AN ASSESSMENT OF THE DETERMINANTS OF IMPORT DEMAND FUNCTION FOR POST INDEPENDENT ZIMBABWE (1984-2008)

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE BACHELOR OF SCIENCE HONOURS DEGREE IN ECONOMICS OF BINDURA UNIVERSITY OF SCIENCE EDUCATION, FACULTY OF COMMERCE

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The undersigned certify that they read and recommend to the Bindura University of Science Education for acceptance a dissertation entitled an assessment of the import demand function for post independent Zimbabwe. This research was submitted by Jokonya Shingirayi Marshall in partial fulfilment of the requirements of the Bachelor of Science Honours Degree in Economics.
DECLARATION

I JOKONYA SHINGIRAYI M solemnly declare that the information in this dissertation prepared in partial fulfilment of the Bachelor of Science Honours Degree in Economics submitted in the department of Economics, faculty of Commerce at Bindura University of Science Education has never been presented, submitted or published in this nature or part. Previous works have been duly accredited and acknowledged properly.
DEDICATION

To the people who matters most in my Life

To those who fear God
ABSTRACT

The research assessed the determinants of import demand function for post independent Zimbabwe (1980-2008). The study employed the ordinary least squares regression model to show the assessment of GDP. Exchange rates and trade openness as the determinants of the import demand function for post independent Zimbabwe. The researcher employed the model to establish the elasticity of the determinants of the import demand function for post independent Zimbabwe. The results indicated that GDP and trade openness have a positive impact on imports in Zimbabwe. Overall the study serves a fundamental and a pivotal role in
making it possible to predict import flows more accurately thereby helping policy makers assess more confidently the overall sustainability of adjustment programs, determine the appropriate speed of trade liberalization process and avoid the possibility of unexpected foreign exchange constraints that might jeopardise the adjustment effort.

ACKNOWLEDGEMENT

Many thanks to the almighty God for making everything possible

The researcher wishes to acknowledge the following people for their deep rooted and unwavering support in all regards to making this happen:

Mr and Mrs Jokonya

Mr Bindu ,my supervisor
Mom and Dad for giving me hope and for being my parents

And last but not least the Jokonya family at large for being there for me all the time
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CHAPTER ONE

INTRODUCTION

Introduction

Understanding how import flows react to changing economic conditions is of paramount importance to policy makers since there is widespread agreement that imports generally
react more swiftly than exports to substantive trade liberalization, resulting in the short-run current account imbalances and a need for temporary financing. This is, incidentally, one of the main justifications used by international organizations for supplementing structural adjustment packages with external loans. Being able to predict import flows more accurately can help policy makers assess more confidently the overall sustainability of an adjustment program, determine the appropriate speed of the trade liberalisation process, and avoid the possibility of unexpected foreign exchange constraints jeopardising the adjustment effort.

This study presents relatively comprehensive evidence about import behaviour in developing countries. The research focuses on the identification of stable parameters in the description of import behaviour and an analysis of the structural and policy determinants of the parameters themselves.

1.1 Background of study

Zimbabwe is one of the less developed countries in Africa. The Gross Domestic Product per Capita is US$ 382, 88 in 2006, which is one of the lowest. The major economic sector is agriculture, which contributed more than 60% of the country’s GDP on average during the period 1980/81-1998/99. The output of this sector depends on weather and as a result; domestic income fluctuates following the change in weather.

Due to the government’s land reform programme, the agricultural sector, as the traditional source of exports and foreign exchange has suffered considerably. The performance of the agricultural sector has been drastically reduced to an extent that the output is now very low to provide raw materials required by the industrial sector. As a result of this and the low domestic capacity, the industrial sector of the country depends hugely on imports of capital and intermediate goods. Low productive capacity of the local industries has also led to a huge increase in the importation of consumer goods.

A major characteristic of the Zimbabwean economy is its openness. Since the implementation of the Economic Structural Adjustment Programme (ESAP) in 1990, the openness has increased considerably. The value of gross imports of goods and non factor
services as a percentage of gross national product (GNP) has shown an upward trend. Imports in Zimbabwe have grown by an average of 11% between 1988 and 1998 reflecting a relaxation of import controls and the inflow of capital goods for investment, but declined rapidly after 1998. The rapid rise of the current account deficit since 1989 was caused primarily by the creation of the Open General Import License (OGIL) list of items possible for importation without first obtaining a foreign exchange allocation from the government. After 1997, the amount of imports levelled off, and dropped rapidly in 1998.

The US Central Intelligence Agency (CIA) reports that in 2001 the purchasing power parity of Zimbabwe’s exports was $2.1 billion while imports totalled $1.5 billion resulting in a trade surplus of $600 million. The International Monetary Fund (IMF) reports that in 1998 Zimbabwe had exports of goods totalling $1.96 billion and imports totalling $1.8 billion. The services credit totalled $383 million and debit $712 million.

The process of deregulation coupled with an appreciable degree of openness during the Economic Structural Adjustment Programme (ESAP) era made the economy vulnerable to the international trade shocks and the widening of the size of disequilibrium in balance of payments (BOP). Analysis of payments in recent years shows that there has been a general upward trend for import payment for the period 2005-2010. The increase in import demand is attributable to a number of macro-economic activities implemented by the monetary and fiscal authorities over time, which boosted the appetite for raw materials to sustain company activities which were around 20-30% thresholds of full capacity (Monetary Policy Statement; 2010). This period was also characterised by reduced local production capacity, which resulted in a reliance on imports as many companies failed to source locally, hence the increased imports. The table and graph below give an overview of trends characterising import demand over this period.

Actual Foreign Payments from 2005-2009 (in US$)

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Month</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>113,657,443</td>
<td>96,625,905</td>
<td>111,585,230</td>
<td>167,252,612</td>
<td>119,146,589</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>97,545,968</td>
<td>92,080,837</td>
<td>125,793,825</td>
<td>134,504,339</td>
<td>136,030,489</td>
<td></td>
</tr>
</tbody>
</table>
As the graph depicts, there was a decline in import demand in 2009. This can be attributed to the introduction of the multi-currency system and the liberalisation of the exchange control framework in 2009, which jump started economic activity as a number of local firms started producing products locally.

