THE MISREPRESENTATION OF INTERNATIONAL TRANSPORT COSTS

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DECLARATION

I **AYOOLA OLUWAREMILEKUN OLA** declare that this master dissertation titled: **THE MISREPRESENTATION OF INTERNATIONAL TRANSPORT COSTS**:

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AYOOLA OLUWAREMILEKUN OLA

DEDICATION

To my wife Olusola Patricia Ola

a blessed friend and confidant

for her encouragement, advice, patience and support.

and to

God Almighty, for His Grace

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I wish to express my sincere appreciation and gratitude to the following individuals, without whose assistance, this study would not have been possible:

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ABSTRACT

International transportation costs and the use of a country's imports cif/fob ratios as a measure for *ad valorem* shipping and direct international transportation costs measures has been at the forefront of international transport costing debates. Many researchers and analysts use the imports cif/fob ratios as a proxy for direct transportation costs in the absence of direct measures.

The study was motivated to examine the authenticity and use of the imports cif/fob ratios as a measure for international transport costs. The study highlights the impact of the use of the ratios in presenting and interpreting international transportation costs.

The study examined, investigated and analysed data on the United States, Germany, South Africa and Malawi and provided empirical evidence that the imports cif/fob ratios as a measure for *ad valorem* shipping and international transport costs are distorted and misused and are therefore misrepresentative and uninformative of the actual direct shipping and international transport costs of countries. Evidence from the study shows severe limitations in using the imports cif/fob ratios, as the trade data used for devising them are largely unreliable and inaccurate.

Users of the imports cif/fob ratios generally assume when using the ratios that, the composition of imports are constant. By means of correlation analysis, the evidence from the countries analysed in this study shows otherwise and prove that where the quality of trade data applied are reliable and accurate, a country's composition of imports has a considerable and significant effect on the level and trend of the country's imports cif/fob ratios. On the other hand, where the data is unreliable, the resulting imports cif/fob ratios from the computation are inaccurate and insignificant as an informative indicator of the country's actual international transportation costs.

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LIST OF ACRONYMS

ALADI	Asociación Latinoamericana de Integración (Latin American Integration Association)
CIF	Cost Insurance and Freight
COMTRADE	Commodities Trade Statistics Database
CPI	Consumer Price Indices
CSIR	Council for Scientific and Industrial Research
DOTS	Direction of Trade and Statistics
ECED	National Council on Economic Development
ECLAC	Economic Commission for Latin America and the Caribbean
ECMT	European Conference of Ministers of Transport
FOB	Free on Board
GDP	Gross Domestic Product
IFS	International Financial Statistics
IMF	International Monetary Funds
LIP	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
N/A	Not Available
NBER	National Bureau of Economic Research
OECD	Organisation for Economic Co-operation and Development
SA	South Africa
SITC	Standard International Trade Classification
UKZN	University of KwaZulu-Natal
UN Comtrade	United Nations Commodities Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
US	United States of America
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1. INTRODUCTION

Globalization highlights the fact that no nation is totally self-sufficient and that every country must become involved at various levels of trade to sell what it produces, acquire what it lacks and produce more efficiently in certain economic sectors than its trade partners (Rodrigue, Comtois & Slack, 2009). They further emphasised globalization of production as concomitant to the globalization of trade and that one cannot function without the other. Rodrigue et al., 2009 compared international transport costs to a pedal upon which both the globalization of production and trade throttles. International trade has been identified to be of greater significance to the development of nations than was perceived in the pre-globalization era. This link is highlighted in the increase in relevance of international transport costs as a driver of the development and growth of nations, a crucial determinant of production, trade patterns and consequently economic integration in this globalized era. The proficiency and exactness of transportation cost measures are also becoming crucial to economic development as these measures influence, shapes and impacts a nation's access and openness to international trade.

