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The Impact of Exchange Rate  
Devaluation  
on Import and Export Flows  
in  
Mozambique

*Maria Isabel Munguambe*

A Dissertation Submitted to  
the School of Economics and Social Studies  
of the University of East Anglia  
in Part-fulfilment of the Requirements  
for the Degree of Master in Economics and Finance

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## Acknowledgments

To my husband, children and family

## 0. Abstract

One of the proclaimed goals of exchange rate devaluation policies carried out under conventional IMF and World Bank structural adjustment programmes has been to improve the deficit of the balance of trade. This has to do with the theoretical proposition that depreciating the domestic currency can lead to an increase in exports as a consequence of a country's increased international competitiveness or to a decrease in imports as a result of reduction in absorption in relation to real output.

This dissertation aims to examine the extent to which the exchange rate depreciation has affected the balance of trade performance in Mozambique, during the period 1987:I to 1996:IV.

The study yields the following conclusions:

1. The estimated elasticities are generally low.
2. Relative prices have low elasticities and do not have a significant effect on the level of imports of the country although they have a significant (negative) impact on the level of exports.
3. The REER elasticity is low for exports. Although has a unity (negative) elasticity for imports it is not significantly different from zero.
4. Income elasticity presents unit elasticity for imports but it is not statistically significant. As to exports the income elasticity is less than one which is not statistically significant as well.

The results of the present study suggests that the Marshall-Lerner condition does not hold so far. Thus, it is not straightforward to conclude that measures towards exchange rate devaluation, by themselves, would generate the expected improvement in the trade balance. Complementary economic policies upon the balance of payments should be taken into consideration in order to generate the expected positive response of the trade balance.

## 1. Introduction

The present dissertation focuses on the Mozambican experience in the field of international finance policies, namely the exchange rate devaluation policies, and the correspondent effects on the balance of payment, particularly in matters related to the *deficit* of the balance of trade and the current account.

Since Mozambique achieved its political independence from Portugal, in June 1975, the country has been ruled under two different political systems:

- The first one, during the period 1975-1987, with the features of a centrally planned economy;
- The second, since 1987, a market-oriented economic system.

In connection with these political systems, two different exchange rate regimes came into force at the economic level, namely (i) the *fixed exchange rate*, which was inherited from the colonial era, and (ii) the *floating exchange rate*, which entered into force in connection with the three-year structural adjustment programme, known as the Economic and Social Rehabilitation Programme (PRES), launched in 1987 by the Mozambican government under the auspices of the Bretton Woods institutions, namely the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD) or World Bank, to which the country formally joined since September 1984.

The structural adjustment programme in Mozambique can be seen as a consequence of a number of internal and external shocks and adverse factors as well as a succession of natural disasters for long periods of time (namely droughts and flooding), which led to a heavily indebted economy following a dramatic shortage of foreign exchange currency, that had become serious from 1982.

Thus, the aim of the PRES was to achieve financial stability both at a national and international level, and to reactivate the economy in a sustainable form, by eliminating internal and external imbalances in the economy.

To this end, a series of financial, monetary and trade policy measures have been implemented in order to revert the negative trend of the economic performance of the country, being the measures connected to the exchange rate considered as the crucial ones for the purpose of strengthening the position of the balance of payments and the establishment of a better relationship between the country and its partners and creditors as well.

Measures related to exchange rate, were at two different levels: Firstly, a gradual reform on the then in force exchange rate system, i.e., from *fixed* to *floating* regime, meaning the gradual dismantling of exchange controls towards a market-based rate. Secondly, a devaluation process of the national currency, the *Metical* (MT) through a unification between the values of official exchange rate and the prevailing exchange rates within the parallel market.

The aim of this work is to evaluate the outcome of the exchange rate devaluation process for the import and export flows in Mozambique, during the period 1987:I - 1986:IV. To carry out this 3 x objective, the rest of the work is structured as follows: *Section 2* presents facts about economic background and exchange rate regimes in Mozambique; *Section 3* outlines the theoretical framework and a review of literature. It also presents some aspects of the current debate on the subject of devaluation; An econometric model, data and methodology, as well as the analyses of empirical findings is presented in *Section 4*; Finally, *Section 5* highlights the concluding remarks.

## 2. Facts about economic background in Mozambique

### *General overview*

Mozambique, a sub-Saharan country, is situated on the southern east coast of the African continent. It is bounded on the east by the Indian Ocean, on the north by Tanzania, on the west by Zambia, Malawi, Zimbabwe, Botswana and South Africa, and on the south by South Africa and Swaziland<sup>1</sup>.

The country's economy has great potential with significant natural resources which includes forests and wildlife, minerals, fisheries, natural gas and hydroelectric resources, as well as unexplored capacities in the field of tourism and a privileged location with about 2,500kms of the Indian Ocean coast with three superb ports, each railway linked to inland thus being the natural way to the open sea for four of its inland neighbouring countries (Malawi, Swaziland, Zambia and Zimbabwe).

This natural endowment, particularly in so far to the ports is concerned, has been an important source of foreign currency which has contributed to the softening of the account balance deficit.

However, according to the World Bank<sup>2</sup>, Mozambique is considered one of the world's poorest and least economically developed countries in the sub continent. With an estimated population of 18.0 millions in June 1996, the country's total GDP was approximately US\$1740 million, corresponding to a per capita of only US\$ 96.4.

<sup>1</sup>see map in annex.

<sup>2</sup>World Development Report 1990.

For five hundred years, Mozambique was a Portuguese colony, having gained its independence in June 1975, with a backward economy that was and still is structurally dependent and extremely vulnerable: Actually, Mozambique operated transit facilities towards its ports for neighbouring countries, and supplied basic raw materials to Portugal, the colonial center, mainly by the monoculture of sugar, cotton, tea, sisal and cashew nuts, produced in intensive forced labour schemes. It also served as a market to sell manufactured goods from Portugal.

During the colonial era, the country was also a considerable reserve of cheap labour force for the gold mines and farms in South Africa and Rhodesia. In 1970 there were 113,000 Mozambicans working in South Africa gold mines. In return, Portuguese authorities received for decades 60 percent of that labour force wages in gold at the official price corresponding to US\$ 34.13 per ounce.

Portugal was then able to sell the gold at a profit on the world market as the price of gold rose, thus providing important foreign resources to partially cover the chronically external imbalances accounts between the colony and the colonized country. However, after the independence, these revenues fell dramatically with a negative impact on the country's foreign currency earnings, when South Africa unilaterally canceled the gold agreement and reduced the inflow of Mozambican immigrating worke force.

Nowadays, about 80 percent of Mozambique population live in rural areas being dependent on family subsistence production. As a consequence, Mozambique has a heavily dependent export sector which is supported by a set of agricultural and other primary products that traditionally accounted for a significant proportion of the GDP (cashew nuts, shrimps, cotton, sugar, sisal, copra, tea, timber, mineral coal, citrus fruit). In addition, the country rely, to an even greater extent, on the importation of crude oil, raw materials, capital goods and machinery, intermediate producer goods as well as consumer products, which

are not produced domestically, in order to fulfill its industrial expansion and satisfy the rising consumption necessities of an ever growing urban population.