### 1.2 Statement of the problem

Developing countries import many goods at world prices since they are not sufficiently available domestically. Increase in the world price of these goods leads to an increase in the domestic prices further aggravating the inflationary problems. It is also argued that the ratio of the export price index to import price index of developing countries has been declining or deteriorating over the long run, implying that these countries have faced chronic balance of payments problems as a result of the unfavourable world prices. The Zimbabwean economy exhibits huge import dependency like any other developing country. The local manufacturing firms depend heavily on imported a capital and intermediate goods, which directly affects investment, which is the motor of economic expansion. But, the country has low levels of capital stock and intermediate goods. It is argued that lack of sufficient amount

<table>
<thead>
<tr>
<th>Month</th>
<th>Import 1</th>
<th>Import 2</th>
<th>Import 3</th>
<th>Import 4</th>
<th>Import 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>114,883,497</td>
<td>109,381,645</td>
<td>114,773,747</td>
<td>96,673,318</td>
<td>76,592,289</td>
</tr>
<tr>
<td>April</td>
<td>119,617,370</td>
<td>81,443,783</td>
<td>98,825,423</td>
<td>111,145,418</td>
<td>75,018,475</td>
</tr>
<tr>
<td>June</td>
<td>141,196,413</td>
<td>130,245,321</td>
<td>138,206,588</td>
<td>171,294,661</td>
<td>128,362,305</td>
</tr>
<tr>
<td>July</td>
<td>125,464,833</td>
<td>110,253,135</td>
<td>139,163,797</td>
<td>213,708,800</td>
<td>150,287,674</td>
</tr>
<tr>
<td>August</td>
<td>88,950,900</td>
<td>99,885,491</td>
<td>120,893,562</td>
<td>96,827,725</td>
<td>130,859,408</td>
</tr>
<tr>
<td>September</td>
<td>94,893,695</td>
<td>131,559,995</td>
<td>160,386,013</td>
<td>174,193,859</td>
<td>154,776,830</td>
</tr>
<tr>
<td>October</td>
<td>72,914,398</td>
<td>137,817,079</td>
<td>146,873,875</td>
<td>200,490,261</td>
<td>186,683,289</td>
</tr>
<tr>
<td>November</td>
<td>72,627,845</td>
<td>111,921,439</td>
<td>145,543,443</td>
<td>164,808,855</td>
<td>101,436,659</td>
</tr>
<tr>
<td>December</td>
<td>66,735,166</td>
<td>114,923,149</td>
<td>105,842,214</td>
<td>136,006,576</td>
<td>103,111,905</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,214,698,728</td>
<td>1,325,072,392</td>
<td>1,535,028,057</td>
<td>1,801,642,328</td>
<td>1,473,029,227</td>
</tr>
</tbody>
</table>

SOURCE: RBZ (2010)
of capital and intermediate goods directly reduce investment, in turn leading to lower economic growth. The country’s exports are mainly primary good (agricultural products). Fluctuations in production and earnings in these sectors lead to fluctuations in overall output of the economy which also results in swings in imports and balance of payment position.

1.3 Study objectives

The main objective of this research is to empirically assess the determinants of the import demand function of Zimbabwe using ordinary least squares (OLS). Other objectives include:

- To estimate the income elasticity of Zimbabwe’s imports.
- To estimate the exchange rate elasticity of Zimbabwe’s imports.
- To assess determinants of import flows for Zimbabwe, fundamentally for forecasting purposes.
- To offer concrete recommendations based on findings of this research.

1.4 Justification of the study

Most of the studies that have been carried out in many countries mainly focussed on the comparison of the export and import demand functions merely for the purpose of assessing balance of payment stability in those countries. (See, for example, Malley and Moutos (2002), Caporale and Chui (1999), Hooper et.al (1998), Ghei and Richett (1999), Faini, Pritchett and Clavijo (1992), Winters (1987), and Goldstein and Khan (1985). However, in developing countries such as Zimbabwe, importation of goods is inevitable. This is so because of lack of capacity to produce its own investment goods. As such, assessing the implications of export and import demand functions on BOP stability may be of little significance. In this study, the researcher has found it to be more significant to model only the import demand function, and find the major determinants for the purpose of making it possible to predict import flows more accurately thereby helping policy makers assess more
confidently the overall sustainability of adjustment programmes, determine the appropriate speed of trade liberalisation process, and avoid possibility of unexpected foreign exchange constraints that might jeopardise adjustment efforts.

The analysis of the determinants of the import demand function will help in identifying important variables that may result in better foreign trade and exchange rate policy. To the researcher, the analysis will enhance critical skills in problem analysis, data gathering and an analytical interpretation of results.

1.5 Hypothesis

H01: GDP and foreign reserves impact positively on the volume of imports in Zimbabwe

H02: The exchange rate has a negative impact on the volume of imports in Zimbabwe

1.6 Delimitations of the study

The data that will be used in the research will be for post independent Zimbabwe. The data will be obtained from the Reserve Bank of Zimbabwe, Ministry of finance, Central statistics office (CSO), International Monetary Fund and the World Bank.

1.7 Limitations of the study

In Zimbabwe, evaluating the quality of data, there is no adequate, consistent data in domestic sources. For example, there is discrepancy of exchange rate data reported by the central statistics office and the reserve bank of Zimbabwe. Therefore the limitations of the model used here is that it assumes that volume of imports is determined by the effective exchange rate and not the actual exchange rate for which data is not readily available.

The second major limitation of the study is that some variables such as foreign reserves of the Zimbabwean economy, which has proved to be of importance in similar studies carried out in other countries, do not have readily available data.
1.8 Organisation of the rest of the study

The rest of the study is organised as follows; Chapter 2 will dwell on the review of the literature relating to the research topic covering areas such as theoretical literature review and empirical literature review. It will outline what other researchers have found in relation to the research area. Chapter 3 presents the methodology used in the study and it focuses on areas such as research philosophy, research design, research instruments, data collection procedures and data analysis. Chapter 4 will be on data presentation and discussion to establish trends and relationships. Chapter 5 concludes the study with the overall summary, conclusions and recommendations.
2.0 Introduction

The main purpose of this section is to review the theoretical framework and empirical literature so that it can help us to analyse the major imports of a country and the relative significance of these in similar studies on import demand that have been carried out previously.

2.1 Theoretical literature review

Countries import goods, because one country cannot make everything that is needed to support its people or because they are harder, more expensive or impossible to make inside their country. Imports, along with exports, form the basis of international trade. A country has demand for an import when domestic quantity demanded exceeds domestic quantity supplied, or when the price of the good or service on the world market is less than the price on the domestic market.

The demand theory of imports is that when income increases, people will have more money and the purchasing power rises so that they tend to buy more domestic and foreign goods and services. Hence, imports also increase. Theoretically the income elasticity of demand for imports is positive. In some cases, it may be negative theoretically if imports are lower in consumption. “If imports are the excess of domestic consumption over domestic supply
then income elasticity for imports could be negative if domestic supply is more income elastic than domestic consumption” (Egwalkahide, 1999:13-14).

In the traditional model, the demand for imports is seen as a simple function of income, as is the demand for domestically produced consumer goods. This is written as:

\[ M = mY \]

Imports will be a percentage \( m \) of national income \( Y \), and so \( m \) is the marginal propensity to import (MPM). Thus as national income rises, so will imports (Heathfield and Russell, 1992). The dominant economic doctrine during 17\(^{th}\) and 18\(^{th}\) century was mercantilism, which was highly nationalistic (Souderton and Reed, 1994). In view of this, the most important way in which a nation could grow rich was by exporting more than it imported. Exports were viewed as favourable because they help to obtain precious metals, which are indicators of richness and powerfulness of the country, while imports were considered as unfavourable in view that they reduce the country’s true source of richness, namely precious metals, and thereby hinder growth of output. On the basis of this, they argued that governments should discourage imports and encourage exports. This view is not relevant for Zimbabwe because its industry depends on imports of intermediate and capital goods. In addition, its agricultural sector depends on imports of fertilisers and agricultural machines. Even the transport sector depends on imports of spare parts, vehicles and machineries. Thus, all these sectors will be affected if we impose restriction on imports, leading to lower income.

