Thesis

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REAL EXCHANGE RATE BEHAVIOUR AND MERCHANDISE EXPORTS IN TANZANIA

AUGUST 1996

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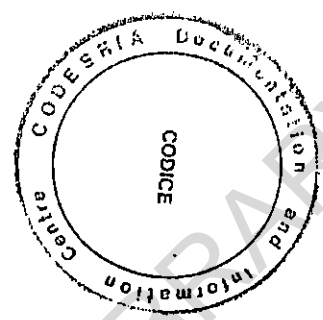

Longinus Rutasitara

A Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy (Economics) of the University of Dar es Salaam

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the University of Dar es Salaam the thesis entitled: ***Real Exchange Rate Behaviour and Merchandise Exports in Tanzania,*** in fulfilment of the requirements for the degree of Doctor of Philosophy (Economics).

Ndulu :

Professor Benno J. Ndulu
(SUPERVISOR)

Date 2nd August 1996

DECLARATION

I, **L o n g i n u s R u t a s i t a r a**, do hereby declare that this thesis is my own original work and it has not been presented and will not be presented to any other University for a similar or any other degree award.

Longinus Rutasitara
Date 06th August 1996

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L. Rutasitara

DEDICATION

To my parents

ABSTRACT

The present study examines the relationship between export performance and the real exchange rate (RER) behaviour in Tanzania. The analysis of the RER (defined as the relative price of the tradables to nontradables) seeks to establish the influence of the factors affecting the RER. These factors (RER determinants) include macroeconomic and trade policies, the parallel exchange market premium, external terms of trade and capital inflows. In turn, the study aims to infer on the indirect influence and policy impact of these factors on export performance through the RER. The RER behaviour in this study includes three elements: the actual RER, the RER misalignment and uncertainty. These are estimated and their relationship with export performance established.

It is hypothesised that changes in the RER are positively related to export performance, while misalignment and uncertainty are negatively related to exports. To the extent that the RER determinants cause an appreciation (or depreciation) of the RER, then they harm (or boost) export expansion. The study further hypothesises that agricultural exports are less responsive to the RER than manufactured exports.

Largely secondary data and documented material are used. The study uses both qualitative and quantitative analyses. The latter include simple trend, correlation and regression analyses. Different measures of exchange rates are computed and their time profiles analysed. Measures of aggregate export performance are also constructed and major trends related to an evolving export policy and the exchange rate regimes.

The respective influences of the RER determinants on the actual RER are investigated via a simple RER model. Correlation and regression analyses are used to investigate the relationships between exports and the RER, and RER misalignment and RER uncertainty. The indirect effects of the policy and "quasi"-policy RER determinants on export performance are derived as a product of the derivative of RER with respect to RER determinant (in the RER function) and the derivative of the exports with respect to the RER (in the export function).

The study finds that while official policy opposed nominal exchange rate adjustment even as internal and external imbalances increased, the RER appreciation and misalignment were particularly strong since the end of the 1970s to mid-1980s. Trends in real exports show weakest performance also during this sub-period. Some recovery during the latter half of the 1980s when the RER begins to depreciate is noted.

Along with the descriptive analyses, the quantitative analyses confirm the hypotheses that export performance is directly related to the RER and negatively related to RER misalignment and RER uncertainty. Further, the responsiveness of agricultural sector exports to changes in the RER behaviour is found to be smaller than that for total and manufactured exports.

The results of the study point to a need for policy actions aimed at reducing RER appreciation, RER misalignment and uncertainty. Overly expansionary macroeconomic policies have an undesirable effect of fuelling inflation. Efforts in dealing with the chronic budget deficits are highly recommended. As for exchange rate policy, a *flexible* official nominal exchange rate that is varied with continual reference to the difference between the domestic and (weighted) foreign rates of inflation is appropriate. Also, to avoid the incidence of RER misalignment and uncertainty the state should demonstrate a steady commitment to the recent economic reforms.

The lower elasticities of supply response of the agricultural exports imply the need for fairer budgetary allocations to the agricultural sector for new and maintenance of infrastructure, education, research and extension. No less vital is the need to closely relate the producer prices of export crops to the changes in the nominal exchange rate and world prices with any taxes that affect production or sale of export crops.

Manufactured exports face stiffer competition. Concern is not only with the capacity utilisation levels but also with price and quality competitiveness.There is a challenging need for government, like in some Asian countries, to actively support local export firms while up-holding continuing trade and exchange rate liberalisation.

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INTRODUCTION

1.1 Background

1.1.1 The Subject and Motivation of the Study

This study examines the relationship between the real exchange rate (RER) behaviour and aggregate merchandise exports in Tanzania over the past two decades. Three levels of aggregate exports are considered: total merchandise exports, and agricultural exports and manufactured exports as sub-categories.

Factors that explain the movement of actual RER are investigated. These factors (referred to as RER determinants) include macroeconomic policies, trade policies and external factors, such as terms of trade, interest rate and capital flows. In turn, the study examines the indirect influence of these RER determinants on export performance. What is the impact of macroeconomic policies, trade policies, the parallel market premium, external terms of trade and capital flows on aggregate exports? What is the extent of RER misalignment and RER uncertainty in Tanzania, and how are they related to export performance? Are there sectoral differences in supply responses to RER changes between agricultural and manufactured exports? Sections 1.2 and 1.3 elaborate further on the specific questions and objectives set for this study.

The study is motivated by observations from literature that associate poor export growth with inappropriate internal policies in developing countries. Misaligned real exchange rate is one of the internal policy-related factors believed to be responsible for poor export performance.[1] Citing recent studies on developing countries, the study examines the concept of the RER, the related policies, and their relationship with export performance. The discussion narrows the focus to Tanzania.

[1]See, for instance, World Bank (1981), Pfeffermann (1985), Edwards (1988, 1989, 1990), and Pick and Vollrath (1994), among others.

1.1.2 Real Exchange Rate and Exports in the Developing Countries

The RER has been defined in a number of alternative ways.[2] The conceptual definition more suited to the discussion of economic adjustment is the one based on the simple model of two sectors - the tradables and nontradables sectors. In that case, the RER is defined as the relative price of tradable to nontradable goods, that is,

$$(1.1)\ RER = P_T/P_N$$

where P_T is the price level of tradables and P_N is the price level of nontradables (or home goods).

The RER signals the relative incentives to produce and consume tradable or nontradable goods. Assuming a "small" and open economy, so that P_T is exogenously determined, the RER acts also as an indicator of the country's international competitiveness. A fall in the RER (a real appreciation) implies loss of competitiveness of the country's tradables and diminishing prospects for export expansion.

In most less developed countries (LDCs), "exchange rates" may immediately be taken for *nominal* exchange rate policy, mainly because of the considerable controversy that has been stirred by devaluation. The bulk of the discourse has focused on devaluation effects on exports, imports, and debt, as well as on the domestic price level, government revenue, income distribution and socio-political consequences. The latter effects have been at the centre of many a government's strong resistance to devaluation. Less pessimistic views, however, propose conditions under which a devaluation can produce greater benefits than costs. These conditions relate to various levels of application of fiscal or monetary, incomes and pricing

[2]See, among others, Helmers (1988), Dornbusch (1980, 1988), and Edwards (1988, 1990).

policies, and special attention to economy-wide or sectoral infrastructure and institutional reforms.

Compared to the nominal exchange rate, RER concept comprises not only the conduct of the nominal exchange rate policy, but also the macroeconomic and trade policies, as well as the influence of the exogeneous factors such as external terms of trade. Thus, the RER approach encompasses a wider set of factors other than just changes in the nominal exchange rate. This is in line with the view that nominal exchange rate policy ought to be applied (and assessed) not in isolation but within some policy-mix whereby macroeconomic, incomes and pricing policies are most closely related to the nominal exchange rate policy.

The link between export growth and economic growth appears frequently in development literature. The controversy here concerns which one of the two precedes the other. The different reviews do not indicate conclusive victory of one hypothesis over the other.[3] It may, however, be asserted that, to have an "exportable surplus", a country ought to generate sufficient output. This is as true in the sense of the classical "comparative advantage" as in "a command economy" where export quantities can be procured by "directives" even when domestic demand has not been met. Thus, the dynamism of export performance primarily lies in the domestic supply (productivity) conditions. It entails the ability of the country to expand (and diversify) its export "base" and export shares. Besides affecting the external competitiveness (demand) of the country's tradables, the RER is a supply-side variable as it alters the relative profitability of producing tradables and nontradables.

Early attempts to describe prospects for export expansion in the LDCs in the 1950s and 1960s developed around the "export pessimism" hypothesis. On the supply side was the belief that price elasticities of supply of LDC exportables were too low. For instance, institutional rigidities were cited as fetters to the effectiveness of

[3]Lal and Rajapatirana (1987), Edwards (1993) and Greenaway and Sapsford (1994) have assessments of methods and results of a number of these studies.

such policy instruments as the exchange rate.[4] On the demand side, export commodities were seen to be constrained by low foreign price and income elasticities of demand, development of synthetic substitutes, and unfavourable trade policies and practices that limited entry of LDCs manufactures into developed countries' markets.[5]

It has been observed, however, that although most LDCs have faced similar external conditions, they have since grown at different speeds, in terms of economic and export development. Table 1.1 shows some contrasts among regions in the developing countries. Asia outperforms Sub-Saharan Africa (SSA) in real GDP growth, inflation, as well as merchandise export and import trade. Except for the "initial conditions", the differences in performance amongst countries are attributed to differences in their respective internal policies and strategies they pursued in adjusting to external shocks.[6]

Table 1.2 shows the relative shares of developing countries, SSA and Tanzania in world merchandise exports. Since the mid-1980s the share of Sub-Sahara Africa shows relative decline from just over 2 per cent to less than 1 per cent, while Tanzania's is close to zero. Of greater concern, however, is the fact that in most Sub-Sahara African countries export decline has largely been due to the decline in *volume* terms; hence, the need to examine domestic supply constraints.[7]

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[4]See, for instance, Love (1984: 280).
[5]See, for instance, Nurkse (1961) and Kovac (1990).
[6]The view pinpointing poor economic performance of mainly Sub-Sahara Africa compared to the Asia region is a typical example. See, for instance, Ghura and Grennes (1993). Even within a group of South-East Asia and South-West Pacific countries (Thailand, Malaysia, Indonesia, Australia, the Philippines, and Papua New Guinea), where some countries have done better than others, a similar view is advanced from recent studies edited by MacIntyre and Jayasuriya (1992); it is noted, that "...while all six countries have been working under similar international economic constraints..., their track records have differed markedly." To explain this variance, MacIntyre *et al.*, (1992: 3) note that "...special attention needs to be given to domestic factors".
[7]This is variously stressed in Svedberg (1988), World Bank (1989), Svedberg and Erzan (1991). Svedberg *et al.*, (1991) show that, compared to other developing countries as a whole, the major exports of Sub-Saharan African countries face lower tariff rates in the developed countries. Arrangements such as preferential treatment under the Generalised System of Preferences (GSP) and the Lome convention are cited.

Table 1.1 Some Comparative Indicators of Economic Performance: Sub-Saharan Africa and Developing Countries *(all in annual per cent change)*

Indicator, Area / Period	1967-76	1975-84	1985	1987	1989	1991	1992
Real GDP							
Developing Countries	5.7	4.5	5.2	5.7	4.1	4.5	5.8
Asia	5.0	6.3	7.3	8.1	5.5	6.1	7.8
Sub-Saharan Africa	4.8	2.3	3.6	2.5	2.8	1.2	-0.6
Consumer Prices							
Developing Countries	15.9	24.2	35.1	35.2	61.9	35.7	38.8
Asia	10.3	7.5	6.7	9.2	11.5	8.4	7.5
Sub-Saharan Africa	8.6	23.6	19.7	27.0	27.3	67.8	77.7
Merchandise Exports *(volume)*							
Developing Countries	6.7	0.7	0.5	12.1	5.8	8.1	9.5
Asia	10.9	9.0	3.2	21.3	6.0	11.9	11.2
Sub-Saharan Africa	3.1	0.3	0.4	-2.3	7.4	0.4	0.1
Merchandise Imports *(volume)*							
Developing Countries	8.7	4.9	-0.5	6.9	8.5	9.7	10.5
Asia	5.9	7.8	7.0	11.2	12.7	11.7	12.2
Sub-Saharan Africa	5.2	-0.9	2.1	-4.3	1.3	-1.0	1.4
Terms of Trade							
Developing Countries	4.5	2.1	-2.1	1.8	4.1	-3.7	-1.2
Asia	-2.2	-	-0.2	-0.1	3.9	-0.2	1.2
Sub-Saharan Africa	0.5	-1.0	-0.1	-7.8	-2.8	-3.7	-4.4

Sources: IMF (1984, 1993a) *World Economic Outlook*: Statistical Appendices.

Table 1.2 Relative Shares in World Merchandise Exports *(Percentages)*

Area, Country/Year	1960	1970	1975	1980	1985	1987	1989	1991
Developing countries	21.9	17.8	24.2	28.7	23.9	20.4	21.6	22.8
Sub-Saharan Africa	2.3	2.4	2.2	2.4	1.7	1.1	0.8	0.8
Tanzania	0.01	0.08	0.04	0.03	0.02	0.01	0.01	0.01

Sources: Computed from UNCTAD (1988, 1989, 1993) *Handbook of International Trade Development Statistics.*

Different comparative studies point to successful export performance in countries that had more liberal exchange rate regimes. Even where state intervention occurred as in the Republic of Korea, this was in the manner purposefully supportive of outward-orientation, putting domestic producers on "equal footing" with international competitors.[8] On the contrary, where government intervention in support of domestic industry was coupled with distortions of price incentives, export performance was weak.[9]

In most countries in SSA economic stagnation has gone hand in hand with the decline in export performance. Inappropriate macroeconomic and trade policies are linked to government inability to provide sufficient incentives for exports, mainly agricultural exports (World Bank, 1981). These include inflationary fiscal policies due to narrow tax bases, inefficient public enterprises, high protective tariffs in favour of import substitution industry, overvalued exchange rates and state intervention with the price mechanisms. External terms of trade, vagaries of nature, and political instability have also taken their toll.[10]

Most of the above constitute a subset of factors that theoretically are key determinants of the RER.[11] Recent studies have empirically examined the behaviour of the RER in the developing countries, and the relationship between the RER and indicators of economic performance, including exports (for instance, Ghura and Grennes, 1993; Grobar, 1993; Cottani, Cavallo and Khan, 1990; Jebuni, Sowa and Tutu, 1991; Edwards, 1988, 1989, 1990; Ndulu and Lipumba, 1989, 1991; Ndulu and Semboja, 1993; and Pick and Vollrath, 1994). With a few exceptions, the majority of these studies are largely based on cross-country data. The present study focuses specifically on a single country, using time series data.

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[8]For instance, the state supplied domestic producers with market information, efficient export finance and infrastructure. See Rhee (1984), World Bank (1991), and Gillis *et al.* (1987) for comparative analyses mainly highlighting case studies from Asia.

[9]In addition to studies cited in the preceding note, one may include Balassa (1984, 1990), Meir (1989) and Krueger, Schiff and Valdes (1989), among other studies.

[10]See, for instance, World Bank (1981, 1990, 1994).

[11]Theoretical analyses of the determinants of the RER are carried out by, among others, Edwards (1988, 1989), Khan and Ostry (1992).

1.1.3 Tanzania: Economic Crisis and Policy Responses

Like most developing countries, Tanzania has faced various internal and external problems impacting adversely both on policy and economic performance. The economy is dominated by the agricultural sector.[12] This has been a major source of exports and raw materials for the domestic industries that depend considerably on imported inputs.

During the first six years of independence (since 1961), economic policy aimed at higher growth of income, and import substitution industrialisation, with a wide room for private and foreign investment. In 1967 the policy shift towards socialism led to the nationalisation of private enterprises (most private agricultural estates, commercial and financial institutions), and subsequent expansion of the public sector. While the economy remained "mixed", the private sector was curtailed. Although the socialist policies were articulate on the rural sector, industry was initially seen as the basis for economic transformation.

A number of reviews point to impressive economic performance in the 1960s to around 1978, with an average annual growth rate of about 5.4 per cent.[13] Annual rates of inflation were below 10 per cent, permitting positive increases in real per capita income. The provision of social services, mainly education and health was also deemed to be satisfactory.

A brief account of the economic crisis and policy responses that followed is divided into two sub-periods: 1979-85 and 1986-90 (Charts 1.1, 1.2, and 1.3).

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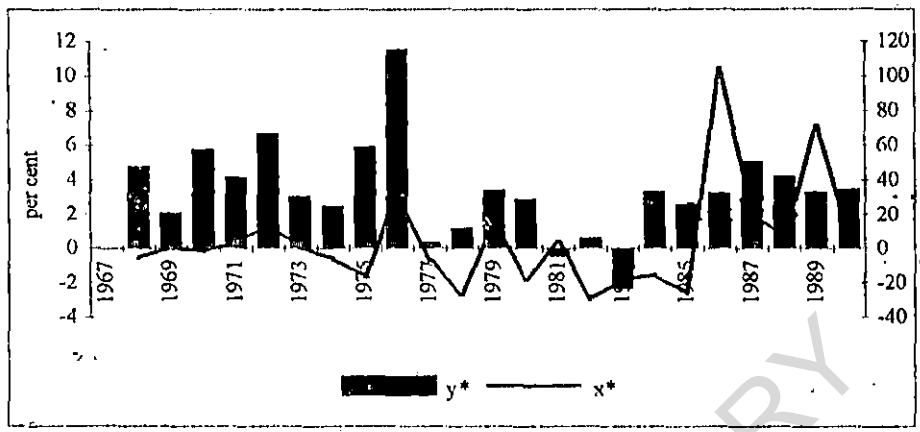
[12]For instance, over 1980-90 the sector accounts for the average of 48 per cent of Gross Domestic Product (GDP) at Factor Cost at constant 1976 prices The average for manufacturing during the same period is about 9 per cent; this was a decline from just above 12 per cent in the late 1970s.

[13]For instance, Singh (1986) and Bagachwa (1992).

Chart 1.1 Real GDP and Real Merchandise Exports (1967-90) *(annual percent change)*

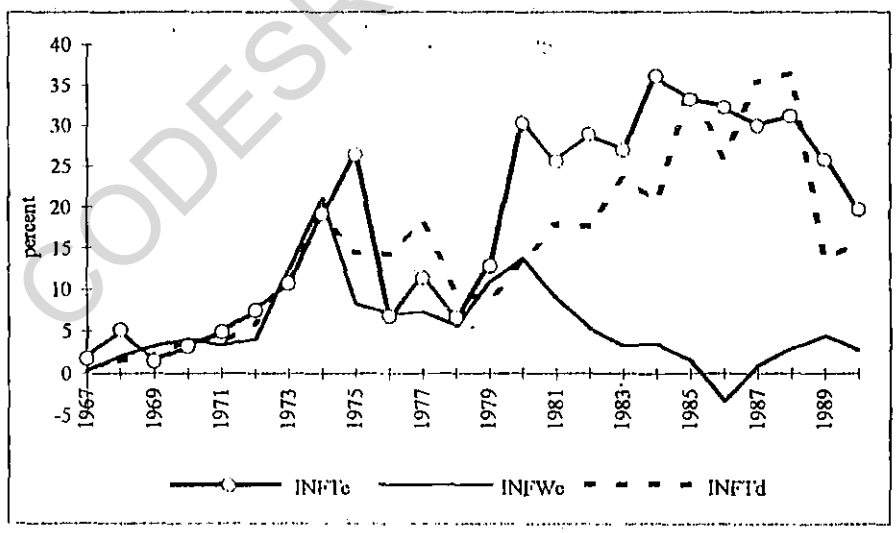


Notes: LEFT SCALE is annual percentage change in real GDP (y*). RIGHT SCALE is annual percentage change in real total merchandise exports (x*) obtained as nominal total merchandise exports deflated by GDP deflator:

Sources: (URT) *National Accounts of Tanzania* and *Foreign Trade Statistics* (various).

Chart 1.2 Tanzania's Domestic Inflation and Trading Partners' Inflation

(annual percentage change)



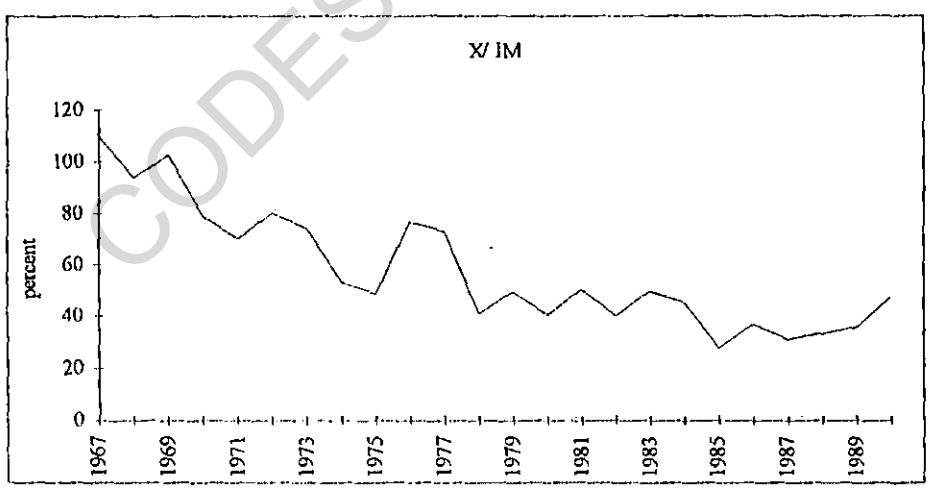
Notes: INFTc : annual percentage change in Tanzania's Consumer Price Index; INFTd: annual percentage change in Tanzania's GDP deflator; INFWc: annual percentage change in the weighted Consumer Price Index of ten (10) of Tanzania's major trading partners (United Kingdom, Germany, USA, Japan, Belgium, France, The Netherlands, Italy, India, and Sweden)

Sources: Bank of Tanzania *Economic and Operations Report* (various issues) and *Hali ya Uchumi* (*Economic Surveys*) (various issues).and IMF *International Financial Statistics*, 1992).

In the sub-period 1979-85 economic performance faltered. Real GDP and exports declined (see, Chart 1.1). The rate of inflation ranged between 12.85 per cent in 1979 to 36.14 per cent in 1984. The budgetary resources gradually failed to cover the financing requirements for the social infrastructure and industrial capacity created in the 1970s.[14] Monetary accommodation of public sector financial losses added to inflationary pressures.[15] Inflation was also fuelled by shortages of domestically produced goods.

Shortages of manufactured goods were invariably due to excess capacity caused by declining capacity to import intermediate and other vital inputs.[16] This reflected the inability of the country to generate enough output to export. Chart 1.3 shows the steadily declining "command" (purchasing power) of merchandise exports over imports, which definitely is a function of both external terms of trade and export volumes.[17] The overall decline in the X/IM ratio in Chart 1.3 is another way of showing that the trade balance was steadily deteriorating over time.

Chart 1.3 Ratio of Merchandise Exports to Merchandise Imports



Notes: X is Total merchandise exports, M total merchandise imports.
Sources: Based on data from Bank of Tanzania (1982) and *Foreign Trade Statistics* (various issues).

[14]Bank of Tanzania (1982: 198), for instance, points out that this problem began already in the fiscal year 1978/79.
[15]On this phenomenon see, for instance, Ndulu and Hyuha (1990).
[16]For more incisive analyses of other factors affecting capacity utilisation in the manufacturing sector in Tanzania, see, for instance, Wangwe (1977) and Ndulu (1986a).
[17]In a broader sense, the country's capacity to import depends also on the foreign aid.

Table 1.3 Selected Macroeconomic Indicators:

Year	y*	I/GDP	INF	MS*	DV	TOT	FORES
1967	4.00	17.9	1.75	27.3	0	97.50	61.7
1968	4.78	17.7	5.17	-2.7	0	92.90	77.5
1969	2.08	15.5	1.41	25.4	0	112.30	80.3
1970	5.80	22.5	3.23	18.1	0	106.50	65.0
1971	4.21	26.4	4.92	18.2	0	98.80	60.3
1972	6.73	21.8	7.46	17.8	0	95.30	119.6
1973	3.04	21.1	10.71	18.2	-1.68	118.80	144.6
1974	2.51	22.0	19.19	22.2	1.71	108.00	50.2
1975	5.91	21.1	26.47	24.5	3.22	92.60	65.4
1976	5.70	22.9	6.78	25.1	13.70	126.20	112.3
1977	0.40	20.0	11.36	20.2	-1.07	140.40	28.8
1978	2.13	25.2	6.60	12.6	-7.00	114.90	99.9
1979	2.91	26.1	12.85	47.0	6.62	114.70	68.0
1980	2.49	23.0	30.26	26.9	-0.24	100.00	20.3
1981	-0.50	24.7	25.65	18.1	0.98	85.00	18.8
1982	0.59	21.0	28.95	19.5	12.08	88.20	4.8
1983	-2.38	13.6	27.06	17.8	20.04	91.00	19.4
1984	3.38	15.3	36.14	3.7	37.25	96.20	26.9
1985	2.63	15.7	33.29	30.3	14.26	90.50	16.0
1986	3.26	19.5	32.42	28.0	87.18	103.60	61.1
1987	5.09	30.3	29.95	32.0	96.51	89.40	31.8
1988	4.23	30.6	31.19	35.1	54.51	94.30	77.7
1989	3.34	34.5	25.85	29.5	45.50	93.00	54.2
1990	3.49	47.6	19.70	40.6	35.03	89.00	192.8

Notes and Sources:

y* is annual percentage change in real GDP at factor URT *National Accounts of Tanzania* (various)

I/GDP is ratio of investment to GDP from IMF (1993) *International Financial Statistics.*

INF is annual rate of change in the National Consumer Price Index as measure of rate of inflation, based on Bank of Tanzania *Economic and Operations Report* (various issues) and *Hali ya Uchumi* (*Economic Surveys*) (various issues).

MS* = annual percentage change in money supply, broadly defined, Bank of Tanzania data.

DV is annual percentage change in the nominal exchange rate (TSH per USD 1), based on calendar year average rate from Bank of Tanzania *Economic and Operations Reports* (various issues and World Bank (1992) *World Tables.*

FORES = Foreign Reserves in million USD from IMF (1993) *International Financial Statistics.*

TOT: Index of Tanzania's External Terms of Trade from World Bank (1992) *World Tables.*

Like in most of SSA, the problem of poor export performance has been identified as supply-based. For instance, the decline in real exports in the period 1977-85 is largely attributed to *quantum* decline (56.8 per cent) - the rest (43.2 per cent) is attributed to adverse terms of trade.[18]

The development strategy placed greater emphasis on import substitution industrialisation (ISI). This involved giving greater protection to mainly state-owned manufacturing from internal and external competition. Perhaps, what may not have been appreciated is the extent to which protective measures undermined the competitiveness of the exports both on cost (and hence international price) and quality counts (Ndulu et *al.*, 1993). Resort to export incentive schemes in the early 1980s did not yield intended results due to various operational problems but also, equally significantly, the unfavourable macroeconomic environment (Lyakurwa, 1991 and Musonda, 1992).

Domestic inflation became higher than that of trading partners mainly since around 1974, and more markedly after 1978 (Chart 1.2). It has been one of the factors undermining the price competitiveness of the country's exports. To curb inflation it was necessary to reduce government spending and limit credit expansion or money supply, to improve performance of the public enterprises, reduce price distortions (due to controls and subsidies), and reduce sectoral infrastructure problems. External assistance badly needed by government was made conditional upon such reforms, to accompany nominal exchange rate devaluation. Resistance of government to devaluation and other reforms during this period is on record.[19]

The period since 1986-90 has seen gradual macroeconomic reforms, trade and exchange rate liberalisation, recognition of the role of the private sector and a wider place for market forces. Initiated in 1984, the slow process took hold, amidst vocal opposition from critics (including a notable section of the political leadership), during

[18]For more details see, for instance, Ndulu et *al.*(1989) especially Table 10 p.14.
[19]See, for instance, Nyerere (1980).

the period of the first Economic Recovery Programme (1986-90) (ERP I). ERP I was preceded by adjustment programmes that failed to alter the decline in real output and exports in the first half of the 1980s.[20]

Modest records have been achieved during ERP I. Inflation only slowed down to 20 per cent by 1990. Still worrying was the overall budget deficit. As a percentage of GDP it increased from 10 per cent in 1986 to nearly 14 per cent in 1990 (Lipumba, 1992: 47). Moreover, a big part of the recurrent budget relied on foreign aid. On the other hand, the liberalisation measures helped check the decline in real GDP and exports.

A comparison of these two sub-periods (1979-85 and 1986 onwards) shows an obvious difference in overall export record between the periods before and after 1985. Better performance in the latter period is, if by coincidence, matched by gradual macroeconomic and trade policy reforms, including wide-order depreciation of the nominal exchange rate. This contrasts with the period prior to 1985 when the economy was largely under inward-looking type of policies and relied more on "directives". For a long time Tanzania maintained a "passive" exchange rate policy (Gulhati, Bose and Atukorala, 1986 and Ndulu, 1993). At the same time, her development strategy was accompanied by policies that biased incentives against agriculture and exports in general. A gradual change from this seems to have started from the mid-1980s.

[20]The earlier programmes were the National Economic Survival Programme (NESP) (1980-82) and Structural Adjustment Programme (SAP) (1983-85).

1.2 Statement of the Problem.

A question may be raised, therefore, as to whether there can be a systematic relationship between the conduct of macroeconomic policies, trade policies, and policy reactions to external shocks and observed trends in exports. The main way through which these policies can affect export growth is by altering the relative price incentives of tradables and nontradables, or the RER.

One of the ways of exploring the extent to which such policies are related to the actual expansion of exports is through the medium of the RER. First, this requires knowledge about the RER itself and its determinants. If the impact of the policies in question on the RER can be established, then it is possible to infer on the indirect effect of these policies on exports through the RER.

Thus, the study examines closely the RER path, and its determinants such as the nominal exchange rate, premium on the parallel market exchange rate, macroeconomic and trade policies, external terms of trade and foreign resources inflows. This provides a basis for examining the nature of two questions about the macroeconomic environment, namely, the RER misalignment and RER uncertainty.

The basic questions follow: What is the relationship between the RER behaviour (changes in the actual RER, RER misalignment and RER uncertainty) and aggregate export performance? What is the relationship between each of the RER determinants and export performance? What can be said about any differences in sectoral (agricultural versus manufactured exports) responses?

1.3 Objectives of the Study

The broad objective of the study is to provide empirical evidence of the relationship between the RER and export growth. For policy purposes the study seeks to point out factors that precipitate RER misalignment and uncertainty and the way they affect export responses.

The specific objectives of the study include:

(i) to obtain and explain empirical estimations of different exchange rate measures. Time profiles of the bilateral and multilateral RER as well as the rate based on the parallel market are analysed.

(ii) to examine the factors explaining the nature of the official nominal exchange rate policy stance.

(iii) to study the effects of the RER determinants and their relationship to the external competitiveness of Tanzania's exports.

(iv) to derive measures and discuss the implications of RER misalignment and uncertainty.

(v) to estimate the impact of the RER behaviour on export performance - real total, agricultural and manufactured exports. This is intended to explore any differences in the responsiveness of sectoral exports to the RER related policies.

(vi) to estimate the impact via the RER of the trade and macroeconomic policies, terms of trade and other RER determinants on exports.

1.4 Significance of the Study

Empirical studies of this nature are only recently emerging in the developing countries. The intended contribution is by way of assessing the potential of macroeconomic and trade policies, as well as policy reactions to external shocks in the process of "recovery" where export expansion is critical. The mentioned policies in Tanzania have been undertaken in a slightly unique political-economy. Though the economy has remained "mixed", there have been, for a long period since 1967, serious attempts towards central, directive planning, even though the significance of controls has been diminishing since the late 1980s' reforms.

1.5 Theoretical Background and Hypotheses.

The study relies on two main strands of theory. The theory of RER determination is used to investigate the major factors (including the main policies in question) that explain the RER path in Tanzania, while the theory of supply forms a basis for the investigation of export supply responsiveness to changes in the actual RER, RER misalignment and uncertainty.

1.5.1 Real Exchange Rate Determinants

The importance of RER as an indicator of intersectoral resource movements and international competitiveness of a country has led to detailed theoretical enquiry into factors affecting its level and changes. Examples of such theoretical works include, among others, Dornbusch (1974, 1980), Edwards (1988, 1989, 1990), Edwards and van Wijnbergen (1989), Aghevli, Khan and Montiel (1991), Khan and Ostry (1992), Elbadawi (1989) and Ndulu (1993).

The main theoretical determinants of a country's RER include commercial policies (trade taxes, and non-price measures on both the internal and external trade), the parallel foreign exchange market premium, external terms of trade, international interest rates and transfers. Together with changes in productivity, these are considered to be fundamental determinants of *equilibrium real exchange rate* (ERER). Theoretical analyses attempt to predict the various impacts of these factors on the ERER. The equilibrium real exchange rate is defined as that ratio of the price level of tradables to the price of nontradables that, given the present and future ("sustainable") values of the fundamentals, results in a simultaneous achievement of both internal and external balance (Edwards, 1988, 1989). Internal balance generally implies absence of excess supply or demand in the domestic market for nontradables,[21] while external

[21] Internal balance practically implies absence of inflationary pressures - these may emanate from persistent fiscal deficits or expansionary monetary policy - which generate excess aggregate demand or they may arise from (aggregate) supply shocks.

balance implies that the current account can be financed by sustainable capital inflows (Edwards, 1989; Aghevli *et al.*, 1991; Khan et *al.*, 1992).

For analytical and policy purposes, it has been desirable to establish the ERER, from which "departures" of the actual RER can be used as guide for making appropriate adjustments in the RER determinant(s) to correct for any misalignment. Factors that may cause the actual RER to deviate from the ERER in the short- to medium-run are mainly inconsistent nominal exchange rate and macroeconomic policies.

Traditionally, the benchmark for adjustment has been based on the Purchasing Power Parity (PPP) definition of $ERER_{PPP}$ level for some base year when macroeconomic and trade balances are thought to have been in equilibrium. Over time, however, the ERER changes with current and anticipated changes in the fundamental determinants. Thus, unlike the $ERER_{PPP}$ definition, ERER is not a constant, but changes with the evolving structure of the economy as reflected by changes in the fundamentals.

The purpose presently is to deduce from the various theoretical analyses, knowledge of the effect of each determinant on the actual RER in direction and magnitude. Is the effect an appreciation (a decrease in RER) or depreciation (an increase in the RER)?[22]

It is assumed that actual RER has two components: the ERER given by the fundamentals, and that part due basically to (if) any deviations from the ERER (or RER misalignment.

Further, the RER determinants may be grouped into two classes:

(i) (directly) policy-related determinants - including trade, macroeconomic and nominal exchange rate policies and

(ii) "*quasi-policy*" or partly-policy related RER determinants. These include the parallel market premium, external terms of trade and

[22]Here, only a brief mention is made of the main determinants and their generally hypothesised effects (direction) on the RER (more in 1.5.3 and later in Chapter II especially 2.3.2).

foreign inflows; so categorised here because domestic policy has limited control over these variables.

A restrictive trade policy regime is likely to lead to RER appreciation because it is assumed to cause an increase in the domestic price of the nontradables, while trade liberalisation is likely to lead to RER depreciation. To the extent that expansionary macroeconomic policies will likely cause inflation they are associated with RER appreciation.

An increase in the parallel exchange market premium is associated with ERER appreciation (Edwards, 1989; Ndulu, 1993). The effect is akin to an increase in export tax (Pinto, 1989, 1991; Ndulu, 1993). An improvement in the terms of trade and higher capital inflows are expected to lead to RER appreciation, similar to Dutch Disease effect (for instance, White and Wignaraja, 1991 and Corden, 1984).

Details of the transmission from a change in a given determinant to the change in (or effect on) the RER are reviewed in Chapter II in a theoretical setting, while the latter part of Chapter III attempts an empirical estimation of both the direction and magnitude of the effects of these RER determinants, following which empirical correlates of the RER behaviour are derived.

1.5.2 Real Exchange Rate and the Supply of Exports

The link between the RER (and indirectly its determinants) and export performance can conceptually be adduced from the basic supply-price relationship. The RER is assumed to be a supply price, signalling movement of resources between tradables and nontradables. A positive relation is assumed to hold between the movement in the RER and exports, other things remaining constant.

To this, output (real GDP) is added to represent the capacity output base for exporting. Other things remaining constant, it is expected that a larger "exportable surplus" becomes possible when output expands.

1.5.3 Hypotheses

As may be already apparent from 1.5.1 and 1.5.2 a number of hypotheses emerge. However, only the leading ones are mentioned in this sub-section. Since the study seeks to establish the relationship between the RER behaviour and export expansion, and in view of the definition adopted for the RER behaviour, the main hypotheses can be stated as :

(i) There is a direct relationship between the (actual) RER changes and aggregate export expansion. It is thus expected that aggregate exports respond positively to changes in the RER. This implies that a rise in the RER, or RER depreciation is associated with an expansion in exports.