### *Exchange rate regimes*

As to the exchange rate regimes, Mozambique has inherited a *fixed exchange rate regime* from Portugal, by June 1975, when the country becomes independent. The then domestic currency, *Mozambican Escudo*, was linked to the *Portuguese Escudo* for the purpose of exchange rate procedures, through the Bank of Portugal.

It came to an end in 1977 when Portugal had to devalue the *Portuguese Escudo*, following its economic and readjustment programs under the IMF and World Bank auspices.

By that time, without moving away from the fixed exchange regime, Mozambique's monetary authorities decided to introduce an independent new basis for the determination of the exchange rate, where the domestic currency was pegged against a set of representative foreign currencies in the country's economy, in order to stabilize the domestic currency, and to avoid adverse inflationary effects degenerated by the Portuguese economic performance.

However, the apparent stability of the domestic currency and its consequent overvaluation trend had contributed to the worsening of a number of financial and structural desequilibra within the country economy. In addition, natural disasters such as severe years of droughts, military instability, as well as the serious effects of the international crisis generated by the second oil shock in 1979, led to a 25 percent fall in GDP between 1980 and 1987, and a 75 percent fall in exports. Hence, the country reached a situation in which an extremely low exchange rate was artificially maintained by the monetary authorities, thus meaning an overvalued domestic currency.

The economy became distorted and the fixed exchange rate increasingly prove to be ineffective under the circumstances, leading to a steady growth of informal market activities. After a negative evolution of the variables dictating the Mozambique's economy, the government decided to join the Bretton Woods institutions, and to move from a central oriented economy to a market oriented one. As referred before, such move led to the introduction of the Economic and Social Rehabilitation Program (PRES), launched by the government in 1987, with the assistance of the earlier on referred Bretton Woods institutions.

The PRES comprises a package of macroeconomic policies and measurements which aim at the reactivating of the productivity and the gradual reduction of internal and external imbalances. In this list of measurements the exchange policy was viewed as one the most important for the program to be successful.

In 1986, the domestic currency was clearly overvalued, being exchanged in the parallel market against the US\$ at about 41 times the official rate. But since 1993, the domestic exchange rate has been market determined. However the adjustment of the exchange rate towards the market rates took a long and gradual path:

According to the Bank of Mozambique, the currency was devaluated from 39 MT per US\$ to 202 MT per US\$, in 1987, and the exchange rate peg was changed from a basket of six currencies to the US\$, in a *flexible* base. Devaluation continued at regular intervals until 1989, April, when a system of monthly devaluation was instituted.

In December 1989, in an even *more flexible* basis, the exchange rate peg was changed again to a basket of ten trading partners' currencies and in October 1990, a secondary market for foreign exchange was introduced with market determined exchange rates.

In 1991, after another substantial devaluation, the secondary market became the principal exchange market. In 1992, official and secondary market were brought together, but a special rate for tied aid was temporarily introduced having been abolished later on in 1983.

Although a parallel exchange rate market still exists, the premium between the official and parallel market rates was by 1996 down to less than 4 percent in December 1995.

As a concluding remark we may notice that the exchange rate has been brought to market levels, with little difference from the parallel market rate, through initial devaluation and the subsequent establishment of a foreign exchange market.<sup>3</sup>

### *Trade and balance of payments in Mozambique*

In 1986, under a fixed exchange regime, trade in Mozambique had a number of comprehensive restrictions on international trade. All imports and exports were subject to licensing.

Import licenses were granted on the basis of a central plan and the availability of foreign exchange directed to five different funds (namely the export retention fund, the freight fund, the petroleum fund, a fund for specific projects, and the general exchange fund).

Enterprises were allowed to import and export directly, since 1987, and the number of products controlled by state trading monopolies was substantially reduced. It was only in 1990 that a system of nonadministrative allocation of foreign exchange for key imported inputs for selected industries became operational.

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<sup>3</sup> see table 2.1.

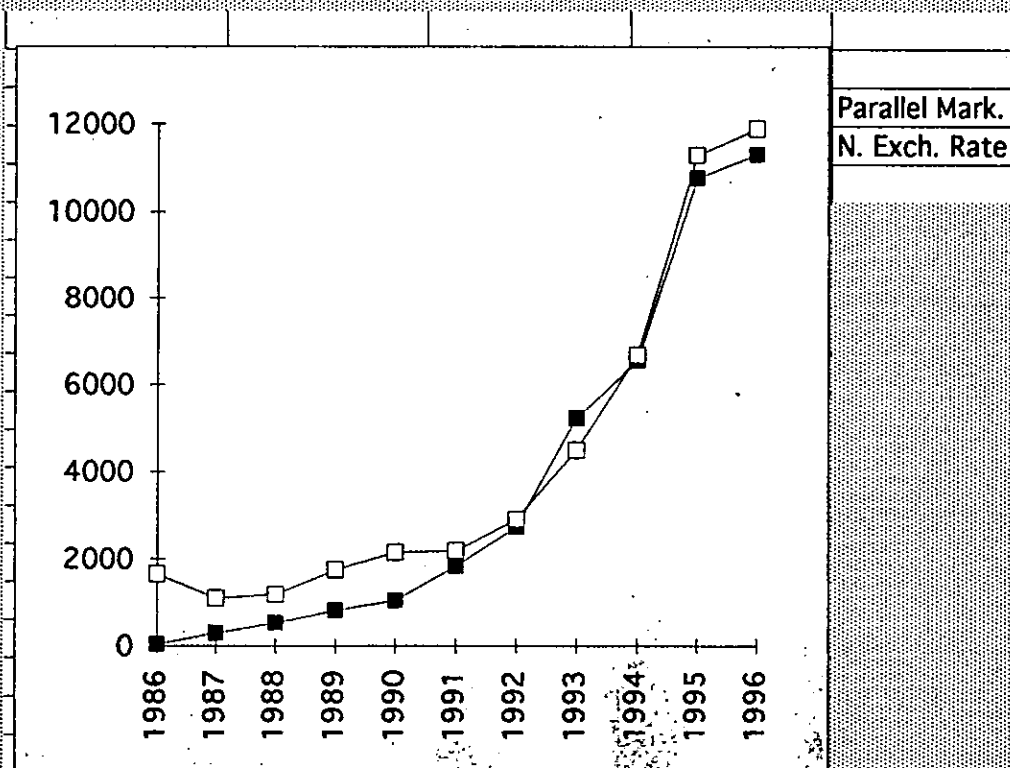
Table 2.1: Nominal, Parallel and RER (1986- 1996)

TIME	OFFICIAL NER (END-PERIOD) (MT/US\$)	PARALLEL MARKET (MT/US\$)	REER (1990=100) (PER MT)	OFFICIAL NER (% CHANGE)	RATIO OF PARALLEL TO OFFICIAL RATE
1986	39.7	1650	377.4	-8.0	41.6
1987	289.4	1096	147.7	628.3	3.8
1988	528.6	1183	95.6	82.6	2.2
1989	819.7	1755	99.2	55.1	2.1
1990	1038.2	2155	100.0	26.6	2.1
1991	1845.4	2193	85.0	77.8	1.2
1992	2742.1	2917	65.5	48.6	1.1
1993	5238.4	4500	63.9	91.0	0.9
1994	6552.5	6679	61.8	25.1	1.0
1995	10776.0	11300	59.1	64.5	1.0
1996	11307.0	11900	67.9	4.9	1.1

Sources: Bank of Mozambique;  
Mozambique Statistical Yearbook, 1996;

Note:

REER : Real Effective Exchange Rate  
NER: Nominal Exchange Rate



In 1991, with the expansion of the secondary foreign exchange market, the system of import licenses was significantly streamlined. In August 1991, the tariff structure was simplified from one with 34 rates to one with only 5 rates ranging from 5 to 35 percent.

