*_j is 30 per cent, the maximum rate of 23 per cent applies. For the computed rates falling between the two bounds, a graduation of rates are applied. The formula for the stabilised share of revenue due to country j can be written as:

$$0.23 \geq \frac{R_{sj}}{M} \geq 0.17 \tag{3}$$

Appendix 3B: Highlights of the Common Monetary Area Agreement

1. Management of Gold and Foreign Exchange Reserves: The respective monetary authorities have responsibilities over the management of gold and foreign exchange reserves of the two countries. However, to enable the South African authorities to monitor the exchange control system of the CMA, each member state provides the South African Reserve Bank (SARB) with a monthly statement reflecting the total balances of gold and foreign exchange, including rand held by the monetary authorities and authorised dealers in their respective areas.

2. Legal Tender: Article 2 establishes rand as legal tender for CMA, although there is provision for the LNS countries to introduce their national currencies, constituting legal tender only within their respective national borders. The rand is therefore the monetary standard for the CMA and any other national currencies must not only be pegged but must also be unconditionally convertible into rand.

3. Foreign Exchange Reserve Backing of the Namibia Dollar: The foreign exchange reserve backing of the issuance of the domestic currency can be agreed upon by the contracting parties. Initially this was set at 100%.

4. Conversion Rates: The rate of conversion or the bilateral exchange rate between the rand and the Namibia dollar can be agreed upon by the contracting parties. At the time of the introduction of the Namibia dollar the conversion rate was set at 1:1.

5. Access to South African Money and Capital Markets: Articles 3 and 4 provide for the free flow of capital within the area. Both private and official capital flows are encouraged, provided such flows are neither disruptive to money and capital markets nor inconsistent with the management of domestic financial institutions. Further, governments and private companies of the contracting parties have access to the South African capital and money markets. In order to underwrite the monetary stability of the Area, the SARB acts as a lender of last resort to the monetary authorities of the LNS countries.

6. Gold and Foreign Exchange Transactions: Article 5 gives provision for Namibia to have access to the foreign exchange markets of South Africa: in the case of BoN for its own transactions and on behalf of the Government, and in the case of authorised dealers for transactions in terms of the exchange control provisions of Namibia or as approved by BoN.

7. Repatriation of Loan Capital and Profits: Permission is not required to repatriate approved foreign loan capital and to transfer net trading profits earned in Namibia and accruing to non-residents.

8. Exchange Control: The exchange control provisions of the Government of Namibia shall in all material aspects be substantially in accord with the exchange provisions ruling in South Africa as amended from time to time.

9. Compensatory Payments: Article 6 establishes the formula for computing compensation payments for seigniorage representing a return on the rand currency circulating in Namibia. Seigniorage is calculated as follows: $s = (2/3) * (i^{\text{bondyield}}) * (cu^R)$, where $i^{\text{bondyield}}$ represents annual yield on most recently issued long-term South African government stock and cu^R an estimate of volume of rand in circulation in Namibia. The 2/3 is based on interest earned by a portfolio in the area, which is likely to contain both long-term and short-term assets with lower yields.

10. Transfer of Funds Within the Joint Monetary Area: A contracting party shall not apply any restrictions on the transfer of funds (current and capital transactions) to or from the area of the contracting party. Restrictions can be only imposed in cases of investment or liquidity requirements which may from time to time be prescribed to domestic financial institutions, but such restrictions should not be discriminatory to any contracting party. Also the Government of Namibia may introduce measures relating to investment of funds in domestic securities, for the mobilisation of domestic resources in the interest of the development of its area. Members also have obligations to jointly work together to avoid disruptive capital flows arising as a result of measures taken in one area.

Appendix Table 4.1: Structure of Exports for Namibia and South Africa (R million)