Contrary to mercantilism argument, (Adam Smith, 1776) formulated the classical theory of absolute advantage. The idea of Adam Smith is that trade between two countries is based on absolute advantage (Salvatore, 1990). This means that a nation can produce one commodity cheaply while it can produce another commodity expensively. This nation has absolute advantage in producing first commodity while it has absolute disadvantage in producing the second commodity. Therefore this country can benefit by exporting the commodity, which it produces cheaply or efficiently and import that commodity which it produces inefficiently. By this process, resources are utilised effectively and the output of both commodities will increase and thereby both countries will benefit more from free trade than restricted trade. According to Smith, import is important for economic growth.
David Ricardo’s idea of comparative advantage argument modified Smith’s view on absolute advantage. According to Ricardo, a country should export the commodity in which its absolute advantage is greater and import the commodity in which its absolute advantage is smaller. In real world, the assumption of homogenous labour is not valid since the level of labour skills is different and labour is not the only factor of production. Ricardo did not mention the other factor of production, capital. Thus, absolute advantage depends not only on labour value but also on capital value. In his view, imports assist output growth if a country imports a commodity in which its absolute disadvantage is greater.

During the 1950s and the 1960s, the policy of industrialisation through import substitution was dominant strategy for economic development. The infant industry argument was the oldest argument in this area. The aim of the argument is to protect home industry from foreign producers in the initial stages of production until it could compete with low cost foreign producers (Singh 1985). It is also stressed that, at the initial stage of production, cost per unit of output is high and therefore protection is essential in order to be able to withstand the competitive conditions. Protection is not, however, considered to continue forever. It is argued that it should be avoided after the domestic industries are able to compete with foreign producers and achieve economies of scale. Contrary to this argument, it is argued that restriction of import leads to the decline of imported inputs essential to the export sector, further discouraging export promotion and therefore leading to the decline of the growth of GDP (Jebuni, et al, 1994). Thus, the policy of import substitution affects the export sector in less developing countries like Zimbabwe and this policy has anti-export bias where the industry is import dependent (Lyakurwa, 1991). The other view is that the protected industry expands at the cost of other industries, and its production growth is less than the fall in production elsewhere (Salvatore, 1990). Therefore, the net effect may be negative. Even empirically, there is weak evidence that support import substitution strategy (Dornbush, 1992). Though, formerly, there was a support for import substitution strategy, and currently the situation is changing. There appears to be an agreement that trade promotes growth by enabling countries to acquire goods that they have no capacity to produce. Thus, liberalisation of trade and payments removes anti-export bias, and this promotes the export sector and therefore leads to the improvement of foreign earnings and growth of GDP. Therefore, import liberalisation is important to help export sector, given the
fact that a country like Zimbabwe, among the developing countries, is highly dependent on imports from developed countries. In broad classification, most of the goods imported by these countries include capital, intermediate and consumer goods. It is widely argued that the importation of capital, intermediate goods has substantial impact for the development of these economies. However, the effect of imported consumer goods on GDP growth is not clear.

In the 1950s and 1960s, it was widely believed that industrialisation in the developing countries would take place if manufactures were given secure domestic markets that would allow them to build up productive capacity. The so-called import substitution strategy was to protect domestic producers from competition by quotas and tariffs, so that they would expand their production to replace goods that used to be imported. (Dornbush and Fischer, 1990). By the 1980s, it was clear that the import substitution strategy had failed in most countries. The domestic producers, safe from foreign competition, produced at high costs and small volume, and with very little innovation. In the 1980s, most countries decided that they would try to reduce trade barriers and enter world markets. They started to liberalise imports by reducing tariffs and quotas, and to encourage exports through devaluation and more direct measures. Exposure of domestic producers to foreign imports was regarded as a spur to greater efficiency.

In a bid to encourage domestic industries and to save foreign exchange, countries, impose some restrictions on imports (Singh 1985). The restrictions aimed at promoting import substitution industries with the primary objective of saving substantial foreign exchange by encouraging use of locally available raw materials. The instruments to protect and encourage import substitute industries that are adopted are tariffs, non tariff barriers such as quota, import license, exchange control, devaluation, and subsidies, technical, administrative and other regulations. The main control instruments used are as follows:

Tariff is among the most important forms of import control mechanisms. At theoretical level, when a tariff is levied on imported goods, their price increases in the home market by the amount of the tariff (Kreinin 1995). As the price of imported goods increases, the demand for them declines, and this may bring about a shift to domestically produced substitutes by consumers. Increased consumption of home product would encourage
domestic industries to increase production and become more competitive. There is however a controversy about the effect of tariff in developing countries. One issue in this case is that if the exporting countries get subsidy from their governments, the effect of the tariff may be neutralised to that extent (Singh 1985). Thus, in order to make tariff effective, the importing countries set tariff rate at prohibitively high levels.

Import quota is one of the non-tariff barriers that are imposed on importation of goods. At theoretical level, it is argued that a government can reduce the volume of import directly by lowering import quota (Singh 1985). As the volume of imports decreases, the domestic price of import rises due to high domestic demand for imported goods. Thus, the demand for imported goods decreases, and consumers shift to less desirable domestic substitutes. The consequence of this is that domestic production of import competing goods increases, leading to a rise in output. There is debate about the advantage of quota over an equivalent tariff. It is argued that tariff may be preferable to an equivalent quota since it does not generate income for the government if the government is not a supplier, however it benefits the quota holders, but also creates administrative complications and corruptions (Singh 1985). Contrary to this reduction of the import with tariff creates domestic distortions and retaliation of foreign supplier.

Import license is another instrument of import control mechanisms. A government can reduce import by directly reducing value of import license. The difference between quota and import license is that quota is imposed on volume of import while value of import license is that quota is imposed on volume of import while value of import license is levied on foreign exchange.

Exchange control is one of the import control measure. In order to reduce import, the government of a country gives foreign exchange in small amount. This means, the government directly controls the foreign exchange in order to maintain the balance of payment (Singh 1985).

According to (Kreinin 1995), devaluation is a reduction in the exchange value of a currency of a country. Devaluation is an instrument of import control. It is argued that a reduction in
the exchange value of a country’s currency restricts imports and exports. This means that as a result of devaluation, the prices of export product imported by foreign buyers are lowered, while the prices of imports increased. Thus, as a result of high price of import, the consumption of imported goods decline and consumers shift from imported goods to domestic substitutes; due to low price of export, the demand for export increases, thereby improving foreign trade balances and increasing domestic output. In contrast to this argument, in developing countries devaluation maybe unsuccessful in increasing exports and lowering imports (Singh, 1982). This is because developing countries cannot easily increase their exports even if the world demand for the goods increased and at the same time the world demand for their goods increased and at the same time the world demand for their exports is elastic with respect to income and price, “most imports of developing countries are inputs into production and the elasticity of substitution in production between imports and domestic value added is essentially zero” (Ghei and Pritchett, 1999:468). Therefore, devaluation has little role in achieving macroeconomic balance.

However, most of the restrictions on imports have been relaxed due to the adoption of trade liberalisation processes though Structural Adjustment Programmes. The liberalisation processes were characterised by the dismantling of a detailed system of multiple exchange rates, export bonus schemes, quotas and licenses and the reduction of import taxes in order to promote free trade.