In December 1993, the tariffs on imported inputs were reduced to 5 percent. While import and export licenses are still required, they are used primarily to ensure compliance with import-support procurement rules imposed by donors and for statistical purposes. The exchange and trade system have largely been liberalized, with only a few restrictions remaining on current transactions. Import and export licensing procedures have been considerably streamlined and now fulfill mostly statistical purposes to meet the procurement and auditing requirements of import-support schemes.

In the early eighties, the balance of payments with respect to the external economic relations held between Mozambique and other countries evolved in the following manner:<sup>4</sup>

*Table 2.2.* reveals a BOP with a chronic reduction in exports, over the period 1980 - 1986. The observed reduction can be explained as follows:

- The negative effects of the continuous drought which directly affected the principal agricultural products for exportation;
- Irregular supply of crude oil and the consequent significant decrease in the receipts concerning the exportation of oil derivatives, namely fuel and diesel;
- Destructive and destabilizing actions directly done by the then Southern African apartheid regime in support to the armed rebel force in the country. Those actions destroyed commercial network particularly in the countryside, the majority of wooden sawmills, a great deal of infrastructures and a diversity of equipment. All this, blocked the normal flow of goods for consumer and export purposes.

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<sup>4</sup> see *table 2.2.*

Table 2.2. BOP (1980-1986)

Period:1980 - 1986  
(In millions US\$)

ITEMS	1980	1981	1982	1983	1984	1985	1986
<b>Trade Balance</b>	-519.4	-520.3	-606.7	-504.8	-444.0	-347.1	-463.6
• Exports	280.8	280.8	229.2	131.6	95.7	76.6	79.1
• Imports	800.2	801.1	835.9	636.4	539.7	423.7	542.7
<b>Services Balance</b>	96.4	55.8	30.8	-0.1	-32.2	-92.9	-158.7
• Receipts	171.3	178.5	171.3	165.8	118.0	107.1	119.0
• Payments	74.9	122.7	140.5	165.9	150.2	200.0	277.7
<b>Current account without unreq. transfers</b>	-423.0	-464.5	-575.9	-504.9	-476.2	-440.0	-622.3
• Unreq. official transfers	55.9	57.4	79.4	89.6	167.7	139.0	213.0
• Private transfers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Current account with unreq. transfers</b>	-367.1	-407.1	-496.5	-415.3	-308.5	-301.0	-409.3
<b>Capital account</b>	364.2	409.0	395.3	42.8	-73.0	-39.7	-49.5
• Inflow	503.1	718.2	724.6	339.3	264.8	238.8	284.0
• Outflow	138.9	309.2	329.3	296.5	337.8	278.5	335.0
• Short Term Capital (net)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
• Direct Investment	0.0	0.0	0.0	0.0	0.0	0.0	1.5
<b>Errors and Omissions (net)</b>	-29.6	-70.1	-42.3	9.2	25.7	-22.7	-28.7
<b>Overall Balance</b>	-32.5	-68.2	-143.5	-363.3	-355.8	-363.4	-487.5

Source: Bank of Mozambique

The above mentioned break was not, however compensated by other receipts in foreign currency which forced the mobilization of reserves and also lead to the adoption of selective and restrictive policy in foreign currency expenses. At the same time, strict measures were introduced for import and "invisible" expenses.

In order to face the economic difficulties, caused by exogenous factors accumulated throughout the 1980s, besides supporting itself by its own means, namely by reducing in a significant way the international monetary reserves, the break in the receipts in foreign currency demanded other resorts such as:

- Donations that were offered by various countries and organizations (both non governmental and governmental) as a result of an international movement of solidarity towards Mozambique, which consisted in aid donations that constituted a significant support to the BOP ;
- The use of mid and long-term credit for sponsorship of projects, food products, oil, raw materials or even for helping the BOP;
- The utilization of trade credit from socialist countries. Such credits had favourable conditions of reimburse and interest.

The evolution of exports and imports of Mozambique by category of countries, over the period 1973-1982, i.e., the years shortly before and after independence, was as follows:<sup>5</sup>

The development of commercial exchange shows that until 1977, despite adverse exogenous factors that followed the political independence of the country (such as actions of economic sabotage by the former settlers and the fleeing of thousands of Portuguese skilled cadres; heavy flooding that affected the country in 1977 plus the effects of the Rhodesian sanctions and aggressions in 1976 and 1977), it was possible to maintain the deficit of Mozambique's external trade to the same level as in 1973.

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<sup>5</sup> see table 2.3.

Table 2.3. BOP by Categories of Countries

Current prices (10 <sup>6</sup> MT)						
COUNTRIES	1973	1975	1977	1979	1981	1982
OCDE Countries						
• Exports	4166	3200	3706	5861	5167	3453
• Imports	7874	6550	6445	7646	12382	12352
• Balance	-3708	-3350	-2739	-1785	-7215	-8899
Central Planned Economies						
• Exports	3	0	12	773	2040	1154
• Imports	5	56	117	3339	3982	7202
• Balance	-2	-56	-105	-2566	-1942	-6048
Other Countries						
• Exports	1372	1850	1205	1677	2720	4047
• Imports	3536	4139	4259	7590	11954	12020
• Balance	-2164	-2289	-3054	-5913	-9234	-7973
TOTAL						
• Exports	5541	5050	4923	8311	9927	8654
• Imports	11415	10745	10821	18575	28318	31574
• Balance	-5874	-5695	-5898	-10264	-18391	-22920

Source:Economic Information, 1984, Mozambique

Recent developments show that the balance of payments position strengthen in 1995<sup>6</sup>. The value of merchandise exports grew by 13.0 percent in 1995 to US\$ 169 million. This result reflected for the most part favourable international prices, as there was a decline in the volume of exports of main commodities.

In the event, the trade deficit declined from the previous year by about US\$ 255 million to US\$ 615 million. The services account deficit increased slightly, to US\$ 169 million. As a result, the current account deficit before grants declined by US\$ 210 million, to US\$ 684 million.

Mozambique's exports are still well below the levels attained in the past and represents one fifth the level of imports. As referred before, Mozambique has a large and relatively untapped natural resource base, particularly concerned to agroindustry and energy. Over the medium term, the resulting rise in the country's output and exports would substantially improve the balance of payments and reduce the country's dependence on external aid.