The RER is presumed to be a transmission mechanism through which the RER determinants exert their influence on export supply. Thus, hinging upon (i) (for the main determinants of interest for this study), it is hypothesised that:

(a) A restrictive trade policy is harmful to export performance, because it induces RER appreciation. Conversely, trade liberalisation, by inducing RER depreciation is positively related to export growth.

(b) An increase in the parallel market premium negatively affects exports, since it induces RER appreciation.

(c) Increases in either external terms of trade and / or in foreign inflows are likely to have negative effects on export performance, since they induce RER appreciation.

(d) Macroeconomic balance and export performance are negatively related. For instance, expansionary macroeconomic policy has, by inducing RER appreciation, a depressing effect on export performance.

(ii) It is also hypothesised that RER misalignment is negatively related to export performance. This is because misalignment entails incorrect price signals as between the tradables and the non-tradables sector so that, in the common case of sustained appreciation, the profitability of the tradables gets eroded.

(iii) Large fluctuations in the RER imply greater uncertainty (risks) and high costs in terms of adjusting resources back and forth between the tradables and nontradables sectors. Therefore, it is expected that economic activity, and exports in particular are negatively related to RER uncertainty.

(iv) Furthermore, it is assumed that the responsiveness of exports at different sectoral levels of aggregation is different. In particular, it is hypothesised that agricultural exports are less responsive to changes in the RER than manufactured exports. As Balassa (1990: 384) points out, there has been popular belief that in less developed countries "agricultural exports are less responsive to prices than industrial exports". Perhaps, this proposition can better be resolved empirically for a given country.

1.6 Methodology

The study employs existing theories to study the relationship between RER behaviour and aggregate exports in Tanzania. The analyses are largely at a macro-level. Thus, the study relies on aggregated secondary, data and documented materials. These have been obtained from government institutions and their publications. The principal sources include Bank of Tanzania, Bureau of Statistics, Planning Commission, Ministry of Agriculture and the Marketing Development Bureau and libraries, to mention a few.

Both qualitative and quantitative analyses are used to test and qualify the outlined hypotheses. As for the quantitative methods simple descriptive statistics and regression analyses are used to analyse largely time series data.

1.7 Scope and Limitations of the Study

The study's principal focus is the RER behaviour, (RER path, RER misalignment and uncertainty). Detailed analysis of the nominal exchange rate policy is carried out to highlight on the accompanying macroeconomic and trade policies. These and other factors that influence the RER are investigated in an empirical model of RER. The study in turn tries to establish the magnitude of the impact of the RER determinants on export performance.

It is recognised that similar analysis could be extended to include exports of services, saving-investment process, and imports. These are important areas that could not reasonably well be included in the present scope. Furthermore, the present study does not get into the detail of basically micro-economic level commodity-by-commodity analysis.

The study covers the period 1967-90. However, the analysis concerning the nominal exchange rate regime is extended to 1993 to cast on some recent developments and prospects for exchange market unification. As for exports and export policy, some background analysis between 1960 and 1967 is also briefly given.

The time perspective of the study was mainly dictated by the availability of data. For most of the variables data are available on an annual frequency. However, there are lags in the availability of the secondary data varying between two to four years. Also, inconsistencies in the trade data were encountered: different, and more often the same, sources happen to have different figures for the same item(s). In many cases, the latest available sources (e.g. publication), the "most updated" were sought. This necessitated frequent revisions.

1.8 Outline of the Study

The remainder of the study begins, in Chapter II, with a more detailed review of theoretical and empirical works cited in the introduction and others on the subject of this study. The review is preceded by an overview of exchange rate and trade policies in the developing countries, pointing out outstanding institutional features related to the conduct of macroeconomic and trade policies, and noting some recent reform measures. The bulk of the chapter dwells on the concept of the RER and the determinants of the RER, and reviews the few available studies that relate the RER behaviour to export performance in the developing countries. On the basis of these reviews, rudiments of the approach of the present study are outlined.

Chapter III examines the behaviour of the exchange rates in Tanzania. Different definitions and measures of nominal and real exchange rates are constructed and analysed. The conduct of the nominal exchange rate policy is examined in a historical perspective and major events bearing on the RER are pointed out. This is followed by an empirical examination of the determinants of the RER *via* a RER model. Estimations of the extent of RER misalignment and RER uncertainty based on the results RER model are carried out and results discussed against the actual economic and institutional developments in Tanzania.

Chapter IV presents a descriptive review of the performance of exports and related policies. As the focus is on aggregate analysis, only three major levels of aggregate merchandise exports are considered: (i) total (merchandise) exports, (ii) total manufactured exports and (iii) total agricultural exports. Attempts are made to measure aggregate export performance over time and major trend features are analysed along three sub-periods. The evolution of policies related to exports is critically examined with due reference to the salient exchange rate regimes and other institutional changes pertaining to exports.

Chapter V makes an empirical estimation of the relationships between the RER behaviour measures derived in Chapter III, and time series of aggregate export

performance (total exports, total manufactured exports and total agricultural exports from Chapter IV). Attempts to explore the time series characteristics of the RER and aggregate export are made. The chapter proceeds to estimating the relative impact of the RER determinants on export performance by integrating results from Chapter III and those of this chapter. The aim is to approximate the relative effects of the RER *directly policy* and *quasi-policy* determinants on real exports via the export function and RER movements.

Chapter VI gives the summary and main conclusions of the study, policy implications of the results and suggested areas for further research.

II

REAL EXCHANGE RATE AND EXPORTS IN DEVELOPING COUNTRIES: SOME THEORETICAL AND EMPIRICAL INSIGHTS

2.1 Introduction

This chapter seeks to deduce a theoretical framework for the analysis of the relationship between the RER behaviour and export growth in Tanzania. It is based on a review of major exchange rate and trade policies, and the concept of the RER as it theoretically and empirically has been related to export performance in a number of other developing countries.

Section 2.2 gives an overview of nominal exchange rate and trade policies, export incentives and other factors that are considered to influence export performance in the LDCs. This is by no means an exhaustive account of these topics, but a background discussion projecting some salient features, institutional or otherwise, which influence the working of the macroeconomic and trade policies in these countries. The Real Exchange Rate concept is introduced in section 2.3. This section also describes the theoretical determinants of the RER, and elements of the RER behaviour (actual RER path, RER misalignment and RER uncertainty). Section 2.4 takes up the theoretical relationship between the RER behaviour and export supply. This is followed in section 2.5 by a review of recent empirical studies relating the RER behaviour to export performance indicators. Section 2.6 briefly presents a suggested approach of the present study and section 2.7 gives concluding remarks for the chapter.

2.2 Exchange Rates and Export Incentives: An Overview

2.2.1 Nominal Exchange Rate and Trade Policies

The nominal exchange rate between the home currency and currencies of other countries is an important price and policy variable. Authorities aim to maintain a correct and relatively stable rate so as to avoid high variations that can generate uncertainty.

Nominal exchange rate arrangements practically followed lie between two theoretical extremes: fixed and freely flexible rates. Under the Bretton Woods system countries maintained their (official) nominal exchange rates within a narrow band around a fixed par value, mostly in reference to the US dollar.

Between 1970-73 the developed market economies shifted towards floating rates. Many developing countries chose to peg their currencies to one or more of the "strong" currencies of the advanced countries, or to the Special Drawing Rights (SDRs) of the IMF. By 1989 about half of the developing countries pegged their currencies to the US dollar or to the French frank and about a quarter pegged to a composite (basket) of currencies of major trading partners with weights based on volumes of trade flows (IMF, 1989). For many LDCs greater flexibility is hampered by an undeveloped financial infrastructure (Black, 1976; Crockett and Nsouli, 1983) while inconvertibility of their currencies makes it difficult for their financial markets to be properly integrated into the international financial system (Krueger, 1983). Few countries have futures markets for foreign exchange. Moreover, since the domestic capital market is highly repressed, the effectiveness of traditional instruments of monetary and fiscal policies is greatly impaired.

Many LDC exchange rate regimes have leaned comparatively more toward greater *fixity*, in the sense that it is the monetary authorities - and not the free market for foreign exchange - that determine the exchange rate and exercise the discretion to keep it at what level they consider to be appropriate. The "traditional" theory then, that the nominal exchange rate is determined by the flow supply and demand for

foreign exchange, ("the balance of payments view of the exchange rate" determination) is not allowed full play. Indeed in countries suffering long-standing payments problems one observes a dominance of excess flow demand over supply of foreign exchange, with governments trying to regulate both flows through various trade and exchange controls.

The administration of the controls has resulted in multiple exchange rates. Strict trade and foreign exchange regulations prompted by foreign exchange shortages have contributed to the growth of unofficial (illegal) parallel market for foreign exchange and smuggling.

A number of LDCs have, during the 1970s and 1980s, attempted more liberal trade and exchange reforms (Thomas and Nash, 1991). Trade policy reforms aim for a lower and more uniform tariff structure, reduced dispersion of the tariffs and reduction of non-tariff measures. Exchange rate reforms include moves towards greater *flexibility* and unification of the exchange market in attempts to achieve a stable and realistic exchange rate.[23] Tanzania adopted a crawling peg since 1986 and is now embarking on a course towards exchange market unification. It appears, however, that persistent failure to address sources of domestic imbalances is a potential pitfall in the way of attaining objectives of unification.[24]

Barely have LDCs hidden their dislike of devaluation. In some cases devaluations have been undertaken rather after than before the external payments imbalances reached crisis levels (Krueger, 1978; Edwards, 1989). More theoretical and empirical work has been done than it is necessary to dwell on now.[25] The outcome of devaluation for each country is empirical. It depends on the structure of the economy,

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[23]Uganda adopted an auction for foreign exchange in 1982; between 1984 and 1989 the list of countries that moved toward some form of floating included Jamaica, Nigeria, the Philippines, Zambia, Ghana, Sierra Leone, Guinea, Bolivia, Dominican Republic, Maldives, Paraguay and Venezuela (IMF, 1989). In a review of economic adjustment in 29 Sub-Saharan African countries during the latter half of the 1980s up to 1991, World Bank (1994: xvii) classifies 17 of these "adjusters" as countries *with flexible exchange rates*, and 12 as countries *with fixed exchange rate;* Tanzania is placed in the group of countries *with flexible exchange rates*.

[24]See, for instance, Agénor, P. and Flood, R. (1992), and Pinto (1991).

[25]On the various aspects and reviews of devaluation experiences in the developing countries, see also, Bird (1983), Edwards (1985, 1989) and Edwards and van Wijnbergen (1989).

the severity of the imbalances "before" devaluation, the timing and rate of nominal devaluation, and the supportive policies that accompany it.

When especially moving from an initial position of disequilibrium, in particular an overvaluation, nominal devaluation can be an effective tool in switching resources towards the production of tradables and consumption expenditure towards nontradables (Edwards, 1989; Aghevli et *al.*, 1991). In the short-run, a devaluation can have a stimulating impact on the supply side to the extent that prices of domestic inputs (labour, land and capital) rise less than proportionately to the prices of final output (IMF, 1987). It is important whether a *real* devaluation is achieved and how long it can be sustained, since there exist potential off-setting forces, mainly those that put pressure on the domestic price level. It may serve only to mention some of the consequential ones. Some of these have been used as economic arguments against devaluation, although it is conceivable, that an awareness of these pitfalls can serve as a guide for necessary contingencies when devaluation becomes inevitable.

Pressure on the domestic price level may be due, first, to the impact rise of import prices in local currency. Second, where domestic production is heavily dependent on imported inputs, the cost-push effect amplifies the rate of inflation.[26] Third, possible wage rises - if there is some degree of indexation may, also offset the *real* devaluation.[27] Hyuha (1990) notes of a case in Tanzania whereby state-owned and other firms secured government "permission" to raise prices of their products to make up for the devaluation effect on their input prices. The firms raised prices by more than the proportionate rate of devaluation.

Inflation and the redistributive problems that go with it, are probably the most detested effects placed on devaluation. However, it has been observed also that devaluation is by no means the principal cause of inflation. "...[C]ountries that have devalued have already been experiencing inflation under the impact of monetised

[26] See, for instance, van Wijnbergen (1986).
[27] *ibid.*

fiscal deficits" (Cohen, 1991:45) or a failure to offset the effect of current account surpluses on money supply (Krueger, 1978).

A desirable result of a devaluation is that the consequent rise in the general price level should reduce the real value of wealth, financial assets and real cash balances, so that ultimately domestic absorption may be reduced. Depending on the price and income elasticities of demand for imports, the current account may improve to the extent that imports decline. This should be coupled by an increase in the supply of tradables that, in turn, depends not only on the real increase in the price incentive (to which resources movements respond), but also the ease with which resources can switch across sectors. The latter depends on the institutional policies - like pricing, incomes policies, and infrastructure.[28]

In addition to attention to non-price supply constraints, the conduct of macroeconomic policies following a devaluation has a critical impact on the eventual change in the real price incentives. Indeed it may not ultimately be accurate to apportion the outcome solely on devaluation as distinct from other "supportive" policies.

2.2.2 Export Incentives and Trade Orientation

A striking distinction in economic and export performance among developing countries has been explained around two types of trade policy orientation: outward *versus* inward orientation. Studies by Krueger (1978, 1984), Bhagwati (1978, 1988), Lal and Rajapatirana (1987) and Syrquin and Chenery (1989), conclude that countries that adopted outward-oriented trade and development strategies became successful exporters, and achieved higher levels economic growth rates, efficiency in resource

[28] A number of studies in developing countries widely find positive elasticities of agricultural supply to price incentives (e.g. Bond, 1983; Balassa, 1990; Ndulu *et al.*, 1989,1991; and Mshomba, 1989). Provided the devaluation is effectively "passed through", solving non-price supply bottlenecks is emphasised (Oyejide, 1990, Binswanger, 1989; and Thomas and Nash, 1991).

(re)allocation and labour and factor productivity. Also they coped better with external shocks in the 1973-76 and 1979-81 periods than those that were inward-oriented (Balassa, 1984).

An important explanatory variable of trade orientation is the incentive structure that has nominal exchange rate and trade taxes as main determinants of the net return to export or import activities. Comparisons are made between the effective exchange rate of a country's exports (EER_x) with that of its imports (EER_m) - where the EER_x is the amount of domestic currency actually received per unit of foreign currency for exports *f.o.b*, and EER_m, the amount actually paid per unit of foreign currency for imports *c.i.f.* - in both cases, after account has been taken of all duties and taxes (subsidies) applying to the exports or imports.

Bhagwati (1988) describes as export promotion an incentive structure that is characterised by *neutrality of* incentives between exporting and importing, i.e. $EER_x \cong EER_m$ (and not necessarily by a positive bias in favour of exports, $EER_x > EER_m$) This is similar to World Bank (1987) description of outward-oriented strategy as one that neither discriminates between production for the domestic market and for export market, nor between the purchase of domestic and foreign goods. Conversely, inward-orientation, describes a setting of policies that make the average $EER_m > EER_x$. Such is the incentive structure in the majority of developing countries with trade and industrial policies biased in favour of the domestic market over the export market and is identified with import substitution industrialisation.

The upshot of these comparative studies has been to push the urge for trade and exchange rate reforms towards export promotion. Though the reliability of these definitions is beset by inadequacy of data (Helleiner, 1990), they indicate the general bias in the relative incentives inherent in a given policy orientation. Perhaps in addition, it is desirable to consider the EER_x and EER_m in *real* terms, that is, against the domestic inflation and foreign price level.

Often countries apply more direct, non-exchange rate promotional devices such as export rebates, export credit, reduced duty on imported inputs, preferential allocation of foreign exchange to export producers, and foreign exchange retention schemes.[29] Unlike the exchange rate these are more selective, and each device confers an implied subsidy element. They are susceptible to lobbying and cheating.[30] If they are numerous, administrative costs may be unjustifiably high. It may even be suggested that fewer of them would be required in the absence of exchange rate overvaluation and premium on import licences.

In a broad sense, the conduct of the exchange rate policy is central to the incentives underlying a given trade strategy. However, equally important are the macroeconomic policies since they affect the domestic price level, and hence the real incentive or indeed, the relative profitability of producing for exporting.

2.3 Theoretical Determinants of the Real Exchange Rate

2.3.1 Real Exchange Rate Concept

The two-sector definition of the RER is sometimes referred to in literature as "dependent economy" or "trade definition" of the RER, originally associated with Swan (1960) and Salter (1959).[31] It is assumed that the economy is "open" (trading), and "small", that is, its terms of trade are exogenously given. A parallel can also be drawn with the Meade-Swan-Salter (MSS) synthesis of policies for internal and external balance. The added assumption due to Meade (1951) is that international capital flows are insensitive to domestic interest rates.[32] As seen in 2.2, this is close to "real world" situations in most LDCs (for instance the presence of "repressed" domestic capital

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[29]A range of these incentives is treated by Milanovic (1986) for the case of Turkey, Rhee (1984), Lyakurwa (1991) and Department of Marketing (1986) and Bagachwa et *al*. (1990).

[30]See, for instance, Bhagwati (1982).

[31]See, for instance, Dornbusch (1980:97), Edwards (1988:57), O'Mara (1990) and World Bank (1990:12).

[32]This is demonstrated geometrically by means of IS-LM framework by, for instance, Stevenson, Muscatelli and Gregory (1988: 229-231).

markets and the inconvertibility of most national currencies). To the extent that the MSS synthesis seeks for a combination of policies that aim to bring about internal and external balance, the link with the definition of the ERER is not far-fetched, since the ERER also is about the simultaneous achievement of both internal and external balances.

In theory, tradables are those goods that are traded across frontiers.[33] Their prices in domestic currency depend on world market prices, nominal exchange rate, and trade policies. Nontradables include those goods and services that are not traded across the frontiers. Their prices are determined by domestic supply and demand conditions, which are a product of government policy actions. Nontradability may arise due to the nature of the commodity (like most services, construction). Transport costs may prohibit accessibility to export or import points. Also, activities that are highly "sheltered" or protected qualify as nontradables. Protection of manufactures has been common in the developing countries, thus enlarging the nontradables sector.

Despite the difficulties in making a sharp demarcation, the two-goods case provides a means of capturing the main macroeconomic, trade and other factors that influence the relative price (RER) (World Bank, 1990). The RER determinants provide an array of possible policy instruments that influence the relative prices and resource allocation in the adjustment process. Each RER determinant implies some action to bring about an appropriate RER. The problem lies in assorting the right combination, and it requires some prior knowledge of the likely *effect* (direction and magnitude) of given determinant on the RER.

The next sub-section examines the theoretical effects of the different factors (determinants) on the RER. An idea about the magnitude of these effects is an empirical subject in Chapter III.

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[33]The tradables are, in other works, divided into importables and exportables. We are sticking to the two-goods definition of the RER. However, in the discussion, the distinction is quite useful: importables and exportables make a class of tradables. The price level of tradables becomes a weighted average of the two. Thus, assuming weights to be *a* and *b* for exportable and importables respectively, the price level of tradables (P_T) can be defined as $P_T = P_{im}^{a} \cdot P_{x}^{b}$ and $a+b=1$.

2.3.2 Effects of Real Exchange Rate Determinants

The description of the theoretical effects of the RER determinants is drawn from those studies cited under 1.5.1. and a few others. Closer attention is given to the assumptions governing the transmission of an effect from a change in a given RER determinant to the final impact (real appreciation or depreciation) on the RER.

2.3.2.1 Fundamental Determinants

The fundamental determinants that affect the equilibrium real exchange rate are outlined first: these include trade policies (export and import taxes, and other forms of trade and foreign exchange controls) and government consumption. These are within direct influence of domestic policy-making. Largely exogenous to policy making are international terms of trade and to some extent, the capital inflows, and changes in overall productivity in the economy. However, the effects of these factors on the equilibrium real exchange rate can be significant.

Trade policy variables include export and import taxes and quantitative measures such as quotas, as well as exchange and capital controls. A restrictive import policy, for instance, raising import tariffs or contracting import quotas, has the effect of raising the domestic price of importables relative to nontradables. The final impact is a result of two effects: the substitution effect and the income effect.

The rise in the domestic price of importables induces a reduction of demand for importables and imports, and a shift of demand towards nontradables. The price level of nontradables will increase for there to be an equilibrium in the market, leading to a lower ERER, or RER appreciation. The final outcome, however, depends on two key assumptions. First, is the extent to which aggregate demand shifts towards the nontradables. This will determine the pressure on the price level of nontradables. It is assumed that there is a fair degree of substitutability (mainly in consumption) between the importables and the nontradables. Second, an increase in the import tariff lowers

real income, causing a decrease in effective aggregate demand for both classes of goods, and thus predictively, a downward pressure on their prices, which implies a RER depreciation. This income effect is the opposite of the substitution effect.

Thus, if it is assumed that the substitution effect overshadows the income effect the net effect of a permanent increase in an import tariff will be RER appreciation. According to Edwards (1988) and Valdés and Dorosh (1991) this seems to be a plausible assumption. It may generally be considered that a more restrictive regime will lead to *net* RER appreciation, while trade liberalisation will lead to *net* RER depreciation. However, the definitive result is empirical.

An increase in export taxes reduces the domestic currency price of exportables relative to the nontradables or a RER appreciation. Conversely a reduction in export taxes induces a RER depreciation.

Although the parallel market premium may be regarded as quasi-policy variable, it has been found to be a good proxy for the degree of exchange and capital controls (for instance, Edwards, 1989) while others take it as manifestation of underlying inconsistencies in macroeconomic and nominal exchange rate policies.[34] The purpose here is to seek a possible relation to (if not impact on) the RER. Edwards (1989) draws attention to the fact that the parallel market and the RER may be jointly determined. On the one hand, parallel exchange market premium has been viewed as an implicit taxation on export earnings that, by regulation have to be surrendered at the official depreciated rate (Pinto, 1989, 1991). The rise in the premium can thus be considered to have the same effect on the ERER, that is causing an appreciation (Ndulu, 1993). An asset market approach has been provided by Elbadawi (1989) proposing the same relation basing on the speculative pressure of the parallel market premium. An expected rise in the premium leads to a decline in the demand for domestic money relative to foreign-currency denominated assets. The required

[34] In a number of studies, it has been taken as a proxy for RER misalignment. For instance, Grobar (1993), Cottani *et al.* (1990).

increase in the supply of foreign currency implies that the RER has to appreciate. Though it is not easy to say which one always precedes the other, the premium and the official RER can be considered to move together as Kaufmann and O'Connell (1991), and Ndulu (1993) suggest.[35]

The effects of government spending and its composition have also been explored. A number of assumptions influence the final impact. It is commonly assumed, for instance, that most of government spending is on nontradables. If so, an increase in government spending implies higher income (to recipients) and hence, higher demand for the nontradables leading to higher prices and hence, real appreciation (assuming the substitution dominates the income effect). In practice it is difficult to measure with precision the nontradable output consumed by government (apart from the most obvious such as wage bill, construction and a range of services). However, if the increase in spending is financed from sources that reduce income, the effect on the RER will be weakened, since a decrease in disposable income (e.g. via higher income tax) creates a tendency toward real depreciation. It does seem then that the final effect may be ambiguous.

Improved terms of trade will lead to an increase in the demand for importables relative to nontradables. For an equilibrium to hold in the nontradables market, nontradables prices must fall, which implies ERER depreciation. The final outcome depends on the degree of substitutability between the tradables and nontradables. On the other hand, improved terms of trade imply higher real income, which increases aggregate demand. The income effect on the ERER will depend upon the relative income elasticities of demand for tradables and nontradables. If demand is heavily tilted towards the nontradables, their price level will rise, leading to RER appreciation. Again the net effect is empirical, depending on which of the price and income effects dominates.

[35]One possibility is that the nominal official and parallel exchange rates may follow each other when overtly or covertly, for instance, the official policy is to narrow the spread between the two rates.

Inflows of foreign resources are expected to lead to an appreciation in the ERER, as are increases in international interest rates. For the inflows, appreciation is supposed to come about via a spending effect. Increased inflows imply higher real income that induces higher aggregate demand for nontradables - assuming a positive income elasticity of demand for the nontradables. This requires an increase in the prices of nontradables relative to the tradables, and hence, RER appreciation.

From the policy point of view in poor countries, the inflows are exogenous to domestic policy since some conditions are attached on their use. Though the general hypothesis is that of causing a RER appreciation, the final outcome may depend on how the inflows are spent. It may be that most of the inflows are directed primarily towards the tradables, and do not immediately boost spending on nontradables.

Changes in the ERER may also be brought about by changes in productivity due to better technology, or even improved competitive advantage. An increase in productivity in the tradables sector may lead to ERER appreciation since increased productivity is assumed to induce a drop in the relative price of tradables. On the other hand, however, increased productivity may also lead to a rise in real income, inducing higher demand for nontradables. In turn, this will lead to a rise in the price level of the nontradables or a real exchange rate appreciation.

If improved productivity takes place in the nontradables sector, and there is a relative fall in their prices consequently, the real exchange depreciates. The end result depends, therefore, on which sector productivity takes place and the subsequent responsiveness of the relative prices.

Thus, for most of the fundamental determinants, their eventual effect on the (equilibrium) real exchange rate depend on a number of other factors, which makes an empirical analysis of the actual effects necessary.

2.3.2.2 Non-fundamental Determinants

Non-fundamental factors that cause the actual real exchange rate to deviate from its underlying equilibrium RER path relate to the conduct of macroeconomic and nominal exchange rate policies. These cause temporary deviation of the RER path from the equilibrium track determined by the fundamental or real factors.

For there to be no significant deviations of the actual RER from the underlying equilibrium track, the basic requirement is that both fiscal and monetary policies be consistent with a chosen (nominal) exchange rate regime (Edwards, 1990). An expansionary macroeconomic policy within a fixed exchange rate regime will result in RER appreciation.[36] Excess domestic credit creation will lead to excess demand for all classes of goods and financial assets. Excess demand for tradables has a negative effect on the trade balance, and may lead to decumulation of foreign reserves or an increase in foreign borrowing. On the other hand, excess demand for nontradables exerts an upward pressure on the domestic price level, and hence a RER appreciation. In the absence of corrective change in other determinants, such a change in the actual RER represents a RER misalignment (Edwards, 1988:11).

The configuration of "macroeconomic balance" requires co-ordination of monetary and fiscal policies so that "...domestic credit grows at a rate consistent with a reasonable target inflation rate and real output growth while the nominal exchange rate changes at a rate equal to the inflation differential" Ndulu (1993: 235),[37] that is, the difference between domestic and foreign inflation rates. Foreign inflation is definitely beyond control of domestic policy, but its behaviour is an important "input" for domestic macroeconomic and exchange rate policy-making. In other words, the design of domestic policies ought to take into account foreign inflation developments.

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[36]The opposite may be the case in a situation of floating exchange rates. In that case, as demonstrated by Dornbusch (1976) and Edwards (1988: 11-14), expansionary monetary policy leads to an instantaneous rise in the nominal exchange rate and, because goods prices do not react immediately, the temporary overshooting in the exchange rate takes place. This implies also that the RER temporarily too, departs from the long-run equilibrium path. But as gradually domestic prices pick up, the RER returns to its equilibrium track.

[37]See also, (Aghveli et al., 1991:14) for a similar viewpoint.

A rather general way of viewing the conditions for the requirement of "macroeconomic balance" is to put together two conventional theoretical strands, the Law of One Price and the Quantity Theory of Money equation.[38]

Thus, assuming the law of one price applies (implying the Purchasing Power Parity holds), then

(2.1) $P = EP^*$

where P is the domestic price level, P* is the foreign price level and E is the exchange rate defined as units of domestic currency per one unit of foreign currency.

Equation (2.1) implies that the domestic price level P is a function of the nominal exchange rate E and the world prices P*.

Taking small percentage changes on both sides, we get:

(2.2) $\dot{P} = \dot{E} + \dot{P}^*$

where the variable with a dot on top implies proportionate change - for instance, $\dot{P} = \Delta P/P_{t-1}$, $\dot{E} = \Delta E/E_{t-1}$ and so on.[39]

Exchange rate stability requires, as in the extreme case of fixed exchange rate regime, that $\Delta E = 0$, that is,

(2.3) $\dot{E} = \dot{P} - \dot{P}^* = 0$

[38] This explanation recognises the problems of the PPP, especially in the developing countries as noted by Sachs and Larrain (1993), among others.
[39] This convention is followed throughout the rest of the text.

Equation (2.3) then implies $\Delta P = \Delta P^*$, stating that the change in the domestic price level be equal to the change in the foreign price level. From this simple relationship is the notion encountered in literature, that should the domestic rate of inflation exceed the rate of foreign inflation, the nominal exchange rate has to be depreciated (or devalued). In a way, flexibility of the exchange rate is implied in this equation as a second option (apart from control of domestic inflation, P); otherwise if the exchange rate is not adjusted, the country loses its international competitiveness.

From the Quantity Theory of Money identity,

(2.4) $P = (MV)/T$

where M is volume of money supply, V is velocity of circulation, T is volume of transactions or output (y)) and, assuming V to be constant, and taking rates of change on both sides, then,

(2.5) $\dot{P} = \dot{M} - \dot{y}$

This implies that, to keep the level of domestic prices stable ($\Delta P = 0$), the growth rate of money supply must not exceed the growth rate of output. For instance, if the growth rate of money supply ($\Delta M/M_{t-1}$) exceeds the growth rate of output ($\Delta y/y_{t-1}$), then inflation is likely to occur.

Combining (2.3) and (2.5), for exchange rate stability leads to

(2.6) $\dot{E} = \dot{M} - \dot{y} - \dot{P}^* = 0$

In turn, this condition implies the "macroeconomic policy balance" (MAP) - obtained by subtracting $\dot{E}$ from both sides in (2.6) as:

$$(2.7)\ \text{MAP} = (\dot{M} - \dot{y} - \dot{P}^* - \dot{E}) = 0$$

In theory then, equation (2.7) implies that, for there to be overall macroeconomic policy balance, all the elements must offset each other. Despite the usual criticisms of the Purchasing Power Parity, upon which MAP derivation builds, two things flow from (2.7). First, $0 < \text{MAP}$ connotes expansionary macroeconomic policy (expanding aggregate demand) with potential to cause a rise in the domestic price level, and hence RER appreciation. Conversely, $\text{MAP} < 0$ implies contractionary policy, which will tend to bring down domestic price level and so a RER depreciation. Fiscal policy is incorporated within monetary growth in (2.7). This is critically true for countries where fiscal deficits are monetised (see, for instance, Sachs and Larrain 1993, Greene and Canetti 1992, Collier and Gunning 1991). Further, supply-side sources of pressure on domestic prices would be reflected in ΔY.

Second, nominal exchange rate devaluation (associated with ΔE) would lead to RER depreciation, depending on what is happening to other variables in (2.7) and hence the need to see nominal exchange rate policy *within* the entire context of "macroeconomic balance". This would be in line with the assertion often made, that the effect of nominal devaluation on the RER will depend upon the ability of accompanying fiscal or monetary policies to contain domestic inflation. Further, as Edwards (1989:144) notes from empirical studies, the wide differences of the effects of nominal devaluation on the RER across countries could be attributed also to institutional characteristics of each country in respect mainly of labour markets, and in

general, their incomes policies. This rationalises the focus of the present study on the macroeconomic balance later in our empirical investigations.

To sum, it is clear from this account that for most determinants, the eventual effect on the RER depends on a number of (different) factors or mechanisms. Table 2.1 lists the RER determinants and their hypothesised effects on the RER:

Table 2.1 Expected Effects of Real Exchange Rate Determinants

RER Determinant	Effect on RER
fundamentals	
A restrictive (trade) import policy	-
Trade liberalisation	+
Increase export taxes	-
Increased government spending on nontradables	-
Parallel exchange market premium	-
External terms of trade improvement	-
International capital inflows (positive inflows)	-
Increase in international interest rates	+
Improved productivity of tradables	-
non-fundamentals	
-Expansionary monetary or fiscal policy	-

Notes: Sign (+) means RER depreciation whereas sign (-) stands for RER appreciation.

Accordingly, the skeletal RER model summarising these RER determinants can be written in brief as equation (2.8) below:

$$(2.8)\ RER = RER(F_i, MAP)$$

where F_i (i = 1,2,...n), are fundamental determinants of equilibrium RER discussed in detail in subsection (2.3.2.1) and MAP represents the non-fundamental component, essentially summarised by equation (2.7).

The magnitude and direction of the change in the RER - whether it is an increase in the RER (a real depreciation) or a decrease in the RER (real appreciation) following a change in a given RER determinant are empirically tested in Chapter III.

2.3.3 Three Elements of Real Exchange Rate Behaviour

The three aspects of real exchange rate behaviour to be closely analysed in this study are the RER (path) itself, RER misalignment and RER uncertainty.

2.3.3.1 Real Exchange Rate Path

The RER has been formally defined and needs no further notes here. The time series of actual (or observed) RER will be measured by using appropriate price indices. The movement of observed (actual) RER measure is traced over time, an analysis being made of the prominent turns - appreciation or depreciation. As noted earlier, the actual RER will change because of changes in the RER determinants discussed in the previous section. This is attempted in Chapter III which also attempts to approximate the impact of each determinant on the actual RER.

2.3.3.2 Real Exchange Rate Misalignment

The second aspect is RER misalignment. As seen earlier, this presumes existence of long-run equilibrium real exchange rates (ERERs), which depend on real variables only (the fundamentals). The actual RER, on the other hand, responds not only to the real variables but also to the monetary variables. The actual RER will

normally deviate from the long-run equilibrium. Sustained departures of the actual from the long-run equilibrium real exchange rates signify RER misalignments (Edwards, 1990). Macroeconomic policies that are inconsistent with a chosen nominal exchange rate regime are one of the ways by which RER misalignment will occur.

By an appropriate method it is possible to deduce the time series of RER misalignment from empirical RER model of the RER determinants as deviation of actual RER from ERER. The ERER is estimated by assuming some "sustainable" (or long-run) levels of the fundamental determinants.

Other studies have pointed to the existence of high parallel market exchange rate premium as signifying presence of macroeconomic misalignment (e.g. Grobar, 1993). Ghura and Grennes (1993) find it to be a good indicator of misalignment in Sub-Sahara African countries with relatively "fixed" exchange rate regimes and where the official exchange rate is kept below the market rate and thus create an excess demand for foreign exchange. The parallel market premium is also linked to overly expansionary fiscal policies and distortions arising from other non-price measures.

2.3.3.3 Real Exchange Rate Uncertainty

The third aspect is RER uncertainty.[40] The time path of the actual RER is, statistically, a starting point for analysis of RER uncertainty. This is because exchange rate uncertainty is often associated with the "statistical measures" of exchange rate variability, such as the standard deviation and other measures.

More frequently encountered in literature is *nominal* exchange rate uncertainty. It would appear, however, that the *uncertainty* measure associated with the RER is probably more suitable in an economy with relatively *fixed* nominal

[40] In this study, the RER uncertainty and variability are used interchangeably. Other studies use the term "instability".

exchange rate regime. In that case, the measure signifies unstable relative price incentives between tradables and nontradables sectors.

As pointed out by Cottani et *al.*, (1990: 62),

> "Large swings in RERs mean greater uncertainty with respect to relative prices. The results are greater risks, shorter investment horizons, high adjustment costs as production moves back and forth from tradable to nontradable sectors, and financial instability as expectations of exchange rate changes lead to interest rate volatility"

The measure reflects the behaviour of RER determinants, mainly those affecting domestic inflation and expectations related thereto. In particular, high RER variability can be expected to adversely affect economic agents' credibility in government commitment to enacted or pre-announced policies that directly affect incentives in engaging in various economic activities.

There is not much agreement, however, on the implications of exchange rate uncertainty on the economic agent's perception of the costs (or risks) associated with a given level of measured exchange rate variability. For instance, Medhora (1990: 315) notes, of nominal exchange variability, that "(i)t is entirely possible for a low measured variability to be consistent with high a *priori* uncertainty ... and *vice versa*". A similar line of argument is pointed out by Asseery and Peel's (1991) review of previous theoretical works.

The general thinking, however, is that high variability is associated with high uncertainty that will prompt risk-averse agents' to scale down expectations. Presently, interest is mainly in the relationship between a measure of RER uncertainty and economic activity - in this case aggregate exports.

2.4 Real Exchange Rate Behaviour and Export Supply: Theoretical Links

After the empirical estimation of the effects of the RER determinants on the actual RER the analysis further explores the impact of these RER determinants on export performance. Since it is assumed that the effects of these is mirrored through the RER, the first task is to examine briefly the hypothesised link between the RER and (aggregate) export supply.