As more researchers highlight transportation cost as a significant force on which globalization of trade thrives, this drives for a more proficient and effective uniform transportation costs measure in which users would be able to access and measure the costs of transportation and trade between countries. To nations, the accuracy of the interpretation and presentation of their international transport costs and its direct shipping costs, by measurement in particular, has become crucial as it is now a tool for the anticipation of trade and economic development. Transportation and its importance for nations has become an indispensable means for nations to reach out to the world market and strengthen their global integration and attract foreign direct investment. Hence, the measurement (presentation and interpretation) of international transport costs relating to nations and their trading partners are of major interest within the global market place.

Transportation costs are cited as one of the most significant aspect of trade costs: costs which include all costs incurred in securing goods to their final destinations other than the marginal costs of producing the good itself. While direct shipping costs are often cited as the primary sources for international transport costing, these primary sources of transportation costs data are not available for most countries and are considered commercially sensitive information.

In the absence of accurate direct measures (primary sources) for transportation costs one alternative which has been used in the depiction of international transport costs over the years has been a country's import cif/fob ratio. More recently, however, the definition and usage of these ratios as a measure for international transport costs has been questioned and its impact on trade mostly in developing countries, has been stretched.

This paper investigates the intricacy and inaccuracy in the measurement of international transport costs through the use of the imports cif/fob ratios as a measure (direct proxy) for a country's *ad valorem* shipping or international transport costs and its impact on trade.

1.2. BACKGROUND AND CONTEXT

By its very nature, the representation of international transport costs is linked and motivated by the need for effective and efficient trade. Several decades ago, before the advent of modern trade, trade anticipation and motivation might have emerged necessitating that the local and international movement of goods be structured around freight forwarder. However, it was the needs, specialization and competitiveness among countries within the international markets that brought importance to the representation of international transport costs.

The productivity and competitiveness of nations within the international markets are both directly and indirectly impacted by the *ad valorem* shipping costs which impacts the nation's cost of delivered goods and investments, and subsequently its economic growth. As a result, the determinants and analyses of international transport costs has increasingly become an area of interest in recent literature to both researchers and analysts alike with the desire to better explain economic development, trade patterns, transportation costing, and possible scenarios in reducing transaction costs motivating this interest.

Direct shipping costs are construed as the conventional way of determining the cost of moving goods between nations which is used in part in pre-determining the market price of those goods. On the other hand, the cif/fob ratios are articulated as the unconventional way of determining the cost of moving goods. But unfortunately, very few countries report detailed information on direct shipping costs anymore, so the unconventional way has become the standard for measure. The conventional economic principle affirms that trade flow is reported by exporting nations without the inclusion of freight and insurance (fob) costs, while on the other hand importing nations provide reports inclusive of freight and insurance (cif) (Hummels and Lugovskyy, 2006). By definition, the use of the imports cif/fob ratios as a measure for international transport costs is being questioned as earlier mentioned, but the focus of the controversy is on its accuracy when being used to reveal international transport costs of nations. As the ratio is an indirect measure of international transport costs, which captures transportation cost, but does not take the variability in the composition of imports into account.

Hummels and Skiba (2004) emphasise the Alchian-Allen Effect of higher priced imports as having a lower *ad valorem* cost as compared to lower priced imports. Although the conventional economic theory supports this notion as it promotes economic efficiency through the provision of multiple mixtures of goods, often at lower costs, several users of the imports cif/fob ratio that use the ratio to measure international transport costs mostly assume the composition of trade to be constant.

According to Chasomeris (2009a), the imports cif/fob ratio has been used by many as a measure (direct shipping costs) for international transport costs; the likes of the United Nations, African Development Bank, International Monetary Funds (IMF), World Bank, in several pre-eminent publications on trade and transport and by several researchers. This despite criticism from several quarters on the use of these ratios as a measure for direct shipping or international transport costs due to the fact that most users and analysts assume when using these ratios that a country's composition of imports are constant and that the ratios are a true reflection of the country's actual costs of transport without taking into account the inconsistencies that might be present in data used in computing the ratios in the first place. Data collection relies on independent reporters of the same trade flow gathered for

reasons other than shipping costs (Hummels and Lugovskyy, 2006). Despite these misgivings and shortfalls, the ratio is still the mostly widely used and accepted measure for international transport costs.