Regulation of trade has been a key feature of the Zimbabwean trade for three decades (1970-1990s). During the UDI period (Unilateral Declaration of Independence) between 1965 and 1980, international sanctions, domestic policies to cope with them, induced import-substitution industrialisation. A sophisticated import control system was built up, which the new government continued to use after independence in 1980.

However due to increased political pressure to join the international trend of liberal economic reform trade liberalisation was adopted. The Economic Structural Adjustment Programme (ESAP) was announced in July (1990) and there was full trade liberalisation. This gave easier access to imported intermediates and raw materials, and an overall expansion of import-dependent activities was expected. The delayed devaluation kept imported inputs cheap although some tariffs and charges were imposed. Opening up for free imports of
inputs basically allowed the protected, domestically oriented industries to expand and involved no structural change. Firms with the most restricted access to imports before liberalisation, of course benefitted most. No shift from domestically oriented to export activities is observed and exports stayed on trend during 1991. The second phase of the liberalisation changed the conditions for import-competing industries dramatically. They had been protected from competition for decades. The inflow of imported final goods made many domestically oriented manufacturing firms unprofitable. Imports crowded out domestic production. (Rattso and Torvik 1998)

In broad classification, most of the goods imported by developing countries such as Zimbabwe include capital, intermediate and consumer goods. It is widely argued that the importation of capital goods and intermediate goods has substantial impact for the development of the economies of developing countries.

Capital goods, in most cases, constitute a greater percentage of goods imported by developing countries and these are defined as produced commodities, which serve as inputs in the production of other commodities (Baark 1988). These capital goods broadly consist of three main goods namely transport, agriculture and industrial equipment.

High technology imports like capital goods are helpful for high production and industrial development. The role of capital goods in the manufacturing sector can be seen from two “main stream” perspectives. These are growth oriented and innovation oriented approach (Baark 1988). The first approach focuses on the role of capital goods in economic growth. Here, it is said that capital goods help to achieve new manufactured goods and affect the three main sectors of the economy, namely, agriculture, industry and transport. Import of machines that are related to agricultural and industry increases a country’s output as inputs into production. Similarly, efficient transport system is essential to facilitate the movement of goods at low cost.

Thus, the development of these three sectors leads to the growth of the economy. Imports of capital goods are also influenced by the investment policy of the government. An increase in industrial growth in turn requires substantial additional imports of capital goods.
Intermediate goods are composed of raw materials, semi-finished goods and fuel. Intermediate goods are input for the production of other commodities. Imports of these goods from developed countries bring new technology to developing countries, which in turn enhance the productivity if factors and leads to the growth of output (Coe, et al, 1997). This implies that these new technologies increase efficiency and thereby raise the scale of production and which in turn reduces the cost of production. The benefit is more if developing countries like Zimbabwe import from an industrial country that has a large “stock of knowledge”. For instance, (Keller 2000) argued developing country stands to gain more in terms of both the product that it can import and the direct knowledge it can acquire than it would import from another developing country. This implies that importing a new (or better) type of intermediate goods will increase the degree of specialisation in the production of other products. One example, which is sighted in this respect, is import of crude fertiliser, which constitutes high-technology imports from developed countries to developing countries. This is a transfer of foreign technology that helps us to increase productivity in the agricultural sector.

The effect of imports of consumer goods on economic growth (measured by GDP growth) may be ambiguous. Imports of consumer goods like medical and pharmaceutical goods are important to make worker healthy and healthy workers are more productive than unhealthy workers, in turn leading to growth of GDP. Imports of non-durable consumer goods like food have adverse effect on real GDP growth if there is sufficient amount of domestic production since the shift of demand towards imports would reduce the demand for domestic goods: hence production of domestic goods, in turn leading to slower growth in food production (Jaeger 19920. On the other hand, if there is no enough domestic production, import of these goods is important for economic development since workers need food to be strong and productive. Consumer goods like radio, TV contribute information for society.

2.2 Empirical literature
This section is going to review the empirical literature on import demand functions for a number of countries and investigate the relevance of the determinants used for the countries regarding the determination of the import demand function.

Several factors make predicting import flows in developing countries difficult. In particular, quantitative restrictions can be singled out because they drive a wedge between actual and desired imports, making the estimation of notional, i.e. unconstrained, demand parameters problematic. Other complications include the pervasive presence of high and variable tariffs, which make observed boarder prices an unreliable indicator of import costs. Similarly, developing countries’ dependence on foreign capital goods makes aggregate estimation sometimes misleading (Khan 1975: de Helo and Vogt 1986) because the marginal propensity to import is highly dependent on the composition of income. These issues have been addressed to some extent in the empirical literature on trade focussing on developing countries. Also, the modelling of the impact of quantitative restrictions has been given considerable attention. (Khan 1974), by positing that import restrictions vary over time in a serially correlated way, models their effect by assuming an autoregressive process in the error term. Others, (Dutta 1964), (Turnovsky 1968), (Chu et al 1983), (Pritchett 1988) and (Moran 1988) have used indicators of foreign exchange availability as a proxy for the government’s inclination to impose import controls. An important shortcoming of this approach is that, with some noticeable exceptions (Chu et al 1983), it does not allow for the recovery of the structural parameters.

An early attempt to model aggregate import behaviour of developing countries within an explicit inter-temporal framework is that by (Winters 1987). The model developed by winters uses a utility function where imports are separable from home goods. It focuses on the inter-temporal substitution of imports and there is no contemporaneous substitution (i.e. relative price effect) because home goods are not an argument in the sub-utility function. The access to international capital market is important when overvaluation of the administered exchange rate implies an unmanageable trade deficit, which is, it is assumed, is the more empirically relevant case. It is possible that a country runs a trade surplus at an overvalued exchange rate, even though the surplus is similar than it would be at the equilibrium exchange rate.
Single equation models indicated that imports can be explained by the real exchange rate and the national income. Some recent change in the overall trend of series is evident and well captured in and reflected on the estimates. Vector auto regressive models of imports yielded similar results as captured by the single equation framework and pointed out a nearly two-quarter horizon for the effect of the real exchange rate on the trade deficit to be realised. Regarding the real exchange rate emerging as a central issue in the public and policy making debates, it should be mentioned that the real exchange rate is revealed as a significant determinant of imports, but not of exports. At the same time, Vector Auto Regression finding that the real exchange rate is a determinant of current account indicates that the effects of the real exchange rate on trade deficit basically operates through the imports, but not exports. These observations might suggest that a real exchange rate depreciation e.g. a real depreciation of Zimbabwean dollar, will not induce a huge increase in exports but it will shrink the volume of imports significantly, hence reducing the size of the trade deficit. Therefore, on the exports front as the unit labour costs and export prices are basic determinants, public and private policy measures toward inducing productivity increases should be taken.

(Goldstein and Khan 1985) provides a survey of studies on income and price effects in foreign trade, with an excellent discussion of the specification and econometric issues in trade modelling, as well as summary of various estimates of price and income elasticity’s and related policy issues. The researcher will first discuss a small subset of recent studies.