COMMODITY	SOUTH AFRICA				NAMIBIA			
	1990	%	1991	%	1990	%	1991	%
Food/livestock	2389	3.5	2114	3.3	478	16.8	679	19.8
Fruit	1478	2.4	1966	3.1	—	—	—	—
Beverages/tobacco	210	0.4	399	0.6	—	—	—	—
Raw materials	3916	6.4	3529	5.5	—	—	—	—
Hides/skins	249	0.4	180	0.3	—	—	—	—
Coal	3620	5.9	3898	6.1	—	—	—	—
Metal ores	3272	5.4	3276	5.1	943	33.1	808	23.6
Oils/fats	103	0.2	119	0.2	—	—	—	—
Chemicals	2174	3.6	2694	4.2	—	—	—	—
Manufactured goods	1457	2.4	1673	2.6	570	20	720	21
Textiles	443	0.7	462	0.7	—	—	—	—
Diamonds	5375	8.8	6018	9.4	847	29.7	1220	35.6
Metals products	8149	13.4	8788	13.6	—	—	—	—
Machinery/transport equip	2514	4.1	3147	4.9	—	—	—	—
Other manufactures	612	1	723	1.1	—	—	—	—
Clothing	218	0.4	362	0.6	—	—	—	—
Other	6738	11.1	5401	8.4	10	0.4	4	0.12
Gold	18070	29.6	19648	30.5	—	—	—	—
TOTAL	60988	100	64395	100	2847	100	3430	100

Sources: 1. Statistical Bulletin, Government Statistical Services, various issues; Statistical/Economic Review, Ministry of Finance, various issues

Appendix Table 5.1: Namibia and South Africa’s Principal Trading Partners (Averages:1989-95)

Namibia				South Africa			
Imports from		Exports to		Imports from		Exports to	
RSA	86.3	RSA	25	Germany	16.2	US	6
Cote d’Ivoire	3	Spain	18	US	13.5	Japan	5.7
Germany	2	Italy	17.7	UK	11.1	UK	5.5
USA	1.3	UK	8.8	Japan	10.1	Italy	4.8
Russia	1.2	USA	7.5	France	4.1	Germany	4.8
UK	1.1	Germany	7.1	Italy	3.5	Belgium	2.3
Zimbabwe	1	Ned	4.9	Taiwan	2.5	Taiwan	1.8
Japan	0.8	Swi	4.4	Ned	2.2	France	1.7
Norway	0.5	France	4.4	Switzerland	2.1	Hong-Kong	1.7
France	0.5	Belgium	1.8	Belgium	2.1	Spain	1.2

Source:DOTS and Bank of Namibia

Appendix Table 5.2: Namibia: REER, Equilibrium RER Indexes, and RER Misalignment

	REER			REER _x			REER _m		
	REER	ERER	MISRER	REER	ERER	MISRER	REER	ERER	MISRER
1974	139.9	135.8	3.03	165.31	159.26	3.80	118.4	115.9	2.16
1975	134.0	137.7	-2.75	153.15	161.47	-5.16	117.2	117.6	-0.32
1976	133.0	137.4	-3.21	149.83	159.62	-6.13	118.0	118.3	-0.26
1977	133.3	135.8	-1.80	149.67	155.75	-3.90	118.8	118.5	0.25
1978	129.6	134.1	-3.34	141.33	152.05	-7.05	118.9	118.4	0.48
1979	129.1	131.9	-2.16	139.55	147.03	-5.08	119.4	118.5	0.77
1980	129.1	129.4	-0.27	140.29	141.86	-1.11	118.8	118.2	0.50
1981	131.3	128.4	2.22	144.83	140.00	3.45	119.0	117.9	0.98
1982	131.0	128.7	1.75	143.80	140.53	2.33	119.3	117.8	1.26
1983	138.2	129.2	6.95	159.35	141.53	12.60	119.8	117.8	1.74
1984	129.8	130.2	-0.30	144.62	143.70	0.64	116.5	117.7	-1.00
1985	111.4	127.2	-12.46	113.13	138.90	-18.55	109.6	116.2	-5.66
1986	105.9	122.9	-13.84	106.95	132.16	-19.07	104.8	114.0	-8.08
1987	105.3	118.1	-10.87	108.65	125.16	-13.19	102.0	111.3	-8.30
1988	101.5	111.9	-9.35	101.20	115.88	-12.67	101.7	107.8	-5.64
1989	102.0	105.9	-3.69	101.96	107.03	-4.75	102.1	104.6	-2.36
1990	100.0	104.2	-3.98	100.01	105.25	-4.98	100.0	102.9	-2.79
1991	98.1	102.3	-4.11	98.74	103.04	-4.18	97.4	101.4	-3.94
1992	103.0	100.7	2.32	105.27	101.39	3.83	100.8	100.0	0.81
1993	103.3	100.5	2.73	106.96	101.62	5.25	99.7	99.7	0.06
1994	103.4	100.9	2.50	105.64	102.59	2.97	101.2	99.4	1.82
1995	99.9	101.0	-1.10	101.59	103.19	-1.55	98.2	99.2	-1.00

Note: Misalignment is calculated simply as: MISRER=100* (REER-ERER)/ERER.