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<sup>6</sup> see table 2.4.

Table 2.4: BOP (1987-1997)

ITEMS	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
<b>Trade Balance</b>	-545.0	-632.6	-702.9	-751.1	-736.5	-715.7	-822.9	-869.0	-552.7	-556.5	-539.0
• Exports	97.0	103.0	104.8	126.4	162.3	139.3	131.8	149.5	174.3	226.1	221.0
• Imports	642.0	735.6	807.7	877.5	898.8	855.0	954.7	1018.5	727.0	782.6	760.0
<b>Services Balance</b>	-148	-102.7	-144.8	-112.6	-109.6	-132.8	-126.7	-162.8	-127.3	-85.3	-74.5
• Receipts	137.0	156.6	166.7	173.4	202.8	222.6	239.8	245.9	291.7	314.2	342.3
• Payments	285.0	259.3	311.5	286.0	312.4	355.4	366.5	408.7	419.0	399.5	416.8
<b>Current account without unreq. transfers</b>	-693.0	-735.3	-847.7	-863.7	-846.1	-848.5	-949.6	-1031.8	-680.0	-641.8	-613.5
• Unreq. official transfers	304.2	376.8	387.5	448.4	501.7	499.4	503.3	564.6	339.2	282.9	354.6
• Private transfers	0.0	78.0	85.0	97.5	107.6	110.0	125.0	137.5	0.0	0.0	0.0
<b>Current account with unreq. transfers</b>	-388.8	-280.5	-375.2	-317.8	-236.8	-239.1	-321.3	-329.7	-340.8	-358.9	-258.9
<b>Capital account</b>	-76.8	-126.2	-55.0	-83.5	-187.5	-155.1	-107.0	-22.1	57.6	238.6	184.5
• Inflow	301.1	247.5	256.7	251.4	144.1	169.8	185.5	260.3	282.3	347.4	317.4
• Outflow	384.1	378.2	315.1	344.1	354.1	350.2	324.5	317.4	269.7	181.3	197.3
• Short Term Capital (net)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
• Direct Investment	6.2	4.5	3.4	9.2	22.5	25.3	32.0	35.0	45.0	72.5	64.4
<b>Errors and Omissions (net)</b>	24.7	35.2	29.8	3.1	-33.6	-12.4	-7.8	4.2	27.1	57.8	-5.6
<b>Overall Balance</b>	-440.9	-371.5	-400.4	-398.2	-457.9	-406.6	-436.1	-347.6	-256.1	-62.5	-80.0

Source: Bank of Mozambique

### 3. The effects of devaluation: a theoretical framework and a review of literature

#### *Some important concepts*

At this stage, it is worth starting by some important concepts related to the subject under study.

To begin with, it can be said that exchange rates constitute instruments of a major importance within the foreign exchange market framework, as a means to overcome the barrier that results from the use of different currencies in international transactions.

Thus, an *exchange rate* ( $e$ ) is the price of one currency expressed in terms of another currency, either using *indirect quotation* (in terms of foreign currency units per unit of domestic currency as it is used in the UK), or *direct quotation* (in terms of domestic currency units per unit of foreign currency, which is commonly accepted as a more conventional definition).

The existing literature distinguishes between three main cases of exchange rates:

(i) *The nominal exchange rate* ( $e$ ) or simply the *exchange rate* as defined before, which is *bilateral* in its feature in the sense that it is the exchange rate for one currency against another, in nominal terms;

(ii) *The real exchange rate* ( $RER$ ) which tells us about the relative prices of goods between two different countries when measured in a common currency. It is also known as the *terms of trade* as it measures a country's competitiveness in international trade:

$$RER = \frac{eP^*}{P}$$

where  $P^*$  and  $P$  represent the foreign and domestic price levels, respectively and  $e$  the nominal exchange rate. This definition is most used for studies related to developed countries. Eduards (1988) presents an alternative concept of *RER* as a ratio of domestic prices of tradable goods ( $P_T$ ) to the nontradable goods ( $P_{NT}$ ) which is suitable for studies related to developing countries::

$$RER = \frac{P_T}{P_{NT}}$$

and,

(iii) *The effective exchange rate*, an index number that measures a given currency's value in terms of a trade-weighted average of a basket of foreign currencies. In this case, the specific weight attached to each currency in the basket depends upon its share of total international trade. Unlike the *nominal exchange rate*, the *effective exchange rate* is *multilateral* in its features as it involves a set of foreign currencies.

For the purpose of this study it is also helpful to distinguish between the concepts of *depreciation* and *devaluation*: Both consist of a fall in the value of a domestic currency against other currencies, in order to assist in the removal of a balance of payment *deficit*. While the former is determined under a *floating exchange regime*, by the forces of demand for and supply of currencies in the foreign exchange market, the later results from administrative reductions in the exchange rate of a local currency against other currencies, carried out by the monetary authorities, under a *fixed exchange regime*.

The expected effects of both *depreciation* and *devaluation* is to make imports more expensive and exports more cheaper, thereby reducing the domestic demand for imports and increasing export demand from the rest of the world.

## *Theoretical framework and a review of literature*

A review of the literature suggests that currency depreciation generates price incentives that, among other benefits, leads to an increase in exports because of higher export prices in domestic currency or increased international competitiveness (Crockett, 1981, Thomas, 1989) and a shift from production of goods that are heavy users of imported to those that depend on domestic inputs (Johnson, 1987).

To discuss the effects of devaluation on relative prices, balance of payments and current account and aggregate output, one must consider the following models of analysis:

- Simple Keynesian model
- Absorption approach
- Monetary approach and
- Synthesis model

Edwards, S., (1989: 70) presents a simple schematic description of the implications of these different models.<sup>7</sup>

Although there has been growing consensus on a theory that allows a simultaneous approach, authors still disagree on different forms that depreciation may assume: either large and very rare devaluation or small and frequent depreciation. On the other hand there is also the choice of using other alternative balance of payments policies such as "financial restraint or exchange controls".

The basic models of balance of payments policy assume that devaluation influences both external balance and internal balance. In the former, by reducing the current account deficit if certain conditions hold, while in the latter it leads to an expansion of output and employment in a given country.

---

<sup>7</sup> see table 3.1

Table 3.1. Effects of Devaluation under Alternative Models

Model	Relative prices	Bal. of Pay. and c/ac	Aggregate output
Simple Keynesian model	Nominal devaluat. always affects relat. prices and RER because domestic prices are given.	Nominal devaluat. improves c/acc and BOP, as long as Marshal-Lerner condition holds.	If devaluat. improves c/acc expressed in domestic currency, aggregate output increases in short and long run.
Absorption approach	If a country is specialized in production, a nominal devaluat. may result in relative price changes.	A devaluat. will improve the c/ac if it reduces expenditure relative to income, because of "expenditure reducing" or "expenditure switching"	Output may increase if there are unutilized resources. Under some conditions (nontradables and imported intermediate inputs, for example) output may decrease.
Monetary approach	If PPP holds, nominal devaluat. have no effect on the real exchange rate.	Short -run positive effects on BOP via real balance effect; model not specific about current or capital accounts.	No effect in short or long run; output is exogenous at full employment.
Synthesis	Relative prices are affected in short run; nominal devaluat. may also affect RER in medium to long run if initial condition is one of RER misalignment (effects depends on macropolicies.)	If devaluat. affects RER it will improve both the BOP and the c/acc; dynamics vary depending on specification used.	Devaluation can either increase or decrease aggregate output.