The assumed theoretical relationship between exports supply and the RER may be traced in the theory of supply in which the supply price is the basic argument. For exports, assumed mainly to originate from the tradables sector, the RER is suitable since suppliers of exportables compare the relative price of exports to that of nontradables before allocating their resources between the two classes of goods. The RER has thus been used in export functions to represent price incentives.

In this way, it can be posited that an increase in the RER or a RER depreciation will lead to an increase in the supply of exports since this implies increased relative price incentive for producing tradables. Conversely, real appreciation is associated with a decline in export incentives, and can be expected to induce a shift of resources away from tradables sector. Thus, policies and events that result in a higher domestic rate of inflation, for instance, lead to a RER appreciation and undermine the competitiveness of the tradables.

In other studies, for instance, Goldstein and Khan (1985), the components of the RER, in particular, the foreign price and the domestic price appear as separate arguments in the export supply function.[41] Though the nominal exchange is not explicitly included (the price received by exporters is already expressed in domestic currency), the essence of the basic relationships is similar to those in respect of the RER. For a given level of export price, (assuming a "small" country), it is still possible

[41]The supply function, here appears as an element in the imperfect substitutes model of trade. Specifically, $X_i^s = j\,[PX_i(1+S_i), P_i]$ $j_1 > 0$ $j_2 < 0$, where X_i^s is the quantity of exports supplied from country i to the rest of the world and is positively related to the domestic price received net of trade taxes (S is subsidy rate), and negatively related to P_i, the price level of home goods (Goldstein *et al.*, 1985:1046-1047).

for this country to affect its export volume to the extent that the country can alter internal profitability of producing and selling exports through its influence on the domestic price level (Goldstein *et al.*, 1985: 1048). Thus, greater duty is assigned to domestic policy for improving internal profitability of exporting.

Thus, letting X^S stand for the quantity of (aggregate) exports, the expected relation between the level of export supply and the RER, RER misalignment and RER uncertainty can be simply represented as:

$$(2.9)\quad X^S = f(\text{RER, RMIS, RUN, y} \ldots) \qquad f_1 > 0,\ f_2 < 0,\ f_3 < 0,\ f_4 > 0$$

where RMIS = a measure of RER misalignment

RUN = measure of RER uncertainty

y = is real output (GDP).

On the other hand, RER misalignment signifies distorted incentives. In its common manifestation of real overvaluation, misalignment implies negative incentives for export activity.[42]

RER uncertainty implies unstable relative prices. As such, increasing uncertainty is expected to have a negative effect on exports and economic activity in general, since wide fluctuations in the RER mean unstable prospects for investment and trade.

Thus, both RER misalignment and uncertainty may be expected to be negatively related to export performance. It is conceivable that RER misalignment and uncertainty could be happening at the same time. A persistent overvaluation increases speculation as to impending devaluation (Dornbusch, 1988): this is a source of

[42]This is one of the consequences of overvaluation as elaborated by, among others, Dornbusch (1988).

cross-country data and others use single-country time series data, it is interesting to observe convergence or divergence in the conclusions.

2.5.1 Methodological Questions

Most studies address the problems involved in the measurement of the RER. These concern the choice of appropriate proxies for prices of tradables and nontradables. The practical data problems in the LDCs are elaborated by, among others, Edwards (1990). Part of Chapter III takes up the question of measurement of the RER for Tanzania.

Two studies that examine all the three elements of RER behaviour at a time are Cottani *et al.* (1990) and Ghura *et al.* (1993). Other studies stress on one or other elements of RER behaviour and their effects on economic or export performance.

Employing secondary data, the studies use regression analyses (Ordinary Least Squares or Instrumental Variables) to investigate the impact of RER determinants on the actual RER. This applies to both studies using single country time series and those (the majority) using cross-section data. RER misalignment is then determined on the basis of these estimates. The theoretically founded method involves estimating a series of ERER points (path), about which deviations of the actual RER are measured and taken for RER misalignment. Estimation of the ERER requires the incorporation of the impact of each of the fundamental determinants of ERER. In Cottani *et al.* (1990), Ghura *et al.* (1993), and Pick *et al.*, (1994) RER misalignment is derived from the estimated RER model. It is termed "model-based" RER misalignment, as distinct from that taken as observed departures of actual RER from a chosen Purchasing Power Parity ERER ($ERER_{PPP}$).

Correlation analysis is also used to measure the strength of association between exports and RER behaviour (e.g. Cottani *et al*, 1990; Ghura *et al.*, 1993). However, as pointed out elsewhere, the simple descriptive statistics do not give strong indications

of long-run relationship between the RER measures and exports (Rose, 1991: 307). They have to be supplemented by parametric methods, mostly OLS and instrumental variables. Lately, co-integration analysis has been added by, for instance, Asseery and Peel (1990) in the investigation of effect of exchange rate instability on export flows.

It is worth noting that there are other analytical studies that do not necessarily use parametric methods, but present strong evidence in support of the need to maintain real depreciation following a policy change or event (such as a supply-shock) that puts pressures on the domestic price level. Often encountered are those studies that relate to the ability of devaluation to elicit supply response of exports, its effects on the level of imports, government budget and other effects. Donovan (1981), using a "*before-after approach*" notes the fact stressed elsewhere (for instance, Edwards, 1989 and Krueger, 1978), that the real effect of devaluation lasts only a while: in 1 to 3 years the real effect gets eroded by inflation, so that the supply response dwindles after the real effect of nominal devaluation has been eroded by the rise in inflation.[46]

Most studies use cross-section approach since they study groups of countries that are sampled on the assumption that they have similar economic structure and face common external influences.[47] However, since countries have their own peculiarities, mainly in the degrees of policy orientation, not all conclusions from cross-country studies can be generalised for all countries without qualification - hence the importance of individual case studies.

2.5.2 Major Conclusions.

With regard to empirical estimation of the RER determinants, most results are from cross-country studies, notably Edwards (1989), Cottani et *al.* (1990) and Ghura et *al.* (1993) and Pick et *al.* (1994). The hypotheses in respect of the fundamental and

[46]Edwards (1988) and Edwards and van Wijnbergen (1989) review more studies on devaluation effects.
[47]See, for instance, Greenaway and Sapsford (1994).

non fundamental determinants are tested, and most conform to expected results. In a few cases estimations yield weak coefficients. For instance, Cottani *et al.* (1990) find the coefficients on terms of trade and capital inflows to be weak and statistically insignificant. Nevertheless, most estimates lead to quite indicative measures of RER misalignment (the model-based measure), where this is attempted, for instance, Cottani *et al.* (1990) and Pick *et al.* (1994).

The results of the studies on the relationship between RER behaviour and export performance are unanimous on two aspects. Both single country and cross-country studies confirm a positive relationship between the RER path and (some measure) of export performance. Second, the impact of RER misalignment and exports is generally found to be negative.

The relationship between export performance and RER uncertainty appears to be ambiguous. In the developing countries most results show that RER instability is detrimental to export performance (Krueger, 1978; Caballero and Corbo, 1989; Cottani *et al.*, 1990; Ghura *et al.*, 1993; Grobar, 1993).[48] Not in all cases do results show a strong negative relationship. For instance, Edwards (1990) finds the relationship between RER instability and export growth rate to be weak.

Other analytical studies point to closely similar implications. The proposition that there should be real depreciation is clear in, for instance, Donovan (1981) and Gulhati, Bose and Atukorala (1986). In a study of 9 African countries, Gulhati *et al.* (1986) found that governments throughout the 1960s and 1970s had a "passive" attitude toward exchange rate policy. They find that exchange rate appreciation in the 1970s was associated with falling exports in Tanzania, Kenya, Madagascar and Somalia. Furthermore, the study attributes successful export performance in the Export Promotion Zone (EPZ) and tourism in Mauritius in 1984 to a positive impact of a real

[48]Caballero *et al.* (1989) cite works on Chile by Behrrman (1976), Colombia by Diaz-Alejandro (1976), and Brazil by Coes (1979) that show a negative relation between real exchange rate variability and exports.

depreciation supported by considerable depreciation of real wages. The study, however, does not directly treat the RER determinants.

As expected, differences among the empirical studies appear in the *magnitudes* of the elasticity coefficients (in a few instances, the signs). This can be attributed to differences in the size (and length) of the sample group (and period), and estimation procedures (e.g. the presence or otherwise, of lag structure). Perhaps, what may be taken as powerful leads from these studies, is the direction (sign) and statistical significance of the coefficients - as plausible basis for testing the theoretical relationships.

2.6 Approach of the Present Study

The scope of most studies that examine the relationship between the RER and exports does not include an investigation of the impact of individual RER determinants on exports. As the question would be put: Having examined the impact of the RER determinants on the RER and the impact of the RER on exports: Is it possible to infer on the indirect impact of these RER determinants on (aggregate) export performance via the RER? Close to this line of enquiry, is the study by Ndulu et *al.* (1993) which, among other things, examines the indirect impact of mainly policy RER determinants on Tanzania's manufactured exports.

The present study essentially draws on the major conceptual and empirical approaches cited in the review. It makes the model-based analysis of the RER determinants and estimation of RER misalignment and RER uncertainty for Tanzania. The links of these aspects of RER behaviour and aggregate exports are then tested.

Thus like, Ndulu et *al.* (1993) and Pick et *al.* (1994), the study estimates the RER equation (for the RER determinants) and an export equation in which the focal argument is the RER. Pick et *al.*, (1994) deal with agricultural exports at a more disaggregated (commodity) level for a group of ten developing countries. Unlike these

studies, however, RER misalignment and RER uncertainty, each in turn, take place as arguments in the export function.

The indirect effects of the RER determinants on export performance are empirically derived from the estimated RER and export supply equations. The indirect impact coefficient of a given RER determinant on aggregate exports can be approximated as a product of the derivatives from the estimated RER model (2.8) and the export function (2.9) as product of the respective derivatives:[49] that is,

$$(2.10)\quad \frac{\partial x}{\partial Fi} = \frac{\partial x}{\partial RER} \cdot \frac{\partial RER}{\partial Fi}$$

where "x" stands for real exports, and F*i*, a given RER determinant.

Equation (2.10) is anticipated to give some indication of the responsiveness of real exports (total and sectoral) to individual RER determinants.

An extended empirical model for RER determinants is introduced and estimated in Chapter III. This forms the basis for the estimation of RER misalignment. The export supply function (2.9) and estimates relating aggregate exports to RER misalignment and uncertainty are done in Chapter V, where also, derivation of the indirect effects of RER determinants on the aggregate real exports (2.10) is carried out using empirical estimates from both functions.[50]

Few studies have investigated the time series characteristics of the data for the relationships on hand. Two closely related studies, Asseery et *al.* (1991) - relating exports to real exchange rate uncertainty, and Rose (1991) - relating trade balance to the real exchange rate, explored the order of integration of the time series and

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[49] For quick reference these are :(2.8) RER = RER(F_i, MAP) and (2.9) $X^S = f$(RER, RMIS, RUN, y).

[50] As pointed above, other things being equal assumption is implied as an attempt to track (isolate) the desired object of analysis, and recognition of the complexity of the interrelationships of economic variables is emphasised at the end of this and the last chapter (Chapter VI).

combination thereof (i.e., checking for co-integration): but these were done on developed market economies.[51]

Trade policies are part of the RER determinants: a limited discussion of the export incentives in the context of trade orientation is made along Bhagwati (1988). Specifically, average *real* effective exchange rate for both exports and imports are derived and analysed. However, the profile of the actual export promotion incentive schemes are beyond the scope of the present scope.

2.7 Concluding Remarks

This chapter has elaborated on some common problems in the conduct of nominal exchange rate and trade policies in developing countries. It was noted that there was more anxiety about the consequences of devaluation than a conviction of the need to conduct fiscal or monetary policies consistent with the chosen relatively "fixed" (predetermined) nominal exchange rate and trade policies. Export incentives were linked to these policies, emphasising on the *real* return (internal profitability) and international competitiveness of the tradable goods.

The RER concept, RER misalignment and uncertainty were analysed and their theoretical relationship with export supply discussed. The analysis of the few previous studies focused mainly on methodology and general conclusions regarding the effects of the RER behaviour on export performance in the developing countries.

Drawing on the methodology from the previous studies, this study lays emphasis on the three aspects of RER behaviour and their empirical relationship with aggregate export performance in Tanzania. The next chapter examines the behaviour of exchange rates in a macroeconomic perspective.

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[51] Asseery *et al.* (1991) extend into an error correction model, having established co-integration.

III

THE BEHAVIOUR OF EXCHANGE RATES IN TANZANIA

3.1 Introduction

During the 1960s and 1970s, the ordinary perspective of managing the nominal exchange rate in Tanzania, seems to have centred mainly on the notion of exchange rate as a "price". Policy was preoccupied with keeping "stability" of the value of the Tanzanian shilling (TSH) against foreign currencies, and not mainly as a tool of balance of payments adjustment. Few small adjustments of the parity were made. Even when serious internal and external imbalances appeared towards the end of the 1970s, particularly large nominal exchange rate changes were resisted.

Like many developing countries, Tanzania has had a relatively "fixed" or predetermined exchange rate regime, and for most of the period until at least the mid-1980s preference was given to rather administrative trade and exchange controls, in an environment of largely expansionary macroeconomic policy. Thus, apart from the observed nominal exchange rate, there is a need to investigate the underlying nature and behaviour of the RER that incorporates the effects of both domestic and external factors including the nominal exchange rate.

This chapter attempts to analyse developments in the nominal and real exchange rates in Tanzania, with the aim of identifying some major policy determinants of their paths, and to investigate the extent of RER misalignment and RER uncertainty.

Section 3.2 presents analyses of the behaviour of the exchange rate policy indicators mainly the nominal and RER measures. Section 3.3 makes an historical analysis of the exchange rate policy in Tanzania, highlighting macroeconomic and trade policy developments considered to be most pertinent to the nominal exchange rate policy stance through different episodes. Though the analysis spans 1967-90,

recent developments between 1990-93 in the foreign exchange market are briefly discussed.

Section 3.4 investigates the determinants of the RER in Tanzania and measures of RER misalignment and uncertainty are estimated. This is followed by concluding remarks.

3.2 Movements in the Exchange Rates 1967-90

3.2.1 Definitions and Measures

The term "exchange rate" is commonly used to refer to the price of one unit of a currency (or a commodity) in terms of another currency or other currencies (or commodities). As used here, nominal exchange rate (E) is the number of Tanzanian shillings (TSH) per unit of a foreign currency. It can also be referred to as a bilateral rate. The Bank of Tanzania quotes daily buying and selling rate against the United States dollar (USD). Rates for other currencies are determined as cross-rates for these currencies against the USD in the international markets.[52] There has been a parallel market for foreign exchange in the "strong" currencies, and the bilateral nominal rate in this market has for a long time been recorded in USD terms.[53] Since many international transactions are recorded in United States dollars (USD), and the USD appears to be the most current on the parallel markets, frequent use is made in the text of two nominal bilateral rates, that is, the official (E) and the unofficial (E_u) rates. Rates for major trading partners are carried in the appendix, but they are used in the computation of the multilateral exchange rate.

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[52]The foreign currencies include: Australian dollar, Austrian schilling, Belgian franc, Canadian dollar, Commorian franc, Danish kroner, deutsche mark, Netherlands guilder, Ethiopian birr, French franc, Indian rupee, Italian lire, Japanese yen, Kenyan shilling, Lesotho maloti, Malawian kwacha, Mozambique meticais, Mauritian rupee, Norweigian kroner, Pakistan rupee, pound sterling, Rwanda franc, Somali shilling, Swaziland emalangeni, Swedish kronor, Swiss franc, Uganda shilling, Zambian kwacha, and Zimbabwe dollars IMF (1993b:501).

[53]Mainly recorded in dollar terms, the earliest series are found in Picks Currency Yearbook; records by Kimei (1987), Maliyamkono and Bagachwa (1990) and own recent experience.

The multilateral exchange rate, also called the "effective exchange rate"[54] combines the bilateral nominal rates using some *weighting scheme* for a selected set of countries that Tanzania does trade with most. Selection of a partner country and its *weights* is so made as to reflect the importance of the country's trade with Tanzania - the "home country".[55] The multilateral rate can thus be considered to be superior to the bilateral rate since it takes into account movements in both the cross-country rates and price levels.

Computation of the RER in this study follows the "trade theory definition" introduced in Chapters I and II. The empirical definition used by, among others, Edwards (1989), White *et al.* (1991), and Fleissig and Grennes (1994), among others, can be written out as:

$$(3.1)\quad RER = \frac{E \cdot P^*_T}{P_N}$$

where E is nominal bilateral exchange rate, P^*_T is the foreign price level of tradables, and P_N is the price level of nontradables.

The nominal trade-weighted multilateral exchange rate index can be used in place of E to obtain a trade-weighted multilateral real exchange rate index (MRER), that incorporates the foreign price indices (P^*_T) of the countries involved.

Wholesale Price Indices (WPI) or the Export Unit Values of Manufacturing (XUV) of the foreign trading partners are usually taken as proxies for P^*_T. The export

[54]Usage of "effective" exchange rate by the International Monetary Fund (IMF) and in other works connotes *a trade-weighted* measure of the exchange rate as distinct from the bilateral exchange rate. But elsewhere in development economics literature (for instance, Krueger, 1978), "effective" rate is the rate that is reached at after taking into account the effects of trade taxes on the nominal (or real rate). In this study "effective" will be used in the latter sense. The trade-weighted real exchange rate will be referred to as the multilateral real exchange rate (MRER) as distinct from the bilateral real exchange rate (BRER).

[55]Weights can be based on export trade, import trade or total trade, that is exports+imports. In the computations here, total trade is used as a basis so as to get a more comprehensive coverage of the trade flows.

unit value of manufacturing is especially more representative of the type of commodities developing counties import from the developed countries, while both the WPI and XUV are far better than the Consumer Price Index (CPI*, where "*" denotes trading partner), since CPI*s of the developed country do not adequately cover commodities that developing countries import from developed countries.

As Edwards (1988, 1989, 1990) and White *et al.* (1991) point out, given the difficulties of accurately measuring the price level of the nontradables in the developing countries, a convenient option is to use the domestic price level, usually Consumer Price Index (CPIs) as P_N. In these countries, the CPIs are more heavily weighted towards nontradables.

Although this study utilises more the trade theory definition, it is worthy making a few notes on the more traditional version of exchange rates, based on the Purchasing Power Parity (PPP) doctrine. This is because, despite the criticisms levelled against it, the PPP definition has been and still is frequently used for policy assessment of the appropriateness of a given nominal rate relative to the rate considered to be an "equilibrium exchange rate". According to this theory, the exchange rate change between two currencies basically depends on the two countries' price levels.[56]

The PPP exchange rate differs from the trade theory version in that both the price variables refer to the same type of indices, for instance both could be CPIs. The trade theory definition uses different types of price indices, the main distinction being that between tradables and nontradables. Though the PPP-based exchange rate can still be used as an indicator of the country's international competitiveness, it fails to explain changes in the relative incentives and resource movements across sectors as does the trade theory definition.[57]

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[56]See, for instance, Pick *et al.*, (1994: 555). The purchasing power parity exchange rate can be defined as $E_{PPP} = E_0 P / P^*$, where E_{PPP} is the nominal PPP exchange rate in domestic currency units per unit of foreign currency, E_0 is the base year nominal exchange rate, P* is the foreign price level and P is the domestic price level.

[57]See, for instance, Edwards (1990), White *et al.* (1991).

For the PPP exchange rate, selection of "the equilibrium rate" depends on what the policy analyst considers to be a relatively stable year (period), that is, a year with satisfactory balance of payments and internal stability (no disruptive inflation). Deviations of Eppp from the base year are taken as deviations from the equilibrium. However, it becomes necessary to make frequent revision of the equilibrium base year, since structural shifts take place in the economy over time. The trade theory definition avoids this problem, since the equilibrium in this case is not an "immutable" number but keeps on varying with changing factors that affect external and internal balances. Factors that affect both the "home goods" market and the external balance differ in intensity over time, so that the underlying equilibrium RER can differ from one period to another.

By the definition of the RER in (3.1), a rise in the RER index depicts a real depreciation, and a fall in the index, a real appreciation.[58] A real depreciation signifies a fall in the relative price of non-tradables and improvement in the country's external competitiveness.

The next problem is the choice of a base year. In most computations in this study, 1972 was selected as base year.[59] It appears that the domestic rate of inflation and that of trading partners were not very far apart in the period 1967-1974 (for instance, Chart 1.2): this would make any of these years better as a base than, for instance, 1980. On the other level, 1972 and 1973 had higher reserves than 1966 and 1980. After the peaks of 1972 and 1973, the reserves fell off, and rose markedly only in 1976 and 1977 (Table 1.3).

Thus, if one should rule out 1970-1971 because of the "mini-balance of payments crisis" (more on this in part 3.3 below) during which reserves dropped from USD 80 million in 1969 to USD 65 million and USD 60 million (1970 and 1971)

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[58]In other works, the RER is defined in the reciprocal form, with the index of the foreign price level in the denominator (see, for instance, Helmers, 1988). In those cases, a real appreciation is depicted by an increase in the RER, and a real depreciation by a decrease in the RER index.

[59]Other years used elsewhere in the case of Tanzania: *1966* (Lipumba, 1991b), *1968* Musonda (1992), *1972* (Ndulu et al., 1989), *1973* (Lipumba, 1987), and *1980*, (Kimei, 1989).

respectively, another attribute that could be attached to 1972 (even 1973) compared to the years just back, is the fact that the economy had (increasingly since 1967) firmly taken on new special features, given by the broad socialist orientation. These include expansion of the public sector in production, finance and a range of commercial activities, a drift towards central control over prices (including interest and exchange rates) and stifling of private competition. These continued to influence macroeconomic management for many years.

Table 3.1 shows nominal exchange rates, the official rate (E) and the unofficial rate (E_U), Eppp and the parallel exchange market premium (PREM)- all based on the USD. The comparison of E and Eppp captured by DE_{PPP} suggests nominal overvaluation (negative sign) for most of the 1970s to 1986. At least in terms of the sign (with doubts on the magnitudes) DEppp supports oft-made assertions that the Tanzanian currency has been overvalued for most of the period until after the mid-1980s.[60] 1985 had the highest overvaluation.

[60]For instance, Musonda (1992) computes the PPP exchange rate in the similar way it is done here, except for the base year. Hyuha (1990) has a similar conclusion based on IMF data on CPIs, tracing overvaluation since 1966.

Table 3.1 Nominal Exchange Rates and Related Indicators

Year	E	E_U	PREM	Eppp	DEppp
1967	7.14	8.70	21.85	7.20	-0.83
1968	7.14	8.50	19.05	7.28	-1.85
1969	7.14	8.70	21.85	6.99	2.16
1970	7.14	10.10	41.46	6.81	4.79
1971	7.14	11.60	62.47	6.87	3.96
1972	7.14	15.40	115.69	7.14	0
1973	7.02	14.50	106.55	7.44	-5.65
1974	7.14	13.50	89.08	7.99	-10.62
1975	7.27	20.60	179.51	9.25	-20.32
1976	8.38	21.90	161.34	9.35	-10.32
1977	8.29	21.50	159.35	9.78	-15.25
1978	7.71	13.10	69.91	9.68	-20.37
1979	8.22	20.00	143.31	9.82	-16.25
1980	8.20	25.70	213.42	11.27	-27.23
1981	8.28	35.10	323.91	12.83	-35.47
1982	9.28	43.40	367.67	15.59	-40.48
1983	11.14	39.60	255.48	19.18	-41.91
1984	15.29	60.00	292.41	25.05	-38.97
1985	17.47	100.80	476.99	32.23	-45.79
1986	32.70	167.50	412.23	41.88	-21.92
1987	64.26	180.00	180.11	52.52	22.36
1988	99.29	210.00	111.50	66.19	50.02
1989	144.47	270.00	86.17	79.48	81.79
1990	195.07	330.00	68.17	90.25	116.15

Notes and Sources:

E = Nominal exchange rate in TSH / USD 1, being annual averages, from Bank of Tanzania *Economic and Operations Reports* (various issues).

E_U = Unofficial (or parallel) market nominal exchange rate in TSH/US $1 complied from Kaufmann and O'Connell *et al.* (1990), Maliyamkono *et al.* (1990), Kimei (1987) and own observations.

Eppp = Purchasing Power Parity (real) exchange rate obtained as $E_{1972}(CPI_{US}/CPI_{TZ})$.

DEppp = Percentage deviation of E from Eppp obtained as (E-Eppp)/Eppp (per cent).

PREM = Parallel market premium obtained as $(E_U - E)/E$ (per cent).

Table 3.2 shows computed real exchange rate indices: the trade-weighted multilateral real exchange rate (MRER), the bilateral real exchange rate (BRER), the unofficial or parallel market real exchange rate (URER). MRER (index of multilateral real trade-weighted exchange rate), obtained as:

$$\text{MRER} = \frac{\sum_{i=1}^{10} a_{ih} \cdot E_{ih} \cdot P_i^*}{P_h} \qquad (3.2)$$

where a_{ih} = trade weight, as ratio of country *i's* trade (import and export) in home (*h*) country's (Tanzania's) total trade, and $\Sigma a_{ih} = 1$; E_{ih} = nominal exchange rate between major trading partner *i* and home country (Tanzania) as number of Tanzanian shillings per unit of currency of country *i*; P_i^* = index of manufacturing unit value of country *i*; P_h = Tanzania's consumer price index.[61]

Two official bilateral rates are presented. BRER follows the trade definition with the US export unit value of manufacturing (XUV) in the denominator, while BRERc uses the Consumer Price Indices (and is as such related to PPP) except that the official nominal exchange rate (index) varies through time.

The last three columns in Table 3.2 carry these real effective exchange rates. Notice that they are tied to MRER, the trade-weighted multilateral exchange rate, which is preferred to the bilateral real exchange rates (BRER and BRER_C) - the reason is given in 3.2.2.

[61]Major trading partners and weights in parentheses are: United Kingdom (0.288), Germany (0.179), Japan (0.12), The Netherlands (0.096), United States of America (0.086), Italy (0.081), India (0.04), Belgium (0.04), Sweden (0.038), France (0.032). Based on URT (*1987) Foreign Trade Statistics.*

Table 3.2 Real Exchange Rate Indices

Year	MRER	BRER	$BRER_c$	URER	$REER_x$	$REER_m$	rmx
1967	96.81	101.44	99.18	57.97	94.77	121.55	1.28
1968	90.49	99.12	98.45	53.42	88.62	114.60	1.29
1969	93.26	102.47	102.16	60.55	90.45	122.18	1.35
1970	95.93	106.39	104.79	72.54	93.40	117.77	1.26
1971	100.70	104.55	103.96	101.84	97.81	121.22	1.24
1972	100.00	100.00	100.00	100.00	98.06	123.58	1.26
1973	116.62	95.62	94.36	85.26	114.03	136.90	1.20
1974	127.15	97.00	89.38	88.19	117.63	147.60	1.26
1975	116.14	90.76	79.68	142.75	106.78	132.27	1.24
1976	109.48	103.64	89.68	116.98	105.32	123.37	1.17
1977	113.90	97.49	84.76	82.33	92.75	123.23	1.33
1978	130.52	90.81	79.63	64.44	110.85	149.31	1.35
1979	150.63	96.90	83.75	73.78	135.52	168.78	1.25
1980	132.40	82.80	72.77	124.06	109.62	137.18	1.25
1981	80.80	72.50	64.53	99.06	77.39	86.51	1.12
1982	61.44	65.40	59.52	95.41	61.17	65.18	1.07
1983	54.40	61.08	58.09	127.10	54.24	59.74	1.10
1984	48.98	61.91	61.04	131.40	48.84	53.39	1.09
1985	41.69	51.07	54.21	203.31	41.55	46.18	1.11
1986	122.70	69.97	78.08	178.57	122.70	128.59	1.05
1987	219.85	101.64	122.36	139.33	219.85	234.74	1.07
1988	260.59	121.39	150.02	130.37	260.59	278.60	1.07
1989	302.20	142.98	181.78	137.65	302.20	319.67	1.06
1990	336.04	160.35	216.15	133.39	336.05	400.20	1.19

Notes:
MRER = index of trade-weighted multilateral RER (as in equation 3.2).
BRER = bilateral real exchange rate using the official nominal exchange rate, computed as $(E_{US} \cdot (P_{US}/CPI_{TZ})$ where P_{US} is the US index of export unit values of manufacturing, and CPI_{TZ} the consumer price index for Tanzania (TZ).
URER = parallel market real exchange rate computed as $E_U \cdot (P_{US}/CPI_{TZ})$.
$BRER_c$ = real exchange rate computed as $E_{US} \cdot (CPI_{US}/CPI_{TZ})$.
$REER_x$ = average real effective exchange rate for exports (see footnote 62).
$REER_m$ = average real effective exchange rate for imports(see footnote 62).
rmx = ratio $REER_m/REER_x$.
Sources: own computations.

The RER may still be improved by defining the net real incentive to the exporter as real (total) return per unit of foreign currency-worth of exports: the real effective exchange rate for exports ($REER_X$). This is done by deducting export taxes paid and adding export subsidies received.[62] Similarly, it is possible to get the real trade-weighted effective exchange rate for imports, ($REER_m$) by adding import taxes to the real amount that has to be paid per unit foreign currency-worth of imports. The RER is adjusted by the implicit import tax rate, t_m computed as a ratio of total import duty collections to total value of merchandise imports.

The total export tax and import duty collections are obtained from the annual *Economic Surveys* where they appear among sources of recurrent revenue. However, the export taxes taper off from 1984 onwards. This coincides with government policy to decrease export taxes on exports as one of the steps to encourage exports.[63] Until then, mainly traditional exports (including the main agricultural exports, coffee, cotton, tea, tobacco and sisal, together providing about 70 per cent of foreign exchange earnings) contributed about 80 per cent of total export tax revenue.

Data on the specific export incentives (including exemptions) are not available in time series amenable to the $REER_X$ computation introduced above. Although the calculated $REER_X$ fails to cover these and other incentives availed to exporters, the index gives an approximate indication of the relative incentive to exporters implied by the level of explicit taxation. Likewise, it is not possible to assign a monetary value to the quantitative restrictions, bans and quotas, particularly in terms of the "scarcity premium" they offer to holders of import licences. Together with the *ad hoc* duty exemptions, these measures confer a pecuniary incentive effectively meaning lower real amount paid per unit of foreign exchange worth of imports.

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[62] This is computed as $MRER(1-t_x+s)$, where t_x is the explicit tax rate obtained as a ratio of total export tax revenue to total exports, and s, a ratio of total export subsidies to total exports. For imports, average real effective exchange rate is computed as $MRER(1+t_m)$.

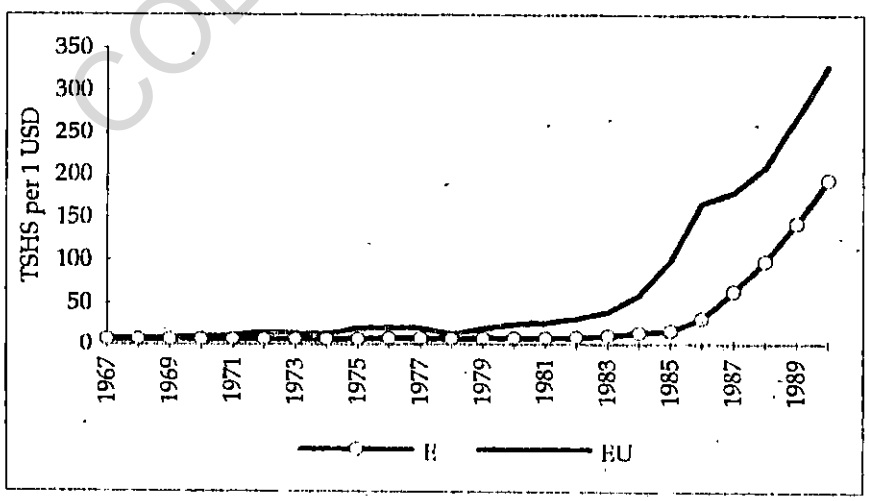
[63] The same sources do not show explicit export tax collections after 1985: after this year the specific item of this revenue source disappears. However, there could still be some positive export taxes even if small.

The foregoing are a few definitions and measures of exchange rates in Tanzania. The next sub-section attempts a descriptive analysis of the movements of these exchange rates and their relationships. Use is made of simple correlation and estimation of trend. Entire period (1967-90) statistics smooth over inter-period movements; the division of the period into sub-periods, is intended to facilitate sorting of some of the major factors affecting the exchange rate movements.

3.2.2 Trends in the Exchange Rates

Chart 3.1 shows the low variation in the nominal exchange rate, closely followed by the unofficial exchange rate (E_U) in the period 1966-85. After 1985 they both sharply swing upwards. The same picture is revealed by the low trend growth coefficients in Table 3.3. The parallel rate is always higher than the official rate. The magnitude of the parallel market premium can be appreciated by the vertical distance between the nominal and parallel rates in Chart 3.1.

Chart 3.1 Official and Unofficial Nominal Exchange Rates



Source: Based on Table 3.1.

Table 3.3 shows correlation coefficients between various exchange rate measures. The statistics only roughly show how closely together the pairs are associated. The high positive correlation coefficient between the official and unofficial exchange rate in the 1980s implies that the unofficial rate persistently rose above the official rate as the latter depreciated - an undesirable result from the policy perspective.

Table 3.3 Nominal and Real Exchange Rates: Correlation coefficients

Exchange Rate	1966-72	1973-79	1980-85	1986-90
$E - E_{LI}$	0	0.72*	0.92*	0.99*
E -EP	0	0.82*	0.99*	0.99*
EP-EPc	-0.38	0.79*	0.99*	0.98*
MRER-BRER	0.32	-0.24	0.96*	0.99*
MRER-BRERc	0.39	-0.31	0.96*	0.99*
BRER-BRERc	0.95*	0.62	0.97*	0.99*
BRER-URER	0.03	0.51	0.03	-0.81*
MRER-URER	0.79*	-0.35	0.04	-0.87*

Source: Basic data and definition of variables from Table 3.1.
* statistical significant at the 1 % level.

An attempt was also made to determine the significance of the "swings" along the paths of the different exchange rate measures on the basis of trend coefficients (Table 3.4). Noteworthy is the statistically significant drop in the MRER (and BRER) during 1980-85 period while, during the same period, the parallel rate and the parallel premium maintain positive trend growth. In the sub-period 1986-90 the MRER rises while the PREM and URER drop.

Table 3.4 Trend Coefficients of Nominal and Real Exchange Rates Indices and the Unofficial Parallel Market Premium

Exchange Rate	1966-72	1973-79	1980-85	1986-90
E	0	0.03*	0.23*	0.44*
	-	(2.28)	(2.75)	(9.55)
EU	0.10	0.03	0.27*	0.18*
	(0.02)	(0.68)	(5.54)	(14.90)
EP	0	0.03	0.40	0.02
	-	(0.47)	(1.03)	(0.03)
MRER	0.03*	0.03	-0.20*	0.23*
	(4.94)	(1.01)	(-6.36)	(3.96)
BRER	0	0	-0.08*	0.20*
	(0.16)	(-0.36)	(-5.91)	(6.41)
URER	0.12*	0.01	0.07	-0.06*
	(4.77)	(0.13)	(0.28)	(-2.33)
PREM	0.57*	0.01	0.13*	-0.44*
	(3.95)	(0.12)	(4.14)	(-5.27)

Notes: The trend coefficients were obtained by estimating $\log E_t = a_0 + a_1 T + u_t$ where T is trend or time period. A negative coefficient indicates a fall in the real exchange rate (a RER appreciation and a positive coefficient RER depreciation).

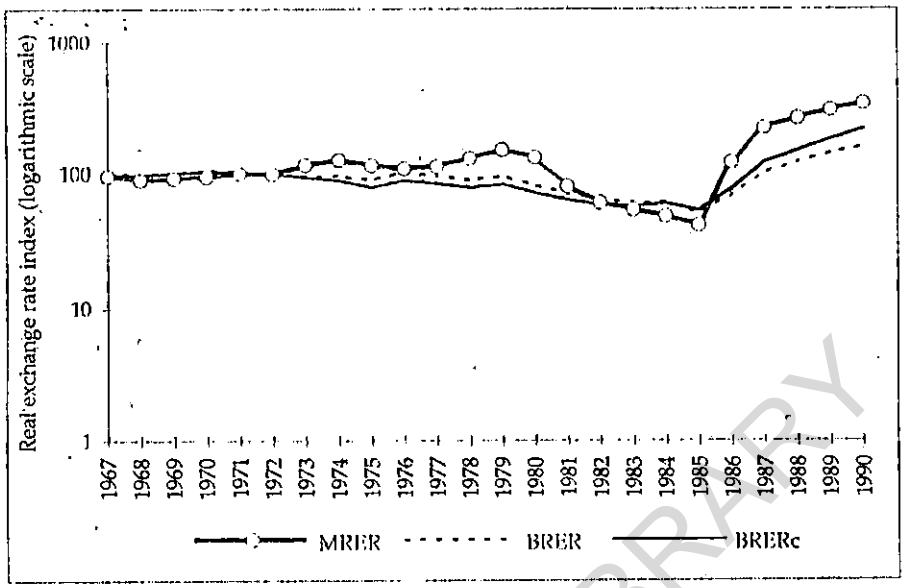
t statistics in parentheses.