Appendix Table 5.3: RER Misalignments Decomposed

	RER	RER^	ERER	RER-ERER	RER^-ERER	MISRER
1974	139.9	138.99	135.8	2.98	2.32	5.30
1975	134.0	139.68	137.7	-2.79	1.40	-1.39
1976	133.0	134.33	137.4	-3.27	-2.26	-5.53
1977	133.3	128.07	135.8	-1.82	-5.85	-7.67
1978	129.6	129.91	134.1	-3.40	-3.19	-6.58
1979	129.1	127.98	131.9	-2.18	-3.03	-5.22
1980	129.1	126.95	129.4	-0.27	-1.93	-2.20
1981	131.3	129.24	128.4	2.20	0.63	2.83
1982	131.0	129.53	128.7	1.73	0.63	2.36
1983	138.2	132.31	129.2	6.72	2.39	9.11
1984	129.8	133.09	130.2	-0.30	2.19	1.89
1985	111.4	113.05	127.2	-13.31	-11.81	-25.12
1986	105.9	108.60	122.9	-14.90	-12.34	-27.25
1987	105.3	106.45	118.1	-11.51	-10.42	-21.93
1988	101.5	100.92	111.9	-9.82	-10.34	-20.15
1989	102.0	101.18	105.9	-3.76	-4.60	-8.36
1990	100.0	103.86	104.2	-4.06	-0.29	-4.35
1991	98.1	99.07	102.3	-4.19	-3.17	-7.37
1992	103.0	98.39	100.7	2.30	-2.29	0.01
1993	103.3	100.27	100.5	2.69	-0.27	2.42
1994	103.4	102.94	100.9	2.47	2.01	4.49
1995	99.9	104.37	101.0	-1.11	3.30	2.20

Notes: Based on the following formula: $RERMIS_t = [\ln(REER_t) - \beta'(F_t^P)] - \beta'(F_t - F_t^P)$ where ERER

denotes $\beta'F^P$ the equilibrium real exchange rate derived from as the 5-year moving average of the fitted REER from the static long-run regression. REER^ is the fitted real exchange rate, while RER is the actual real exchange rate.

Appendix Table 6.1: Consumer Price Indexes(P)

P _i	Exportables	Importables	Tradables	Nontradable	Weight of P _i in P	% tradable
Food	8.3	14.6	22.9	5.6	28.5	80.4
Transport	0	15.6	15.6	5.1	20.7	75.4
Housing	0	0.8	0.8	19.2	20	4
Home goods	0	6.6	6.6	3.7	10.3	64.1
Misc. goods/services	0	4.3	4.3	2.6	6.9	62.3
Clothing/footwear	0	4.3	4.3	0	4.3	100
Beverages/tobacco	0	1.9	1.9	1.9	3.8	50
Recreation	2.2	1.9	4.1	0	4.1	100
Medical care	0	0.7	0.7	0.7	1.4	50
Total	10.5	50.7	61.2	38.8	100	61.2

Source: Central Statistics Office, Windhoek, Namibia.

Appendix Table 6.2: Unit Root Tests

Variable	Dickey-Fuller tests(t_f)		Augmented Dickey-Fuller tests(t_f)	
	NAM	RSA	NAM	RSA
Food	-1.505	-1.391	-2.262	-2.691
Grain	-2.721	-0.105	-2.397	-0.820
Meat	-1.464	-0.981	-2.201	-1.929
Fish	-1.743	-2.502	-2.710	-1.322
Fruit	-2.260	-2.677	-2.799	-2.112
Veg	-2.874	-2.358	-3.639	-2.000
Housing	-2.001	-2.495	-1.875	-1.890
Power	-1.956	-4.038	-2.093	-3.258
Clothing	-2.951	-3.555	-3.982	-3.901
Footwear	-1.983	-2.359	-1.942	-2.531
Furniture	-2.861	-3.026	-2.938	-2.685
D.service	-2.368	-3.735	-2.359	-1.881
Drinks (al)	-2.087	-3.340	-2.646	-2.421
Drinks (non-al)	-2.881	-3.241	-3.635	-3.321
Tobacco	-3.537	-0.951	-3.430	-1.691
Transport	-1.726	-3.408	-1.871	-3.405
Vehicles	-2.307	-3.132	-2.322	-3.111
Recreation	-2.402	-3.087	-2.610	-3.472
Medical	-2.002	-3.442	-2.956	-3.191
services	-3.170	-2.12	-2.212	-1.805
P	-2.585			
Pus	-2.792			
P*	-2.428			
NEER	-1.935			
US\$				