To add further support for the scepticism of the use of the imports cif/fob ratios as a measure for direct shipping or international transport costs data quality issues, compounded by the continued assumptions in the use of the ratios and the interpretation of the ratios in relation to transport costing is the fact that it is given as one of the factors impeding trade mostly in developing and underdeveloped countries. Over the years, participation and competitiveness in world trade has become increasingly dependent on the type, quality, patterns and costs of transportation. The fact remains that, as the price of the vast bulk of traded goods is exogenous for developing countries, the use of imports cif/fob ratios as a measure for international transport costs has the potential to result in high shipping costs for these countries. When import shipping costs become more expensive, it results in higher inflation for the receiving country because of the increased cost of imported finished goods. These additional costs on intermediate and capital goods, also increase the costs of local production (Economic Commission for Latin America and the Caribbean (ECLAC), 2002), which consequently reduce the levels of foreign investment. Clearly, there is a need to explore and quantify the definition, use and impact of the imports cif/fob ratios as a measure for direct shipping and international transport costs on trade.

1.3. PROBLEM STATEMENT

This study investigates the intricacy and inaccuracy associated with the use of import cif/fob ratios as a measure of international transport costs and its impact on trade flows in countries. As trade costs is increasingly becoming an area and subject of concern increasing attention is being given to international transport costs in both the empirical trade literatures and in theoretical models of international trade.

Trade imposed barriers are becoming less significant and interest is increasingly being shifted towards the role of non-policy barriers such as transport costs and their effect on trade flows.

This has led to growing interest in the sourcing of a credible, proficient and effective transport costs measure which would more accurately reflect the cost of international transportation. Arguably the widely used and most recognized measure (imports cif/fob ratios) for international transport costs has been at the forefront of transport and trade costs controversies. It is perceived as an impairment to true and accurate measure of international transport costs. This measure (cif/fob ratios) which uses data mainly sourced from the IMF database, has not always accurately portrayed the true composition of trade and transport costs nor does it depict the true definition of the term. It has generally misrepresented the international transportation costs of countries.

1.4. RESEARCH AIMS AND OBJECTIVES

The study focuses on the misrepresentation of international transport costs through the imports cif/fob ratios in terms of definition, use, presentation and interpretation as a measure for direct international transportation costs. The main aim of this research is to investigate the misrepresentation of international transport costs as measured by the country imports cif/fob ratios. The following specific objectives have been identified for the study:

- **To examine the use of imports cif/fob ratios as a measurement for international transport costs.** This involves the collection of data and information on the characteristics, patterns and perceptions of the use of the imports cif/fob ratios as a measure for international transport cost.
- **To highlight and establish the level of inaccuracy in the use of the imports cif/fob ratios as a measurement for international transport costing.** This involves the examination of the impact and the level of irregularities emanating from the use of the imports cif/fob ratios as a measure for international transport costs through the data and information collected on the characteristics, perceptions and patterns of the ratios.
- **To determine the reasons for the inconsistencies in results of transportation costs using the imports cif/fob ratios.** This involves examining and analysing data from sample countries to determine the source of the impact and the irregularities identified.

1.5. RESEARCH METHODOLOGY

The freight transportation costs data used today in transport costing are typically derived from secondary data, aggregated piecemeal data, facility-specific surveys, or broad cost indices (Holguin-Veras, 2010).

This study follows an empirical quantitative based method of research, using the inductive approach of research to draw observation on the irregularities in the use of imports cif/fob ratios as a measure to cost international freight. Secondary data were retrieved from prior studies, books, journals and electronic resources that related to the objectives of the study. The major trade data were sourced from the International Financial Statistics (IFS) database of the International Monetary Fund (IMF) and the UN Comtrade.