* for coefficient that is statistically significant at the 1% level.

Source Based on Tables 3.1 and 3.2.

Chart 3.2 compares the three measures of the real exchange rate indices based on the official exchange rates, i.e. MRER, BRER and $BRER_C$. The bilateral rates, BRER and $BRER_C$ move much closer together than to the MRER, in the entire period. They move gradually downwards with minor fluctuations prior to 1980.

Chart 3.2 Real Exchange Rates Indices



Note: A fall in the in index signifies RER appreciation while a rise in the index signifies RER depreciation.
Source: Based on Table 3.2.

In the sub-period 1980-85 both bilateral rates make a downward turn - see, for instance, the BRER negative trend coefficient in Table 3.4.[64] After 1986 they both swing upwards. In contrast, the MRER undulates with two prominent "peaks" above the bilateral rates in the sub-period 1973-79. Like the bilateral exchange rate, the MRER drops in the 1980-85 period (with negative trend coefficients) and shoots up in the 1986-90 sub-period (with positive trend coefficients).

The differences between the multilateral real exchange rate (MRER) and the BRER can be attributed to the difference in construction. The MRER is trade-weighted and so it incorporates more information on cross-exchange rates and prices than does the BRER. The MRER is thus considered to be a more correct basis for policy analyses.[65] Unless stated clearly otherwise, the RER in this study refers to MRER.

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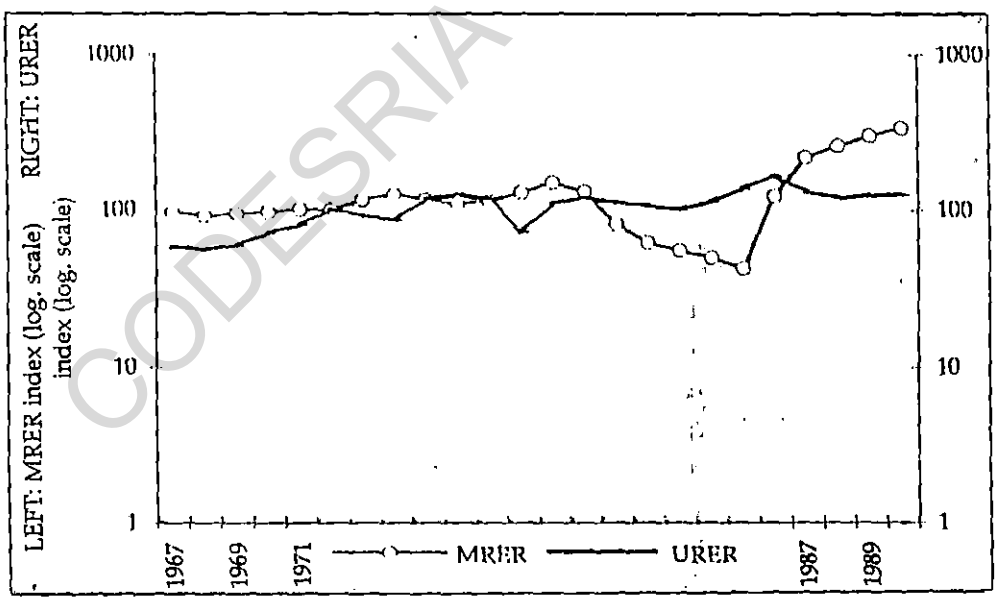
[64] Since both bilateral rates move close together and since the $BRER_C$ index uses the CPIs (similar to the PPP), we shall be contented with focusing on BRER.
[65] See, for instance, Edwards (1989) and White *et al.* (1991).

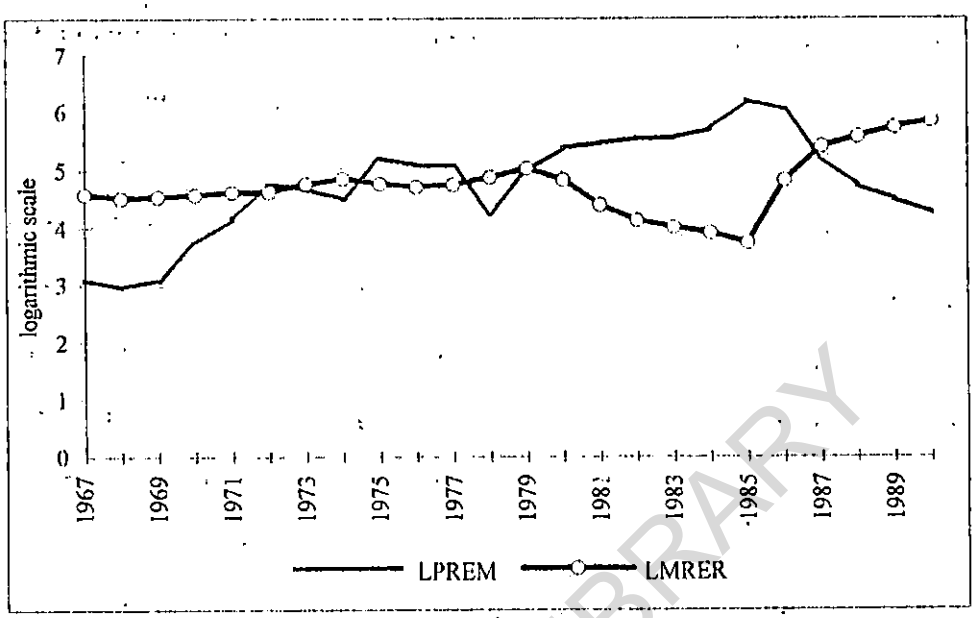
A second contrast is that between the official and the unofficial or parallel market real exchange rate. This is drawn by comparing the MRER and the URER. In Table 3.3 the official real exchange rates show the least correlation with the URER except in the 1986-90 sub-period when the coefficients are larger and negative. Instances of negative correlation suggest that as the MRER appreciated (i.e. with overvaluation), the URER depreciated (a rise in URER). The opposite scenario of the relationship between MRER, URER and the parallel market premium appears in the sub-period 1986-90. More generally, Charts 3.3 and 3.4 depict this negative relationship. However, it cannot yet be affirmed as to which of the URER (or indeed, the parallel exchange market premium) and the actual RER leads the other.

Chart 3.3 Official and Unofficial Real Exchange Rates Indices



Source: Based on Table 3.2.

Chart 3.4 Real Exchange Rate and the Parallel Market Premium



Notes: LPREM log of parallel market premium (per cent). LMRER = log of MRER index (1972 = 100).
Sources : Based on Tables 3.1 and 3.2.

Thus far, this section has carried out computations and comparisons of a number of nominal and real exchange rates. The next section traces the changing nature of the nominal exchange rate regime in Tanzania, the alternative domestic policies applied in lieu of nominal exchange rate, and the consequences of such policy in Tanzania.

3.3 Nominal Exchange Rate Regime

3.3.1 Choice of Nominal Exchange Rate System

In-depth studies have been made on the various aspects of the evolution and conduct of the exchange rate policy in Tanzania: for instance, Green, van Arkadie and Rwegasira (1980), Lane (1984), Lipumba (1987, 1991a, 1991b), Ndulu (1993), Kaufmann *et al.*(1991), Kimei (1987, 1989) and Musonda (1992). A number of issues regarding the conduct of the exchange rate policy stand out prominently. These include the choice of the exchange rate regime as between fixed and flexible

exchange rate systems, the type of peg, management of the foreign exchange market and considerations of the socio-political effects of nominal exchange rate actions.

Tanzania has, for a long time, maintained a predetermined exchange rate regime. The nominal exchange rate has been under full control of government through the central bank. It has been "administratively set", varied discretely by small amounts for most of the period, changing to a relatively more flexible type (a crawl) after 1986. The Bank of Tanzania, on behalf of government effects any changes in the official par value of the Tanzanian currency, usually along criteria set by the overall economic policy objectives. The presumed merits of the fixed exchange rate system, such as, providing domestic price stability and certainty for trade and investment decisions would certainly have been in sight from the beginning, but the lean towards relative *fixity* was also consistent with central economic planning for socialist orientation. The Bank of Tanzania was from the early days bestowed with powers to manage foreign exchange policy, foreign exchange control, import licensing and export promotion. It was also chosen from the outset, to peg the Tanzanian currency, at first to the United Kingdom Pound Sterling (UKP), and then changing to the USD, the SDR and an unspecified "basket" of major currencies (see Table A3.3).

A fully flexible exchange rate regime theoretically is said to have the advantage of enabling the exchange rate to automatically achieve external balance, thus freeing authorities to pursue monetary and fiscal policies for their domestic objectives.[66] Few countries practise a fully flexible exchange rate system. Experience in the more advanced countries has shown that a freely floating exchange rate regime carries with it the danger of exchange rate instability due mainly to speculation and further possibility of inflation caused by this exchange rate instability.[67]

Nevertheless, perhaps another reason for Tanzania's choice of a fixed regime, as seen then could have been the view that "(t)he technical problems and costs of

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[66] Aghveli et al., 1991:13).
[67] *Ibid.*

managing an independently floating currency were always perceived by the Bank and Ministry of Finance as beyond Tanzania's competence,..." (Green et *al*. 1980:51).

The choice for *fixity* demands fiscal and monetary policy discipline. In the least, it requires that the rate of domestic credit does not exceed a specified level determined on the basis of the world rate of inflation, the domestic growth of real income and the income elasticity of demand for money. Since domestic authorities do not have full control over foreign prices and income levels, and they do not always succeed in keeping to the targeted levels of domestic credit expansion, money supply or the rate of domestic inflation, adjustment of the nominal exchange rate is another tool available. As such *fixity* should not preclude nominal exchange rate adjustment.

Besides, "stability" of the exchange rate (meaning low variability) is not by itself ideally sufficient for the required *certainty*, especially when this "stability" is induced by administrative controls. Under these circumstances, as experiences in Tanzania and elsewhere show, what authorities and economic agents consider to be "realistic" levels do not always coincide. This is shown, for instance, by the emergence and divergence of the parallel market rate from the official rate.

A related issue concerns the importance that should be attached to the nominal exchange rate as a policy tool for economic (including, balance of payments) adjustment as compared to other selective policy measures such as commercial policies and administrative controls.

3.3.2 Onset of Overvaluation

The period 1967-72 is notable in that both the nominal and real exchange rates show the least fluctuations compared to the rest of the period. Although a number of control measures - mainly on capital and imports were already in place,[68] both the internal and external balances were not as precarious as in the subsequent period.

[68]This started with controls on capital outflows in 1965.

Initially, Tanzania's currency was pegged to the United Kingdom pound sterling (UKP) at TSH 20 = 1 UKP, equivalent to TSH 7.14286 = 1 USD.[69] Backed by reasonably adequate initial foreign exchange reserves from the East African Currency Board and satisfactory balance of payments, the exchange rate remained relatively stable up to 1972. At about 4.7 per cent per annum (though higher than early 1960's rate of 3.8 per cent) the average rate of inflation was not alarming, and lower compared to the subsequent periods. The recurrent budget showed surplus that, except in 1973/74, continued until 1977/78. Economic activity (for instance, GDP growth rate, and capital formation) showed satisfactory performance. On this strength, the Bank could avoid the necessity to devalue the TSH in 1967 following the devaluation of the UKP in November: it was hoped that any consequent increase in imports could be adequately dealt with appropriate tariff measures.[70]

Table 3.5 Some Indicators for Internal and External Balance

Period Average, Per cent

Indicator/ Period	1967-72	1973-79	1980-85	1986-90
Average growth rate of real GDP	4.7	2.6	1.1	3.9
Average rate of inflation[a]	4.0	13.4	30.2	27.8
[Foreign rate of inflation]	(4.5)	(9.4)	(7.3)	(3.6)
Budget deficit/Total expd[b]		22.2	38.0	37.1
Parallel premium	56.6	110.0	350.0	193.0
Terms of Trade (average change)	-6.1	4.4	-3.5	-7.0
Foreign Reserves[c]	77.4	117.5	17.7	83.5

Notes: [a]: average rate of change in NCPI. In parentheses is rate of change in the consumer price index of industrialised countries. [b]: for the overall budget balance. Total expenditure includes both recurrent and development expenditures. [c]: average for the period in current million US dollars.

Sources: Bank of Tanzania (1982), *National Accounts of Tanzania*, and *Economic and Operations Report (various issues)*, World Bank (1992), IMF(1993c).

[69]The Bank of Tanzania Act (1965) created the country's first central bank. Operations began in June 1966.

[70]See, for instance, Kimei (1987).

The first (minor) balance of payments problem appeared in the 1970-71 period. In 1971 the current account stood at TSH -486.6 million, a steep fall compared to the 1969 balance of TSH 226.4 million. Official foreign exchange reserves declined from TSH 564.2 million in 1969 (December) to TSH 422.2 million in 1971 (December). This was attributed to a sharp rise in imports of mainly capital goods, a decline in the agricultural export volumes, particularly sisal and cotton, inordinate delays in shipments of exports, and capital outflows (due to the sharp rise in emigration).[71]

The payments crisis was averted by use of more careful import and exchange control measures - the introduction of the annual Foreign Exchange Plan and the Finance and Credit Plan in 1971. The Open General Licence (OGL) list was also introduced (Kimei, 1987). By the second half of 1972 "external balance" is reckoned to have been restored, and improvement in the reserves position continued into 1973, after which a series of more serious external and internal shocks set in.[72]

Falling reserves, an appreciating real exchange rate, the domestic rate of inflation that run ahead of the rate in major trading countries, and an "unsustainable" current account deficit indicated the onset of overvaluation. Taking 1972 as base year, movements in the bilateral real exchange rates and the Purchasing Power Parity exchange rate estimates indicate a tendency toward appreciation since around 1969 and 1970.[73]

3.3.3 Pressure on the Nominal Exchange Rate

In the period 1973-85, the nominal exchange rate was not adjusted in response to external and/ or internal imbalances which were worsening due to a series of economic shocks like the rise in oil prices, higher prices of grain imports in 1973, drought 1974/75; policy-induced dimensions -villagisation programme effect on

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[71] Bank of Tanzania (1971) *Economic Bulletin* Vol III No.3.
[72] Green et al. (1980), Bank of Tanzania (1982).
[73] Reference may be made to Table 3.1 and related description.

agriculture, capital and import implications of the Basic Industry Strategy, the break-up of the East African Community in 1977, the coffee boom (a positive shock) and the 1979 war with Uganda. Capital inflows (medium- and long-term loans) and transfers did not grow sufficiently to match the increasing import requirements. Thus, since 1974 recourse was to "exceptional financing". Foreign reserves were drawn down, except in 1976 and 1977 following the windfalls of the coffee boom. By 1981 Tanzania was in accumulated payment arrears of TSH 2,600 million.[74] This was about 54 per cent of that year's merchandise exports. Domestic inflation became higher in the 1970s, and still far above the average of the industrial countries, the main trading partners.

Between 1979 and 1985, the economic crisis and foreign exchange shortage deepened further. After a brief period of relaxation of import controls following the brief coffee boom, controls on imports were tightened. Government was also pressured to reduce spending in view of the rising budget deficits financed by bank borrowing. The acute shortages of goods and foreign exchange led, from 1979 onwards to a rapid increase in parallel market activities. The premium on the parallel market exchange rate accelerated from about 200 per cent in 1979 to around 400 per cent in 1985 (see Table 3.1).

The pressing need for a corrective action on the exchange rate was already recognised by government by the late 1970s, only that consensus with the IMF was hard to reach on the extent and timing of devaluation.[75] In the event, the devaluation and initial liberalisation measures made between 1980 and 1985 were considered to be too limited. IMF pressed for about 40 per cent in 1979 and above 80 per cent in 1981/82 (Kimei, 1987:202).

The reasons for maintaining a relatively "fixed" exchange rate even when the economy faced external and internal imbalances may lie in the authorities' resolve to

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[74] Hanak (1982).
[75] See, Singh (1984) and Maliyamkono et *al.* (1990).

rely more on controls; but there were also other reasons why devaluation was especially detested. It was argued that, being a "price-taker" for both her imports and exports, Tanzania could hardly change the external terms of trade by devaluing. The dollar price of exports could not be changed by devaluation, and export earnings would increase only if export volumes increased. The latter would require an increase in the domestic price of exports; but domestic prices of exports, like prices of other key commodities, were under government control and could be varied with or without a need for exchange rate devaluation. There was doubt too, if the supply elasticities for many of the commodities were high enough, especially for the agricultural exports, and even if so, the benefit would have to be set against the increased costs of allied imported inputs and transportation cost that would increase with devaluation.

It was also thought to be highly unlikely that Tanzania could reduce the import bill by devaluing: the domestic price of imports would rise by the same rate of devaluation, but at the same time, aggregate demand for imports was deemed to be highly inelastic in view of the strong demand for imported investment and intermediate goods, imports of food grains and other necessities. It was, therefore, considered prudent to use selective devices within foreign exchange budgeting and import tariffs rather than the exchange rate.

Income distribution argument was yet another forceful argument against large exchange rate devaluation in the 1970s. It appeared that such an action would tend to shift income away from the relatively poor food producers to relatively richer producers of exports, and from import-consuming wage earners to private businessmen.[76] This would be inconsistent with the overall objective of equity.

Seen in isolation, the effectiveness of devaluation in a developing country like Tanzania may not seem to be readily credible.[77] But the costs of continued inaction in

[76]Green *et al.* (1980).

[77]Some of the arguments against devaluation in a developing country were introduced in Chapter II. Hyuha (1990) assesses, among other things, the working of the Marshall-Lerner condition in the case of Tanzania. On the other hand, the structure of domestic production, characterised by considerable dependence on imported inputs makes the structuralist view *á la* van Wijnbergen (1986), for instance, noteworthy.

terms of overvaluation and loss of external competitiveness often will not be sustained for a long time. As many analysts observe, a devaluation has to be part of a "policy package" that, among other things, attempts to forestall possible negative effects of a devaluation and to boost the positive effects. Notable among the former type of measures are contractionary macroeconomic and income policies to control domestic inflation. Supporting higher relative prices to producers of exports and improvement of physical and administrative infrastructure are some measures that may sustain the effects of devaluation in eliciting higher output response. Infusion of foreign aid in support of the reform effort begun in the mid-1980s eased supply constraints by enhancing possibilities of acquiring vital imported inputs. However, there has been limited success in controlling inflationary fiscal policy in Tanzania for most of the period under study.

3.3.4 On Consequences of *Fixed* Nominal Exchange Rate Regime.

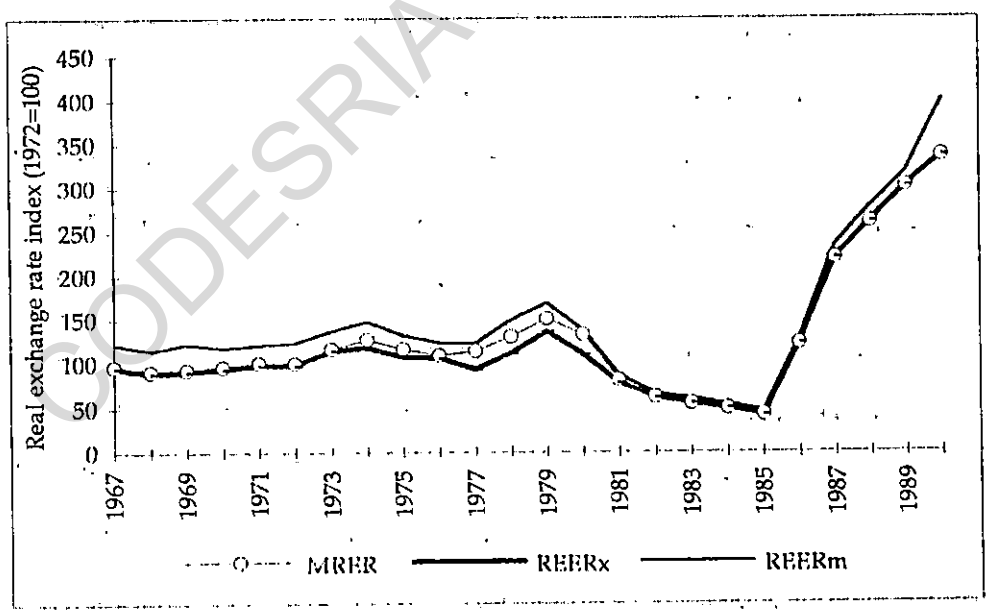
Alternative measures were employed to implement the development strategy, the outstanding feature of which was a drive for import substitution industrialisation. High import tariffs were set on consumer goods, so as to offer protection to domestic producers. The tariff rates were lower on intermediate and capital goods as these were considered to be key inputs in the industrialisation process.

In spite of the data coverage problem in the construction of average REERs, inferences about trade orientation can be drawn from the computed $REER_x$ and $REER_m$, indicating whether there is a bias of policy toward import substitution or to export orientation. Even with limited coverage, these measures for Tanzania lender some support to the claim that the trade and exchange rate regime favoured import substitution prior to the mid-1980s. Generally, $REER_m > REER_x$, describes the incentive structure of a more inward-oriented (also import substitution) regime,

although this does not necessarily preclude the possibility of having individual establishments within the economy that were export-oriented.

Since computationally the REERs are tied to the multilateral RER (MRER), no wonder they follow the MRER trend; but it is within the common expectation, that $REER_x$<MRER implies reduced real return after an export tax, and $REER_m$>MRER implies extra "reward" for engaging in importing. This scenario changes when the gap between the two REER measures gradually closes (see also the ratio rmx in Table 3.2, and Chart 3.5). It has to be noted that other qualifications, such as the extent of non-tariff protection measures are important elements of the orientation of the trade or exchange rate regime.

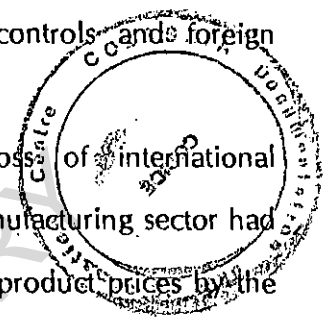
Chart 3.5 Average Real Effective Exchange Rates



Source: Table 3.2.

The structure of protection that emerged conferred to public enterprises (and a few other private interests) who had preferential access to the meagre foreign exchange

allocations, the advantage of acquiring import requirements at artificially low costs. Most industries, however, could not meet the domestic market demand as manufacturing output declined. The industries faced a number of constraints, largely related to low capacity utilisation as the economy's capacity to import declined. Import volumes were compressed through tighter import controls and foreign exchange rationing.



One of the effects of overvaluation was the loss of international competitiveness of the country's exports. Most firms in the manufacturing sector had high unit cost at low scales of output and, guaranteed of high product prices by the cost-plus method and of continued existence by "soft budgets", the firms were less conscious of cost efficiency.[78] Prices of their products were less competitive in the foreign markets. Thus, tracing the real exchange rate for the manufacturing sector (as a ratio of price of manufacturing in domestic market to price of manufacturing in export market), Musonda (1992) shows Tanzania's exports started losing international competitiveness already since 1976, continuing through 1988.

For the agricultural exports, an overvalued currency accentuated the bias against the sector already denied a fair share of resources throughout the 1970s. It is not only that the overvalued exchange rate meant less return per foreign currency unit of export but also this return was further eroded by export taxes (falling heavily on traditional exports), marketing margins of the crop public enterprises and rising domestic inflation. The results included a tilt of terms of trade against export produce in favour of food crops and inducing a shift of a significant amount of labour to more profitable non-tradable activities.[79]

The general public gradually lost confidence in the official regulated trade and exchange channels. Exporting through the official channels carried some implicit tax, as all export earnings had to be submitted to the central bank at the official exchange

[78]The concept of "soft budget" in relation to performance of public (government-owned) enterprises in manufacturing and services sectors is elaborated by Eriksson (1991). See also, Musonda (1992).
[79]See, for instance, Ellis (1982), Ödegaard (1985) and Ndulu (1986b).

rate. Access to official foreign exchange allocation gave the few holders of import licenses cheap foreign exchange, some of which ended up on the parallel market where it would be disposed of at a higher rate. Venues that bring in foreign exchange to government were evaded as import and exchange restrictions became tougher.[80]

3.3.5 Towards Foreign Exchange Market Unification (1986-93)

By the mid-1980s notable features in the economy in crisis included, *inter alia*, unabated shortage of foreign exchange, inflation, growing budgetary deficits (financed by bank borrowing) and firm controls on internal and external trade. Early efforts at liberalisation in mid-1984 included allowing "own fund" imports, and partial elimination of quantitative restrictions. These were followed by larger exchange rate depreciation in 1986 and a series of depreciations thereafter. Policy efforts to encourage exports included elimination of export taxes on major exports. Trade liberalisation also aimed to facilitate importation of vital inputs and consumer goods.

A number of sources for foreign exchange gradually came into effect (in essence, a multiple foreign exchange market):

(i) the traditional official source, (from the official export earnings availed to the public - state and private sectors, through the system of allocation administered by the central bank.

(ii) own foreign exchange, which depended on the various foreign exchange retention schemes, and other own sources which authorities committed themselves not to query the owner - main source of "own funds" imports

(iii) grants and loans

(iv) import support (or Commodity Import Support funds provided by

[80] A more recent account of the parallel exchange market is given by Maliyamkono *et al.* (1990) and Kaufmann *et al.* (1991).

bilateral donors: the beneficiaries remit local cash cover via the Treasury.

(v) "new" Open General Licence (OGL) facility[81] and

(vi) suppliers credit.[82]

Judging by the declining trends in the parallel (unofficial) market premium, the unofficial exchange market remained quite active, though by the end of 1990 the premium had shrunk to around 58 per cent. A moderate slowdown in the rate of domestic inflation to 19 per cent, and a gradual reduction in government bank borrowing for financing budget deficits may explain a noticeable RER depreciation. But these do not appear to be strong enough to support the idea that by 1990 exchange rate overvaluation had been completely eliminated.

Some institutional changes were made to try to instil a sense of confidence among the private sector and to improve competitiveness of the financial sector. The latter included laying down the legal framework licensing operations of other / foreign commercial banks. The new Foreign Exchange Act, 1992 and allied subsidiary legislation in relation to *Bureaux de Change (BDC)* made way for the introduction of *Bureaux de Change* (21 April 1992) so that residents are free to possess and sell foreign currency, and all external current account payments may be effected through this window.[83] The commercial banks and the *bureaux* became conduits for foreign exchange allocation and relaxation of exchange controls. The unofficial parallel (UP) - the illegal exchange market - premium fell 37 per cent from previous year level of about 60 per cent.

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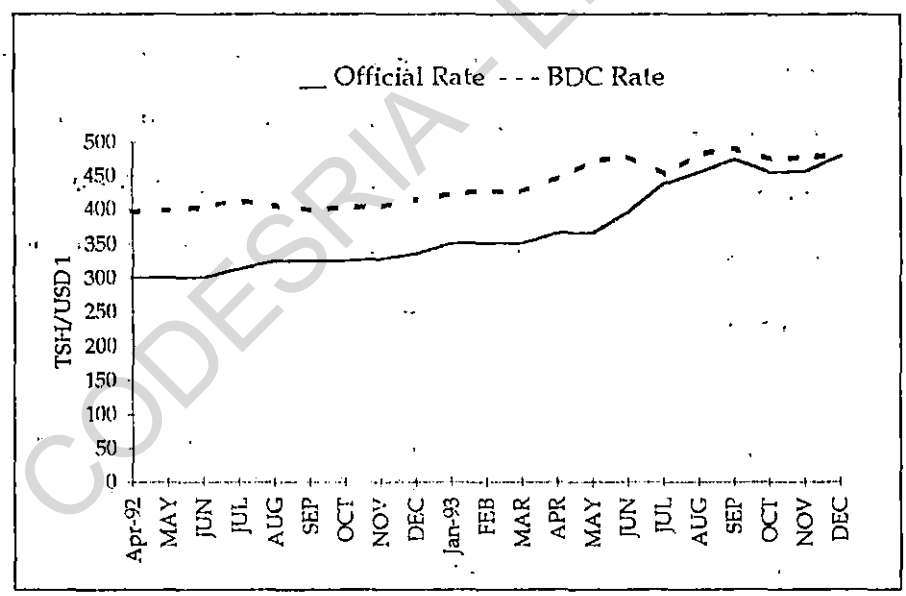
[81]Established in 1972 (via Government Notice No.47 of 1/3/1972, *Open General Licence (OGL) 1972* OGL prescribed the list of products that could be imported (depending on the availability of foreign exchange), and the confinee institutions that were granted sole rights to import specified goods. It has undergone changes (1973, 1974, 1976). It was suspended in 1982 as foreign exchange hit harder, so that all imports required the Bank's specific licence. In February 1988, a "new" OGL was established with the support of World Bank, as part of support effort for the ERP (1986-90). Further changes in the procedures were made in 1991-92, and among other things, the range of eligible products expanded, and the 100 per cent cash cover requirement was relaxed (from *The Express* June, 24-30, 1993).

[82]These have been described variously by Ndulu et *al.* (1993), Musonda (1992).

[83] Bank of Tanzania (1992) *Economic Bulletin* and IMF (1993b).

The premium on the *BDC*, though of a very short duration, is indicative of the tendency to narrow the gap between the official and observed rates of both the *BDC* and unofficial exchange markets.[84] Chart 3.6 shows the *monthly* official bank and Chart 3.7 shows *BDC* mean selling rates (TSH/USD 1) and premium on the *BDC* rate since April 1992. The tendency is for the gap between the two rates to converge, and the premium on the *BDC* rate to fall. The premium falls sharply to below 5 per cent between July and December 1993.[85] On the other hand, basing on annual observations (for instance, Tables 3.1 and 3.6), the premium on the unofficial market rate has also been declining since 1985.

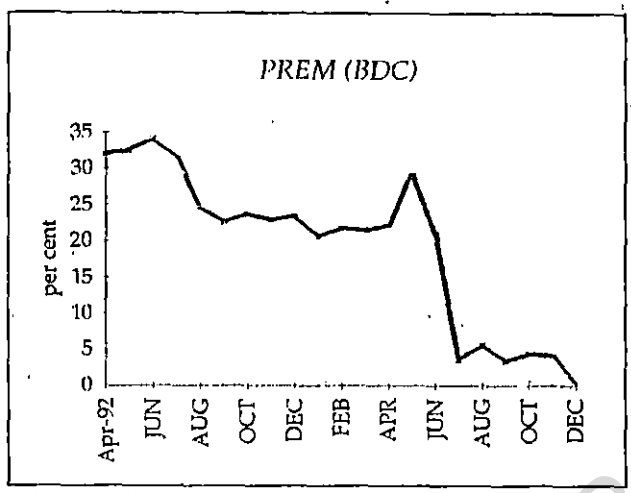
Chart 3.6 Official Bank and *Bureau de Change* Exchange Rates



Source: Bank of Tanzania (1993) *Economic Bulletin Vol XXIII No.3.*

[84]The UP rates have always been higher than both the official bank and *BDC* rates.
[85]This may be attributed to the introduction of foreign exchange auctions (20th July 1993) and unification of the official bank and *BDC* rates the following month.

Chart 3.7 Premium on the *Bureau de Change* Exchange Rate *(Monthly)*



Source: Data from Bank of Tanzania (1993) *Economic Bulletin Vol XXIII No.3.*

Table 3.6 shows the annual average premium on the *BDC* (1992-93) and the unofficial market. Even though by 1993 the premia on both the *BDC* and the UP market declined and the apparent gap between them narrows from 10 percentage points in 1992 to 2 points in 1993, it is too early to conclude about the steadiness of the trend towards unification given the volatility of the unofficial parallel market.

Table 3. 6 Bank, *Bureau de Change* and Unofficial Parallel Exchange Rates and Premia (1990-93)

Year	Bank Rate	*BDC* Rate	Unofficial Parallel Rate (UP)	Premium on *BDC* (%)	Premium on UP (%)
1990	195.05	-	330.00	-	68.17
1991	233.90	-	370.00	-	58.19
1992	316.90†	403.40†	435.00	27.30	37.27
1993	411.47‡	460.41‡	470.00	12.00	14.34

Notes: †average of 9 months (APR-DEC), ‡ averages of 12 months JAN-DEC.

Sources: Data from Bank of Tanzania (1993) *Economic Bulletin Vol. XXIII Vol. 3.* Unofficial parallel market rate- averages for the year, own observations approximated.

The prospects for a stable unification can be speculated on depending, as it does, on the steadiness with which authorities demonstrate ability to contain inflation and adhere to reforms and so command credibility amongst the key economic agents. Advantage of experiences of some Sub-Saharan countries has to be taken, in regard mainly to possible sources of inflation and the feasible extent of trade and exchange liberalisation.[86] It does appear, that what seems to be gradualist approach to unification thus far is on the right track. However, a more incisive evaluation of the Tanzanian experience is essential as the process of macroeconomic reforms continues.

In short, the narrative of the issues surrounding the nominal exchange rate shows that the exchange rate was allowed to be overshadowed by administrative (price and quantitative) controls. That the period up to 1972/3 saw a relatively "stable" exchange rate owes mainly to the fact that no serious external and internal imbalances had emerged, even though limited controls were already in place. From 1974 authorities placed more attention on managing control instruments in trying to overcome the imbalances. Expansionary fiscal policies and declining aggregate supply resulted in domestic inflation far in excess of foreign inflation. Along with exchange rate reforms and trade liberalisation, from the mid-1980s came a number of foreign exchange "windows". However, these did not appear to offer equitable access to foreign exchange. The need for an eventual unified exchange market stood out as a desirable end.

The next part of this chapter attempts to establish the impact of some of the RER determinants and consequences of the nominal exchange rate policy on the RER, and to deduce empirical measures of the other aspects of the RER behaviour in Tanzania.

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[86]Examples of these include Zambia, Ghana and Uganda which, at different times have undertaken exchange rate reforms aiming to unify exchange rate markets and to eliminate parallel (largely illegal) foreign exchange markets. See, for instance, Agenor and Flood (1992). Kiguel and O'Connell (1995) examine, among other things, unification experiences and policy implications in eight developing countries.

3.4 The Real Exchange Rate Behaviour

The early sections of this chapter introduced different measures of the RER. It was also shown how these measures varied over time. The major factors surrounding the nominal exchange rate have been analysed in the preceding section. This section focuses on the actual RER and RER misalignment and uncertainty with at least three objectives. First is an attempt to attach possible explanations to the observed "swings" on the path of the RER over time: a short account is in sub-section 3.4.1.[87] Second, in view of the theoretical determinants of the RER examined in Chapter II, to what extent do these explain the movement of actual RER in Tanzania? This is carried out via a RER model in sub-section 3.4.2. Third, in section 3.4.3 time series measures of RER misalignment and RER uncertainty are derived.

3.4.1 Actual Real Exchange Rate: Related Policies and Events

The basic contrast between the nominal exchange rate and the RER is that the latter reflects the effects of a number of variables. Apart from the nominal exchange rate changes, it incorporates factors (policy and non-policy) that determine the internal and external balances of the economy. The domestic determinants work mainly through the domestic price level. The external factors affecting the RER include foreign inflows, international terms of trade, interest rates, exchange rates and commercial policies.

Although we are unable to deduce any equilibrium RER at this juncture, swings in the observed RER can be associated with movements in some of the factors that affect the RER and its variability. Looking back at the movements in the RER (e.g. in Chart 3.2), apparently observed major up- or down- swings in the RER can be associated with some distinct policy and non-policy actions and events.

[87] Recall that of the real exchange rate indicators computed, the multilateral real exchange rate (MRER) was considered to be superior. Unless clearly stated otherwise, RER is intended to mean the MRER.

In the first place, attention is drawn to the comparison of findings so far with those from other developing countries regarding the trends in the bilateral and multilateral exchange rates. Edwards (1989), for instance, finds that in countries that pegged to the US dollar the two (BRER and MRER) tended to move together prior to 1971, after which they exhibit differences, sometimes moving in opposite directions. In particular, the MRER exhibited greater variability in the post-Bretton Woods period, partly reflecting the volatility of exchange rates in the industrialised countries.[88]

Chart 3.2 shows a similar behaviour of the MRER and BRER indices in the case of Tanzania. Prior to 1972 the two move close together, and then part beginning 1972. One would thus conceivably suggest that most probably the wide nominal exchange rate variability that followed the Bretton Woods in the major industrial countries would show in greater MRER variability in the developing country trading with and/or pegging to those developed countries' currencies. This can be considered to be one of the possible sources of the observed depreciation of the MRER after 1972 in the case of Tanzania.

The incidence of phenomenal macroeconomic pressures through the balance of payments that followed the first oil crisis and drought, may probably explain the RER appreciation after 1974 up to 1976.