Notes: (1) Critical values: DF:test: 5%=-3.22; 1%=-3.58; ADF test: 5%=-3.80; 1%=-4.15

Variable names: prices for the CPI sub indexes (i.e. food, housing, transport, furniture, clothing, footwear, recreation, medical services, drink and beverages); P=consumer price index; Pus=US consumer price index; P*=index of foreign prices; NEER=nominal effective exchange rate: US\$=US cents per unit of Namibian dollar. The second column under DF and ADF represents South Africa.

Appendix Table 6.3: Cointegration Tests (Food Items)

Regression	SBDW	Residual DF
Grain	0.375	-2.043
Meat	0.789	-3.280
Fish	0.300	-1.900
Oils	1.370	-4.867*
Dairy	0.600	-2.574
Vegetables	1.130	-4.034*
Fruits	0.798	-2.683
Sugar	0.824	-3.845*
Coffee	1.510	-4.667*
Other foods	0.440	-2.330
Drinks/tobacco		
Non-alcoholic drinks	0.511	-2.515
Alcoholic drinks	0.561	-3.410
Tobacco	0.516	-3.007

Notes: SWDW test: critical values for a sample size of 50:5%=0.72 ; Critical values used in ADF test: 5%=-3.509 and 1%=-4.168

Appendix Table 6.4: Cointegration Tests (Non-Food Items)

Regression	SBDW	Residual DF
H/hold&furniture	0.430	-3.476
Furniture	0.510	-2.726
H/hold operation	0.273	-2.285
Appliances	0.442	-2.299
Domestic services	0.419	-2.330
Consumables	0.333	-2.537
Other	1.190	-4.611*
Housing	0.292	-1.872
Power	0.288	-2.299
Clothing/footwear	0.497	-6.278*
Transport	0.409	-2.575
Vehicles	0.680	-6.318*
Transport costs	0.431	-2.583
Transport services	0.349	-2.655

Notes: (1) SWDW test: critical values for a sample size of 50:5%=0.72; ADF test: 5%=-3.509 and 1%=-4.168

Appendix Table 7.1: External Shocks and Response Measures (as % of GDP)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Total shocks due to:	12.3	7.1	3.5	-5.1	-6.8	-3.7	-8.8	-14	-4.6	-1.8	3.2	0.6	0.8	-12.1
Terms of trade	11.6	2.3	1.9	-1.6	-5.4	3.1	2.3	-6.8	-0.5	4.9	4.5	3.8	0.9	-5.9
Export price	-12.2	-7.3	3.1	-6.9	-12.4	4.8	7.2	6	2.4	0.5	-2.8	-0.9	-2.6	6.4
Import price	-0.6	-5	5	-8.5	-17.8	7.9	9.5	-0.7	1.9	5.4	1.7	2.9	-1.7	0.5
Retardation in world trade	0.7	4.8	1.6	-3.5	-1.4	-6.8	-11.2	-7.2	-4.1	-6.7	-1.3	-3.2	-0.1	-8.7
Export quantity adjustment	-16.1	-13	-10.3	-18.6	-19.4	-0.8	-1.6	-10.3	-8.9	-4.2	3.9	1.5	-6.4	-8.7
Reduction in imports due to: Import replacement	0.8	-1.7	-0.5	0.1	-2.2	0.0	-0.6	-0.2	-0.1	-0.04	0.01	0.1	-0.3	-0.1
Economic compression	-0.8	-4.8	-0.2	-5.4	-14.3	-0.02	-1.0	-0.8	-0.8	-0.01	0.00	-0.1	-1.6	-0.02