Khan 1974 has investigated for the period 1951-1969 employing annual data for individual countries using the following model specification:

\[ \text{LogMd} \]

which is the import demand function, where \( i \) is the quantity of imports of country i, \( v_i \) is the unit value of imports in country i, \( r_i \) is the domestic rice level of country i, \( G_i \) is the real GNP of country i, and \( e_i \) is an error term associated with each observation. Since each variable is defined in logarithmic terms, the estimated coefficients are the elasticities of imports with respect to the corresponding variables. Having estimated these variables using OLS, Khan tried to analyse the determinants of imports in fifteen developing countries using a two-stage estimation procedure for the period 1951-69. In his result, all except for six countries,
Income elasticity of import is significantly different from zero and has position at the five percent level of significance in the long run. However, in the short run, income elasticity of import is significant and positive for four countries, but not for other countries.

(Warner and Kreinin 1983) have also employed a similar model, but their approach is different from Khan 1974 in two respects: Firstly, there are two distinct investigation periods, the periods of fixed and flexible exchange rate regimes, to analyse the behaviour of the model in two periods. Secondly, Warner and Kreinin estimated the import demand function as (Khan 1974) did, but they also repeated the estimation after excluding the petroleum products. Quarterly data for the periods 1957:1-1970:4 (fixed exchange rate period) and 1972:1-1980:4 (floating exchange rate period) separately have been employed to estimate the model. Warner and Kreinin model of import demand function is as follows:

\[ \ln M = c \]

\[ \ln M = \ln M = \ln M = \ln Y \]

Import demand function for the 1972:1-1980:4 period:

\[ \ln M = \]

\[ \ln M = \]

\[ \ln M = \ln Y \]

Where, is the import price in foreign currencies, M is the volume of imports on a per capita basis is the real GNP on a per capita basis, PD is domestic prices, PM/PD denotes the relative prices, and E stands for the exchange rate. As all the variables are expressed in logarithms, the parameters of this model are again interpreted as the elasticities of the dependant variable with respect to the independent variables. Exchange rate was included in the model only for the floating exchange rates period and it was calculated as an import-weighted effective exchange rate. Having estimated the demand for imports using OLS technique, Warner and Kreinin reported that the introduction of floating exchange rates appeared to have affected the volume of imports in several major countries, but the direction of change varied between them.
(Hemphill 1974) gave attention to import capacity and import restriction. He estimated import demand function for eight developing countries based on the traditional import model. The model relates import demand with foreign exchange receipts and foreign exchange reserve. The result is consistent with the theory that import is highly dependent on capacity variables, namely foreign exchange receipts and foreign exchange reserve. But, this approach does not consider the effect of demand side factors like GDP growth and relative price on imports.

According to (Moran 1989), LDCs import depends on both the demand side and capacity factors. He estimated the general import model, which incorporated both traditional and Hemphill import model, using pooled cross-section time-series data for twenty-one developing countries during the period 1970-83. Real income is considered, as determinant of imports but its significance, measured by the corresponding t-values, is smaller than the significance of foreign exchange receipts and international reserves. The short run income elasticity of import is also generally statistically significant. The estimates of the traditional model showed that the income elasticity of import is statistically significant and it is higher than the corresponding elasticity in the general model. In his result, the general import model dominates the traditional and Hemphill model. He concluded that an import model that neglects either the traditional or Hemphill variables will give biased result for developing country imports. The other interesting result is that the measure for import capacity is more dominant for developing countries group as compared to all others. Moran used the foreign exchange stock and flows as a measure for import capacity. But, (Lopez and Thomas 1990) argued that this is equivalent to estimating something very close to identity.

(Lopez and Thomas 1990) estimated import model for the seven Sub-Saharan Africa countries with slight modification from that of Moran 1989 using OLS estimation procedure for the period 1966-86. The major difference of their model from that of Moran 1989 is that they used export debt ratio as an indicator for import capacity, absorption as a percentage of GDP as another very influential demand variable, in addition to the real GDP, and real effective exchange rate instead of relative price. In this study, real income (measured by GDP) elasticity of import has expected sign and is statistically significant except for two countries.
On the other hand, (Mwega 1993) estimated the generalised import demand of Moran 1989. He used an error correction model to estimate demand elasticity for aggregate imports and components in Kenya over the period 1964-1991. In this result, real income is not significant in the long run in the import for food, beverages and tobacco, which are consumer goods. In his view, the reason for this is that, as the economy expands, domestic production substitutes these goods. Similarly, real income does not have a significant influence in the long run on mineral fuels and lubricant imports, which are part of intermediate goods. In his view, the reason for this is that, real income is highly correlated (0.84) with relative import prices. Machinery and transport equipment that are part of capital goods are significantly influenced by real income.

(Yuan and Kochhar 1994) also estimated (Moran 1989) type general model for China during the period 1980-1992 based on a quarterly data, using Johansen’s co-integration estimation procedure. The difference of this model from (Moran 1989) is that international reserve is ignored and industrial output is used instead of GDP. This result shows that output elasticity of aggregate import is positive and significant in the short run as well as in the long run, and that the short run output elasticity of import is greater than the long run. In their view, the reason for this result is that import substitution strategy has played an important role over the same period. In addition to this, they also identified the causality relationship between industry output and GDP growth; the result in this case suggested that the casual relationship between imports and GDP is in both directions.

On the other hand, (Umo and Fakiyesi 1995) examined the determinants of the components of import in Nigeria, based on OLS estimation procedure for the period between 1950 and 1958. They tested for structural break by partitioning the years. The regression result shows that the import of machinery is negatively related to real per capita income in the period 1955-1972. This means that an increase in per capita income is not spent on purchase of machinery or investment. According to his view, the reasons for this relationship could be due to the problems of ineffective planning and civil war. The import of invisible goods is positively related to real income, but it is not statistically significant. The researcher’s explanation is that it may be collinear with the population variable. Per capita income is not significant in the import of food and durable consumer items. Similarly, raw materials, which are intermediate goods, are not related to per capita income. The weakness of this study is
that it is based on Engle Granger two-step procedure in which the DF and ADF tests generally suffer from parameter instability. In addition, the power of these tests is low, and the standard errors of the co-integrating vector are biased and cannot be used for hypothesis testing (Enders 1995).

In Ethiopia, (Girma 1982), (Mulunech 1982), (Alem 1995), (Solomon 2000) and (Tura 2001) have studied the effect of GDP growth on imports. (Girma 1982) estimated value of import as a function of GDP only in Ethiopia during the period 1970 to 1978, based on OLS estimation method. In his result, GDP is significant and positively affect import of goods. (Mulunech 1982) estimated import demand in Ethiopia during the period 1965-1980, based on OLS estimation method. In this model, explanatory variables were GDP and foreign exchange reserve. The results show that income elasticity of aggregate import is negative and significant; that means as income increases import goods decreases. In his view, the reason for this negative relation can be attributed to “the nature of Ethiopian economy where there is no free market operating on its own and the quantity and quality of imports is determined by the government at the central level”. In other words, there is a positive income elasticity of imports of semi-finished and capital goods, but income elasticity of raw materials, fuel and consumer goods is negative and all are significant. The weaknesses in the above three studies are that they used small sample, and they did not test stationarity of the data. Small sample size may give biased results while using non-stationary data may give highly significant result, which is spurious (Gujarati 1995)

2.3 Conclusion

This chapter focused on the literature behind the study of imports, focusing mainly on the theoretical and empirical literature. Several studies that have been carried out in other countries have been outlined. This will enable the researcher to come up with the necessary information that will enable him to construct a model for import demand in Zimbabwe. The next chapter will look at the methodology that will be used in constructing the import demand function in Zimbabwe.
CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter focuses on the methodology to be used to come up with the results. The model that is going to be used is also explained in this chapter. Various aspects are to be discussed and these include model specification, OLS estimation method and testing for autocorrelation.