The study used correlation analyses between a country imports cif/fob ratios and that country's composition of imports. The findings of the correlation analyses was used to draw conclusion and make recommendations from the information gathered through critical evaluation against the findings of the studies in the literature review.

1.6. LIMITATION OF THE STUDY

This study is an additional contribution to the growing body of knowledge on international transport cost measurements and their impact on trade between countries. It is hoped that the study will suffice as a vital contribution to the promotion of transport cost measurement and trade.

Moreover, this study seeks to give information on issues ranging from the arguable definition and the questionable use of the imports cif/fob ratios as a measure of direct international transport costs to the debatable assumptions of the composition of imports that arises when the imports cif/fob ratios are being used so as to qualify the use of these ratios as a measure.

Finally, given the very pertinent nature of this work, it is hoped that the study will provide practical solutions to this impediment beyond its academic value. This will be the case because, by glimpsing into the extended impact of the ratios on trade, it provides an insightful

look beyond the representation of the ratios as a measure of international transport costs. It is therefore hoped that international economists, analysts and traders alike would find the suggested conclusions simple, practicable and easy to apply in the measurement of international transport costs.

1.7. OVERVIEW OF THE DISSERTATION

This dissertation is structured as follows.

Chapter Two (Literature Review): This section provides an overview of international transport costs. It examines perspectives and perceptions of the import cif/fob ratios as a measure of international transport costs from a theoretical viewpoint. The review is divided into three main parts: examining the international trade and transport cost concepts; the assessment of and use of the imports cif/fob ratios; and the perceived repercussions of the use of the ratio as a measure of transportation cost on trade anticipation and participation.

Chapter Three (Research Methodology and Design): The chapter starts with an introduction of the methodology used. It goes on to discuss the data collection and analysis techniques used for this research.

Chapter Four (Data Presentation, Analyses and Discussion of Results): This chapter presents the analyses and discussion of the empirical data. The first section introduces and deduces the viability and reliability of the sourced data. It then provides a descriptive analysis of the data used in the examples. The chapter concludes with the application and discussion of the information derived from the data, providing comparisons between freight rates measured using IMF and national source data, taking into consideration the composition of imports in the measurement of transportation costs for the USA, South Africa, Germany and Malawi. Correlation and comparative analysis was then used to clarify the relationship that exists from the data interpreted.

Chapter Five (Conclusions and Recommendations): This chapter sums up the findings and the significance of the research by presenting the main conclusion and recommendation for

improvement in the measurement of international transport costs. The chapter concludes with the implications and the limitations of the study and identified future areas of research.

1.8. CONCLUSION

This chapter provides an introduction and background to the misrepresentation of international transport costs through the use of indirect or unconventional methods to determine the costs of international transportation or freight. The economic growth and development of nations today relies upon their productivity and competitiveness in the global market place. With transportation costs being adjudged as a significant drive by which global trade thrives, the accurate measurement of international transport costs has become of greater importance and interest to nations in their drive for competitiveness in the global market. This study provides a platform upon which the measurement of international transport costs is investigated. A detailed literature review on the research is presented in Chapter Two.

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

The purpose of this chapter is to provide a synopsis of the literature that was reviewed in order to better understand and provide a contextual base for analysing the misrepresentation of international transport costs. The chapter starts with an exploration of the theoretical context surrounding the study before providing a review that briefly explores international trade, transport, transport costing and cost measurements and other related concepts. The chapter then examines empirical evidence on transportation and international transport costs. This is followed by an exploration of the role, perceptions, and determinants of transport costs. The chapter then reviews the measurement of international transport costs in view of the perspectives and perceptions of the use of imports cif/fob ratios as a measure for direct shipping costs before reviewing the definition, source, nature and composition of the ratios as a measurement for international transport. The chapter concludes with a review of the impact of the use of the ratios as a measure for international transport costing and provides some concluding remarks.