Source: Edwards, S. (1989:70), Table A-2.

Traditionally, the *elasticity approach* is one of the theory that examines the effect of exchange rate devaluation policies on the current account balance, assuming that income and all other things are held constant. To a large extent, whether devaluation is desirable or not will depend on whether it is effective in strengthening the current account, and the elasticities approach proposes a simple criterion, known as the *Marshall-Lerner condition* for judging whether devaluation will achieve that aim.

The *Marshall-Lerner condition* states that the sum of the country's elasticities of demand for imports and foreign demand for the country's exports is greater than unity for a large country; for a small country the sum should be greater than zero. This means that devaluation is not always an effective policy for improving the current account, if we assume that its effectiveness also depends on the degree of elasticity of a given country's trade.

Pilbeam (1992) reasons that despite their simplistic assumptions, two of the framework approaches, namely the *national income framework* and the *elasticity framework*, have remained influential because they contain clear and useful messages for policy makers. A devaluation is more likely to succeed when elasticities of demand for imports and exports are high and when it is accompanied by measures such as fiscal and monetary restraint that boost income relative to domestic absorption.

Edwards (1988a), go further reasoning that simple Keynesian models of open economy can be integrated with the elasticities approach to investigate the effectiveness of devaluation as policy tools. In this case, as long as the Marshall-Lerner conditions hold, a nominal devaluation will be effective: the balance of trade will improve, output will go up, and a real devaluation will take place as a result of a nominal adjustment to the exchange rate.

## Debate

Alongside with the overall programmes of structural adjustments, the specific issue of current depreciation, as a tool of ameliorating the balance of payments, has for long been a highly controversial one particularly among the developing countries, especially in Sub-Saharan Africa, when discussing with the IMF.

The controversy arises not only because there exist different alternatives for strengthening the balance of payments but also the empirical evidence gathered from the Sub-Saharan African countries that have gone through devaluation processes as a means to resolve their balance of payment desequilibria, shows very few positive results and general highly cost effective mechanism.

These costs made the governments very suspicious of the arguments for devaluation and quite often we find many African countries preferring to avoid depreciation whenever possible or, as the case of Mozambique, to adopt a more cautious attitude.

Towards the end of the 1970s, in an attempt to raise its popularity with respect to the advocacy of devaluation, the IMF decided to soft-pedal (Bird, G. 1983). This simply meant that instead of stipulating devaluation as a 'precondition' for its support or as a 'performance criteria', the Fund accepted much more muted agreements with governments to participate in reviews of the exchange rate, with the availability of Fund finance not normally depending on the outcome. However, Bird continues, this 'softening' in the Fund's attitude towards currency depreciation transpired to be temporary and by the end of early 1980s had to be reversed.

Before we proceed in analysing the *pros* and *cons* of the devaluation, it is worth noting that this controversy goes with the ever growing accusations against the institutions of the World

Bank and IMF. Some of the accusations go so far as to say that the Bank and the Fund:<sup>8</sup>

- Apply identical remedies, irrespective of a country's circumstances;
- support programmes that do not work;
- are anti-growth;
- harm the poor;
- ignore the views of governments of developing countries.

Some tend to see this issue in ideological terms but the controversy is so acute and complex to pinpoint that the real situation is that both institutions have also been accused, from the left of keeping wicked right-wing regimes in power and, from the right, of keeping wicked left-wing regimes in power as well.

### *The pros*

Though it is very often said that the Bank and Fund programmes worsen the poverty, this is an assertion very hard to get clear empirical evidence besides the fact that good data are available for only a couple of countries, normally outside Africa.

Adjustment programmes do affect the poor in many different ways. Currency devaluation and other measures such as cuts in public spending, are likely to harm some of the poor, especially those who live in towns; the rural poor, who in countries like Mozambique, are the great majority of the population, are likely to benefit from devaluation, because the changes will not reduce their purchasing power (they buy much less imports than the town dwellers).

However, in global terms the very poorest are always at risk during adjustment processes. So, because of market failures, there has been an emerging consensus within the Breeton Woods

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<sup>8</sup> See *The Economist*, October 12th - 18th 1991.

institutions, which not only puts emphasis on social investments (provision of essential services like primary education and health care) but also takes into account the top agenda of the structural adjustment programmes in developing countries - the reduction of poverty incidence.

Basically, advocates of devaluation argue that it is an invaluable instrument for strengthening the balance of payments mainly because devaluation implies changes in relative prices

### *The cons*

Critics of devaluation procedures argue that devaluation is stagflationary reducing real output and increasing the domestic rate of inflation (Bird, G., 1983). That argument has been prompted by the observation that several less developing countries which adopt stabilization programmes that include devaluation experienced stagnation and even increased unemployment. Critics also see it as having a potentially perverse effect on the balance of payments.

### *Alternative BOP policies*

The position backed by the economists who argue in favour of currency depreciation is that balance of payments will always be ameliorated if accompanied by appropriate good policies.

Because of some adverse effects of devaluation I mentioned earlier on and because achieving a reasonable package of good policies in the way suggested by the Harberger's thirteen rules of good economic policy management is almost a difficult task for a developing country (Dornbusch, R., 1993:15), policymakers are most frequently inclined in applying alternative policies such as: tariffs, multiple exchange rates, domestic taxes and subsidies.

Advocates of these alternatives believe that, where overall price elasticities are very low, signaling that devaluation may be a failure, as is the case for most developing countries, criterious choice of some forms of price discrimination can help to improve the balance of payments position.

However the literature is full of examples of loss of efficiency incurred by the abuse of price discrimination. First there are the administrative costs of implementing such cumbersome schemes. Then comes a legion of corruption and rent seeking activities often associated with multiple rate schemes.

In the case of multiple exchange rates Bird, G. (1983) points out that Streeten (1971) has suggested that it would be feasible to establish a system of dual exchange rates under which one relatively high exchange rate would be established in traditional primary exports and essential imports, both of which he assumes are subject to inelastic demand; with a lower rate being used for trade in manufactured, infant-industry, exports, and for non-essential imports where the price inelasticity of demand is high.

Depreciation can also be viewed against the alternatives of credit controls and exchange controls. I will not go in much details about these choices. It suffices to say that depreciation seeks to induce economic growth through the external trade. Reducing the nominal supply of money by means of credit controls most probably will leave relative prices unchanged and thus the effects on balance of payments will be negligible; the consequences for economic performance are more adverse if the controls result in increase of the cost of credit.

Exchange controls are considered by their followers as having more direct effects on imports, besides the fact that they are ease to apply discriminatory between imports. However there is the same set of disadvantages in so far to the corruption and administrative costs are concerned. It is also believed that exchange controls do suppress imports rather than encouraging exports, the principal motive of currency depreciation.