3.1 Model Specification

3.1.1 Theoretical model

The early theoretical demand (D) models showed that the main determinants of imports are real activity variables such as GNP or industrial output, and relative prices (the ratio of unit value of imports of the country to domestic price level). However, for most less developed countries, the effect of foreign exchange is a very important factor in the determination of imports. In addition, these countries employ trade and exchange restrictions either due to inward oriented policies or lack of capacity to import that would directly affect both the relative price and the volume of imports (Hemphill 1974). Thus, foreign exchange reserves (FRV) and foreign exchange inflows (EXG) should be included in the determinants of import (Hemphill, 1974 and Moran 1989).
The theoretical foundation on which the model will be predicted is the simple linear relationship between imports as dependant variable on one hand and on the other hand, independent variables, which include exchange rates, Gross Domestic Product (GDP), and foreign exchange reserves. The theory thus states the determinants of import demand as shown below:

\[ = f (GDP, EXG, FRV) \]

### 3.1.2 Empirical model

The theoretical foundation of import demand model rooted in the works of Hemphill (1974) and Moran (1989) identified the determinants of import demand as foreign exchange reserves, Gross Domestic Product and exchange rate. In this study, import demand is depending upon Economic Structural Adjustment Programme, Gross Domestic Product, Exchange rate and Trade openness. The regression model will thus be constructed as follows:

\[ \text{In} \ln EXG + \]  

(1)

Where: \( GDP = \) Gross Domestic Product

\( EXG = \) Exchange rate

\( TOP = \) Trade Openness

\( = \) Total imports

\( = \) Dummy variable

\( = \) Random error term

, and are the elasticities of income, exchange rate, trade openness, and dummy variable of the Zimbabwean economy. On prior grounds, only A dummy variable was included in the import demand model to capture the period before and after the introduction of Economic Structural Adjustment Programme (ESAP) in the country in 1990. Voth imports and exports were liberalised. The dummies are binary
variables 0, 1 where 1 is for post ESAP and 0 for pre –ESAP. Their coefficients are expected
to assume any value between greater than or less than zero.

3.2 Justification of the variables, estimation model and statistics package

3.2.2 Variables

3.2.1.1 Gross Domestic Product (GDP)

This is a measure of the amount of goods and services produced over time in a nation,
(World Bank; 2002). An increase in output leads to an increase in real income which
generally improves living standards. As GDP increase people will have more money and the
purchasing power rises so that they tend to buy more domestic and foreign goods and
services, hence imports increase as a result of an increase in GDP. Thus, there is a positive
relationship between GDP and imports.

3.2.1.2 Exchange rate

The exchange rate emerges as a central issue in both foreign and local trade. Thus, it is
revealed as a significant determinant of imports. The VAR finding the exchange rate is a
major determinant of the current account indicates that the exchange rate on trade deficit
operates through imports, and not exports. A reduction in the exchange value of a country’s
currency restricts imports and expands exports. As a result of currency depreciation, prices
of imports are increased, and prices of exports are lowered. Due to the high price of
imports, the consumption of imported goods decline as consumers shift from imported
goods to domestic substitutes.

3.2.1.3 Trade openness
Trade openness is a proxy used to measure the openness of the economy with regards to international trade. It is calculated as a percentage of total imports to nominal Gross Domestic Product. An increase in openness of trade results in an increase in import levels.

### 3.2.1.4 ESAP

This is to be used as a dummy variable. The dummy variable is to capture the period before and after the introduction of the Economic Structural Adjustment Programme (ESAP). Before the introduction of ESAP, trade was characterised by many import restrictions. Therefore, there is need for that in our model. After introduction of ESAP in 1990 trade was liberalised and there was free flow of imports into the country. The dummy variable will take the values 0, for pre-ESAP and 1 for post-ESAP.

### 3.2.2 Statistical package

The equation will be estimated using **EVIEWS** econometric package. This statistical package gives values for the proof of existence or non-existence of the problems of autocorrelations and multi-co linearity. Autocorrelation is measured by the Durbin-Watson statistic value (DW). A Durbin Watson statistic of any value not close to 2 will imply serious autocorrelation. If the DW-statistic is found to be exactly 2 in the model, we conclude that there is no first order autocorrelation, either positive or negative. The problem of multi-co linearity to econometric research is that it will be difficult to separate the effects of one explanatory variable on the dependent variable from the other. The effect can be detected by merely looking at the correlation matrix for a relationship that exceeds 0.8. If the relationship of variables exceeds 0.8; the rule of thumb is to drop one of the correlated variables in the regression.

This package also provides the Coefficient of Multiple Determination \( R^2 \) and the p-value, which are important statistic values in the analysis of multiple regression results. The value explains the proportion of variability of the dependent variable (import demand) that can be
attributed to changes in the independent variables. It explains how well the independent variables explain the dependent variable in the multiple regression models. The p-value indicates the alpha (α) level at which our model is statistically significant.

3.2.3 Estimation model

3.2.3.1 Ordinary Least Squares (OLS)

Ordinary least squares was the estimation method that was used in this research. Since non-stationary data cannot be estimated using OLS, the research presumes that the data is stationary. The simple classical regression model in its general form which is the universal set contains simple (two variables) and multiple regression as complementary subsets may be represented by:

\[ Y = \]

Where \( Y \) is the dependent variable; ++................. are \( k \) independent variables, and are the regression coefficients, representing the parameters of the model for a specific population and is the stochastic disturbance term which can be interpreted as resulting from the effect of unspecified independent variables and or a totally random element in the relationship specified.

The two-variable population regression function is given by: =, but we do not observe it so we estimate it from the sample regression function =. This function is equal to =.

One can rewrite the sample regression function as In other words, the residuals are the differences between the actual and estimated value. With \( n \) observations, we want to choose and such that the sum of the residuals is minimised: . This turns out not to be a very good rule because some residuals are negative and some are positive (and they would cancel each other), and all residuals have the same weight (importance) even though some are small and some are large. Least squares criterion: Minimise with respect to and.
3.3.2.2 Assumption of the model

\[ E[]=0 \]

Strict exogeneity, the errors in the regression should have a conditional mean zero

\[ E()=0 \]

Here it is assumed that the hypnotised model represents the true linear relationship such that after extraction of the RHS influences from the endogenous variable, the residual component has an expectation of zero.

Are uncorrelated

This assumption implies that there is no tracking in the endogenous variable, nor in the error component. The concept of tracking can intuitively be defined as the fact that the variable values at any specific index \( t \) can be predicted by previous variable values \( t-k \).

\[ V \]

It is assumed that the endogenous and residual variables are homoskedastic (constant variance over the complete range). The errors are assumed to be normally distributed and are conditional on the repressors.