Sources: Statistical Abstract, CSO, 1996

Appendix 7A: The Ballasa Methodology

Export Price Effect: $TOT_{xt} = V_{xt}(P_{xt} - P_{x,t-1})$: (+) denotes a gain in export value by Namibia at time t due to a favourable export price change from year t-1 to year t; P_{xt}=unit value of exports in year t; $P_{x,t-1}$ =unit value of exports in year t-1; X = value of exports, fob (US\$); $X_{vt} = X_t/P_{xt}$= volume of merchandise exports in year t. Import Price Effect: $TOT_{mt} = V_{mt}(P_{mt} - P_{m,t-1})$: (+) denotes an increase in the value of imports for Namibia at time t due to unfavourable import price change from year t-1 to year t. P_{mt} = unit value of imports in year t; $P_{m,t-1}$ = unit value of imports in year t-1; M_t= value of imports, fob (US\$); $V_{mt} = M_t/P_{mt}$= volume of merchandise imports in year t. Terms of Trade Effect ($TOT_t = [M_{vt}(P_{mt} - P_{m,t-1})] - [X_{vt}(P_{xt} - P_{x,t-1})]$): $TOTT_t$ represents a net effect of terms of trade variation in year t due to import and export price changes from year t-1 to t. (+) denotes an unfavourable shock. Export Volume Effect (XvE_t): $XvE_t = X_{t-1}(TXvWT_t - GRXvW_t)$: (+) denotes an unfavourable shock on the current account. The export volume effect indicates the share of exports in world total exports as a result of growth/slowdown in world demand. $TXvWT$ = is the expected rate of growth in world export volume at time t, based on the previous ten years derived as: $\log XvW_t = a + bt_t$ where $b = TXvW_t$. $GRXvW_t = (XvW_t - XvW_{t-1})/XvW_{t-1}$, is the growth rate in world exports at time t. Performance Response Measures: Export Quantity Adjustment: $EQA_t = X_{t-1}(GRXv_t - GRXvW_t)$: (+) denotes a rise in Namibia's share of world exports. EQA_t provides a measure of export penetration by the country at time t, assuming that prices had not changed from time t-1 to t. The difference between growth in exports for Namibia and the world indicates the export promotion effort undertaken by the country. $GRXvW_t$ = growth in world export volume from time t-1 to t; $GRXv_t = (X_{vt} - X_{vt-1})/X_{vt-1}$, is growth in volume of exports for Namibia from time t-1 to t; $X_{vt} = X_t/P_{xt}$ volume of merchandise exports. MSUB_t=MH_t-MA_t: If import intensification takes place the country's imports would be higher than expected, and therefore $MSUB_t$ will be positive. $MH_t = M_{t-1}[1 + EL(GRGDP_t)]$ is a hypothetical value of imports at time t, assuming that import elasticity to GDP had remained at its historical level and there is no change in price from time t-1 to t. $MA_t = M_{t-1}(1 + GRMv_t)$ is the value of imports at time t, assuming that no change in price from time t-1 to t had occurred. $GRGDP_t = (GDP_t - GDP_{t-1})/GDP_{t-1}$, Namibia's GDP (at current prices measured in US\$) growth from time t-1 to t. $GRMv_t = (M_{vt} - M_{vt-1})/M_{vt-1}$, is the growth rate in Namibia's import volume from time t-1 to t. $M_{vt} = M_t/P_{mt}$ volume of merchandise imports from time t-1 to t. EL_t is the import elasticity to GDP expected at time t based on the previous ten years derived as: $\log Vi = a + b \log GDP_t$ where $b = EL_t$ and Vi = import volume index at time t-1 to t. Economic Compression (ECOM): $ECOM_t = MvT_t - MH_t$: this measures the change in imports at time t due to compression of economic activity. When economic compression takes place, $ECOM_t$ is positive. $MvT_t = M_{t-1}[1 + EL(GDPT_t)]$ where $GDPT_t$ is the expected trend rate of GDP growth at year t, based on the previous ten years derived as: $\log GDP_t = a + bt_t$, where $bt_t = GDPT_t$, $MH_t = M_{t-1}[1 + EL_t(GRGDP_t)]$ as calculated above.

Source:McCarthy, et al. (1994)

Appendix Table 7.1: ADF Unit Root Tests for Rates of Growth: 1973 to 1995

	GDP	Exports
SACU		
Botswana	-3.843**	-4.285**
Lesotho	-3.456*	-4.435**
Namibia	-3.706*	-4.192*
South Africa	-3.565*	-3.048*
Swaziland	-3.457*	-3.357*
Other SADC		
Mozambique	-3.817**	-3.646*
Mauritius	-3.720*	-4.471**
Zambia	-3.098*	-4.305**
Zimbabwe	-4.568**	-3.285*

Critical values: 5%=-2.997 1%=-3.75