There is reckoned to be an easing in external accounts in 1976 and 1977 following improvement in domestic food output and the coffee boom. These can be associated with the observed depreciation up to 1979.

However, a host of other events took place within this period that culminated into marked external and internal imbalances by the end of the 1970s. For instance, following the coffee boom, government allowed import liberalisation, but soon the terms of trade fell as the boom withered; then came the second oil price shock (1978), and war with Uganda (1978-79). Expansionary fiscal policy was pursued, with limited

[88]Between 1970-73 the Bretton Woods system, basically gold standard, gradually gave way to floating exchange rates. Tanzania's currency was originally linked to the UK Pound Sterling. In 1971 it was linked to the US dollar. Subsequent changes are indicated in an appendix Table A3.3.

nominal exchange rate action. Instead, a tight trade policy regime that fell heavily on imports, contributed to declining growth of output of tradables, particularly manufactures and agricultural exports.

These events and policy measures, can be linked to the sharp real appreciation of the RER between 1979 and 1985. To these can be added worsening of terms of trade, world recession, the rise in foreign interest rates and decline in net foreign resource inflows.

The real depreciation experienced since 1986 can be attributed to profound policy changes, notably the considerable devaluation, and demonstrable effort toward reduction of expansionary policies.

3.4.2 Estimating the Effects of the Real Exchange Rate Determinants.

3.4.2.1 The Model

The theoretical effects of various RER determinants have been discussed in the previous chapter, while the foregoing sub-section has gone over some historical events apparently related to the observed trends in the RER. To investigate the relative importance of these factors on the actual RER over the period 1967-90 use is made of regression analysis in the following sub-section.

From the literature review, two major sources of changes in the actual RER are to be empirically investigated: namely, the fundamental and non-fundamental determinants. These summarised in equation (2.8).

In the previous chapter, fundamental determinants (F_i) that affect the equilibrium RER (ERER) can be taken out into an ERER function below:

$$(3.3)\ ERER_t = \alpha_0+\alpha_1 T_t+\alpha_2 K_t+\alpha_3 G_t+\alpha_4 PR_t+\alpha_5 IM_t+\alpha_6 XT_t+\alpha_7 TN$$

where T_t = an index of Tanzania's external terms of trade;

K_t = capital inflows

G_t = government consumption

PR_t = parallel exchange rate market premium;

IM_t = a measure of import restrictions;

XT_t = measure of explicit export tax rate

TN = time trend for the effects of changes in productivity

u_t = an error term.

The actual RER adjusts to changes in the equilibrium RER and takes on effects of macroeconomic instability (MAP). Over time then, the response of the actual RER to changes in the equilibrium RER (ERER) may be depicted by a partial (adaptive) adjustment mechanism in the following relation:

$$(3.4) \quad \left(\frac{RER_t}{RER_{t-1}}\right) = \left(\frac{ERER_t}{RER_{t-1}}\right)^{\phi} e^{\gamma(MAP)_t} e^{\varepsilon_t}$$

where ϕ = the partial adjustment coefficient

γ = the rate by which changes in macroeconomic policy balance affect the actual RER

ε_t = error term

The partial adjustment coefficient (ϕ) denotes the amount by which actual RER autonomously adjusts towards the long-run ERER. Equation (3.4) also incorporates the effect of macroeconomic balance, MAP which may cause deviation of the actual RER

from the ERER or RER misalignment. For instance, if MAP = 0 then $e^{\gamma(MAP_t)} = 1$, there will be no misalignment.

Multiplying both sides by RER_{t-1} leads to:

$$(3.5) \quad RER_t = \left[ERER_t\right]^{\phi}\left[RER_{t-1}\right]^{(1-\phi)} e^{\gamma(MAP_t)} e^{\varepsilon_t}$$

Substituting (3.3) for the ERER fundamental determinants (the first term in 3.5) and taking logarithms on both sides, the following equation is obtained:

$$(3.6) \quad \ln RER_t = \phi[\alpha_0 + \alpha_1 \ln T_t + \alpha_2 \ln K_t + \alpha_3 \ln G_t + \alpha_4 \ln PR_t + \alpha_5 \ln IM_t + \alpha_6 \ln XT_t + \alpha_7 \ln TN] + (1-\phi) \ln RER_{t-1} + \gamma (MAP_t) + \varepsilon_t$$

where MAP is measured in terms of growth rates (MAP can take negative values and is not, therefore, in logarithms).

For estimation, (3.6) can be written out as:

$$(3.7) \quad \ln RER_t = \beta_0 + \beta_1 \ln T_t + \beta_2 \ln K_t + \beta_3 \ln G_t + \beta_4 \ln PR_t + \beta_5 \ln IM_t + \beta_6 \ln XT_t + \beta_7 \ln TN + \beta_8 \ln RER_{t-1} + \beta_9 (MAP)_t + \varepsilon_t$$

where $\beta_0 = \alpha_0\phi$, $\beta_1 = \alpha_1\phi$, $\beta_2 = \alpha_2\phi$, $\beta_3 = \alpha_3\phi$, $\beta_4 = \alpha_4\phi$, $\beta_5 = \alpha_5\phi$, $\beta_6 = \alpha_6\phi$, $\beta_7 = \alpha_7\phi$, $\beta_8 = (1-\phi)$, $\beta_9 = \gamma$.

The long-run elasticities α_i's can be obtained as $\alpha_i = \beta_i/(1-\beta_8)$. These apply to the fundamental determinants in the ERER equation.

3.4.2.2 Definition of Empirical Variables and Data

For estimation of equation (3.7), the MRER series obtained in the early part of this chapter is to be used as a dependent variable.

T_t is an index (1972 = 100) of Tanzania's international terms of trade. K_t is a measure of capital inflows. The capital inflows variable includes both long- and medium term items on the capital account and short-term net transfers on the current account of the balance of payments summary originating from Bank of Tanzania. The inflows are deflated by the import price index which was proxied by the wholesale price index of industrial countries.

Government consumption (G_t) was deflated by the national consumer price index. PR_t is the parallel exchange rate market premium (as measured earlier in this chapter); it is used as a proxy for marginal tax rate on exports, mainly in the presence of enforced regulations to surrender foreign exchange earnings.

For a measure of import restrictions (IM_t) the ratio of imports to total supply (that is GDP + imports) was used to reflect the tightness of the trade regime. We expect the ratio to decline the tighter the import restrictions, other things being equal. Here "other things" include factors like the flow supply of foreign exchange, import prices or in general, the terms of trade. Given sufficient data, it may alternatively be measured as the ratio of import duty collections to total revenue: however, data was a limitation.

IMt as measured here (following Edwards 1989, among others) seems to reflect the actual situation in Tanzania (see Table A3.4). For instance, it is declining since the end of the 1970s, quite suggestive of import compression due to foreign exchange crisis. Conversely , an increase in the measure after 1986 should be linked to the easing of not only the foreign exchange shortage but also the relaxation of import restrictions mainly during the period of economic reforms in the second half of the 1980s.

Explicit export tax measure (XT_t) was obtained as ($1-t_x$), where t_x is the ratio of export tax revenue to total exports. TN is time trend for the effects of changes in productivity for the entire economy.

MAP_t, a measure for macroeconomic stability condition was constructed basing on (2.7) as:

$$(3.8)\ MAP_t = (\dot{dc} - \dot{y} - \dot{p}^* - \dot{E})$$

where $\dot{dc}$ is the growth rate of domestic credit expansion, and the rest of the variables as defined before. Domestic credit is the total of bank claims on government and total lending to all domestic sectors (data from Bank of Tanzania). The growth rate of real GDP ($\dot{y}$) is derived from *National Accounts of Tanzania*. $\dot{p}^*$ is the annual percentage change in the foreign price level, based on the industrialised countries wholesale price indexes from IMF (1992), and $\dot{E}$ is the annual change in the nominal exchange rate based on annual average nominal TSH/USD 1 exchange rate.

3.4.2.3 Estimations.

Ordinary Least Squares (OLS) procedure was used. The limited number of observations and the relatively large number of independent variables made selection procedure necessary. The first step involved estimation of the general model (3.7) with no lags except for the lagged dependent variable.[89] This was considered to be an unrestricted model (U) for unrestricted regression. A number of restricted versions (R) were estimated, dropping in turn the variables that proved to be statistically

[89]Trials with lagged explanatory variables did not yield satisfactory results, in part due to the loss of the degrees of freedom given the small number of observations.

insignificant. The procedure specifically involved obtaining restricted sum of squares each time, which were subsequently used to calculate the F-statistic for the null hypothesis that the variable may be excluded from the regression. Subsequently, the variables that were dropped are G, K and XT. The test whether the these are jointly significantly equal to zero was then carried. Using the appropriate F-test the null hypothesis (that $\beta_2 = \beta_3 = \beta_6 = 0$) was not rejected by this test.

It was also vital to check for heteroscedasticity. Glejser's test was used (e.g. Koutsoyiannis, 1987). The absolute values of the residuals were regressed on a constant plus each of the model's ii dependent variables in turn. In most cases no slope coefficient was found to be statistically significant at the 10 percent level. Hence, the null hypothesis of homoscedasticity could not be rejected.[90] The DW is biased towards 2 in the presence of a lagged dependent variable. However, no serious autocorrelation was detected. Use was made of the Lagrange Multiplier test.[91]

In our final model, therefore, terms of trade, the parallel market premium, import restrictions measure, trend variable and macroeconomic policy measure appear to be significant determinants of the RER - noting again that MAP is a non-fundamental determinant.

The estimated final equation is (3.9) (t-statistics are in the brackets):

---

[90] A technique called the Heteroscedasticity Consistent Covariance Matrix (HCCM) available on MicroTSP was invoked as well. The procedure readily provides consistent estimates of the variances of the estimators (and t-statistics) but the estimates of the regression coefficients and R^2 remain unchanged (see, for instance, Ramanathan,1992: 344-5).

[91] (DW), the Durbin Watson test cannot be applied in the presence of lagged dependent variable among the explanatory variables. The alternative Durbin h, was not possible since in most cases T[varβ] > 1 -in computing the Durbin *h* statistic as : $h = (1 - \frac{DW}{2})\sqrt{\frac{T}{1-T[varb]}}$ where T is the number of observations and varβ the variance of the coefficient associated with the lagged dependent variable. See, for instance, Pindyck and Rubinfeld (1991:147-148).

$$\ln RER_t = 0.59 + 0.27 \ln T_t - 0.18 \ln PR_t + 0.20 \ln IM_t + 0.17 \ln TN$$
$$(0.93) \quad (2.37)^* \quad (-5.00)^{**} \quad (3.87)^{**} \quad (4.66)^{**}$$

$$+ 0.54 \ln RER_{t-1} - 0.39 MAP_t$$
$$(5.09)^{**} \quad (-6.85)^{**}$$

Adj. $R^2 = 0.9$, D-W = 2.10, F-statistic = 63.47

* statistically significant at the 10% level
** statistically significant at the 5% level

The long-run elasticities basing on (3.9) are in Table 3.7.

Table 3.7 Long-run Real Exchange Rate Elasticities

Variable	Elasticity
Terms of trade (T)	0.585
Parallel Market Premium (PR)	-0.391
Import Restrictions (IM)	0.435
Trend Variable (TN)	0.369

Note: Computed as indicated below equation 3.7.

Equation (3.9) gives some light on the effects of the different variables on the actual and equilibrium RER. The interpretation of each variable in (3.9) follows.

3.4.2.4 Interpretation of the Results

The terms of trade variable appears with a positive sign and is statistically significant. As it stands, the positive coefficient implies that an improvement in the terms would lead to RER depreciation. This result is similar to that reported by White *et al.* (1991) for current terms of trade. However, it is contrary to conventional expectation. This suggests, as seen in Chapter II, that probably the "price effect" dominates the "income effect", which the present level of analysis is unable to disentangle.

The parallel market premium coefficient retains the negative sign throughout and is statistically significant at the conventional levels; this implies that an increase in the parallel premium will lead to RER appreciation. The result is in line with the theoretical analyses.

On the other level, viewing the parallel market premium as an implicit tax to exporters, this result is consistent with the fact that a fall in the parallel market premium implies a fall in the implicit tax on exporters, and leads to a RER depreciation.

The import restriction measure is statistically significant at the 1 per cent levels. This measure of import tightness has a positive sign, implying that a more restrictive trade regime (showing as a decrease in the import restriction measure) would result in an appreciation of the RER. A less restrictive measure would be associated with RER depreciation. This result is also consistent with the theoretical analysis and can be generalised for import compression or conversely, import liberalisation.

The trend variable shows a direct relationship between technological progress and actual RER. Although it is acknowledged that the effect of technological progress can be ambiguous, this result may only be taken bearing in mind that the trend variable is a proxy that may be picking the effects of other unspecified factors. No clear guide for policy is apparent, unless it is known where, between the nontradables and tradables sectors, the increase in productivity originates, or which of these sectors develops faster than the other.

The coefficient of the lagged RER tells how much the RER is dependent on its previous values, and how fast it responds to changes in the explanatory factors. The current RER reflects about 50 per cent of the previous year RER. The coefficient is high and statistically significant at all conventional levels.

The coefficient on the macroeconomic policy variable (MAP_t) is statistically significant and has negative sign as hypothesised. An expansionary policy, with $(\dot{dc} - \dot{y} - \dot{p}^* - \dot{E}) > 0$ would lead to RER appreciation (by about 40 per cent), and vice versa for contractionary macroeconomic policies.

The adjusted $\bar{R}^2$ and the F statistic for the entire equation show that the explanatory variables in (3.9) together explain 94 per cent of the variation in the actual real exchange rate.

To sum, of the internal policy-related factors, the parallel market premium and tightness of imports appear to be significant fundamental determinants of the RER; but these need qualification. For instance, the dual role of the parallel premium as seen in Chapter II, ought to be recognised. Though it is not directly under control of policy, it signals the need for counter-action against factors that encourage the parallel market.

Second, the measure of import tightness is probably a better indicator of exchange and trade (import) controls. However, as defined above, the variable encompasses a range of policy measures that affect both the total value of import levies and (officially recorded) import volumes: examples include import duties, licensing, foreign exchange rationing, other quantitative measures, and the effect of exogenous increase in foreign resources inflows that ease foreign exchange constraint.[92]

Expansionary macroeconomic policies contributed immensely to changes in the RER. The problem to policy can be cast as a duty to use both supply and demand policies to ensure that the domestic rate of inflation does not exceed the foreign inflation rate. Both the macroeconomic and nominal exchange rate policies are the most direct policy variables affecting the RER.[93]

[92]Against this background may be seen the non-significance of the capital inflows variable in the regression. To the extent that capital inflows relax the import constraint, their effect can be seen as captured by IMt. During the reform period, for instance, some of the inflows were conditional upon nominal exchange rate depreciation and did ease import constraint.

[93]Because of the paucity of observations for 1985-90 it was not possible to carry out the Chow test for structural (policy) shift on or around 1985.

3.4.3 Equilibrium Real Exchange Rate, Misalignment and Uncertainty

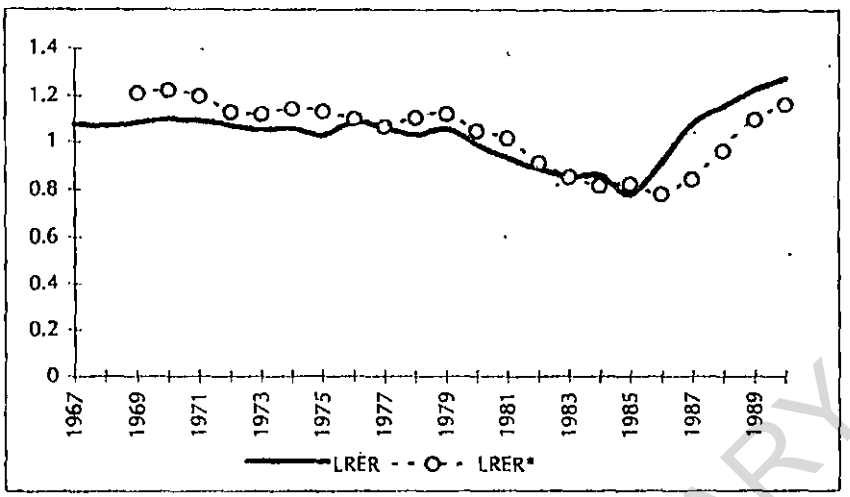
An insight into the RER determinants makes possible exploration of the extent of RER misalignment. RER misalignment is basically a departure of the actual RER from the equilibrium RER, while RER uncertainty connotes fluctuations in the actual RER or RER instability. Having established the empirical effects of the determinants on actual RER, this sub-section attempts to derive empirical measures and interpretation of *model-based* RER misalignment and uncertainty in Tanzania.

3.4.3.1 Estimating Real Exchange Rate Misalignment

To derive the *model-based* measure of RER misalignment, we need to trace the equilibrium real exchange rates (ERER), against which deviations of the actual RER can be examined. The ERER is influenced by the long-term "sustainable" levels of the fundamental determinants. Assumptions have to be made about the possible "sustainable" levels basing on the historical actual levels.

Basing on the results of equation (3.9), long-run coefficients (Table 3.7) were used to fit ERER using "sustainable" levels of the fundamental determinants. The "sustainable" levels for each of the fundamental determinants were constructed as *three year moving averages*. The choice of three years was based on the belief that the period of three years was the best approximation of "medium-term horizon" for making target "sustainable" values of the fundamentals (for planning purposes). Two observations are lost - the series of ERER starts in 1969. This led to an estimation of the path of ERER. Chart 3.8 plots both the ERER and the actual RER - (both in log scales).

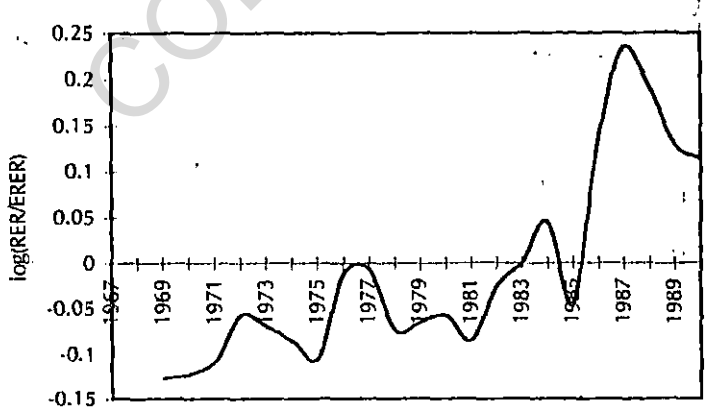
Chart 3.8 Equilibrium and Actual Real Exchange Rates



Note: LRER is the log of the actual RER and LRER* is the log of ERER

RER misalignment can then be taken as percent deviation of the actual from the equilibrium. Equivalently it is demonstrated in Chart (3.9) below as ratio of log (RER/ERER).

Chart 3.9 Real Exchange Rate Misalignment (RMIS)



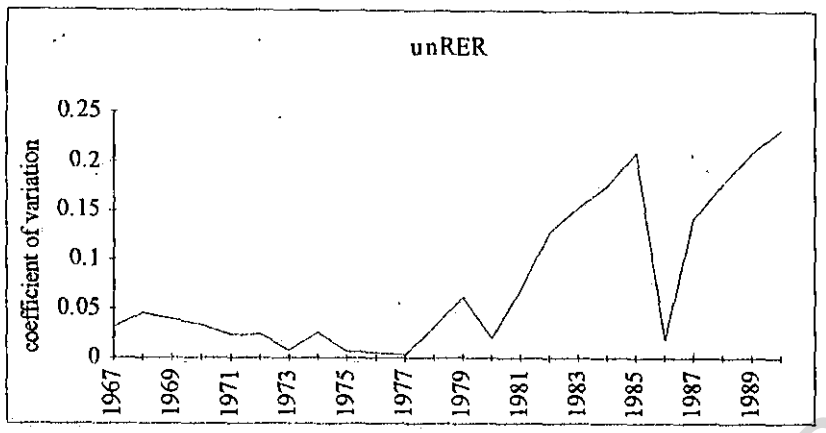
Relative to the ERER, the model-based measure indicated misalignment already from the late 1960 until 1985 - with RMIS below zero. Policies after 1985 seem to have led to a reduction in misalignment. It should quickly be noted that this is only indicative, basing as it does on the assumption made in the computation of misalignment (in this case, for instance, the "smoothing" of the series of the fundamentals). It may nevertheless be noted that the measure compares quite well with alternative proxy measures of macroeconomic misalignment, particularly the parallel market premium in Tanzania and conclusions made earlier in Chapter III basing on the PPP calculations (see Table 3.1 and related account).

Both the model-based measure of misalignment and the parallel market premium proxy move closely since the mid-1970s. The marked misalignment coincides with the RER appreciation (Chart 3.2), a sharp rise in the parallel market premium and a widening gap between domestic and foreign inflation rate (e.g. Chart 1.2). A reversal of RMIS from 1986 onwards also coincides with the RER depreciation, a fall in the parallel market premium and the inflation differential.

3.4.3.2 Estimating Real Exchange Rate Uncertainty

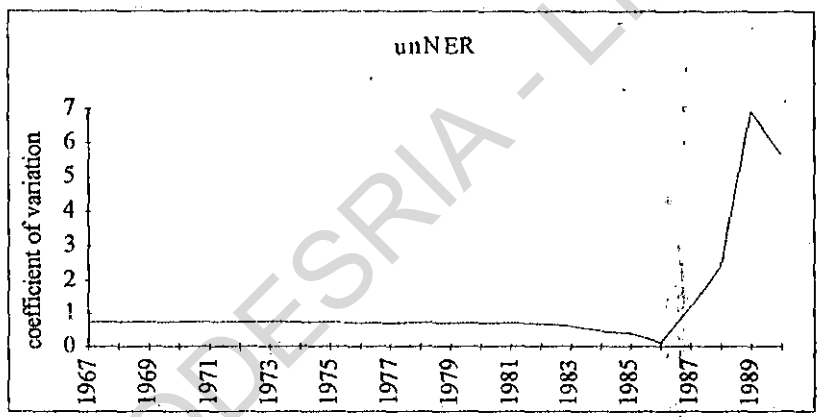
The essence of RER uncertainty was introduced in Chapter II and its empirical counterpart identified with a measure of variability. Uncertainty was measured as squared deviations of observations around entire period mean, for each of the MRER yearly observations and is plotted in Chart 3.10. A similar measure was obtained for nominal exchange rate for comparative purposes (3.11).

Chart 3.10 Measure of Real Exchange Rate Uncertainty (RUN)



Note: unRER is Real Exchange Rate uncertainty (RUN) to be used in later chapters

Chart 3.11 Measure of Nominal Exchange Rate Uncertainty



Note unNER is uncertainty measure base on the official nominal exchange rate.

The uncertainty measure for the RER (RUN) seems to closely reflect what can be supposed to have been the real prospects of the time. Generally low and declining up to 1977, this trend suggests a decline in uncertainty, on at least one count: the policy framework laid by government was firm and predictable: a commitment to widened public sector, administrative controls, and intolerance of the private sector. This kind of low uncertainty did not particularly entail bright prospects for economic activity - mainly of the private and foreign investment.

The subsequent sharp fluctuations suggest unstable prospects. The period 1978-85 saw dramatic shocks and continued resistance to large nominal exchange rate and other macroeconomic reforms. Reference has been made to the early attempts at liberalisation in the first half of the 1980s; but by way of generating uncertainty were anti-liberalisation pronouncements by the authorities alluded to in section (3.3). Overall economic activity, mainly output and trade contracted.

It seems too, that the beginning of serious reforms since 1986 did not abate uncertainty (despite the sudden fall in the uncertainty measure which may be attributed to the maxi-devaluation that was followed by periodic adjustments). Rather, more uncertainty centred on whether government would stay the course of reforms and probably, the practical implications of the evolving multiple exchange rate regime. The parallel market premium, though falling to around 68 per cent in 1990 from the height of 470 per cent in 1985, could not be ignored, mainly as long as trade and exchange restrictions remained in place.

As for the possible explanations, it may be pointed out that this was a first serious attempt to liberalisation. At the same time, there was also overt reluctance of the political superstructure to be seen to tear away from socialism. The difficulties involved in rationalising or privatising ailing public enterprises cannot be underestimated. The speed with which government is pursuing the matter is unavoidably a test of its credibility. As long as the process lasted, there was bound to be uncertainty. Second, although there was RER depreciation the period 1986-90 and RER misalignment was on the decline, "inequitable nature" of the multiple exchange rate system was another source of uncertainty. It would be speculated, however, that much-advocated unification of the foreign exchange market would reduce uncertainty.

The measure based on the nominal exchange rate (unNER) tells that up to 1986 exchange rate uncertainty was low, which followed the widely-known official resentment of devaluation. The nominal rate-based measure in the predetermined exchange rate regime does not seem to accurately depict the uncertainty and

economic activity link. For instance, the prolonged low nominal exchange rate variability (1978-85) (Chart 3.11) would imply high economic activity; but to the contrary, real output and trade were actually declining. After 1986, the rise in unNER can be associated with anticipated devaluation, but it does not otherwise encompass as much information as the RER uncertainty. This by no means implies that the RER uncertainty is a perfect measure, but that it is far better than that based on the nominal rate. In our later analyses, we focus on the RER uncertainty.

3.5 Concluding Remarks

The major factor for the behaviour of the nominal exchange rate was an administrative *fiat* that permitted limited adjustments even in the presence of serious internal and external disequilibria. Expansionary macroeconomic policies, together with other supply shocks contributed to high rate of domestic inflation and continued current account deficits. Failure to correctly adjust the nominal exchange rate, and insistence on controls had negative effects including erosion of the country's external competitiveness as shown by an appreciating RER.

The RER model estimated by the simple OLS method has identified major factors that appear to explain the behaviour of the RER. It can be inferred from these results that observed RER misalignment is particularly large during the period when the differential between domestic and foreign rates of inflation is high. The measure of RER uncertainty was also estimated and possible explanations discussed in light of changing in economic policy orientation.

Having established the actual RER, and measures of RER misalignment and uncertainty, the next task is to establish empirical relationships between these elements of RER behaviour and merchandise exports. Prior to that, the next chapter makes a descriptive analysis of export performance and relates it to trends in the exchange rate and export policy orientation.

IV

MAJOR TRENDS IN AGGREGATE MERCHANDISE EXPORTS

4.1 Introduction

This chapter makes a descriptive analysis of the major time profiles of export performance for aggregate exports: that is, total merchandise exports, and total agricultural exports and manufactured exports as two sub-categories. An attempt is made to relate the salient trends in aggregate exports to an evolving policy on exports and to the episodes in the exchange rate regime seen in the previous chapter.

Section 4.2 makes a descriptive presentation of the structure of merchandise exports: composition, direction and world market shares and their implications. Though reference is made to some individual export commodities, the main purpose is to describe coverage of aggregate exports as defined in the present study, that is, aggregate agricultural exports and aggregate manufactured exports.

Section 4.3 attempts to construct measures of aggregate export performance - *real* exports (domestic price-deflated), real export earnings or the purchasing power of exports, and the export-to-output ratio, for total merchandise exports, agricultural and manufactured exports. The major time episodes in these performance indicators are identified. Section 4.4 characterises the evolution of official export policy and an attempt is made to relate the major trends in export performance from section 4.3 to an evolving export policy and the trade and exchange rate regimes. Section 4.5 concludes the chapter.

4.2 Major Features of Merchandise Exports and Trade

4.2.1 Composition of Merchandise Exports

At independence (1961) the country inherited the colonial pattern of international "division of labour", by which Tanzania supplied primary exports (agricultural and mineral commodities) to the "centre" (the colonial powers). In turn, Tanzania was a market of the centre's manufactured exports.

During the 1960s and earlier, three major crops - sisal, cotton and coffee were dominant, accounting for 60 per cent of total exports in 1962-63.[94] By 1967/68, cashews, tobacco, pyrethrum and tea added onto the list of primary exports. Sisal lost first position to coffee and cotton due to the decline in the world market for the commodity since the mid-1960s. Coffee and cotton have since alternated first position.

Tanzania's exports are still dominated by primary, mainly agriculture products. The commodity composition of exports is concentrated around a few export crops. Three top export commodities accounting for above 35 per cent of total merchandise exports are all agricultural crops (Table 4.1).

In general, the share of agricultural exports in total exports maintains historical dominance, accounting for about 70 to 80 per cent of Tanzania's foreign exchange earnings. As the *Marketing Development Bureau* URT(1985) shows, the importance of these major (traditional) agricultural exports is even greater when the fact is considered that the import requirements for the production of these crop exports are quite low.[95]

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[94] See, URT (1969:140 Table III).

[95] For 1985/86 for instance, the seven major crop exports were expected to earn USD 380 million for USD 108 million import of requirements. That meant they would be producing USD 3.50 of foreign exchange for each dollar spent on their import requirements (URT, 1985:2).

Table 4.1: Major Exports Shares in Total Merchandise Exports
(percentage)

Item/Year	1961	1965	1970	1975	1980	1985	1988	1990
Cotton	12.9	17.4	13.4	10.5	10.3	9.3	20.2	18.2
Coffee	12.8	12.3	16.9	17.0	41.4	34.0	26.0	18.6
Tea	2.5	2.2	2.3	2.9	5.9	4.7	4.3	9.0
Sisal	26.6	20.4	9.7	10.7	2.1	1.7	1.3	0.8
Tobacco	0.2	0.7	2.4	3.1	4.8	3.9	2.6	3.1
Total Major Crops	***65.0***	***53.0***	***44.7***	***44.2***	***64.5***	***53.6***	***54.4***	***49.7***
Minerals	11.6	12.8	9.4	9.5		7.5	4.3	5.6
Manufactures	***9.0***	***7.0***	***6.6***	***8.1***	***16.7***	***11.4***	***19.4***	***4.9***
Petroleum	-	-	6.0	4.9	2.2	4.8	3.3	1.6

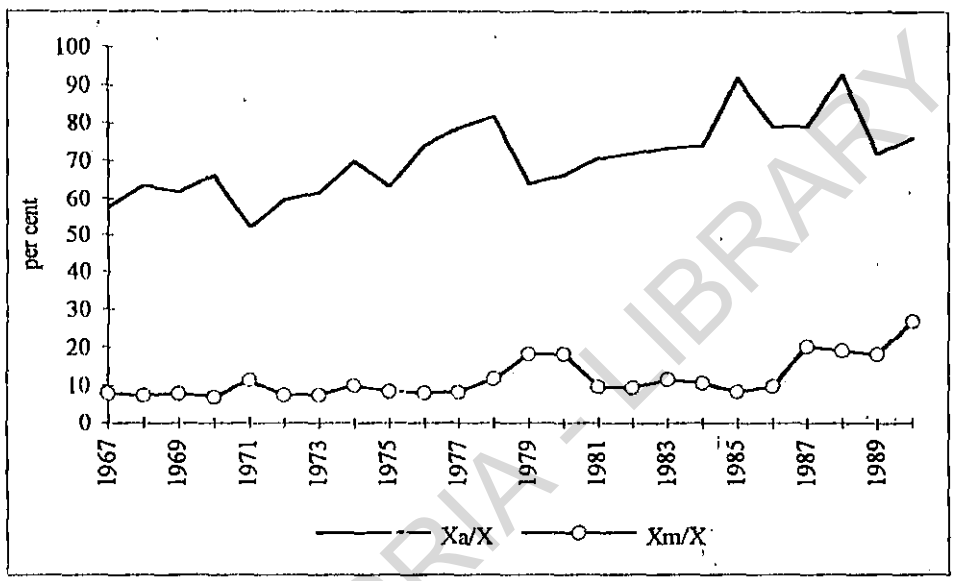
Sources: Computed from Bank of Tanzania (1982 :278), *Tanzania Economic Trends* (1990) Vol. 3 No.1 and (1992) Vol 5. No.2.

"Other" agricultural exports include pyrethrum, cocoa beans, cardamom, sesame, castor seeds, kapok seeds, copra, palm nuts, sunflower and groundnuts. In the present study, aggregate *agricultural exports* (X_a) covers both categories, that is, the major agricultural export crops and "other" agricultural exports just mentioned. In that case the proportion of total agricultural exports in total merchandise exports grows close to 90 per cent since mid-1980s as can be seen in Chart 4.1. *The Economic Survey 1991* (URT, 1992) associates this rise in aggregate agricultural exports with the increase in the exports of "non-traditional exports".[96] The reason for the increase is cited as increasing participation of the private sector in foreign trade a result of trade

[96]The present study does not particularly dwell on the distinction between traditional and non-traditional exports. There appear to be some differences in coverage in different works. In recent Bank of Tanzania reports, for instance, the 1992 *Economic and Operations Report* (June) p.20, minerals are included under non-traditional exports, whereas elsewhere minerals, together with other raw materials are regarded as traditional exports (see, for instance, Skarstein and Wangwe (1986:31). See, also Wolf (1982:54) on the difficulties of the definition.

liberalisation.[97] For instance, non-traditional exports rose from USD 86 million in 1986 to USD 199.11 million in 1990, a rise of 131 per cent while traditional exports actually declined.[98]

Chart 4.1 Agricultural and Manufactured Exports in Total Exports *(Percent)*



Notes: X_a = total agricultural exports, X_m = total manufactured exports and X = total merchandise exports. Base on data from the appendix, Table A4.1.

Non-agricultural exports include minerals, manufactured products (mainly from processed primary products) and since 1967, petroleum products. The main export minerals include diamonds and gold. Diamond exports accounted for 14.1 per cent of total exports between 1965-1969 but declined to under 5 per cent by the mid-1970s due to gradual depletion of reserves.[99] Exports of gold declined from 1.8 per cent of

[97] Among the relaxation of controls in July 1987 was liberalisation of export small grain and cassava, otherwise earlier a prerogative of the National Milling Corporation (NMC), and General Agricultural Products Export Corporation (GAPEX) which were both state-owned. On recent aspects of reforms of agricultural export marketing see, for instance, Amani (1992).

[98] URT *Economic Survey 1991* p.27.

[99] See, URT (1972:71, Table E.3).

total exports to 0.3 per cent by 1969;[100] by then the only major deposit was scheduled for closure by middle of 1970.[101] Gold reappears since the second half of the 1980s in official export statistics, representing official purchases by the Bank of Tanzania mainly from private prospectors, amounts that would otherwise have been exported through unofficial channels.[102]

Manufactured products are broadly defined to include processed primary products such as textiles, cigarettes, sisal twine, cashew kernels, processed coffee, made tea, canned beef, leather products, cotton seed cake, and pyrethrum extract. Others are cement and radio batteries, wood products and other products. These constitute *aggregate manufactured exports* (X_m) in the present study. The totals do not include petroleum and petroleum products as well as minerals.

4.2.2 Direction of Exports

The destination markets for a large proportion of Tanzania's exports are largely industrialised and former colonial powers. Table 4.2 shows the destination of Tanzania's overall exports by major area for selected years.

Destinations of seven "major" agricultural exports by area similar to those in Table 4.2 were computed for the 1980-90 period for which consistent data were obtained. These appear in the appendix Table A4.2. The pattern varies from crop to crop, but Western Europe takes the largest share of hulled coffee, unmanufactured tobacco, and fairly high amounts of tea, raw cotton and sisal fibre. The Asia/ Oceania, and Middle East area takes leading shares of cashew nuts and cloves, followed by tea and raw cotton. Leading importers here include Japan, Hong Kong, Taiwan, Singapore and Thailand.

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[100] *Ibid.*

[101] URT (1969: 82 ff).

[102] For instance, the value of gold exports is put at TSH 2 813 million in 1990 and TSH 6642 million in 1991 (URT *Economic Survey 1991*: 43). New mining centres have been recently discovered at Manyoni, Singida, and Morogoro, and recorded output increased by 45.9 per cent in 1991/92 [Bank of Tanzania (1992), *Economic and Operations Report* June page 16].

Table 4. 2 Domestic Exports by Area of Destination (*per cent*)

Area of Destination/Year	1966	1970	1975	1980	1985	1989	1990
Western Europe	45	35	39	48	57	48	42
North America	11	10	8	4	2	4	7
Eastern Europe	§	§	3	4	2	1	1
Asia, Oceania & Middle East	17	16	31	25	27	31	38
Africa	§	§	13	15	7	14	8
Others	27	37	6	3	4	2	4

Notes :§ Data sources for 1966 and 1970 do not indicate exports to Africa and Middle East. For Asia and Oceania only Hong Kong, India and Australia are indicated in URT (1972). Hence the larger percentage going to "others".
Sources: URT (1972) *Statistical Abstract 1970,* URT (1977) *Statistical Abstract 1973; and* URT *Foreign Trade Statistics (various issues).*

It was not possible to get sufficient data for the destinations of all manufactured exports. Instead, the whole of SITC section 6 [Manufactured Goods by Material] was taken as illustrative, even though it is not adequately representative of the entire manufacturing sector. The shares of each destination were approximated from *Foreign Trade Statistics* data in the period between 1982-90: the summary of these is presented in Table 4.3.