3.3 Data type and sources

3.3.1 Data Sources

The data used in this study is secondary data. Yearly data covering the period 1984-2008 are used to test the relationship between import demand as the independent variable and the specified explanatory variables in Zimbabwe. The data were obtained from different sources. It is important to use specific sources for different kinds of data in order to guarantee consistency and comparability among the data. Therefore, we are forced to use different sources of data. The domestic sources are the annual and quarterly bulletin of the Reserve Bank of Zimbabwe (RBZ), and Statistical yearbook published by the Central Statistical Office (CSO), and IMF’s International Financial Statistics has been used to analyse
the relationship between total imports as the dependant variable and GDP, trade openness and exchange rate as the explanatory variables.

One of the problems in data collection is that different sources use different calendar year. Since it is difficult to compare different calendar year data effort has been made to convert data from different calendar years into the same calendar year.

3.4 Conclusion

The methodology outlined will be adopted so as to come up with an empirical assessment of the import demand function for Zimbabwe. The results will be outlined in the following chapter.
CHAPTER FOUR

RESULTS AND INTERPRETATION

4.0 Introduction

This chapter presents and interprets the empirical findings of the study, pertaining to import demand in Zimbabwe. This section also shows the appropriate tests carried out to ensure that the model satisfies the assumption of Ordinary Least Squares.
4.1 Descriptive statistics

These are the measures of dispersion namely the minimum, maximum, mean, standard deviation, probability and the median. The minimum and maximum values help in checking outliers in the data. The standard deviation shows variability in the data or the extent to which the mean varies from the expected mean.

4.1.1 Summary statistics

<table>
<thead>
<tr>
<th></th>
<th>LNTM</th>
<th>LNGDP</th>
<th>LNEXG</th>
<th>LNTOP</th>
<th>LNDESAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>7.375120</td>
<td>6.374720</td>
<td>4.663920</td>
<td>3.012040</td>
<td>0.760000</td>
</tr>
<tr>
<td>MEDIAN</td>
<td>7.483000</td>
<td>6.452000</td>
<td>2.370000</td>
<td>3.217000</td>
<td>1.000000</td>
</tr>
<tr>
<td>MAXIMUM</td>
<td>7.884000</td>
<td>6.824000</td>
<td>17.50400</td>
<td>5.055000</td>
<td>1.000000</td>
</tr>
<tr>
<td>MINIMUM</td>
<td>6.823000</td>
<td>5.571000</td>
<td>0.405000</td>
<td>0.493000</td>
<td>0.000000</td>
</tr>
<tr>
<td>STD.DEV</td>
<td>0.278142</td>
<td>0.318568</td>
<td>4.894281</td>
<td>1.705003</td>
<td>0.435890</td>
</tr>
<tr>
<td>SKEWNESS</td>
<td>-0.526590</td>
<td>-0.794420</td>
<td>1.213407</td>
<td>-0.210080</td>
<td>-1.217562</td>
</tr>
<tr>
<td>KURTOSIS</td>
<td>2.479844</td>
<td>2.864934</td>
<td>3.353688</td>
<td>1.436243</td>
<td>2.482456</td>
</tr>
<tr>
<td>JARQUE-BERA</td>
<td>1.437238</td>
<td>2.648601</td>
<td>6.265122</td>
<td>2.731114</td>
<td>6.455913</td>
</tr>
<tr>
<td>PROBABILITY</td>
<td>0.487425</td>
<td>0.265989</td>
<td>0.043606</td>
<td>0.255238</td>
<td>0.039638</td>
</tr>
<tr>
<td>OBSERVATIONS</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

The table 4.1.1 shows the descriptive statistics, the measures of dispersion namely the minimum, maximum, mean, mode, standard deviation, probability and the median. There were 25 observations on each variable. Descriptive statistics was carried out whilst the data was logarithmic form. The minimum and maximum values help in checking out outliers in
the data. The standard deviation shows variability in the data to the extent to which the mean varies from the expected mean. Most of the variables are normal with Jacque bera probabilities like imports, GDP, TOP with probabilities of 0.487425, 0.265989, and 0.255238 respectively meaning we reject the null hypothesis of non-normality and proceed with the research. From the table it shows the dependant variable LNTM and explanatory variables are LNGDP, LNEXG, LNTOP and LNDESAP for the period 1984 to 2008. LNTM has a mean value of 7.375120, minimum value of 6.823000 and maximum value of 7.884000 this is because there is a wide variability of standard deviation of 0.278142.

4.2 Diagnostic Tests

4.2.1 Autocorrelation Test

The Durbin-Watson test was employed to test for autocorrelation. The DW statistic of 1.71096 obtained in the study shows that we cannot conclude that there is serial autocorrelation or no serial autocorrelation. The DW is greater than R² implying the absence of spuriousness in the model. Considering the graph below, DW-statistic is 1.71096, and lies between 0.925 and 1.902. Thus, it falls in the zone of indecision. Gujarati 2004 says, although extremely popular, the d test has one great drawback, that is, if it falls in the indecisive zone, one cannot conclude that (first order) autocorrelation does or does not exist.

Figure 4.2.1: Durbin-Watson d statistic

<table>
<thead>
<tr>
<th>+ve Indec</th>
<th>No</th>
<th>Auto</th>
<th>No</th>
<th>Auto</th>
<th>Indec</th>
<th>-ve</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.925</td>
<td>1.902</td>
<td>2</td>
<td>2.098</td>
<td>3.075</td>
<td>4</td>
</tr>
</tbody>
</table>

\[ d = 1.710962 \]
Source: Adapted from Gujarati 2004

Note: No auto is No autocorrelation zone, +ve is positive autocorrelation zone, -ve is negative autocorrelation zone and Indec is zone of indecision.

4.3 Presentation of Results

Total imports as the dependant variable with Gross Domestic Product, Exchange rate and Trade openness as the independent variables is estimated to produce the following results.

Table 4.3.1 Estimation Output

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t-statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>5.430769</td>
<td>0.987523</td>
<td>5.499383</td>
<td>0.0000</td>
</tr>
<tr>
<td>lnGDP</td>
<td>0.221533</td>
<td>0.147757</td>
<td>1.499303</td>
<td>0.1494</td>
</tr>
<tr>
<td>lnEXG</td>
<td>-0.020639</td>
<td>0.011325</td>
<td>-1.822382</td>
<td>0.0834</td>
</tr>
<tr>
<td>lnTOP</td>
<td>0.121274</td>
<td>0.043474</td>
<td>2.789601</td>
<td>0.0113</td>
</tr>
<tr>
<td>Desap</td>
<td>0.346208</td>
<td>0.109532</td>
<td>3.160800</td>
<td>0.0049</td>
</tr>
</tbody>
</table>

R2        | 0.800828    | F-Statistic    | 20.10393    |
Adjusted R2| 0.760994    | Prob (F-Statistic) | 0.000001   |

DW        | 1.710962    |

4.4 Interpretation of Results

The imports demand equation shows that Zimbabwe’s imports demand can be effectively explained using the specified independent variables which are Gross Domestic Product (GDP), Real Exchange Rate (EXG), Trade openness (TOP) and the dummy variable (Desap). GDP, EXG and TOP have correct signs theoretically.
The observed  should lie between zero and one (01). The computed  is in line with this prerequisite and hence the sample regression line fits perfectly. The  is 0.80082, meaning that the model explains 80% of variations in imports demand. This shows a very strong explanatory power of the independent variables in explaining change in the dependant variable which is, imports demand. The remainder is explained outside the empirical model, and is captured by the error term. Maddala (1997) however mentions that an equation with a higher coefficient of determination is not necessarily better than one with a lower value. He also points out that the signs of the coefficients are the most important along with their economic meaning is also essential.