## *Depreciation versus Structuralism*

Finally it is important to view depreciation against the so called structuralism. The theoreticians of structuralism argue that to strengthen the balance of payments you need to increase the aggregate supply preferably to reducing the aggregate demand. In their argument structuralists obviously emphasize policies that may boost the production capacity and the productivity of the resources as well.

To achieve their objectives structuralists claim to change some basic principles and tools of analysis such as: the ownership of the factors of production, the structure and composition of the production activities, the degree of monopoly, the distribution of the GDP consumption and investment.

The structural approach is clearly supply-oriented, has its best results only on the long-run and thus can be easily frustrated by an over- expansionary demand policy.

All the discussion put forward before suggest that devaluation of an overvalued currency is an effective instrument for improving the efficiency of resource allocation and export competitiveness; it can also mitigate the short-term effects of demand restraint. By raising the relative price of the traded goods sector, devaluation not only provides incentives to expand output and employment in this sector, but also induces a shift of domestic demand to the non-traded goods sector and domestic factors of production (Tseng, W., 1984).

According to Bird, G. (1983), devaluation may however be insufficient, on its own, to encourage sustained export growth and balance of payments improvement. For this, income elasticities of demand for exports need to be high in relation to imports and a range of additional policies which create incentives at a disaggregated microeconomic level may be required.

Similarly, it may be desirable to complement exchange rate depreciation with export taxes, which reduce its impact on profitability in the export sector, wages policies, which modify its effect on the domestic price level, and short-term subsidies, which dampen political resistance.

#### 4. An econometric model

##### *Synthesis of Mohsen Bahmani-Oskooee 's model*

Mohsen Bahmani-Oskooee (1984) presented a comprehensive model to analyse the determinants of international trade flows for the case of 7 developing countries (Brazil, Greece, India, Israel, South Africa, Korea and Thailand) , using quarterly data for the period 1974-80.<sup>9</sup>

Later on, the same model with slight modifications was used by the same author in 1991, in order to analyse exchange rate uncertainty and trade flows of a slight different group of developing countries ( Brazil, Greece, South Korea, Pakistan, the Philippines, Thailand, and Turkey), using once again quarterly data for the period 1975-85.

The model used in both studies, has in common the fact that it basically consists of a set of *Import* and *Export Demand Equations* based on the two major determinants of (i) *import volume* (namely the ratio of import price to domestic price,  $PM/PD$ , and the level of real domestic income,  $Y$ ), and (ii) *export volume* (the ratio of export price to world export price,  $PX/PXM$ , and the world income,  $YW$ ). A real effective exchange rate variable,  $REER$ , was added in order to assess the effect of exchange rate changes on trade flows, that results from a floating exchange rate regime.

##### *Specification of the model*

My goal in the present dissertation is to make an application of Mohsen Bahmani-Oskooee's Model to the case of Mozambique, as close as possible given data constraints, and to empirically

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<sup>9</sup> According to the author, the model have been previously estimated by Houthakker and Magee (1969) and Khan (1974) for a number of developing countries under floating exchange rate system, and because of that reason the exchange rate variable was then excluded from their equation.

evaluate the extent to which exchange rate devaluation, which occurred since 1987, has been producing the predicted effects through import and export flows in the country over the period 1987:I - 1996:IV.

The theoretical starting point for the model is the standard theory of demand assuming that import or export quantities demanded are a function of relative prices and income levels. All the variables in the model are expressed in logarithm terms so that the resulting parameters are interpreted as *elasticities*.

Import and export demand functions are reported for the short run, that is, the analysis is simplified by concentrating on the impact effect of a devaluation, not its long term effects, by assuming that trade flows adjust instantaneously to a change in any of their determinants. Hence:

(i) The *Import Demand Equation* is a decreasing function of the ratio of import price to domestic price ( $PM/PD$ ) and an increasing function of the level of domestic real income ( $Y$ ). It can be estimated either by one of the three following equations:

$$\text{Log } M_t = a_0 + a_1 \text{Log } (PM/PD)_t + a_2 \text{Log } Y_t + u_t \quad (1)$$

where,

$M$  is the quantity of imports;

$PM$  is the import price;

$PD$  is the domestic price level; and

$Y$  is the domestic real income.

$u$  represent the error term.

This equation is suitable in the case of fixed exchange rate regime. It is expected that  $a_1 < 0$  and  $a_2 > 0$ .

An alternative equation is estimated which include the real effective exchange rate (REER) as an additional variable, in the case of floating exchange rate regime. This measures the

country's competitiveness in international trade and is defined as units of domestic currency per unit of foreign currency<sup>10</sup>. Thus, an increase in the real effective exchange rate, that is a *depreciation of domestic currency*, is expected to have a negative effect on imports and to stimulate exports. Hence, the expected sign is negative, that is,  $a_3 < 0$ :

$$\begin{aligned} \text{Log } M_t = & a_0 + a_1 \text{Log } (PM/PD)_t + a_2 \text{Log } Y_t + \\ & + a_3 \text{Log } REER_t + u_t \end{aligned} \quad (2)$$

A third alternative to equations (2) should be a specification in the case of import demand function, where PD and PM are computed separately<sup>11</sup>:

$$\begin{aligned} \text{Log } M_t = & a_0 + a_1 \text{Log } PM + a_2 \text{Log } PD_t + a_3 \text{Log } Y_t + \\ & + a_4 \text{Log } REER_t + u_t \end{aligned} \quad (3)$$

The expected signs of these parameters are  $a_1 < 0$  and  $a_2 > 0$ .

As to the Export Demand function, and taking into account the symmetry between import demand and export demand equations; we have:

(ii) The *Export Demand Equation* is expressed as a decreasing function of the ratio of export price to the world export price (PX/PXW) and an increasing function of the world income (YW):

$$\text{Log } X_t = b_0 + b_1 \text{Log } (PX/PXW)_t + b_2 \text{Log } YW_t + u_t \quad (4)$$

where,

<sup>10</sup> In Mozambique the real effective exchange rate index (ITCER) is determined by the monetary authority, The Bank of Mozambique, as follows:

$$\text{ITCER} = \frac{\text{ITCEN} * \text{CPI Moz}}{\text{CPI Partners}}$$

It is the real value of the domestic currency (Metical) against a set of the country's main 13 trade partners, namely, South Africa, USA, Italy, Portugal, Japan, Zimbabwe, UK, France, German, Sweden, Holland, Spain and Switzerland.

<sup>11</sup> see Warner, D. and Kreinin, M. (1982)

$X$  is the quantity of exports;

$PX$  is the export price;

$PXW$  is the world export price level;

$YW$  is the world real income;

$REER$  is the real effective exchange rate; and

$u$  represent the error term.

It is expected that  $b_1 < 0$  and  $b_2 > 0$ .