Table 4.3 Destination of Manufactured Exports [SITC 6] by Area (*per cent*)

Area/ Year	1982	1983	1984	1985	1986	1987	1988	1989	1990
Western Europe	66.18	71.43	72.25	76.06	74.02	49.90	47.64	49.65	41.92
Eastern Europe	2.04	0	3.96	-	-	0.36	0.30	0.12	1.43
North America	12.25	4.66	7.38	4.40	2.18	7.54	5.33	6.85	15.51
Asia/Oceania/M.E	5.25	5.59	4.87	4.56	6.67	21.72	12.01	13.36	13.73
Africa	14.29	18.32	11.53	14.50	16.78	20.48	34.55	29.72	25.70

Source: Computed from URT (1993) *Foreign Trade Statistics 1990:12*

Western Europe dominates here too, although, considerable amounts are shipped to the Asia/Oceania and Middle East area. It is remarkable too, that Africa takes a substantial share of Tanzania's manufactured exports.

These developments in the direction of Tanzania's exports may be seen against the policy background. The Second Five Year Plan (1969-74) envisaged diversification of export markets, to extend links with the rest of Africa, the Middle East, Eastern Europe and Asia. It was thus stated, perhaps not clearly, that this would "... lessen the traditional pattern of dependence upon the Western trading partners, although not leading to decline in absolute size of such traditional trade" (URT, 1969: 141).[103]

There have been serious efforts towards diversification, with emphasis lately on "non-traditional exports" and regional trade arrangements. However, considerable export trade is still concentrated on primary, agricultural commodities, and is done largely with the "traditional markets".

Two simple accounts of the economic significance of this slowly changing pattern are apparent. The largest share of exports comprise raw or partially processed products and a few manufactures. These commodities are largely less-sophisticated, and unskilled labour- or natural resource - intensive. This would seem to be in line with the theory of comparative advantage; but surely a country ought to go beyond the natural "comparative advantage".[104]

Second, the increasing, though modest share of exports going to Africa connotes some economic sense. These exports are mainly finished manufactured products, exported mainly to neighbouring countries. It would be predicted that these export products represent the level of income and pattern of demand (and perhaps, level of sophistication) that is not too different from those of countries with similar level of income. For export market diversification such trade with countries of similar demand patterns holds good prospects.

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[103]Similar objectives on trade were also in the Third Five Year Plan (1976-81).

[104]It can still be argued though, that countries that are developing fast and relying on primary imports such as oil, raw cotton, copper, etc. have (acquired) comparative advantage in the factor "technology".

Nevertheless, the leading destination markets (or trading partners) are high-income economies, and Tanzania's commodity exports are of the type that face low income elasticity of demand. Tanzania consumes an insignificant amount of these commodities by world standards.[105] A small percentage of the export commodities are processed within the country. In addition, there are also a number of other competing suppliers of similar commodities and, as can be seen in Table 4.4 Tanzania's shares on the world markets for her major crop exports are fairly low.[106]

Table 4.4 World Market Shares of Tanzania's Major Exports

(percentages of volumes in thousand metric tonnes)

Year	Coffee	Cotton	Tea	Sisal	Tobacco
1972	1.5	1.5	1.2	28.7	-
1973	1.5	1.2	1.1	24.0	0.6
1974	1.2	1.3	1.2	21.8	0.8
1975	1.5	0.9	1.2	36.8	0.7
1976	1.5	1.4	1.4	31.9	1.2
1977	1.6	1.0	1.3	25.8	0.4
1978	1.5	1.0	1.6	33.9	0.7
1979	1.1	0.8	1.6	32.2	0.5
1980	1.1	0.6	1.3	21.4	0.6
1981	1.6	1.0	1.4	28.4	0.7
1982	1.3	0.8	1.3	31.1	0.7
1983	1.2	0.9	1.3	13.9	0.4
1984	1.2	0.6	1.2	15.2	0.3
1985	0.9	0.6	1.0	9.0	0.5
1986	1.2	0.7	1.0	8.3	0.5
1987	0.9	0.8	1.1	13.8	0.5
1988	1.1	1.1	0.8	12.1	0.6
1989	1.0	0.9	0.8	9.9	0.5
1990	1.2	0.9	1.2	4.6	0.4
1991	1.2	1.3	1.5	6.6	0.6

Source: Computed from UNCTAD *Commodity Year Book* (1988,1989, 1993)

[105]See, appendix Table A4.3, showing Tanzania's share of consumption of four of her major commodity exports relative to world total, based on UNCTAD data.

[106]These shares compare with those computed on value basis by Ndulu *et al.* (1991: 236 Table 9.3) for 1970-85.

Such a brief description, certainly skips important international commodity market arrangements in respect of various commodities, such as export quotas which affect world market shares. However, this may not adequately explain away the fact that domestic supply-side constraints (including policies) adversely affecting export volumes have also been responsible for the low world market shares.[107]

Lack of systematic data made it difficult to compile similar world market shares for Tanzania's manufactured goods. However, it has been pointed out that the unsteady growth of manufactured exports has been due to failing output expansion partly related to the chosen development strategy.

4.2.3 Merchandise Imports

Merchandise imports merit mention since they are closely related to output and export performance. This is especially true in the case of the manufacturing sector, where most establishments depend highly on imported capital, intermediate and even raw material inputs. Capital goods include transport, building and construction equipment as well as different types of machinery. Intermediate imports include crude oil, various agricultural inputs and industrial raw materials.

Table A4.4 in the appendix shows the composition of imports by major end-uses. As industrial activity took hold in the first half of the 1960s, and following the launching of the Basic Industrialisation Strategy after 1976, increasing amounts of intermediate and capital goods were imported. Both these categories maintain a high proportion in the total. Obviously this is far from suggesting that quite sufficient of them have been obtained as required over time Indeed the table fails to depict this fact, particularly as the foreign exchange constraint tightened from the end of the 1970s onwards.

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[107]Though it has not been possible to compile export "quota" performance, an observation of Tanzania's failure to reach allocated levels in respect of coffee, a major crop export, made by Lyakurwa (1986:8) sets an important cautionary note.

With limited capital and technological base, the country depended heavily on imports of mainly manufactured goods. The significance of this structure of imports would have been to give equally strong emphasis to exports, so that ideally at least, exports would be the primary basis for financing key imported inputs. It does appear, however, that initially, policy was not as explicitly emphatic on exporting as it was on import substitution and satiation of domestic market. This point is extended in section 4.4 below.

4.3 Difficulties in Measuring Aggregate Export Performance

This sub-section presents attempts and difficulties in estimating real aggregate export performance: exports value relative to a given price level (domestic and foreign) and exports relative to domestic output. Do they all indicate a similar trend in performance?

For most national product or (income) aggregates it is common to deflate nominal values by the domestic price level to obtain real investment, real consumption, real government spending, etc. Commonly used as deflators are the CPI index and / or GDP deflator. Using this notion, real exports (deflated by domestic price level) could be represented as:

$$(4.1)\quad x = \frac{X}{Pd}$$

where x is real exports, X stands for exports in nominal terms (TShs) and Pd stands for domestic price level, using either NCPI or GDP deflator.

However, how appropriate are such deflators in measuring export performance? Objection to this approach (4.1) in measuring real exports owes to the fact that the measure would tend to overrate export performance in periods of rapid

RER depreciation. This is shown to be the case in Tanzania (below) in the latter half of the 1980s. Nevertheless, the extent of this overestimation is not easy to ascertain quantitatively.

A second method of measuring export performance has been to deflate nominal export values by some (weighted) import price index of major trading partners. Essentially this measures the purchasing power of exports - or real export earnings. The purchasing power of exports can be represented as:

$$(4.2)\quad PPX = \frac{X}{Pm}$$

where X is nominal exports in some foreign currency and P*m* is the import price index -which is a foreign price and, for a "small country", it is taken as given.

While in the first case, one monitors performance relative to domestic price level, in the second case one monitors performance relative to a foreign price level.

An export price index would probably be most ideal third possibility. However, in the absence of an appropriate general export price index (Px) series, it is instructive to try and define some proxy as:

$$(4.3)\quad x^* = PPX \cdot TOT = \frac{X}{P_M} \cdot \frac{P_M}{P_X}$$

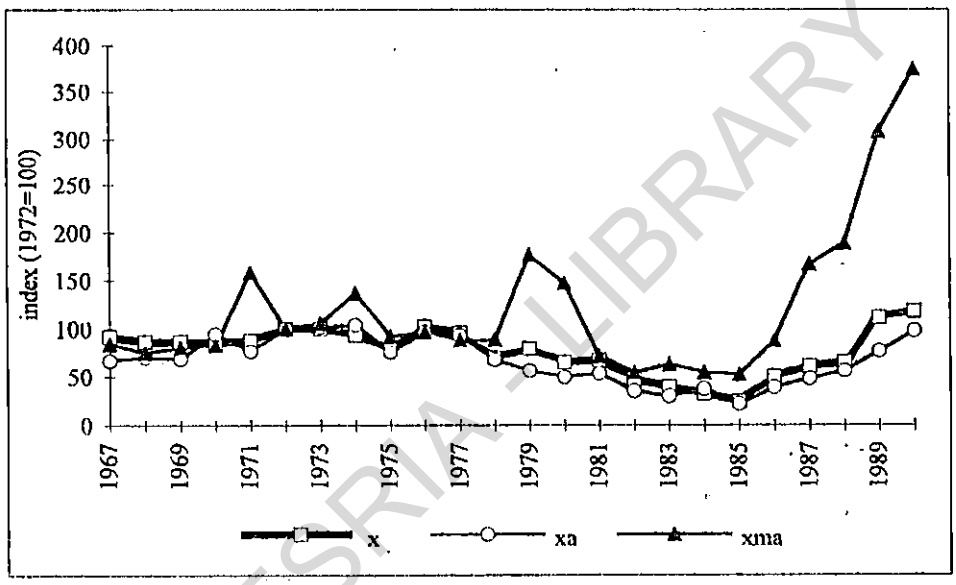
where x* is export price-deflated *real* exports, PPX stands for the purchasing power of exports (=X/Pm),TOT is international terms of trade (=Px/PM). (4.3) is a rough approximation of what may be regarded as an *implicit export price*-based measure.

These measures are presented and discussed, followed by export-to-output ratios. The latter are primarily aimed to corroborate a descriptive analysis of trade or export policy orientation in the subsequent section (4.4).

4.3.1 *Real* exports and Purchasing Power of Exports

Chart 4.2 plots real exports for total (aggregate) merchandise exports, agricultural and manufactured exports (indices, 1972 = 100) obtained by using overall GDP deflator for total exports, and respective sector GDP deflators for agricultural and manufactured exports.[108]

Chart 4.2 Indices of GDP-deflated Real Exports



Notes: x = total real exports, x_a = agricultural exports and x_m = manufactured exports.
Basic data in Table A4.1.

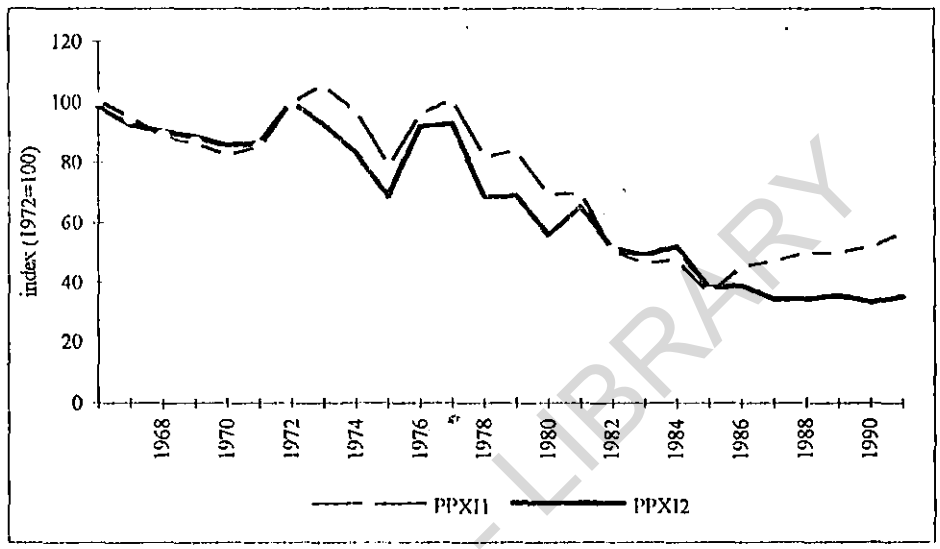
The major features of exports path in Chart 4.2 are the three humps around 1971, 1974 and 1979, a sharp decline between 1979 and 1985, and a steep rise from 1986-90 especially manufactured exports tending thus to *overestimate* performance when RER was depreciating.

The picture is different when use is made of the foreign prices to estimate the purchasing power of exports (4.2). Chart 4.3 plots the purchasing power of Tanzania's total merchandise exports derived as ratio of the dollar value of aggregate exports to the United States export unit value of manufacturing, and a weighted average of export

[108]Data for sectoral GDP deflators were obtained from World Bank (1992).

unit value of manufacturing of ten (10) of Tanzania's major trading partners (used in Chapter III).[109]

Chart 4.3 Purchasing Power of Exports



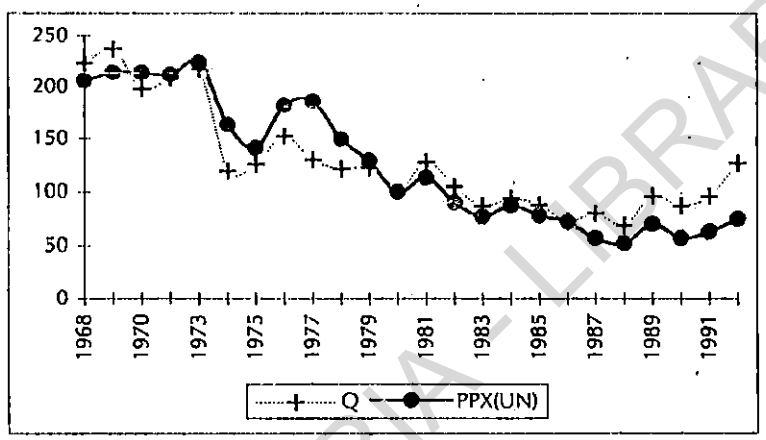
Notes: $IPPX_1$ based on the index of US XUVs of manufacturing. $IPPX_2$: based on trade-weighted index of XUVs of manufacturing of ten major trading partners. Basic data: Table A4.1.

The index obtained by using the United States ($IPPX_1$) and ($IPPX_2$) obtained by the weighted import price differ only slightly. Generally they are higher in the 1960s and 1970s than in the 1980s; both decline steadily after 1979, except PPX_1, which makes a slight upturn after 1985. While the drop in 1978-85 was due to actual decline in export volumes, the continuing drop thereafter may be attributed to a sharp drop in the external terms of trade of about 7.9 per cent on average. Curiously, and in what would portray economic adjustment efforts as a "failure", the PPX2 index fails to show "recovery" when export volumes are *officially* reckoned to have actually improved between 1986-90.

[109]These are the same countries referred to in Chapter III when computing the multilateral real exchange rate used in this study.

The results in Chart 4.3, especially PPX1 are very close to UNCTAD estimations Chart 4.4, mainly PPXUN; Q is the quantum index of exports from the same source). Some compromise picture for the 1986-90 period emerges (compared to objectionable domestic price-deflated real exports in Figure 4.2) in that UNCTAD data indicate a sombre picture of improvement in performance (data up to 1992).

Chart 4.4 Purchasing Power of Exports (UNCTAD data)



Source UNCTAD (1981, 1985, 1993).

Computations using *implicit* export price index (equation 4.3) led to even greater underestimation of performance: that is, they lead to even steeper decline, failing to strike a reasonable middle course. They led to what can be considered to be worse results in the sense that all exports seemed to decline precipitously.

The problem here, however, is that the foreign prices (XUVs) as well as the international terms of trade (TOT) are available for the entire economy and are, therefore, more appropriate for total exports, but not for sector-specific manufactured or agricultural exports.[110]

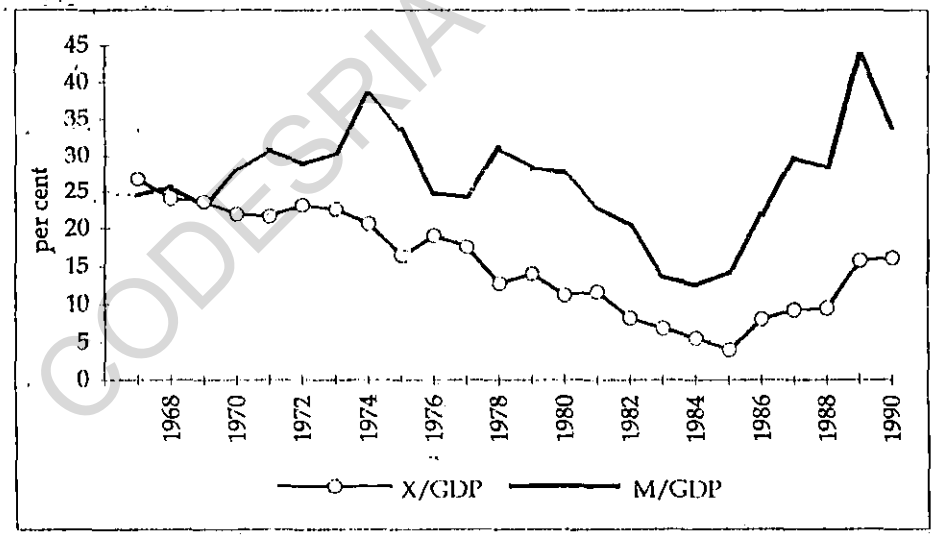
[110] Lack of such general price data specific for agricultural exports and manufactured exports (the latter however, seemed to do well with the XUVs) made it necessary to resort to GDP-deflated real agricultural exports - which do not anyway seem to be overly steep in the period of sharp RER depreciation (1985-90).

4.3.2 Export-to-Output Ratio

Export/output (and import-to-output) ratios have been used to describe trade (or export) orientation of a country. Based on such measures Tanzania has been qualified as "strongly" inward-oriented (e.g. World Bank, 1987). Concern here is just whether the policies were or were not inward oriented,[111] and the fact that such description of policy orientation implies an array of policies that relate to relative incentives to export activities. Chart 4.5 depicts the paths of exports to aggregate output (GDP) ratio. Ratios for agricultural and manufactured export are plotted in Chart 4.6.

The export/GDP ratio shows a steady decline from the average of above 20 per cent in 1967 to below 10 per cent on average in the period 1982-88. Since 1985 (with lowest rate close to 4 per cent) the ratio improves to close to 20 per cent in 1990.

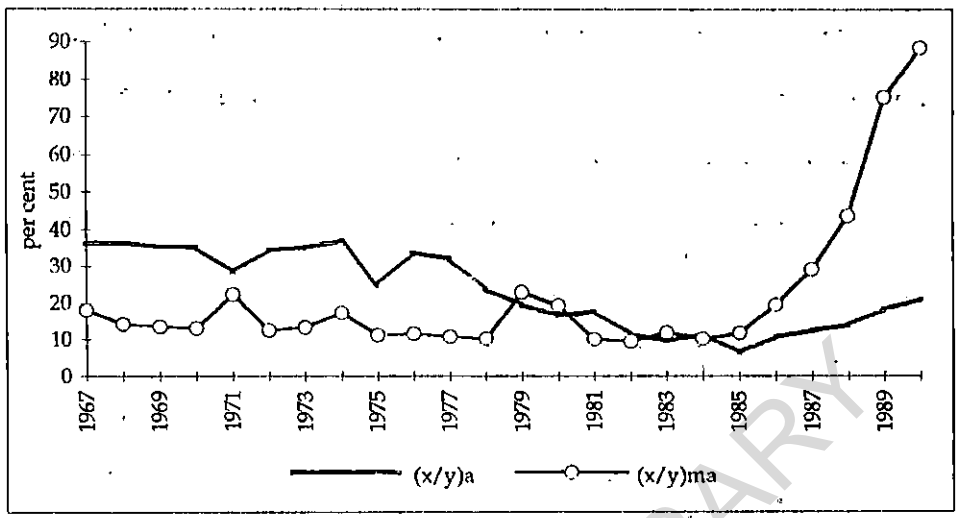
Chart 4.5 Total Export- and Import-to-GDP Ratios.



Source: Based on Table A4.1.

[111] Differing views about the "strength" of Tanzania's inward-orientation can be gathered from World Bank (1987).

Chart 4.6 Ratios of Agricultural and Manufactured Exports to respective Sector GDP (*per cent*).



Note: (x/y)a and (x/y)ma are export/output ratio of the agricultural sector and manufacturing sector respectively. Computations were based on data from sources indicated in Appendix Table A4.1.

During the 1970s, the decline in this ratio has been attributed to a combination of poor export performance in quantity terms.[112] The 1976-77 coffee exports boom registered a short-lived recovery. From 1978 to 1985 the ratio declined continuously. During this time, both output and real exports contracted; so did imports due to severe import compression.

Both sectoral export ratios (Chart 4.6) show a declining trend in the period before 1985. However, the decline is steeper in both cases during the 1979-85 sub-period. Improvement occurs in the period after 1985, and is faster for manufactured exports than for agricultural exports.

[112] Bank of Tanzania (1982:204).

4.3.3 Major Trends in Export Performance

Table 4.5 summarises the movements in export performance indicators in three sub-periods. First, all indicators show that performance in the period 1966-78 is generally higher than that between 1979 and 1985. Second, between 1978 and 1985 the decline is the steepest, and third, since 1985 there is a marked "improvement" - though this is more marked (or actually overstated) in the domestic price-deflated *real* total exports than in the purchasing power of exports evaluated at the foreign prices. The purchasing power of exports hence seems to be more realistic an indicator.

Table 4.5 Average Rates of Change in Aggregate Exports *(growth rates)*

Export Performance Indicator	1967-78	1979-85	1986-90
Total Merchandise Exports			
Nominal values in million US $	5.2	-9.2	2.5
Purchasing Power of Exports (PPX_1)	-1.3	-11.9	2.8
Purchasing Power of Exports (PPX_2)	-2.5	-8.4	-3.1

Source: Computations based on data in Table A4.1.

It is clear that during the adjustment period (1986-90), GDP-deflated measures tend to "overstate" performance, while those based on foreign prices seem to "moderate" the picture. As seen in the beginning of this chapter, officially export volume growth during the last sub-period (1986-90) is reckoned to have been "substantial" though by no means satisfactory. The foreign price-based as well as UNCTAD-based measures of the purchasing power of exports closely reflects this picture for the total exports. In general, continual decline in export performance of total and sectoral exports since the end of the 1970s is noted. In other words, the pre-1970 levels have not been attained.

In the next section, the above descriptions of export performance are used to discuss export policy orientation.

4.4 Major Export Trends and Export Policy Orientation

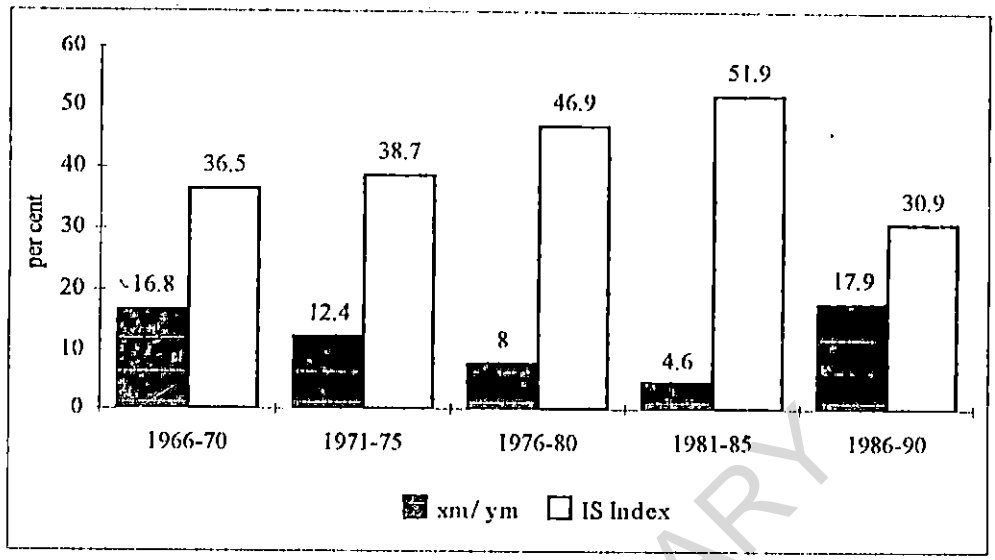
Reduced to three sub-periods, the trends in the purchasing power of exports and export-to-output ratios can be roughly linked to the periodisation of trends in the exchange rate and trade policy regimes seen in Chapter III (especially under 3.3.4). In that sub-section trends in the average real effective exchange rate for imports and exports ($REER_X$ and $REER_m$) were used to characterise (*á la* Bhagwati) increasing import substitution (IS) (1967-85) and decreasing IS from around 1985 onwards.

In the pre-1985 period, the export-to-output ratios, even at sectoral levels, behave in the way consistent with the conclusion in literature linking such performance to inward-looking or import substitution policies. Tanzanian case studies by World Bank (1987), Helleiner (1990) and Musonda (1992) attest to this. In the post-1985 period the scenario changes markedly and reflects tendency towards export orientation.

A comparison may be drawn from Ndulu *et al.* (1993), whereby computed average IS index for *sub-periods* between 1966 and 1985 shows an increase, while export-to-output ratio for manufactured exports is decreasing (see, Chart 4.7).

The IS index moves in the opposite direction of the export-output-ratios. In the post-1985 period, the index dropped from 51.9 to 30.9 per cent while the export-to-output ratio (manufacturing) and those computed in the present case were rising. Most indicators of real exports show positive growth during the last sub-period too.

Chart 4.7 Manufactured Exports-to-GDP Ratio and Import Substitution Index



Notes: $(x/y)_m$ defined as share of export in total manufacturing output. ISI index is defined as production of the manufactures for domestic use (output less exports) as a proportion of total domestic supply (output plus imports).
Source: Ndulu *et al* (1993) Table 3.1.

With these facts, it may be useful next to draw a few impressions of overall policy regarding exports (relative to import substitution) in the context of the overall development strategy and the salient institutional arrangements bearing on export performance. With the major performance trends just discussed in mind, the discussion draws from various policy documents and independent studies.

4.4.1 Policy and Institutional Setting

As a brief background, priority to import substitution industrialisation can be traced in the industrial development strategy in the Three Year Plan (1961-64)[113] and the First Five Year Plan (1964-69). The industrial strategy in the First Plan period aimed:

[113]The industrial strategy followed recommendations of the World Bank (1961) report. See, for instance, Rweyemamu (1973) and Skarstein and Wangwe (1986).

(i) to put up additional processing capacity for local primary products,

(ii) import substitution of mass-produced consumer goods of technical characteristics that can be manufactured at "an acceptable level of efficiency" on the basis of the East African market and

(iii) the manufacture of building materials, mainly cement (URT, 1969: 61).

It was expected that largely private and foreign capital would play a leading role in its implementation. Government offered tariff protection and guarantees against nationalisation and the private enterprise response was forthcoming (Rweyemamu, 1973).

The 1967 policy shift toward socialism touched off significant new changes in the institutional set-up and policy reversal of nationalisation. Despite the new emphasis on rural sector, import substitution industrialisation was seen as key factor to economic transformation and was consonant with "self-reliance", one of the principle policy goals.

To emphasise the importance of the domestic market, (simultaneously de-emphasising exporting) it was asserted, for instance, in the introductory remarks to the Second Five Year Plan (1969-74) that "... the underlying meaning of all these Plans is to transform our economy so that it is no longer export dominated but is directed to the creation and service of a rising local market" (URT, 1969: xvii).[114] The Basic Industry Strategy launched in the mid-1970s echoed the same tone, that is, to cater for domestic demand as a matter of priority. As will be noted, ensuing policies did not only discriminate against the agricultural sector (and exports from this sector) but also they blighted prospects for manufactured exports.

Although such efforts as encouraging diversification of export markets to East Africa and the Socialist countries, and establishment of export promotion department at the Bank of Tanzania in 1972 denote policy attention to exporting, it may be claimed

[114]This idea is not unlike that originating from Prebisch (1950) that developing countries should develop a strategy that involved industrialisation and reduced the role of primary exports. See also Lewis (1989).

that deserving policy emphasis on exports evolved towards the end of the 1970s in response to the emerging foreign exchange crisis. Export drive was made a corner-stone of the early 1980s adjustment efforts (NESP and SAP) and has since been so in the "recovery" phase (1986 onwards). The difference is that "active" export policy in the first half of the 1980s relied on "directives" and controls while sources of incentives distortion remained in place. Growing inflation eroded the producer incentives conferred by any increases in nominal producer prices and the discrete devaluations. Real exports continued to decline as aggregate output declined.

Active export policy has since the mid-1980s increasingly relied on market incentives and less on controls. The liberalisation steps that took place have been related to in other works (for instance, part of Chapter III above, Maliyamkono *et al.*, 1990; and Ndulu *et al.* 1993).

4.4.2 Agricultural Exports

The policy bias against agriculture in terms of resources allocation has been noted, mainly during 1970s. For instance, Skarstein and Wangwe, (1986:13-14) found that investment in the industrial sector as a proportion of total investment increased throughout the 1970s to about 36 per cent in the late 1970s, which was in excess of the planned share of 19 per cent. This is considered to have been "... one of the reasons why supplies of goods and services from sectors like agriculture, transport, power and water tended to lag behind the requirements of the fast growing industrial investments". In the same vein, a report by the Task Force on *National Agricultural Policy* (URT, 1982b: 100) noted of the declining share of government budget devoted to agriculture, and that foreign exchange allocations did not reflect the importance of the sector. It was shown that budget allocations to the Ministry of Agriculture compared to other ministries declined from 14.7 per cent in 1976/77 to 8.9 per cent in

1981/82. This can be expected to have had retarding effects in matters of research, extension and sector specific infrastructure such as storage, processing and transport.

A number of policy factors have been linked to the general decline output during this period. One of these is the manner in which reorganisation of production toward socialist (villagisation) was carried out in the 1970s The distribution of basic "incentive goods" was also dislocated with the ban of private shops in 1976. This was followed by severe shortages in rural areas due to declining manufacturing output, and low capacity to import the shortfall as exports declined (Bevan, Collier and Horsnell, 1989 and Havnevick, Odén and Skarstein, 1990).

The bias has also been engendered by inadequate *real* producer prices (Ellis, 1982; Ödegaard, 1985; Ndulu, 1986b). Such policy is often associated with the objective of extracting resources from the agricultural sector for expansion of the "modern" sector. However, the follow-up question always is how much is "ploughed back" into the sector for agricultural research and extension and infrastructure. However, as indicated above, the share "ploughed back" was less than adequate.

For agricultural exports two relative price dimensions have been in focus. One relates to the proportion of the world market price that the producer gets, and the second is the domestic food-to-export price relationship. In respect of the first, a comparative study by Lele (1990) indicates that Tanzanian producers of the major export crops were receiving a smaller share of the world market price than their counterparts in Kenya. The government of Tanzania undertook, in the first Economic Recovery Programme (1986-89) to increase producer prices of export crops to a target proportion of 70 per cent of world market prices. Institutions such as state-owned export marketing boards had powers to set prices and all procuring and export arrangements. Huge overhead costs of these institutions eroded the residual price received by producers. The second pricing problem is the tendency for relative prices to be in favour of food crops during the 1970s and 1980s. The negative impact of

relative food-to-export crop prices is found to be significant in the regression analysis by Ndulu et al. (1991).

Vagaries of weather have an effect on agricultural production and distribution, including exporting. The distribution problem relates ultimately to poor infrastructure (bad roads and storage space). Noted as particularly bad years are 1974-75, 1982-6, with drought. Droughts reduce output of both export and food crops. The likely consequence is that policy attention shifts to food crops at the expense of export crops.[115]

Needless to say, the factors raised, mainly in relation to pricing require a more updated analysis. The weather factor aside, it may be important to see the rest of the policy-related factors against the background of the clear priority initially given to industry.

4.4.3 Manufactured Exports

The first broad phase (1966-85) of increasing import substitution (or decreasing export-orientation) is associated with policy-induced anti-export bias, perhaps inadvertent, in favour of manufacturing primarily for the domestic market. Capacity utilisation problems and the deliberate policy of increasing reliance on quantitative restrictions in the face of foreign exchange shortage and for protective purposes did not seem to improve the prospects of manufactured exports. As Ndulu et al. (1993) and Musonda (1992) show, for instance, by limiting domestic supply, import controls made domestic sales more lucrative than exporting. Second, reduced access to official foreign exchange fuelled parallel market premium which in turn became an implicit export tax on official exports. This drove a substantial amount of exports into the parallel market.

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[115] Rwegasira (1987) considers the 1974/75 drought to be at least one of the possible reason for government paying greater attention to food crop prices.

The various export promotion measures would appear to have been inadequate in the given macroeconomic environment. The problems that were involved in the administration of the export incentive schemes have been well analysed by Ndulu et al (1993), Musonda (1992), Lyakurwa (1991), Bagachwa et al (1990), and Marketing Department (1986). Arguably, these were only "second best" course of action, the government having failed to undertake bold macroeconomic (including exchange rate) reforms prior to 1986. It possibly could have been due to limited experience in the administration of the "incentive instruments" during the early 1980s; but the presence, at the same time, of severe macroeconomic imbalances, shortages, etc. increased the propensity for the "directly unproductive" activities and diversion of trade flows away from the official channels.

Another note relates to the relation between capacity utilisation levels and export performance. It may be observed from available data for some prominent export industries that capacity utilisation levels have picked up since around 1986, though in general they have not recovered the pre-1979 levels (see, appendix Table A4.5). The more impressive export growth of manufactures during the 1986-90 period (compared to the pre-1979 period when capacity levels were higher) may be attributed to recent macroeconomic reforms and possible improvements in the administration of export incentives. Not in the least, production and export of manufactured goods face new challenges brought about by the opening-up to international competition.

4.5 Concluding Remarks

Basing on descriptive analyses of the major trends in the aggregate exports, the foregoing discussion has attempted to associate measured export performance with evolving export policy orientation. This changed from the early prior emphasis on the domestic market to an active export drive since the early 1980s (within "directive controls" at first, and then with liberalisation since the mid-1980s).

Institutional changes accompanying policy shifts have included pricing and marketing reforms (for agricultural exports), exchange rate and trade liberalisation (e.g. towards foreign exchange market unification, gradual lifting of exchange controls). Of critical interest is the macroeconomic environment which, among other factors, influences the international competitiveness of the country's tradables sector.

There also appears to be a close relation between the major trends (along sub-periods) of the overall merchandise exports (and sectoral exports) and trends in the actual RER seen in the previous chapter. Among other analyses, the next chapter puts these observations to parametric tests.

V

THE REAL EXCHANGE RATE AND AGGREGATE EXPORTS: TESTS OF LINKAGES

5.1 Introduction

As seen mainly in Chapter II, a number of theoretical and empirical analyses have established relationships between the RER behaviour (the RER path itself, RER misalignment and RER uncertainty) with various economic performance indicators in the developing countries. In most studies, there is little controversy regarding the hypotheses linking the RER path and RER misalignment to various indicators of economic performance, including exports. Empirically, the relationship between the RER and economic performance is found to be positive, while RER misalignment negatively affects economic performance.

A number of studies specifically address the question of (real) exchange rate uncertainty. However, the relationship of performance indicators and RER (or in some cases, nominal exchange rate) uncertainty is not unambiguous. Studies that specifically examine the relationship between (real) exchange rate uncertainty and economic (but largely trade) performance do not all confirm the hypothesis that (real) exchange rate uncertainty negatively affects trade performance.

Having analysed the three elements of RER behaviour, it is turn now to investigate their empirical relationships to export performance in Tanzania. The RER stands as the basic argument since it is more inclusive of the other policy dimensions, in particular, the macroeconomic, trade and exchange rate policies which emerge as crucial factors behind observed RER behaviour. In addition to these domestic policy variables, an attempt is made to approximate the impact of changes in external terms of trade and capital inflows (which are largely exogenous to domestic policy), on export performance through their effect on the RER.

Apart from total aggregate exports, two key sub-components of total exports, namely total agricultural exports and manufactured exports will be considered in a bid to explore any differences in responsiveness of these sectoral exports to the RER.

Section 5.2 begins with a restatement of the main hypotheses with preliminary evidence based on simple correlation analysis. It is followed by a brief analysis of the characteristics of data in section 5.3 and tests of the export equations in section 5.4. Section 5.5 brings together results from Chapter III and the present chapter to make inferences on the effects of the RER and its determinants on export levels. This is followed by concluding remarks in section 5.5.