**Intercept(C)**

The intercept term in the equation is 5.430769 and this tells us that holding all the other variables constant, imports of around 5.430769 will still enter the country. This could be attributed probably to the nature of imports which could be said to be necessities.

**Gross Domestic Product (GDP)**

Gross Domestic Product is positively related with import levels with a positive coefficient of 0.221533. Although the coefficient of GDP is correctly signed, the research finds that income is insignificant in explaining import demand. This is in line with the findings of Moran 1989, in which income was considered as a determinant of imports, but its significance, measured by corresponding t-values, is small. Since the import demand equation is expressed in log linear form, the coefficient of GDP represents income elasticity of income.

**Real Exchange Rate (EXG)**
The coefficient of exchange rate is negative, that is, -0.020639. This implies a negative relationship between import demand and the exchange rate. The exchange rate is correctly signed as was expected. However, the t-statistic reveals that the exchange rate is relatively significant in determining the level of imports. The coefficient as a measure of elasticity reveals that import demand is inelastic to changes in exchange rate since it is closer to zero.

**Trade Openness (TOP)**

The coefficient of trade openness is positive, that is 0.1221274 implying a positive relationship between trade openness and import demand. It also implies that imports are elastic to changes in the trade openness, though weakly. This is in tandem with a priority expectations since the openness in trade results in increased flows of imports as there would be no or there would be reduced import restrictions. The t-statistic shows that trade openness is significant in explaining the determination of the import demand function of Zimbabwe.

**4.5 Conclusion**

The regression results are suggestive of a series of interesting relationships among the variables included in the model. All the signs of the coefficients of the independent variables was expected thereby rendering the model applicable in measuring the impact of the specified independent variables on the dependent variable.
5.0 Introduction

After researching and presenting the findings of linear relationship between total imports and the specified variables which are Gross Domestic Product (per capita), real Exchange rate, trade openness and a dummy variable for ESAP in the previous chapters, this chapter will conclude the research by briefly summarising all the previous chapters and providing conclusions based on the results obtained from the study. Recommendations based on these findings will also be looked at in this chapter, which ends with recommendations to policy makers and areas of possible further research.

5.1 Summary

In the first chapter of this research, the researcher briefly looked at the background of imports demand in Zimbabwe and the factors determining the demand for imports under investigation. The null hypothesis that GDP and Trade openness impact positively on the volume of imports while the exchange rate has a negative impact on the volume of imports was adopted. The main objective of the study was to find the linear relationship between imports demand and the specified dependent variables for the period from 1984 to 2008 using the OLS regression technique to estimate the relationship.
After establishing the objectives of the research, the researcher went on in chapter two to look at related theoretical and empirical literature on the subject of import demand theories. Chapter two also reviewed some empirical researches done by other scholars in other countries on the determination of imports demand function. The empirical researches in chapter two formed the basis of the methodology adopted in chapter three of this research.

Chapter three looked at the methodology used in the determination of the imports demand model of Zimbabwe. The chapter focused on the OLS regression technique and secondary methods used to collect data that were used in the research. The chapter also revealed the OLS regression model that was used to test for the linear relationship between total imports and macroeconomic variables. Results obtained from the research were presented and analysed in chapter four.

The results obtained from carrying out the research were presented in chapter four of the research, which looked at data presentation and analysis. Results were presented in tabular form and from E-Views printouts. The results obtained showed that GDP and Trade Openness have a positive impact on total imports. This was done statistically through the use of E-Views package. After realising these relationships, policy recommendations based on these results will be presented in this chapter.

5.2 Conclusions

This research presented empirical analysis of the import demand function for Zimbabwean economy from 1980 to 2008. To situate this study within the context of existing ones against the background of the main object of this paper, a detailed review of theoretical and empirical literature was carried out. This reveals that although there was no consensus on the specific factors affecting imports demand models, most applications of these models to different countries adopt a similar approach, which is the ordinary least squares method (OLS) in either static or dynamic form.

Results from empirical estimation of the imports demand model reveal that the coefficients of virtually all the variables used in the model are consistent on prior grounds. These would
have been useful for policy and forecast. The exchange rate does not significantly affect the volume of imports in Zimbabwe. This can be attributed to the low productive capacity of Zimbabwean industries which necessitates the need to import in order to meet domestic demand regardless of prices.

The non-significance and relative inelastic exchange rate suggests that trade policies that directly interfered with the market determination of imports prices did not, over the period of study, effectively influence imports in the desired direction. This implies that exchange rate and trade policies such as devaluation did little to impact on the volume of imports.

5.3 Policy recommendations

The findings of the study lend support to studies done elsewhere on imports demand. For instance, Moran 1989 finds that in twenty LDCs, the policies traditionally considered (that is, policies that exclusively affect income or exchange rate) will have limited impact on imports demand. Thus, broader policies, which focus on affecting the availability of foreign exchange, should be pursued, as they are likely to yield a larger impact on volume of imports.

The model reveals that imports demand in Zimbabwe is relatively inelastic. This may be attributed to the economic in Zimbabwe which is characterised by low capacity utilisation in the production sector which has resulted in the importation of goods that could have been domestically produced.

Therefore, policy instruments such as devaluation in order to restrict imports and encourage exports do not work. Depreciating the exchange rate will result in an insignificant reduction of import levels. The paper therefore recommends the government not to use the exchange rate as potent instrument of achieving balance of payments stability in Zimbabwe.

Significance of trade openness in the model suggests that if the government is to improve its Balance of Payments, then it has to use import control measures as instruments to reduce import volumes.
5.4 Suggestions for future study

For future studies the researcher suggests that there is need to incorporate more variables in the imports demand model. The variables include import capacity of a country and international reserves among other. This would elevate the credibility of the model since these also affect import demand in developing countries. Other functional forms of the model have to be tested also assess the significance of the determinants of imports demand in developing countries.

The research also suggests the application of the model in different periods, that is, periods, that is, period of fixed and flexible exchange rate so as to effectively assess the effect of the exchange rate of imports demand.
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APPENDICES

Appendix 1: Data Set

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<tr>
<th>Year</th>
<th>TM(US$)</th>
<th>GDP per capita</th>
<th>EXG (1US$/ZIM$)</th>
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SOURCES: CSO, RBZ (on imports and exchange rate respectively)

www.nationmaster.com (on GDP per capita)
## Appendix II: Data set (expressed in natural logarithms)

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### APPENDIX III: Descriptive Statistics

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Appendix IV: Summary of Econometric results

Dependent Variable: LNTM

Method: Least Squares

Date: 10/26/11

Sample: 1984 2008

Included observations: 25

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R-squared 0.800828  Mean dependent var 7.375120

Adjusted R-squared 0.760994  S.D dependent var 0.278142

S.E. of regression 0.135979  Alkaike info criterion 0.975779

Sum squared resid 0.369805  Schwarz criterion 0.732004

Log likelihood 17.19724  F-statistic 20.10393

Durbin-Watson stat 1.710962  Prob(F-statistic) 0.000001