Alternatively,

$$\begin{aligned} \text{Log } X_t = & b_0 + b_1 \text{Log } (PX/PXW)_t + b_2 \text{Log } YW_t + \\ & + b_3 \text{Log } REER_t + u_t \end{aligned} \quad (5)$$

Since an increase in the REER, i.e., a depreciation of domestic currency is expected to have a positive effect on exports, it is also expected that, as a consequence,  $b_3 > 0$ .

### *Data and methodology*

The present study covers a period of 10 years (1987-1996), since the introduction of the devaluation process in the country and the floating exchange rate regime. The model is estimated by *Ordinary Least Squares* (OLS) using quarterly data over the period under consideration.

The main sources for the data are as follows:

Bank of Mozambique, Maputo;

Mozambique's Statistical Yearbook, Maputo, various issues;

International Financial Statistics of the International Monetary Fund, various issues;

Organization for Economic Cooperation and Development (OECD), Statistics of Foreign Trade, Paris, various issues.

It is assumed that Mozambique being a small open economy is a *price-taker* for both import and export prices. As a proxy, import and export unit value indexes from industrial countries are used, taking into account that export destinations were 66 percent to OECD countries, in 1992, and import sources were 50 percent from OECD countries<sup>12</sup>, in 1989.

Most of quarterly data, when not available, were extrapolated from the available annual data. A possible consequence of this data manipulation was the problem of serial correlation.

Data were collected for the variables *M*, *PM*, *PD*, *Y*, *REER*, *X*, *PX*, *PXW*, and *YW*. Index from different base years were spliced in order to form continuous series with 1990=100 as year base.

Hence,

*M* : the dependent variable of import demand function, is the volume of the country's imports, in millions of US\$. Data for this variable were not directly available so they were deflated by the unit price value of imports;

*PM*: is the import unit value index, obtained from the main industrial countries, in US\$;<sup>13</sup>

*PD*: is the domestic price index given by the country's consumer price index (CPI);<sup>14</sup>

*Y*: is the real GDP, in billions of MT;<sup>15</sup>

*REER*: is the index of real effective exchange rate, in MT;<sup>16</sup>

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<sup>12</sup> source *Mozambique Statistical Yearbook*.

<sup>13</sup> source *International Financial Statistics of the IMF*, various issues.

<sup>14</sup> source *Mozambique Statistical Yearbook*, various issues.

<sup>15</sup> source *Mozambique Statistical Yearbook*, various issues.

<sup>16</sup> source Bank of Mozambique.

$X$  : the dependent variable of export demand function, is the volume of the country's exports, in millions US\$. Data for this variable were not directly available so, like  $M$ , it is deflated by unit price value of exports;

$PX$  : is the export unit value index, in US\$. As in  $PM$ , it is obtained from the main industrial countries' index;

$PXW$ : is the world export price index, in US\$;<sup>17</sup>

$YW$  : is the index of world income, in billions US\$, proxied by the index of industrial production in OECD countries.<sup>18</sup>

A point that is perhaps worth making here is about the availability of data information and accuracy of statistics in Mozambique, for long periods of time, in order to allow for the fulfillment of econometric models with sufficient acceptability.

Mozambique's national economic and social statistics are limited in scope and of a relatively suspect quality as a consequence of weak institutional capacity for collection and statistical analysis. For example, one limitation results from the fact that the existing consumer price index data does not cover the whole country, it is only referred to Maputo, the country's capital city. Another example is the fact that most of the data are not directly available, thus having to be manipulated through extrapolation from annual to quarterly data.

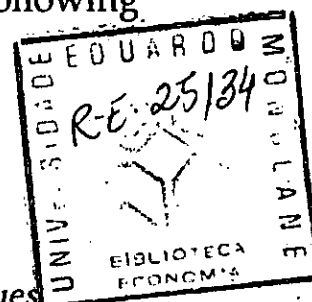
### *Estimating the model*

The import demand equation as well as the export demand equation were estimated for Mozambique with the following results:

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<sup>17</sup> source *International Financial Statistics of the IMF, various issues*

<sup>18</sup> source Organization for Economic Cooperation and Development (OECD), *Statistics of Foreign Trade, Series A, various issues.*



## Import results

The results indicated below were estimated from equation (2):

$$\text{Log } M = 21.1 - 0.076 \text{ Log } PM/PD - 1.05 \text{ Log } REER - 1.36 \text{ Log } Y$$

t-ratio: (1.73)    (-0.22)                      (-2.15)                      (0.72)

R-sq=36.5%      R-sq(adj)=31.2%      F-statist.= 6.89

DW=1.17      n=40

The import results are consistent with the expected signs except for the real income coefficient. Khan, M.(1974) reasons that if an increase in domestic production is due to an increase of import substitute goods, then it is possible for the coefficient of the real income to be negative. It means that income elasticity often shows ambiguous signs.

The price term elasticity is statistically insignificant and is less than a unity which confirms the commonly view that developing countries have a price inelastic demand for imported goods.

Income presents a unity elasticity of import demand which is not statistically significant.

The REER elasticity is significantly different from zero at 5 percent level and has a unity (although negative) elasticity.

Each slope coefficient represents an elasticity, meaning that, *ceteris paribus*, a one percent increase in Y, in  $PM/PD$  or in  $REER$ , leads to a 1.36 percent decrease, a 0.076 decrease, or a 1.05 decrease in the import demand, respectively.

The F test is significant suggesting that the explanatory variables are important in explaining the regression. However the model presents low values for R-sq and R-sq(adj).

The reported Durbin-Watson  $d$  statistics suggests that we are not able to accept or reject the hypothesis of serial correlation, since  $dl < d < du$  for  $n=40$  and  $k=3$ .

### *Export results*

As to the export demand, equation (5) was estimated subject to the errors following a first-order autoregressive process AR(1):

$$\text{Log } X = -13.1 + 1.84 \text{Log } YW + 0.221 \text{Log } PX/PXW + 0.065 \text{Log REER}$$

$$\text{t-ratio: } (-2.70) \quad (4.13) \quad (0.84) \quad (0.44)$$

$$R\text{-sq}=73.7\% \quad R\text{-sq(adj)}=71.5\% \quad F\text{-statist.}=33.67$$

$$DW=0.19$$

Assuming that the error term follows an autoregressive process of order 1, AR(1), that is,

$$u_t = \rho u_{t-1} + \varepsilon_t, \quad \text{where } -1 \leq \rho \leq 1. \quad (6)$$

a  $DW$  statistics close to zero suggests that the value of the coefficient of correlation  $\rho$  is close to one.

In order to make corrections for first order serial correlation, an attempt was made to transform the initial model (5) into a new model in first differences:

$$\begin{aligned} \text{Lnog } dX = & b_0 + b_1 \text{Log } dYW + b_2 \text{Log } d(PX/PXW) + \\ & + b_3 \text{Log } dREER + \varepsilon_t \end{aligned} \quad (7)$$

where,

$$dX = X_t - X_{t-1}$$

$$dYW = YW_t - YW_{t-1}$$

$$d(PX/PXW) = (PX/PXW)_t - (PX/PXW)_{t-1}$$

$$dREER = REER_t - REER_{t-1}$$

$\varepsilon_t = u_t - u_{t-1}$  , denoting a well behaved error term.