5.2 Hypothetical Links

Casual inspection of the behaviour of the real exchange rates in Chapter III (for instance, Charts 3.2 of the RER path, Chart 3.9 of the RER misalignment and export performance in Chapter IV) shows some pattern in the co-movement of RER behaviour (the three aspects) and exports. When the RER is appreciating, notably since the late 1970s to 1985, real exports are declining, and when the RER is depreciating, the purchasing power of exports is rising. That suggests that there can be good reason to suppose that factors precipitating RER appreciation, and hence, causing loss in the country's external competitiveness are related to the country's export growth. The observation for the period after 1986 is that of RER depreciation and a slight improvement in real exports.

On the other hand, an increase in the degree of RER misalignment and RER uncertainty, both of which represent an unfavourable macroeconomic environment, seem to move closely with export decline. *Vice versa*, more visibly in the last period (1986-90), the decrease in misalignment - reflecting RER depreciation - is accompanied by modest recovery in export performance.

Simple correlation coefficients between the RER behaviour and export variables shown in Table 5.1 seem to support, in terms of signs, that there is a positive relationship between the level of the RER and real exports and an inverse relationship between export measures and RER misalignment (both model-based measure of misalignment and parallel market premium proxy) and RER uncertainty.

Table 5.1 Correlation Coefficients between Measures of Aggregate Exports and Real Exchange Rate Behaviour

	RER	RMIS§	PREM	RUN
Real Export				
x	0.36*	-0.61*	-0.65*	-0.81*
x_m	0.51*	-0.35	-0.38	-0.53
x_a	-0.13	-0.74*	-0.55*	-0.65

Notes:§ series begins 1969.
All variable in logarithms: Real exports are all purchasing power of exports deflated by export unit value of manufacturing of major trading partners. x = total exports, x_a = *real* agricultural export and, x_m = purchasing power of manufactured exports; RER = multilateral RER index, RMIS = model-based measure of RER misalignment, PREM = exchange rate parallel market premium and RUN = measure of RER uncertainty.
* The coefficients are statistically significant at the 1 per cent level.

These descriptive statistics, nevertheless, do not fully indicate the strength of the underlying long-term relationship between exports and the RER behaviour variables; they need to be supplemented by more incisive quantitative analyses.

Although account must be taken of such important factors as the effect of the sector- and commodity- specific incentives (or disincentives as the case may be), weather, infrastructure etc., the observed co-movements cannot be dismissed totally as presumptuous for at least one reason - that an increase in the profitability or competitiveness of tradables relative to "home goods" can be expected to induce the movement of resources into the tradables sector and improved export performance.

Taken as a measure of incentives to produce tradables (exportables), the RER has been taken as an important argument in the export function as seen in Chapter II.

To establish the strength and validity of the said observation about the relationships between the RER and export performance, the following function, based on (2.9) is to be estimated.

$$(5.1)\quad x_t = a_0 + a_1 RER_t + a_2 RUN_t + a_3 y_t + v_t$$

where x_t = real exports measure

RUN_t = measure of real exchange rate uncertainty

y_t = real GDP

v_t = error term

The empirical measures of RER, and RUN have been derived in Chapter III. Note that, alternately RUN would be replaced by RMIS, the measure of RER misalignment,[116] also empirically estimated in Chapter III. Measures of export performance have been derived in Chapter IV, but as pointed out at the end of section 4.3, in view of the setback of GDP-deflated exports, it seemed better to adopt purchasing power of exports for total exports[117] and for total manufactured exports. Because of the questionable appropriateness of XUV for agricultural exports, real agricultural exports (GDP deflator-based) as argued in Chapter IV.

[116] For reasons given in Chapter II under 2.4, the two, measuring similar phenomenon cannot appear together in the export function.

[117] Deflated by the weighted XUVs and alternately, the measure based on UNCTAD data. In several trials with the latter, the results were not significantly different from those based on exports deflated by XUVs. As such, estimations for total exports based on UNCTAD data are not reported.

5.3 Notes on the Characteristics of Data

Following the simple correlation analysis and, ahead of parametric analyses of the relationship between RER and exports, we report on the tests of the characteristics of the data series for the RER (path), RER misalignment, RER uncertainty, real export earnings (purchasing power of exports) and real output. Simple unit root and co-integration tests were carried out. What such tests should lead to, usually is to validate or otherwise, the economic relationship thought to exist between variables and, in this case, they served in guiding the choice of the estimation method.

The relative size of the unit root tests obtained show that all series are non-stationary.[118] The Dickey-Fuller (DF), Augmented ADF and Sargan-Bhargava Durbin Watson (SBDW) tests were used. Further testing for co-integration *between* RER behaviour variables and measures of aggregate export performance and real output did not exhaustively confirm existence of co-integration among the variables. The results of these tests influenced the way the export function was subsequently estimated.

Table 5.2 summarises unit root test results on annual data series. The study period is one (in some cases two) observation(s) short of the 25 minimum size for which critical value of the DF class of tests is given. Nevertheless, this critical value (-3.00) at the 5 percent level was taken as a close approximate test level. Except for the ADF of real manufactured exports (x_{rm}) of -3.56, the rest of the DF class of statistics are well below the critical value, indicating that the null hypothesis of (at least) a unit root or non-stationarity cannot be rejected for all the series.

[118] The tests were carried out using PC-GIVE software; Hendry (1989) and Adams (1992, 1993).

Table 5.2: Unit Root Tests for Exports, Real Exchange Rate and Output

Series	SBDW	DF	ADF
x	0.40	-1.35	-1.82
x_m	0.70	-0.96	-3.56
x_a	0.68	-1.54	-2.33
MRER	0.40	-0.52	-1.99
RMIS	0.45	-1.53	-1.46
PREM	0.23	-1.95	-1.82
real output (y)	0.04	-0.75	-1.11

Notes: All variables as defined earlier (see under Table 5.1), and values of all series in logarithms.
DF and ADF are respectively, Dickey-Fuller and Augmented Dickey-Fuller "t test" statistic, and SBDW, the Sargan-Bhargava Durbin Watson test statistic. The Dickey Fuller null hypothesis is *Ho:* I(*1*), that is, the series is nonstationary of order 1 (essentially, thus far the test makes possible that the order of integration is at least 1, i.e., $1 \leq I(d)$. For the SBDW test the null is *Ho*:I(0), that is, the series is stationary.

-As a counter-check, low SBDW statistics compared with the critical value of 0.78 (though this is for T = 50) indicate that the null of stationarity is rejected for all the series at the 5 percent level. (Appendix Table A5.1 gives an extract of the critical values for the DF and SBDW tests for the 5 percent level).

Further, in so far as the said data caveat can be admitted of, there does not seem to be co-integration between sets of variables, of which pairs of interest for the present purpose are mainly those between exports and RER behaviour. This is based on the results of bivariate co-integrating regressions whereof regression residuals were used to carry out DF and SBDW tests for the order of integration.[119] Table 5.3 shows the main co-integrating regressions and test statistics.[120]

[119] In view of the primary interest in the export-real exchange rate relationship it is considered appropriate to limit co-integration probe to the simpler bivariate relationships.

[120] A measure of exports, v_t is regressed on a series for a measure of real exchange rate behaviour, z_t, i.e., $v_t = a_0 + a_1 z_t + e_t$
This is estimated by OLS. If the residuals of the equation ($e_t = v_t - a_0 - a_1 z_t$) are stationary, then the I(1) series v_t and z_t are co-integrated. The previous tests apply. The statistics appear in part II of Table 5.3.

It has been noted that in the bivariate case co-integration is symmetric;[121] and so the choice of the regressor and regressand as reported was made deliberately to yield, at the same time, indication as to the anticipated effect of the RER behaviour variables on exports: reference is made to these in sub-section 5.4.1 below. (critical values of DF and SBDW for co-integration tests for the 2 parameters case are in the Appendix A5.2).

Table 5.3 Co-integrating Regressions and Test Statistics

	I			II		
Regression	**constant**	**coefficient**	**R^2 F(.)**	**SBDW**	**DF**	**ADF**
x on RER	5.666 (9.460)	0.407 (3.859)	0.338 $F_{(1,22)}$ = 14.89	0.35	-1.64	-2.02
x_m on RER	0.997 (10.607)	1.035 (2.230)	0.836 $F_{(1,22)}$ = 12.5	1.14	-2.79	-2.97
x_a on RER	5.420 (12.908)	0.467 (5.283)	0.559 $F_{(1,22)}$ = 7.91	0.93	-2.56	-1.24
x on RMIS	12.431 (10.249)	-1.038 (-3.705)	0.409 $F_{(1,20)}$ = 13.73	1.08	-2.66	-1.49
x_m on RMIS	9.856 (4.757)	-0.948 (-1.936)	0.164 $F_{(1,20)}$ = 3.93	0.70	-1.36	-1.98
x_a on RMIS	10.569 (9.429)	-0.682 (-2.635)	0.258 $F_{(1,20)}$ = 6.94	1.01	-2.34	-1.37
x on PREM	9.339 (26.239)	-0.290 (-3.928)	0.412 $F_{(1,22)}$ = 15.43	0.73	-2.10	-1.83
x_m on PREM	6.768 (10.874)	-0.216 (-1.672)	0.113 $F_{(1,22)}$ = 2.08	0.53	-1.08	-2.52
x_a on PREM	8.518 (26.182)	-0.188 (-2.790)	0.261 $F_{(1,22)}$ = 7.78	0.53	-2.01	-2.94
x on RUN	7.507 (36.558)	-0.145 (-2.388)	0.206 $F_{(1,22)}$ = 5.70	0.49	-1.14	-1.16
x_m on RUN	5.81 (17.137)	0.021 (0.220)	0.002 $F_{(1,22)}$ = 0.05	0.54	-1.02	-3.14
x_a on RUN	7.345 (41.587)	-0.089 (-1.703)	0.117 $F_{(1,22)}$ = 2.90	0.66	-1.38	-2.50

Notes: All variables are as defined under Table 5.1 and all in logarithms.

On the PC-GIVE the SBDW is the DW statistic of the co-integrating equation (Adams, 1993:46); the same is also referred to as the "co-integrating regression Durbin-Watson" (CRDW) statistic (Madalla, 1992:607).

[121] See, for instance, Adams (1992:27) on this point.

Comparing results in the second part of Table 5.3 with the closest critical values in Table A5.2 (for T = 50), it is clear that obtained DF and ADF statistics are, in absolute terms, below the critical levels (-3.67 and -3.29 respectively), so that the null of non-stationarity of the co-integrating regression residuals cannot be rejected.

Neither can the SBDW statistics be taken to unambiguously reject stationarity of the residuals. Only in a few cases are the SBDW above 0.78 (the critical value for T=50, expected to be higher for smaller sample). In the majority cases, the statistic is quite low, evidence that the null of stationarity can tentatively be rejected.

On the whole, the limited sample size and approximate tests do not make it possible to affirmatively accept co-integration among aggregate exports and RER behaviour measures. For this reason *error correction model* analysis is not pursued. However, because of the above said limitation, this failure to establish co-integration does not imply outright rejection of the theory relating aggregate exports and the RER.

Second, the absence of convincing evidence of co-integration has implications for the method of estimation to avoid spuriousness. One suggestion is to work with first differences rather than levels. The argument due to Nelson, Plosser and Shwerts - (see Maddala, 1992: 258-63) that it is better to work in first differences with most economic time series is certainly appropriate when data series are of the difference-stationary processes (DSP) - the fact that can be established by unit root tests.

However, invoking the "rule of thumb" for detecting spuriousness, that is, comparing the relative size of R^2 and DW statistics, it can be seen - referring back to Table 5.3 - that in all regressions, $R^2 < DW$ statistic.[122] This suggests that overall, there is low probability of spuriousness. Thus, the failure of unit root tests and rough indications from the DW and R^2, make definitive resort to estimations in first differences less compelling.

[122] When $R^2 > DW$ then there is a high probability of spurious correlation (Adams, 1993:27).

5.4 Estimations of the Export Supply Equation

5.4.1 Simple Regressions: Exports and Real Exchange Rate.

The simple regressions in Table 5.3 may be referred to again as a point of departure towards an expanded export function, i.e., one in which the domestic capacity base (output) is included. The relevant regressions are reproduced in a more spread layout (Table 5.4) for quick reference.[123] The results provide preliminary evidence of the relationship between individual RER (behaviour) measures and real exports. Nearly all of them, with a few exceptions, are in favour of our central hypotheses.

Table 5.4 Simple Regressions

Dependent variable	Independent variable	constant	Coefficient	R^2	F(.)
x	RER	5.666 (9.460)	0.487 (3.859)	0.338	$F_{(1,22)}$ 14.89
x_m	RER	0.997 (10.607)	1.035 (2.230)	0.836	$F_{(1,22)}$=12.5
x_a	RER	5.420 (12.908)	0.467 (5.283)	0.559	$F_{(1,22)}$ = 7.91
x	RMIS	12.431 (10.249)	-1.038 (-3.705)	0.409	$F_{(1,20)}$=13.73
x_m	RMIS	9.856 (4.757)	-0.948 (-1.986)	0.164	$F_{(1,20)}$=3.93
x_a	RMIS	10.569 (9.429)	-0.682 (-2.635)	0.258	$F_{(1,20)}$=6.94
x	PREM	9.339 (26.239)	-0.290 (-3.928)	0.412	$F_{(1,22)}$=15.43
x_m	PREM	6.768 (10.874)	-0.216 (-1.672)	0.113	$F_{(1,22)}$=2.08
x_a	PREM	8.518 (26.182)	-0.188 (-2.790)	0.261	$F_{(1,22)}$=7.78
x	RUN	7.507 (36.558)	-0.145 (-2.388)	0.206	$F_{(1,22)}$=5.70
x_m	RUN	5.81 (17.137)	0.021 (0.220)	0.002	$F_{(1,22)}$=0.05
x_a	RUN	7.345 (41.587)	-0.089 (-1.703)	0.117	$F_{(1,22)}$=2.90

Note: These are extracted from Table 5.3 above.

[123] For convenience, the estimated equations in this table are not serially numbered with the those in the main text.

The following qualifications can tentatively be made:

(i) The coefficients on the majority of the RER behaviour variables appear with the hypothesised signs. All RER coefficients carry a positive sign, while measures of RER misalignment (RMIS) and RER uncertainty (RUN) carry a negative sign.

(ii) As for misalignment, the model-based measure (RMIS) performs better than the parallel market premium (PREM) in terms of the size of the coefficients. Though significant, the measure of real exchange rate uncertainty has the lowest coefficients.

(iii) In regard to the coefficient of determination (R^2), many of the regressions have R^2 and F-statistics are low. Low R^2 generally implies that there could be other factors - not here specified - that explain variations in exports.

5.4.2 Multiple Regressions

In view of the above, the following sub-section reports estimated equations that predicate export supply on both the RER behaviour and domestic capacity variable (y_t) as proposed in equation (5.1). The equations in dynamic form (including once-lagged dependent variable) are estimated using Ordinary Least Squares method and corrected for serial autocorrelation.[124] Estimations are done in log-levels. The estimations are made over the period 1967-90, except in the case where the model-based measure of RER misalignment appears (the observations of which start in 1969).

Equation (5.2) (in log levels), is for purchasing power of total exports. The t-statistics are in parentheses. The elasticity coefficient of total real exports is positive

[124]Errors are assumed to follow first-order autoregressive, AR(1) scheme.. MicroTSP was used for the rest of the estimations.

(0.45). The coefficient of the measure of RER uncertainty is -0.03 and it is statistically significant at the 10 per cent level.

$$\log x_t = \underset{(-0.02)}{-0.53} + \underset{(1.95)^*}{0.45} \log RER_t \underset{(-1.99)^*}{-0.03} \log RUN_t \underset{(-1.66)}{-0.28} \log x_{t-1} + \underset{(1.36)}{1.42} \log y_t$$

$(\rho = 1.01)$ $R^2 = 0.90$ $DW = 2.40$ $F = 36.98$ $n = 22$

* statistically significant at the 10% level

The coefficients of the capacity variable are positive and not statistically significant at the 10 per cent level. But as will be seen in further results, the coefficient was not "consistent" in terms both of its size and sign.[125]

Following the unsatisfactory indicator for the purchasing power measure of agricultural exports (refer section 4.3), regressions using these as dependent variable yielded unsatisfactory results. Specifically, the regressions in terms of R^2 and F statistics were not significant and so were all the coefficients. These are not reported as they would be of little practical use. Instead, it was decided to resort to real agricultural exports deflated by the sector's real GDP. In addition a dummy variable (WE) was added for the weather factor. Bad years took the value of 1 and the rest of the years, a zero.[126] The equation estimated for real agricultural exports is as follows:[127]

$$\log x_{at} = \underset{(1.41)}{4.92} + \underset{(2.72)^*}{0.39} \log RER_t \underset{(-0.97)}{-0.41} \log y_{at} + \underset{(2.29)^*}{0.47} \log x_{a(t-1)} \underset{(-0.05)}{-0.01} WE$$

Adjusted $R^2 = 0.67$ $DW = 2.01$ $F = 9.67$

*Significant at the 5 percent level

[125] Estimation of the same function in log first differences yielded

$$d\log x_t = \underset{(2.94)}{0.55} d\log RER_t \underset{(-1.56)}{-0.02} d\log RUN_t \underset{(-0.31)}{-0.19} d\log y_t \quad R^2 = 0.34 \; DW = 2.30 \; F = 6.62$$

[126] Particularly bad years with extreme droughts were 1973-4, and 1981-2, although occasional floods wreak havoc to the transporting and / or storing of agricultural produce - Ministry of Agriculture *Crop Statistics Bulletin*.

[127] This was the best fit for agricultural exports in terms of the coefficient of multiple determination and F-statistics. Several attempts with purchasing power of agricultural exports (deflated by XUVs as noted earlier, led to poor results - very low (even negative coefficients of multiple determination, and insignificant coefficients that often were changing signs.

where x_a is real agricultural exports, and y_a is real agricultural GDP.

The RER coefficient is in this case 0.39, which is lower than the similar coefficient in the real manufactured exports equation (below). The capacity variable in the real agricultural exports is above 1, but it is not statistically significant at the conventional levels.

It is readily noticeable that while WE has the expected sign the coefficient is insignificant at the conventional levels. The weather factor nevertheless cannot be totally dismissed on the basis of this result. As earlier studies at a more disaggregated level in terms of individual crops have shown (e.g. Lipumba *et al.*, 1991: 251), the weather factor is statistically significant in the econometric estimations.

For real aggregate manufactured exports, the purchasing power of exports were used as dependent variable. The estimated equation in log levels is 5.5:

$$(5.4)\quad \log x_{mt} = \underset{(-1.14)}{-2.81} + \underset{(2.94)^*}{0.58}\log RER_t - \underset{(-1.88)}{0.04}\log RUN_t + \underset{(3.86)^*}{0.60}\log xm_{t-1} + \underset{(-0.99)}{0.16}\log y_t$$

$(\rho = -0.27)\quad R^2 = 0.92\quad$ F-statistic = 39.98

*statistically significant at the 5 percent level

where x_m is purchasing power of manufactured exports

The RER has the expected sign, and is significant at all conventional levels. Holding other things constant in (5.4), the elasticity of the purchasing power of manufactured exports to changes in the RER is 0.58 and is just higher than that for total exports.[128] The capacity variable has a negative but statistically weak coefficient (in other trials it was positive but still weak).

In the sectoral equations then, the RER is consistently positive and significant. The capacity variable does not maintain a specific sign and is generally not statistically significant at the conventional levels. The following sub-section attempts to explain

[128]Replacing RMIS for RUN led coefficient of RER of 0.601 and a statistically significant coefficient for RMIS of 0.034.

the above results, and brings in the effects of RER misalignment and uncertainty obtained from the simple regressions.

5.4.3 Interpretation of the Results

The simple and multiple regressions in this section provide a basis for a few conclusions and qualifications regarding the explanatory power of the RER behaviour variables on the variations in real exports and export orientation.

The positive and significant RER coefficient in the total real exports (purchasing power of exports for total and manufactured exports, and agricultural exports deflated by GDP deflator) implies a positive response of exports to changes in the RER. From equation (5.2), for instance, an increase in the RER, meaning a real depreciation by 1 per cent, will elicit about 0.45 per cent increase in real exports. On the contrary, RER appreciation will lead to a decrease in real exports. For real manufactured exports (in the multiple regression) the coefficient is 0.58 and for agricultural exports it is 0.39.

The estimates confirm that RER misalignment hurts exports. Ideally, the measures of misalignment sum up the effects of factors such as sources of domestic inflation, currency overvaluation, the tightness of import restrictions and exchange controls. Intrinsically, the parallel market premium adds to the disincentive element as an implicit tax on official exports, thus drawing exports (and export proceeds) away from official channels. The coefficients with respect to these measures are fairly indicative. Thus, an increase in RER misalignment will erode the incentives for producing tradables.

The performance of RER uncertainty (RUN) in the multiple regressions is credible given the conditions in Tanzania, partly because of the dominance of controls in the pre-1985 period, and the slow, unsteady liberalisation, (1984-90). However, probably a different statistical measure of uncertainty could yield better results.

Parenthetically, two further comments ought to be mentioned in regard to the presence of the capacity output variable in our export function. First, is the fact that output itself, or its growth rate, is linked to RER, which may be an indication of a need to specify the output function as well.[129] Second, it was found that the capacity output variable did not significantly in all cases appear to explain variations in real exports as expected. Some likely explanations include: the valuation (deflating method) and the possibility that an increase in domestic output could be followed by a less than proportionate increase in exports due to a number of factors like, an increase in domestic demand, or technical and general export marketing constraints.[130] A further possibility is a situation where real domestic output is growing slowly (or declining), but the "exportable surplus" is made possible through a cut in domestic demand, or extracted by directive like, in a command type economy.

The prevalence of the "directive" type of central planning in Tanzania may have had a significant influence of the latter type. It was seen that at first policy favoured the domestic market during the 1970s, and that this changed to "directive" assignment of export targets (at regional, and sectoral levels) during the early 1980s.[131] While the specific export targets would have been reached, the rest of the output (overall or sectoral) would not necessarily follow suit. The protective measures that made it more profitable to sell in the domestic market rather than to export is a related factor that ought to be borne in mind when considering the estimated coefficients.[132]

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[129] On the conceptual level, an improvement in the productivity of the tradables sector, for instance, may lead to RER appreciation. The earlier discussion under sub-section 2.4.1 is quite relevant here.
[130] See, for instance, Goldstein *et al*, (1985).
[131] A particular case is the National Economic Survival Plan (1981-82).
[132] This is brought out sharply for manufactured exports by Ndulu et *al*. (1993) and Musonda (1992).

5.4.4 Differences in Sector Export Elasticities

The differences in sectoral elasticities of exports with respect to the RER behaviour measures are striking and they have important implications for the assessment of the impact of the macroeconomic, trade and other RER determinants on export performance. Table 5.5 shows the elasticities for the total exports, manufactured and agricultural export sub-categories with respect to changes in the RER behaviour. Consequently, it is necessary to discuss why the elasticities of real manufactured exports should be larger than those for agricultural exports.

The second column gives the coefficients of the elasticity of exports with respect to the RER from multiple regressions. Those in the next three columns are from the simple regression estimations that were *then corrected* for serial correlation.

Table 5.5 Total and Sectoral Elasticities of Real Exports with respect to the RER Behaviour.

Real exports	Coefficient of the RER behaviour indicator			
	RER	RMIS	PREM	RUN
Total exports	0.45	-1.04	-0.29	-0.15
Agricultural exports	0.39	-0.68	-0.19	-0.09
Manufactured exports	0.58	-0.95	-0.22	0.02

An attempt at the explanation is considered along the characteristic differences between the two sectors in the way they influence the ease with which more factors of production can be shifted in response to changes in the relative price incentives.

Short-run response in agriculture is, in general, likely to be slower than in manufacturing for a number of reasons:

First, most factors of production are fixed "in the short-run": substantial acreage expansion requires capital investment that may be beyond reach of the ordinary smallholder producers. Labour increases only over time through population growth or

through migration. The latter may be viewed as a function of wages (or urban-rural wage differentials).

In Tanzania, since the institution of socialism legally proscribed full-fledged rural wage employment, except on few state farms, what counts so much is the rural income as determined by, among others things, the *real* prices received by the rural producers. It has been noted, however, that real producer prices have for most of the time been undercut by inflation and the fact that even the nominal prices received were quite low as a proportion of world market prices (for export crops).

Few variable inputs, like fertiliser, improved seed, pesticides etc. can be quickly changed, subject to availability and affordability to the bulk of small-hold producers. The constraints in the timely supply of these inputs, and problems in rural credit extension hinder growth in productivity. In contrast, once established, manufacturing output can be easily adjusted by varying labour and intermediate or recurrent inputs such as raw materials; perhaps the most binding constraint becomes working capital.

Second, there has been an indirect discrimination against agriculture *via* an overvalued exchange rate and industrial protection, turning terms of trade against agriculture. This implies less than adequate price incentives have been availed to the agricultural sector, through, for instance, low producer prices as against higher prices of manufactured products needed in rural areas. The persistent decline of rural terms of trade accounts for the movement of effective labour from the rural to urban areas.

In addition, a large number of export promotional devices, such as tax rebates, duty drawbacks, seed capital revolving funds and others are specific to industrial products and some non-traditional agricultural exports, but they are less amenable or accessible to agricultural producers. Where the manufactured exports for which the export incentives are secured (like textiles, instant coffee, tobacco products) use agricultural produce as their inputs, it is not clear if agricultural producers share in the benefit at all.

The pass-through of the price incentive element inherent in changes in world prices and or exchange rate devaluation for most of agricultural exports, as seen in Chapter IV has been obstructed to a great extent by pricing policies that give prominence to marketing margins of monopolistic state marketing intermediaries.

Third, inadequate infrastructure in the agricultural sector, mainly transport and storage, and low level of technology limit the degree of responsiveness to price incentives.

5.5 Impact of Real Exchange Rate Determinants on Exports

Since the RER has a strong positive relationship with export performance, and with some knowledge about the RER determinants, this section examines how well these policy and non-policy determinants explain variations in real exports. To what extent do the estimated RER and real export equations help quantify the impact of macroeconomic policies, trade policies, the parallel exchange market premium, external terms of trade and capital inflows on the real exports ?

The macroeconomic policies were seen to comprise actions on fiscal and monetary magnitudes aiming for internal and external balance, while trade policies include mainly trade taxes and other quantitative and administrative measures. The difficulty of overlapping trade policies and macroeconomic measures have been noted in Tanzania, and these somewhat make clear a divide between the two difficult.

External terms of trade are exogenous to domestic policy-making, while capital inflows can be planned for only to a limited extent. To the extent that these factors affect the RER, and therefore, the competitiveness of the tradables, knowledge of their impact can be considered to be an input for policy-making. However, the precision with which their effects can be predicted is little; internal policy-making often has to adjust to these external factors.

Bearing the said policy overlaps in mind, the discussion of the relative impact of the policy-based RER determinants on exports via their impact on the RER will be organised under the following headlines: macroeconomic policies (under this, also a note on the nominal exchange rate), trade policies, and partly-policy RER determinants (to include the parallel market premium and terms of trade and capital inflows.

As such, this section relies on combining the empirical results from Chapter III (taking basically the RER equation), and those from this chapter, in particular section 5.4. More precisely, from the export equation, only the real export elasticities with respect to the RER path (second column in Table 5.5) are made use of , since the RER path seems to perform better during estimations of the export function than the other measures of RER behaviour.

Table 5.6 shows the impact coefficients of the determinants of RER on real exports. The coefficients should be seen as approximations of the indirect effect of the RER determinants on real exports, derived as a product of the elasticity of real exports with respect to the RER and those of the RER with respect to RER determinants.[133] For the significant fundamentals we use the long-run elasticities in Table 3.7. Since the basic elasticities from the RER equations are the same, the differences in the figures as between the three categories of exports in Table 5.6 are governed by the export elasticities with respect to the RER from Table 5.5.

Table 5.6 Effects of the Real Exchange Rate Determinants on Real Exports

RER determinant	Total exports	Agricultural exports	Manufactured exports
Macroeconomic policy	-0.18	-0.15	-0.23
Import Restrictions	0.19	0.17	0.25
Parallel market rate	-0.18	-0.15	-0.23
Terms of Trade	0.26	0.23	0.34

[133] As proposed in Chapter II, the indirect effect of a given RER determinant F_i on exports x is approximated as in equation (2.10).

It follows too generally, that all of the RER determinants have a higher impact on real manufactured exports than on overall exports and agricultural exports.[134]

5.5.1 Effects of Macroeconomic Policies

As noted earlier, probably close to pure macroeconomic policy measure is the one that takes into account the "macroeconomic balance" $(\dot{dc} - \dot{y} - \dot{p}^* - \dot{E}) = 0$ based on equation (3.8). This was seen to have a negative relation to the RER, with an elasticity coefficient of (-0.39), in the estimated RER equation (3.9). Considering real total merchandise exports, and their elasticity with respect to the RER, the indirect impact coefficient of (-0.18) implies that should the overall macroeconomic policy be expansionary by (say 1 per cent), then the resulting RER appreciation will ideally result in a decrease of about 0.2 per cent in total exports. An expansionary macroeconomic policy brought about by domestic credit expansion at a rate in excess of the rate of growth of output, the foreign price level and nominal exchange rate ultimately induces RER appreciation which undermines the competitiveness of the country's tradables.

Although nominal devaluation will lead to real appreciation (depending on the rate of adjustment), assessment of nominal exchange rate change outside of the "macroeconomic balance" relation as argued above (refer 2.3.2.2) is likely to be inaccurate. The large RER depreciation after 1986 cannot be credited only to the devaluation but also to other accompanying macroeconomic reforms. Thus, as argued out in Chapter II we cannot generalise on the macroeconomic effect of nominal exchange rate changes in isolation of the other variables that make the "macroeconomic balance" measure (MAP).

[134]The possible factors for the differences in the responsiveness of real exports are suggested in 5.4.4 above.

5.5.2 Effects of Trade Policy Measures

Considering the import restriction measure in Table 5.6 as a measure of tightness of the trade regime, it is possible to infer that the elasticity of real exports with respect to a change in the magnitude of import restrictions is close to 0.19 for overall total exports, 0.17 for agricultural exports, and 0.25 for manufactured exports. An increase in the import restrictions will result in RER appreciation, which will induce a fall in real exports and *vice versa* by the respective percentage points. The sectoral differences are maintained.

As it stands, the import restriction measure bears elements of both trade and macroeconomic policy. The macroeconomic attribute owes to the paramountcy of balance of payments problems as a reason for recourse to tighter import restrictions (as was the case since the late 1970s and early 1980s), over and above the general trade policy purposes such as protection and revenue.

It may be noted, however, that as constructed, the import restriction measure does not discriminate between the sources of the changes in real imports as between the restrictive/prohibitive and "liberalising" measures. Domestic policy has discretion on most of the measures and only to a limited extent on others, such as those due to foreign aid.

5.5.3 Effects of Partly-policy Real Exchange Rate Determinants

The parallel market premium was also found to exert a significant impact on the RER. Its indirect impact on the real exports as expressed through the real exports elasticities is statistically significant. Though the coefficients indirect effect depict entire period relationship, it is particularly easy to suppose that the (negative) effect on exports was even greater during the 1979-85 period when the increase in the parallel premium was strongest. As the premium decreased towards the 1990s, so would the actual loss of (official) exports: that is, other things remaining the same, the decrease in

the premium is, like a decrease in implicit export tax, likely to draw more exports into the official channels (the observed exports that we are dealing with).

The parallel market is not directly under control of policy-makers, but it has been a powerful indicator of the presence of problems in the macroeconomic environment (such as RER misalignment), in the enforcement of trade-related policies (e.g. the degree of trade and exchange restrictions), and other sources of price (incentive) distortions. The implied policy actions in response to the presence of the parallel market premium are similarly wide-ranging and have included a variety of exchange rate and trade tax (mainly tariff) reforms since the mid-1980s.

The current terms of trade effect (on the RER) was statistically significant, so are the computed elasticity coefficients of real exports with respect to changes in the current terms of trade.[135] Should then, the worsening of terms of trade reduce the prospects for improved export performance since, by these results, it induces RER appreciation? The answer could be in the affirmative, if the result is taken as *net effect* of a change in terms of trade on the RER: that would suggest that the "price effect" of deteriorating terms of trade (causing an appreciation) dominates the "income effect" (inducing depreciation).[136] Conversely, as an improvement in terms of trade would lead to the opposite net effect (a net depreciation), then that implies, better terms of trade will lead to improved export performance.

[135] Once-lagged terms of trade had a negative sign, but was statistically insignificant. A similar result (for the lagged terms of trade) was obtained by Ndulu *et al.* (1993).

[136] Valdés *et al.*(1990:31-32) note that while *a priori*, the net effect of changes in terms of trade is indeterminate, it has been conventional to expect that the "income effect" dominates the "price effect" so that in case of a worsening terms of trade there will be net depreciation. This does not seem to be the case given the results of RER equation estimations.

5.6 Concluding Remarks

It may be stated that macroeconomic policy and trade policies exert consistently strong impact on real exports through their influence on the RER. Considering the expansionary macroeconomic policy, the restrictive trade policy in the 1970s (largely for protection) and on into the mid-1980s for balance of payments purpose, no doubt that the RER appreciation became severe and real exports generally were falling. The turn-around in the macroeconomic and nominal exchange rate policy stance since the mid-1980s and trade liberalisation measures together, are accompanied by RER depreciation and positive albeit slow, improvement in exports.

The sectoral differences in the real exports responsiveness - elasticities with respect to the RER are striking. Possible reasons for the differences were discussed.

Given the elasticities in Table 5.6, ideally one can go back on historical data, (or even assume some future values of policy measures), to see by how much, real exports changed (or would change) for a change in the policy measure during a specified period. It is important to note, however, that the estimations were made over a relatively short period with annual data. Availability of quarterly data would not necessarily alter the underlying relationships, but probably more noteworthy is the fact that there has been a "gradual" divide between the period before and after 1986 in overall policy orientation. While this influenced the relative "magnitudes" of policy actions applied and the economic performance outcomes, our econometric estimations were made over the entire period. It is important, therefore, to take estimation results in Table 5.6 with caution should they be considered for purposes of prediction.

Finally, a few comments are in order on the variables that did not appear to be statistically significant at the estimation stages mainly in Chapter III and this chapter. The measure of explicit taxes in the RER equation was found to have a negative, though statistically insignificant impact on the RER. This was considered to be contrary to the expectation that (say) an increase in explicit taxes would induce RER

appreciation.[137] The reasons considered as explanation for this result, make it difficult to rely on the derived impact elasticities on real exports.[138] However, the failure to get significant influence of export taxes on the RER nevertheless does not make the taxes unimportant in practice. Indeed, a comment is in order, apart from suggesting further research on this specific variable. The elimination of export taxes on the major exports reduced the bias against the (agricultural) exports and cannot be ignored as contributing factor to improved export growth in the late 1980s.[139]

It was found that foreign capital inflows did not perform well in the RER equation as hypothesised. The positive coefficient in the RER equation, it was seen, means an increase in the inflows will require a RER depreciation, so that this will induce an improvement in export performance. However, the coefficient was low and statistically insignificant. As noted earlier, factors like the timing and forms (and at times, external "conditionality") in which the inflows actually came and were put into use could have been the cause for the result obtained, that is, offsetting the "spending effect" on the (say) increased inflows. To the extent that the inflows cannot be predicted or their use entirely be controlled by the recipient (government), there does not appear to be a strong systematic relation that can be relied upon for policy guide from the present estimations regarding the inflows.

[137] Recall from the earlier discussion in Chapter III that in the RER equation, an increase in the tax rate means a decrease in log XT_t which is measured here as log $(1-t_x)$.

[138] For instance, the fact that the post-1985 observations of explicit export taxes were negligible, after the removal of export taxes on major exports, could probably have a weakening effect on the entire period regression coefficient.

[139] The gap between the overall $REER_x$ and $REER_m$ closed since around 1985 (see, for instance, Chart 3.5).

VI

SUMMARY AND CONCLUSIONS

6.1 Summary of Major Results.

The study set to empirically examine the relationship between RER behaviour on aggregate export performance. The definitions and time series measures of the RER, RER misalignment and uncertainty were derived. The factors that affect the RER and their indirect on exports were investigated. Focus on two main sub-categories of merchandise exports -agricultural and manufactured exports was intended to establish whether there were differences in the responsiveness of the two sectors' exports to changes in the RER.

Between 1967 and 1986, the exchange rate policy was not actively used even in the face of severe internal and external imbalances. Instead control and restrictive measures were preferred. Trends in both the bilateral and multilateral indices showed that RER appreciation was particularly steep since the end of the 1970s to mid-1980s. The adoption of a more "active" nominal exchange rate policy and other economic reforms since the mid-1980s were accompanied by RER depreciation.

A simple RER model was estimated to investigate the role of the RER determinants. Estimations showed that expansionary macroeconomic policies, tight import restrictions and the parallel market premium would precipitate RER appreciation. Explicit export taxes, government consumption and capital inflows did not appear to exert a strong impact on the RER. Improvement in terms of trade would lead to RER depreciation.

By using parameters from the estimated RER equation, the time series for RER misalignment were derived The measure of RER uncertainty was approximated from the actual RER series. It was found that the derived measure of misalignment closely moved with the parallel market premium. The high level of misalignment in the 1980s

coincided with the widening gap between the domestic and foreign rates of inflation. The measure of RER uncertainty based on the actual RER showed greater variability in the 1980s - also coinciding with greater RER misalignment.

The descriptive analyses of aggregate export performance indicators showed that between 1979 and 1985 export performance was particularly weak. Some improvement was noted from 1986 onwards.

It was pointed out that initially policy preference was for import substitution industrialisation and pre-eminence of domestic market. The trade and exchange rate policies reflected this *bias* against exports and agriculture as such. For instance, the comparisons of the average real effective exchange rates for exports and imports show a bias of policy against exports in the period prior to 1985, with $REER_x < REER_m$. From 1985 onwards their relationship reversed. They show a distinction between the period prior to 1985 (inward-orientation) and the period after 1985 when policy is relatively more outward-oriented.

Towards the end of the 1970s balance of payments pressures prompted an *active* drive for exports. At first it was an active export drive with controls still in place up to around 1984/85, and thereafter, active export drive with gradual liberalisation.

Looking at the major episodes in the trade and exchange rate regimes, the major trends in real exports, the RER behaviour, it was observed that during the period 1979-85 (with RER appreciation, increasing RER misalignment) export performance was weak while, beginning 1985-86 (with RER depreciation, decreasing RER misalignment and overall liberalisation) *real* exports generally showed some recovery.

The main hypotheses were further put to quantitative analyses using time series methods. The co-integration test was not a complete success. However, both the correlation and regression analyses showed strong direct link between changes in actual RER and overall and sectoral exports. The negative relation between RER misalignment and export performance was also confirmed. Though it assumed the

hypothesised sign, the measure of RER uncertainty often showed weak relation with export performance.

The indirect effects of the RER determinants on exports were derived. Expansionary macroeconomic policies, tighter import restriction policies and the parallel market premium, having a strong negative impact on the RER would be detrimental to export performance. Though the results showed that explicit export taxes did not have a significant impact on the RER (possible reasons were given) it was suggested that this did not diminish the importance of this policy variable.

Our results also imply that improvement in the external terms of trade would boost exports, and that capital inflows would be unimportant for export expansion. In addition to the reasons suggested for these somewhat suspect results, more detailed studies of the effects of these variables on the RER are recommended.

Further our results suggest that agricultural exports in Tanzania have been less responsive to changes in the RER, RER misalignment and uncertainty than manufactured exports. The deliberate initial policy preference to industry could be advanced as a factor contributing to the inadequate resources committed for agricultural infrastructure.

6.2 Comparison with other Studies.

Table 6.1 lists some of the studies cited earlier that address the problems closely related to the subject of the present study. Three aspects of the RER behaviour in Tanzania have been explored, and their relationship with export performance investigated. While a number of studies have investigated the RER determinants via a RER model, only a few, like Ndulu *et al.* (1993), Pick *et al.* (1994) and the present study, examine the indirect influence of some of these determinants on export performance.

With an exception of the present study, the studies in Table 6.1 deal with only one or two and not three, aspects of the RER behaviour at a time. The table shows only the effect on export performance, the focus of the present study, but some of the previous studies consider other economic variables.[140] Out of the 9 references cited (all on developing countries), 4 examine the effects of RER itself, 4 the effects of some measure of RER misalignment and 6 the effects of RER uncertainty on some measure of aggregate exports. It is only Pick *et al.* (1994), which unlike the rest of the studies, examines the influence of RER misalignment on individual agricultural exports.

The quantitative methods of empirical analysis used by these studies have been mentioned in Chapter II. However, the difference of remarkable consequence is that while some studies, including the present study, Ndulu *et al.* (1993), and Caballero *et al.* (1989) essentially are single-country studies, others are cross-country studies. This raises a question about the comparability of the parameters and interpretation of results obtained by both classes of analyses.

Table 6.1 gives only the sign on the estimated coefficient and whether it was or it was not statistically significant. Reasons for not comparing the *absolute magnitudes* of the coefficients from the different studies would include the following:

(i) Differences in the functional forms: while some of the studies in Table 6.1 use log-linear forms, others use linear forms in levels. Even though it is possible to derive elasticities from linear forms too, it would be necessary to recognise that the time spans (and hence, the sample size of the time series) over which the relationships are estimated do not coincide for all studies.

(ii) The valuation methods for export performance measures differ. Some studies use growth rates or export/output ratio or real exports (in local currency or in some foreign currency).

[140] For instance, in addition to the export growth rate, Cottani *et al.* (1990) consider the effects of RER instability (uncertainty) and misalignment on per capita growth rate, net rate of investment, incremental capital-output ratio (ICOR) and agricultural growth.

Table 6.1 Summary of Some Comparisons with Other Studies

Study	Coverage Period	Dependent variable	Measure of RER Behaviour				
			RER	RER misalignment			RUN
				Parallel market	Model-RMIS	PPP-based	
Edwards (1988)	√√ 1965-71 1972-85	$\dot{x}$					(-) w
Caballero *et al.* (1989)	√	x	(+) s				(-) s
Balassa (1990)	√√ 1965-82†	$(x/y)_a$	(+) s				
Cottani *et al.* (1990)	√√ 1960-83	$\dot{x}$			(-)w		(-) s
Grobar (1993)	√√ 1963-85	x_m					(-) s
Ghura *et al.* (1993)	√√	(x/y)		(-) s	(-) s	(-) s	(-) s
Ndulu *et al* (1993)	√ 1966-90	x_m	(+) s				
		(x_m/y_m)	(+) s				
Pick *et al.* (1994)	√√ 1977-88	x_{ai}*			(-) s		
Present study	√ 1967-90	x	(+) s	(-)	(-) s		(-) w
		x_m	(+) s	(-)	(-) s		(-) w
		x_a	(+) s	(-)	(-) s		(-) w

Notes:

x = (total) real exports, $\dot{x}$ = export growth rate, y = real output (GDP),
x/y = export-to-output ratio.
subscripts a = agricultural sector, *m* = manufacturing sector.
† with sub-periods 1965-73, 1974-82, and 1965-82.
*For Pick *et al.* x_{ai} for individual agricultural commodity *i*
RUN = Real Exchange Rate uncertainty
√√ cross-country data, √ single country data.
Estimated signs appear (+) and (-) with an "s" if the coefficient was found to be statistically significant, and a "w" if the coefficient was found to be statistically insignificant or only weak.

Thus, it is fair to base comparisons on the sign and statistical significance reported in Table 6.1. It is clear that evidences from both cross-country and single country studies confirm that export performance is positively related to changes in the RER and it is negatively related to RER misalignment RER uncertainty. However, the relationship with RER uncertainty is *not* strong in all cases.

Comparisons of sector specific elasticities of exports with respect to the RER can be made between the present study and Ndulu *et al.* (1993) and Balassa (1990). Ndulu *et al.* (1993), estimate an export function for (total) manufactured exports similar to the one estimated in this study. The elasticity of real manufactured exports with respect to the RER is found to be 0.68 (or higher 0.97, in first differences). This is not significantly different from the present study's of 0.58.

The differences between the agricultural and manufacturing exports elasticities with respect to the RER in the present study can be contrasted with results obtained by Balassa (1990). Unlike the present study, Balassa (1990) covers a group of Sub-Saharan countries. Basing on the fact that the coefficients obtained for agricultural exports were higher than those for the "total trade in goods and services", Balassa suggests that his result refutes "... the conventional wisdom, which holds that agricultural exports are less responsive to prices than industrial exports". On the contrary, the present study for Tanzania (which is one of the countries studied by Balassa, 1990) finds that agricultural exports are less responsive to the RER than the manufactured exports - at the aggregate sectoral level. Given the specific constraints - technological and institutional, in Tanzania's agricultural sector, the result of the present study is not untenable.

In terms of new contribution, the present study has thus put to test and largely proved right the theory of real exchange rate determination and the relationship between the real exchange rate behaviour and export performance. It has demonstrated that macroeconomic and trade policies as well as some non-directly policy factors can have significant effects on the real exchange rate and through it, on export performance. The policy implications of the study follow.

6.3 Policy Implications

The findings in this study point to the need for policy actions aimed at reducing RER appreciation, RER misalignment and uncertainty. A stable macroeconomic environment is an important requirement for the other export promotion schemes to work in. Overly expansionary macroeconomic policies have an undesirable effect of fuelling inflation. Efforts to improve budgetary operations, particularly on revenue generation and on more prudent spending are required to deal with one of the most persistent sources of inflation in Tanzania - the chronic budget deficits.

As for exchange rate policy, a *flexible* official nominal exchange rate that is varied with continual reference to the difference between the domestic and (weighted) foreign rates of inflation is appropriate. Among other reforms, the gradual liberalisation of the foreign exchange market since 1984 has markedly reduced the importance of the unofficial parallel market premium. It remains desirable, then, that the state demonstrate a steady commitment to these reforms so as to avoid the incidence of RER misalignment and uncertainty. Too frequent (erratic) changes in policy measures or wavering *political will* can weaken credibility of the public in the reforms and reinvigorate the unofficial market.

The *difference* in the responsiveness of agricultural and manufactured exports by no means implies that manufactured exports are doing any better *volume-wise*. In the wake of liberalisation manufactured exports face stiffer competition. Concern is not only with the capacity utilisation levels but also with price and quality competitiveness of the products on the international market.

The lower elasticities of supply response of the agricultural exports imply the need for more long-term investments in the agricultural sector - such as new and maintenance of old infrastructure, improved technology, education, research and extension. Hopefully, such investments can enhance the short-run responsiveness of supply to price incentives and thus also promote improved productivity.

No less important is the need to relate the producer prices of export crops to the changes in the nominal exchange rate and world prices with (if) any taxes affecting production or sale of export crops. Given the liberalisation of agricultural exports marketing, now open to private enterprise, these institutional aspects - pricing and taxation of (agricultural) exports need close policy review.

In general, there is a need for more involvement of government in not only fostering private and foreign investment in export activities but also, like in some Asian countries, to actively give support to local export firms, such as providing information, financing publicity fairs, impressing foreign partners etc. One would be tempted to (still) consider protective measures (for local producers *via* tariffs, for instance) - "infant industry" sort of argument as a way out; however, after more than 20 years, the clear failure of industries (most of them state-owned) to take-off behind high protection, supports the argument for freer competition. Protective measures can only invite retaliatory measures from trading partners and seem to be an aberration when reduction or elimination of tariffs, and trade bloc formation is the contemporary pattern of international trade. This is, therefore, to support continuing trade and exchange rate liberalisation in Tanzania.

The policy recommendations just made do not only seek to gainfully influence real exchange rate movements but also they imply improved productivity growth, which is critical in raising possibilities (or a "surplus") for exporting.

6.4 Suggested Areas for further Study

A few questions arise from this discourse about the recent developments in the real exchange rate trends and prospects for export expansion. The suggested enquiries may be cast in light of on-going policy orientation towards economic liberalisation or as a comparative analysis of pre- and post-reform trends (policy shift analysis).

First, because of data limitations pointed out in the introduction, the present study does not squarely treat the behaviour of the real exchange rate in the period 1990 to the present (1995). As could be noted, computations of the real exchange rate - along the concept adopted by this study - require massive data not all of which are available concurrently. However, the time lags considered, extension of similar analysis to at least 1994 is feasible. This would make possible a more comprehensive analysis of RER developments implied by the trade and exchange rate reforms.

In this connection, one of the areas that requires an evaluation is the nature and extent to-date, of the foreign exchange market, related institutional / financial reforms, the sustainability of exchange market unification (achieved in 1993) and the implications for policy and economic agents (mainly the participants).

As for the prospects of export expansion and diversification issues, the stock of the specific export incentive schemes need to be revisited. To what extent have these schemes been or need be "deepened"? Or which of these incentives can be dispensed with given the widening economic reforms? Such an enquiry would, *inter alia*, give hints about the capacity of government or the institutions so-assigned, to administer these schemes in a credible manner, a factor that might attract or repel much needed private and foreign enterprise in the export sector. The scope of government involvement in helping domestic firms get on an "equal footing" with foreign firms would be an important theme in this regard. What could be added on the agenda as well, is the unfinished process of divestiture and its implications for potential export firms.

As noted earlier, it has been difficult to draw definitive implications for policy of the external terms of trade and capital inflows basing solely on our present results. A more detailed study of the price, and income effects of these *quasi*-policy variables could be helpful in highlighting the effects of these variable on the real exchange rate, and ultimately on export performance.

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APPENDIX : STATISTICAL TABLES

ABBREVIATIONS IN THE APPENDICES

BEL = Belgium
BF = Belgian franc
DG = Dutch Guilder
DM = deutsche mark
FF = French franc
FRA = France
GDP = Nominal GDP in million TSHs
GDP = Real GDP in million TSHs
GER = Germany
IL = Italian lire
ITA = Italy
JAP = Japan
JY = Japanese Yen
M/GDP = Total merchandise imports/output ratio (percent)
NET = The Netherlands
RUP = Indian Rupee
RXG = Total agricultural exports in real terms in million TSHs
RXMA = Total manufactured exports in real terms in million TSHs
RYG = Real GDP of the agriculturalsector in million THSs
RYMA = Real GDP if the manufacturing Sector in million TSHs
SK = Swedish crown
SWE = Sweden
TXD = Total exports in thousands USD
UKP = United Kingdom Pound Sterling
USD = United States of America Dollar
X/GDP = Total merchandise exports/output ratio (percent)
Xan = Total agricultural exports in nominal terms in million TSHs
Xmn = Total manufactured exports in nominal terms in million TSHs
Xn = Total merchandise exports in nominal terms , million TSHs
Xr = Total merchandise exports in real terms in millon TSHs

Table A3.1 Nominal Exchange Rates: Tanzania's Shilling against Major Trading Partners' Currencies *(in units of TSH per unit of foreign currency)*

Year	UKP	USD	DM	RUP	DG
1967	17.2275	7.1772	1.7969	0.95200	1.9942
1968	17.2286	7.2253	1.8082	0.95200	2.0066
1969	17.2286	7.1756	1.9481	0.95200	1.9817
1970	17.2286	7.1683	1.9660	0.95200	1.9940
1971	18.3165	7.1785	2.1954	0.95187	2.2024
1972	16.8979	7.1964	2.2480	0.94022	2.2305
1973	16.0846	6.9345	2.5672	0.90674	2.4583
1974	16.8625	7.1786	2.9929	0.88126	2.8801
1975	16.7976	8.2971	3.1673	0.87989	3.0932
1976	14.2753	8.3579	3.5504	0.93527	3.4058
1977	15.3452	7.9932	3.7862	0.94862	3.8099
1978	15.2280	7.4520	4.0990	0.94105	3.7865
1979	18.4423	8.2627	4.7912	1.01157	4.3486
1980	19.6460	8.2230	4.1931	1.04286	3.8559
1981	15.8292	8.3268	3.6737	0.95623	3.3413
1982	15.5070	9.5156	4.0181	0.98149	3.6418
1983	18.0884	12.4576	4.5784	1.10308	4.0731
1984	21.1105	18.1051	5.7780	1.34560	5.1157
1985	23.5857	16.4993	6.5892	1.41240	5.8529
1986	75.9492	51.7189	26.5634	2.59297	23.5033
1987	155.5051	83.7174	524874	4.95757	46.6392
1988	226.1250	125.000	70.5020	7.13444	62.4532
1989	309.6991	192.300	113.703	8.90361	100.665
1990	379.2906	195.070	131.637	11.14431	116.684

Table A3.1 (continued)

Year	FF	BF	IL	SK	JY
1967	1.4609	0.1445	0.0115	1.3903	0.01983
1968	1.4626	0.1446	0.0115	1.3983	0.01983
1969	1.2931	0.1447	0.0115	1.3915	0.01983
1970	1.2988	0.1443	0.0115	1.3875	0.01983
1971	1.3739	0.1596	0.0120	1.4705	0.02044
1972	1.4065	0.1634	0.0120	1.5174	0.02355
1973	1.4757	0.1682	0.0141	1.5187	0.02584
1974	1.6166	0.1994	0.0110	1.7767	0.02445
1975	1.8586	0.2102	0.0121	1.8868	0.02483
1976	1.6866	0.2333	0.0096	2.0385	0.02826
1977	1.7000	0.2454	0.0093	1.7128	0.03087
1978	1.7913	0.2592	0.0090	1.7395	0.03664
1979	2.0553	0.2957	0.0103	1.9922	0.03751
1980	1.8162	0.2615	0.0089	1.8773	0.03617
1981	1.4557	0.2168	0.0069	1.4935	0.03754
1982	1.4205	0.2042	0.0069	1.3088	0.03726
1983	1.4953	0.2241	0.0075	1.5579	0.04690
1984	1.8821	0.2676	0.0094	2.0254	0.06437
1985	2.1483	0.3227	0.0097	2.1469	0.07324
1986	8.0234	1.2759	0.0382	7.5879	0.19404
1987	15.5018	2.5061	0.0712	14.3315	0.44428
1988	20.6322	3.3589	0.0956	20.4049	0.77480
1989	33.2555	5.3979	0.1517	30.9712	1.04719
1990	38.7823	6.3728	0.1735	34.9916	1.34726

Sources: Bank of *Tanzania Economic and Operations Report (various): For* India and Japan: cross-rates against USD based on IMF (1992) *Financial Statistics Yearbook* 1992.

Table A3.2: Export Unit Values of Manufacturing (in USD) of Tanzania's 10 Major Trading Partners *(Indices 1987 = 100)*

Year	UK	GER	USA	India§	NET	FRA	BEL	ITA	SWE	JAP
1967	27.7	25.4	36.2	26.0	30.7	27.4	21.9	24.0	26.5	26.5
1968	26.0	25.0	37.2	25.9	30.4	27.3	21.7	24.1	26.7	26.7
1969	27.4	25.9	39.0	26.4	30.7	27.5	22.8	24.7	27.9	27.9
1970	29.7	26.4	41.8	28.0	31.5	28.4	24.2	26.2	29.8	29.8
1971	31.6	28.7	43.1	29.4	32.6	30.0	24.0	28.2	30.9	30.9
1972	33.8	32.2	44.3	32.0	36.4	33.0	28.2	31.6	34.2	34.2
1973	36.4	40.4	47.7	37.3	43.5	39.9	36.5	36.9	41.6	41.6
1974	43.5	47.7	56.7	47.9	55.9	45.8	46.8	44.5	53.6	53.6
1975	51.3	54.4	65.0	49.8	62.4	54.7	52.0	51.7	53.2	53.2
1976	46.3	51.5	69.7	48.8	62.1	54.3	51.9	49.5	52.3	52.3
1977	55.4	57.4	73.8	52.5	68.3	58.2	57.3	55.4	57.6	57.6
1978	66.6	67.5	78.8	52.2	76.7	67.8	66.5	62.6	71.5	71.5
1979	81.6	77.7	89.0	58.5	88.3	79.4	78.2	73.4	74.8	74.8
1980	100.6	85.1	99.3	70.2	96.3	88.0	89.6	84.7	79.2	79.2
1981	92.6	72.1	108.2	78.8	83.9	76.9	76.9	78.5	83.6	83.6
1982	84.5	70.3	112.3	80.7	81.9	72.3	72.4	75.9	78.3	78.3
1983	78.9	67.9	111.0	87.1	77.3	68.8	70.7	71.7	76.7	76.7
1984	74.3	63.1	111.6	94.5	70.4	66.2	67.6	68.9	76.6	76.6
1985	76.2	64.0	107.4	100.0	68.9	68.0	68.6	69.3	76.3	76.3
1986	86.8	84.7	104.1	105.4	84.2	86.4	87.2	87.5	91.5	91.5
1987	100.0	100.0	100.0	111.7	100.0	100.0	100.0	100.0	100.0	100.0
1988	109.8	103.3	101.4	121.3	105.6	104.3	105.6	102.3	109.8	109.8
1989	106.2	100.6	103.3	134.2	102.6	101.3	106.4	106.7	109.1	109.1
1990	119.0	116.3	102.7	143.1	118.6	116.5	122.3	124.1	108.3	108.3

Sources: O.E.C.D (1992) *Main Economic Indicators* India§ Wholesale Price Index 1987 = 100) from: IMF (1992) *International Financial Statistics Yearbook*..

Table A3.3 Tanzanian Shilling: Schedule of Major Changes in *Parity*

Date	Per cent change	*Par* TSH/USD	Remarks
June 1966	-	7.1375	TSH pegged to UKP at TSH.20 = UKP 1
Nov. 18, 1967	-	7.1428	UKP was devalued against strong currencies. TSH appreciated 16%. TSH was delinked from UKP to USD.
Dec. 22, 1971	7.9	7.1785	against the USD
Feb. 17, 1973	10.0	7.1964	against the gold standard following 10% devaluation of USD
Jan.20, 1979	15.0	8.2904	against SDR
Mar.7 1982	10.0	9.4069	against USD
Jun. 6,1983	20.3	12.2414	against basket* of Tanzania's major trading partners
Jun. 15, 1984	25.9	17.1742	against USD
Jun. 19, 1986	25.0	40.004	against USD from TSH 30 to 40
Nov. 5, 1988	21.0	120.00	against USD from TSH. 99.17
Jun. 23,1989	4.8	145.00	against USD from TSH. 137.86
Nov. 1989	ca.31.2	190.00	against USD

Note:* The "basket" need not necessarily include some or all of the countries selected in the present study.

Source: Bank of Tanzania, Research and Statistics Department.

Table A3.4 Data in the Real Exchange Rate Regression

Year	T	K	GC	XT	IM	MAP
1967	102.3085	0.028978	0.127691	97.8908	0.371460	0.065628
1968	97.4817	0.037984	0.154553	97.9348	0.374454	0.019076
1969	117.8384	0.044759	0.159517	96.9826	0.349896	0.342718
1970	111.7523	0.083603	0.147048	97.3626	0.395416	0.192933
1971	103.6726	0.143017	0.154115	97.1303	0.418470	0.137523
1972	100.0000	0.115092	0.148923	98.0585	0.402139	-0.08087
1973	124.6590	0.122071	0.171279	97.7800	0.414683	0.018291
1974	113.3264	0.103647	0.185867	92.5089	0.472691	0.526236
1975	97.1668	0.127343	0.191841	91.9392	0.415426	0.101309
1976	132.4239	0.069578	0.184232	96.2001	0.215763	-0.031123
1977	147.3242	0.083244	0.167639	81.4341	0.221898	-0.03782
1978	120.5666	0.098324	0.195403	84.9207	0.274338	0.445502
1979	120.3568	0.116592	0.185447	89.9668	0.249071	0.134438
1980	104.9318	0.084861	0.147221	88.8332	0.219291	0.040280
1981	89.1920	0.078339	0.139047	95.7736	0.179649	0.092699
1982	92.5498	0.060642	0.154892	99.5508	0.150208	-0.02664
1983	95.4880	0.062115	0.150827	99.7189	0.103775	-0.132424
1984	100.9444	0.066976	0.177162	99.7244	0.085009	-0.311960
1985	94.9633	0.091598	0.143917	99.6718	0.097120	0.089114
1986	108.7094	0.148500	0.167771	100.0000	0.135947	-0.717941
1987	93.8090	0.255275	0.126926	100.0000	0.182731	-0.585616
1988	98.9507	0.295002	0.125740	100.0000	0.182152	-0.32925
1989	97.5866	0.385799	0.135259	100.0000	0.237136	-0.32058
1990	93.3893	0.490097	0.130500	100.0000	0.188819	-0.36530

Notes: Variables are as they appear in the text (esp. 3.4.2). The dependent variable, the RER is the index of multilateral exchange rate is the same as MRER in Table 3.2 in the text.

Table A4.1 Data on GDP and Aggregate Exports and Imports.

Year	GDPn	GDPr	T Xn	T Xr	T Xan	T Xmn	X/GDP
1967	6735	13786.50	1796.90	3678.20	1036.90	141.60	26.68
1968	7182	14446.00	1719.00	3465.70	1089.30	126.10	23.94
1969	7460	14746.00	1756.50	3472.00	1085.30	138.50	23.55
1970	8215	15600.08	1797.20	3412.80	1187.40	122.50	21.88
1971	8857	16254.36	1913.10	3510.90	993.40	218.40	21.60
1972	10032	17347.40	2312.70	3999.10	1379.10	171.40	23.05
1973	11490	17874.92	2581.10	4015.40	1589.30	192.30	22.46
1974	14010	18323.31	2878.10	3764.20	2008.00	287.60	20.54
1975	16988	19405.99	2764.00	3157.40	1747.60	231.90	16.27
1976	21652	21652.00	4108.00	4108.00	3037.00	327.40	18.97
1977	25698	21739.28	4518.50	3822.40	3557.20	374.50	17.58
1978	28582	22001.38	3634.80	2798.00	2970.90	426.50	12.72
1979	32117	22755.42	4494.10	3181.85	2879.50	819.20	13.99
1980	37454	23419.00	4167.70	2605.95	2760.00	760.60	11.13
1981	43906	23300.96	5087.10	2699.70	3590.00	495.70	11.59
1982	51946	23439.20	4230.10	1908.70	3042.00	397.90	8.14
1983	62608	22886.39	4270.10	1560.60	3127.00	495.70	6.82
1984	78143	23656.04	4354.90	1318.35	4007.00	466.10	5.57
1985	108083	24277.95	4265.90	985.20	3910.00	351.30	3.95
1986	140793	25070.03	11327.50	2017.00	8957.00	1115.60	8.05
1987	200377	26344.94	18512.10	2433.90	14667.00	3736.90	9.24
1988	285152	27459.91	27041.50	2604.00	25007.00	5149.40	9.48
1989	335505	28378.04	52777.50	4463.75	37830.60	9582.00	15.73
1990	400719	29368.11	64512.30	4728.00	46220.10	17302.70	16.10

Table A4.1 (continued)

Year	M/GDP	TXD	YMA	RYG	RYMA	RXG	RXMA
1967	24.32	251.67	784	5784.27	1580.65	2090.52	285.48
1968	25.53	240.76	890	6032.26	1794.36	2196.17	254.23
1969	22.92	246.01	1019	6090.14	2014.23	2145.29	273.37
1970	27.68	251.71	1137	8411.27	2159.13	2954.02	281.15
1971	30.77	267.94	1301	8480.57	2387.60	2412.54	536.42
1972	28.74	323.91	1571	9112.00	2716.58	3125.96	337.97
1973	30.28	367.68	1730	9078.00	2691.35	3178.60	358.96
1974	38.38	403.10	2035	8807.62	2661.52	3251.05	462.81
1975	33.61	375.03	2436	9529.52	2782.73	2376.74	312.17
1976	24.71	490.22	2811	9046.00	2811.00	3037.00	327.40
1977	24.12	545.05	3287	9156.15	2780.64	2926.08	299.60
1978	31.02	471.44	3859	8983.18	2970.52	2134.03	301.57
1979	28.25	546.73	3668	9049.73	2598.84	1769.33	597.33
1980	27.52	505.75	4097	9374.98	2561.75	1555.36	497.59
1981	22.88	553.74	4501	9472.49	2388.69	1672.06	242.29
1982	20.25	415.35	4361	9600.71	1967.78	1104.21	185.60
1983	13.65	379.70	4869	9879.21	1779.87	943.65	212.15
1984	12.35	388.33	5932	10273.39	1795.78	1169.52	184.04
1985	14.15	286.60	6665	10899.76	1497.11	696.02	176.94
1986	21.72	347.61	8551	11521.62	1522.62	1226.33	297.34
1987	29.61	347.29	14792	12034.16	1944.81	1496.03	566.77
1988	28.35	372.03	15187	12574.84	1462.50	1759.11	639.20
1989	43.73	379.64	15197	13150.70	1385.41	2402.69	1041.37
1990	33.96	393.60	18301	14612.75	1431.53	3069.31	1266.23

Sources: Various issues of *National Accounts of Tanzania*, *Foreign Trade Statistics*, *Statistical Abstracts*, URT (1992), Central Bank's *Economic and Operations Reports*, Bank of Tanzania (1982), *Economic Surveys* (*Hali ya Uchumi wa Taifa*, and IMF (1992, 1993) *International Financial Statistics*.

Table A4.2 Selected Major Exports by Area of Destination *(per cent)*

	1980	1982	1983	1984	1985	1986	1987	1988	1989	1990
Hulled Coffee										
Western Europe	70.5	72.6	76.7	85.0	92.1	89.0	78.5	87.8	74.7	81.3
Eeastern Europe	3.8	4.4	0	0	ne	0	2.7	0	0.8	2.2
North America	4.9	2.9	1.5	0.8	1.3	2.3	2.3	2.9	1.3	1.6
Asia/Oceania/M.E	8.75	17.2	9.4	5.9	6.4	8.3	7.3	11.1	11.8	14.0
Africa	12.0	9.5	12.5	8.3	ne	0.3	9.2	0	11.2	0.7
Other	ne	1.4	0	0	0	0	ne	0	ne	0.3
Sisal Fibre										
Western Europe	27.8	56.5	22.8	26.1	27.7	20.8	22.6	25.3	42.3	39.8
Eastern Europe	54.0	22.9	42.8	28.0	24.8	30.2	39.4	36.7	17.3	15.8
Norht America	0.8	0.5	0	1.9	0	1.3	0	0	4.4	0
Asia/Oceania/M.E	14.1	11.2	17.9	24.2	17.8	12.6	7.8	18.6	23.5	26.1
Africa	6.1	8.5	16.6	19.8	29.7	35.2	30.2	17.6	11.5	18.1
Others	1.2	0.5	0	0	0	0	0	1.9	1.0	0
Raw Cotton										
Westen Europe	24.1	31.7	33.8	40.6	54.7	41.3	44.0	39.4	24.6	27.6
Eastern Europe	1.0	18.7	17.4	5.7	9.9	1.1	4.3	0.7	2.3	2.1
North America	0.5	0	0	0	0	ne	ne	-	-	-
Asia/Oceanla/M.E	64.7	47.2	47.3	47.1	33.7	50.0	46.2	51.7	61.9	59.3
Africa	9.0	2.3	1.3	6.6	1.7	7.5	0.4	8.3	11.2	10.6
Others	0.8	0	0	0	0	0	-	-	ne	0.3
Tobacco-unmanufactured										
Western Europe	89.6	84.4	86.6	93.5	96.6	95.1	92.3	89.1	94.1	88.3
Eastern Europe	0	0	0	0	0	0	0	0	-	-
North America	0	ne	0	0	0	0	0	0	ne	-
Asia/Oceania/M.E	5.7	9.5	ne	ne	ne	3.1	2.3	3.2	4.5	3.9
Africa	3.8	5.6	7.9	5.1	2.5	ne	5.2	7.1	1.3	7.1
Others	1.9	0	0	0	0	0	-	0.5	-	0.6

Table A4.2 continued

Cashewnuts	1980	1982	1983	1984	1985	1986	1987	1988	1989	1990
Western Europe	0	0	0	0	19.2	10.9	0	0	-	-
Eastern Europe	0	0	0	0	15.7	0	0	0	-	-
North America	0	0	0	0	0	0	0	0.7	-	15.6
Asia/Oceania/M.E	98.3	100	100	100	65.1	89.1	100	99.3	63.4	84.4
Africa	1.7	0	0	0	0	0	0	0	36.6	-
Others	0	0	0	0	0	0	0	0	-	-
Tea										
Western Europe	75.8	55.5	56.8	57.4	63.3	45.3	45.4	33.3	35.4	23.6
Eastern Europe	0	0	ne	0	ne	0	0	0.5	0.7	ne
North America	6.6	13.9	8.2	10.6	6.7	8.4	2.2	1.9	2.0	42.2
Asia/Oceania/M.E	2.8	30.6	5.4	5.0	10.6	29.5	34.8	53.3	56.6	28.4
Africa	12.6	0	28.8	27.0	19.1	15.0	17.7	11.0	4.6	5.5
Others	2.2	0	ne	0	0	2.0	0	0	0.8	0
Cloves										
Western Europe	0	9.1	3.5	0	0.1	42.1	0.3	19.7	8.2	-
Eastern Europe	2.6	0	0	0	0	0	-	0	-	-
North America	0	2.0	0	0	0	0	-	0	-	-
Asia/Oceania/M.E	97.2	88.8	95.4	98.0	99.3	57.5	99.4	85.2	91.9	99.9
Africa	ne	0	1.2	2.0	0.6	ne	0.3	0	0	0.1
Others	0	0	0	0	0	0	0	0	0	-

Notes: M.E = Middle East, ne = amount negligible, - data not available.

Source: Computed from export values in million TSH from URT(1993) *Foreign Trade Statistics 1990*:32, Table 12).

Table A4.3 Selected Major Exports: Tanzania's Share of Consumption in World Total

(as per cent of World Total Consumption in '000' metric tonnes)

Year	Coffee	Cotton	Tea	Tobacco
1970	0.02	0.06	0.10	0.10
1975	0.03	0.08	0.10	0.10
1980	0.02	0.10	0.20	0.10
1982	0.02	0.10	0.20	0.10
1985	0.02	0.08	0.20	0.10
1989	0.02	0.08	0.20	0.10
1990	ne	0.07	0.10	0.10
1991	ne	0.09	ne	0.10

Note: ne = negligible, though positive in magnitude.

Source: Computed from UNCTAD *Commodity Year Books* (1988, 1989, 1993).

Table A4.4 Composition of Merchandise Imports by End-Use *(per cent)*

Year	Consumer goods	Intermediate goods	Capital goods
1967	36.6	40.7	23.7
1970	30.0	40.4	29.6
1971	25.3	44.0	30.7
1972	28.7	45.9	25.4
1973	30.4	45.8	23.8
1974	37.0	42.2	20.8
1975	31.4	41.4	27.2
1976	20.7	49.1	29.6
1977	18.6	41.4	40.0
1978	19.4	40.4	40.2
1979	14.6	40.4	45.0
1980	20.4	37.9	41.6
1981	16.2	34.8	48.9
1982	17.2	39.0	43.6
1983	16.9	42.8	40.0
1984	17.9	42.4	39.6
1985	16.2	40.1	43.5
1986	20.0	32.6	47.2
1987	16.7	30.2	53.1
1988	23.1	42.8	34.1
1989	18.4	31.7	49.9
1990	8.1	50.3	41.6

Sources: URT *Economic Survey* and *Hali ya Uchumi wa Taifa* (various issues).

Table A4.5 Average Capacity Utilisation in Selected Industries *(percentages)*

Industry	1976-79	1980-85	1986-90
Textiles	86.75	38.33	26.52
Cigarettes	80.75	71.14	48.28
Tyres/Tubes	81.25	51.00	36.94
Sisal ropes and Twines	59.75	34.66	24.87
Cement	76.25	27.67	38.71
Batteries	70.25	60.67	58.53
Corrugated Iron Sheets	56.75	48.50	49.56
Real Manufacturing GDP Growth Rate	*1.79*	*-4.89*	*3.95*

Notes and Sources: Selection and computations made on basis of complete annual observation from Musonda (1992:96 Table 3.8) up to 1988. Textiles 1986-90 data completed from Mbelle(1992: 190, Table 4). For the rest 1989 and 1990/91 figures are used from Bank of Tanzania *Economic Bulletin* Vol XIX No. 3 Table 2 p.8 for average of Jan-Dec, 1989, and Bank of Tanzania *Economic and Operations Report* June 1991 for 1990/91.

Table A5.1 Critical Values (5%) for Unit Root Tests : Dickey Fuller (DF) and Sargan-Bhargava (SBDW) test statistics

DF[a]		SBDW	
T	value	T	value
25	-3.00	50	0.78
50	-2.93	100	0.39
100	-2.89	200	0.20
∞	-2.86		

Notes: a for individual data series. The model is autoregressive of order 1, and with a constant, e.g. $v_t = \gamma + \alpha v_{t-1} + u_t$, for a given series v_t. The *Augmented* DF model is of the form $\Delta v_t = \gamma + \beta v_{t-1} + \sum_{1}^{p} \beta_i \Delta v_{t-i} + \varepsilon_t$, T is sample size.

Sources: Adams (1992, 1993), Maddala (1992: 606).

Table A5.2:Critical values (5%) for Cointegration Tests

T	SBDW	DF	ADF
50	0.78	-3.67	-3.29
100	0.39	-3.37	-3.17
200	0.20	-3.37	-3.25

Sources: same as for Table A5.1.