Equation (7) was estimated with the following results:

$$\begin{aligned} \text{Log } dX = & -2.43 - 0.072 \text{ Log } dYW - 0.870 \text{ Log } d(PX/PXW) - \\ & (-1.20) \quad (-0.22) \quad (-3.96) \\ & - 0.275 \text{ Log } dREER \\ & (-1.52) \end{aligned}$$

R-sq=77.5%      R-sq(adj)=64.0%      F-statist.= 5.73

DW=1.48

The world income elasticity is very low and has a unexpected negative sign. It is either not significantly different from zero.

The estimated price elasticity is also low, thus indicating that the relative prices do not have a significant effect on the level of the export of the country. The price term elasticity is, however, highly significantly at 5 percent level.

The REER elasticity is low, it is not significant and has the expected negative sign. .

The F test is significant suggesting that the explanatory variables are important in explaining the regression. The model presents better values for R-sq and R-sq(adj), than the estimated import demand model.

The reported Durbin-Watson  $d$  statistics suggests that we are not able to accept or reject the null hypothesis of serial correlation, since  $dl < d < du$  for  $n=39$  and  $k=3$ .

## 5. Concluding remarks

The present study uses a model based on the standard theory of demand to assess the impact of exchange rate devaluation in Mozambique, assuming that import and export quantities demanded are a function of relative prices and income levels, and that trade flows adjust instantaneously to a change in any of their determinants.

The study shows that the income elasticities have not statistically significant impact on imports and export demand, as a rule. Consequently, it seems difficult to observe the Marshall-Lerner conditions in the short-run, in order to conclude in favour of devaluation as the correct measure for the improvement of the balance of trade performance.

Actually, the impact of the adjustment programme in terms of increased export production was still limited in Mozambique.<sup>19</sup> Effectuated devaluations have not achieved the desired results owing to a number of reasons:

The price elasticity for Mozambique's traditional export products is low assuming that the country is a small open economy and the world market demand is fairly constant and does not immediately respond to decreased prices that results from devaluation.

Instead, devaluation continue to increase profits for individual enterprises, especially international enterprises, as well as the inflation rate for the national economy due to increased costs of imports.

Special measures were carried out to increase non-traditional exports, mainly textiles, which were destined to the Eastern Europe market, namely the former Soviet Union. However, purchase orders were cancelled and the lack of alternative outlets reduced the impact far beyond expectations.

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<sup>19</sup> see *Plano Económico e Social*, 1993.

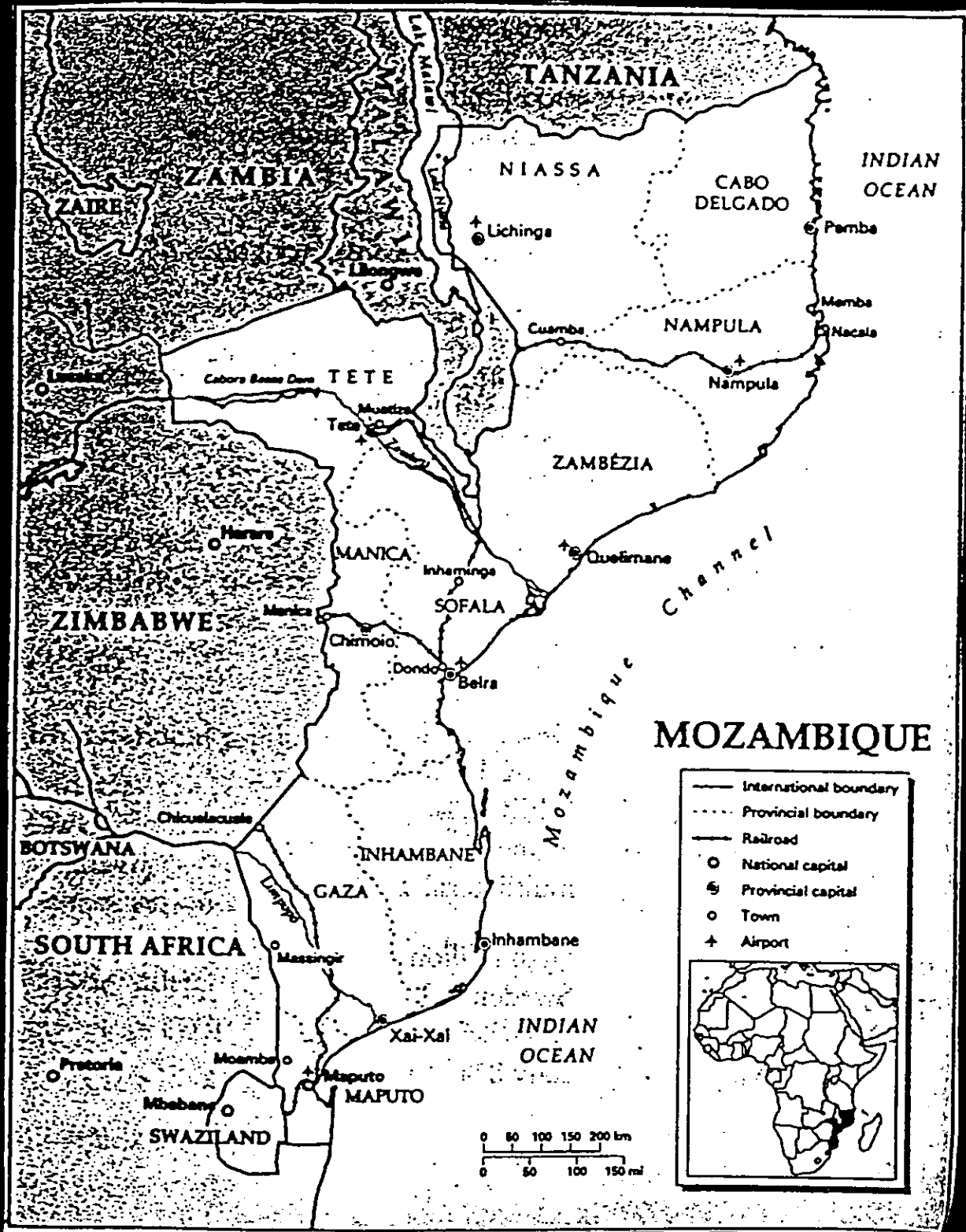
Insufficient investments in upgrading equipment for the production of traditional export crops, combined with a reduction in the world market prices (especially for cotton and copra) are reasons behind declining export revenues which in contrast to initial expectations stagnated over the last years.

Because export revenues have not increased as expected, while costs for imports continue to rise, there is still a high level of deficit in the balance of trade. Poor domestic industry and the high demand for input goods for agriculture mean that a large import requirement must be satisfied in order for the recovery programme to be implemented.

As a concluding remark I argue that in the case of Mozambique competitiveness cannot be achieved unless there is a diversified shift in the composition of exports away from the traditional primary commodities.

In such situation, and as long as the country gets comparative advantages, exchange rate devaluation will generate the expected positive response in the balance of trade.

*Word count: 7657*



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