2.2. THEORETICAL CONTEXT

In this study, international transport costs or transport costs are defined as costs incurred in moving freight across national borders. These freight costs comprise both direct and indirect elements. The direct elements include freight charges and insurance on those freights, while the indirect elements include all costs incurred by the transport operator. For the purpose of this study, the focus will be on the direct elements which are more constant in transport cost rather than the indirect elements which vary with the shipment's characteristics (Matthee, Grater, and Krugell, 2007).

Over the past few decades, various studies have been conducted on the subject of international trade and international transportation costs with the imports cif/fob ratios at the forefront of

studies on transport costing mechanisms. While some studies justify the use of the imports cif/fob ratios as a measure for international transport costs, others have discredited (questioned) the use of the ratios due to the observed inconsistencies and obscurity surrounding cost interpretation of freight rates measured using IMF and national source trade data.

The study by Rousslang and Theodore (1993) set out to identify the costs of transporting goods between nations as a natural barrier to international trade. The study examined international transport costs as a barrier to trade and further compared it with the barriers imposed by tariffs and quotas. In a further study by Hummels (2007), transport costs were analysed relative to the value of the goods being moved and relative to other known barriers to trade, such as tariffs. The study also analysed the extent to which transportation costs alter relative prices (Hummels, 2007).

In ECLAC (2002) analysis of the impact of international transport cost on foreign trade and economic development, it was argued that the price of the vast bulk of traded goods are exogenous for developing countries and therefore the use of the import cif/fob ratios are disastrous to transport costing for these nations. Lugovskyy and Skiba (2008) demonstrated that trade and transportation are closely linked to the economic growth and development of a country and that transportation costs ultimately influence trade. Chasomeris (2009a) discusses the (mis)measurement of international transport costs and argues that there is a degree of misunderstanding and misuse in imports cif/fob ratios as a direct replacement for *ad valorem* shipping cost. His results highlighted the erroneous assumptions made on the composition of trade while using the ratios.

Trade liberalization and technological advances have been two constant dynamics that have long been presented as explanatory factors for the changes in the costs of transport. Sánchez, Hoffmann, Micco, Pizzolitto, Sgut, & Wilmsmeier, (2002) argue that trade liberalization is a reason for the experienced reduction in customs tariffs, a fact acknowledged by Prabir De, (2007) who cited it as the main reason for the changes experienced in international transport costs. Prabir De, (2007) also argued that the quality of infrastructure and related services,

which play an important role in the flow of international trade, are necessary for achieving positive changes in costs of transport.

The Silk Routes provide evidence that the shipping of high-valued goods over long distances has been undertaken as a result of people wanting to consume goods that are not produced within reach (Thisse, 2009). It is a well-known fact that international trade has been adversely affected in the past by the lack of availability of international transportation services and the costs thereof.

Considering the increase in trade dependency in the world today as a result of globalisation and technological development changing the approach to production and trade both in developed and developing countries, more focus has been placed on the need for a better enabling environment to trade both profitably and competitively. This need has led to logistics and transportation costs gaining momentum as they invariably dictate the pace and direction of trade and globalisation. Behar and Venables (2010) acknowledge this when they cited from the Growth Commission's report that integration into the world economy is one of the key factors determining the success of the fastest growing economies.

Many countries, however still lag behind in terms of trade liberalisation and global integration, causing them to miss out on beneficial gains from such trade opportunities (Behar and Venables, 2010). One major outlined reason for this short coming has been high trade costs.

2.3. INTERNATIONAL TRADE

International trade is the exchange of raw materials, goods and services across the geographical borders of countries across the world. International trade resulted from the Industrial Revolution of the eighteenth and nineteenth century, but the rapid development in transportation facilities in the twentieth century is credited with the surge in modern day international trade (EconomyWatch, 2010b). But according to ForexNews (2010), the internationalisation of trade is not a recent economic concept.

Due to the increased level of global economic integration, changes in economic policies, and its effect on economy performance and the need to integrate competitively; understanding the dynamics of international trade has been an area of intense study. According to Hummels (2007), one possible explanation for the changes in international trade which might have led to these observed economic changes is the decline in international transportation costs, which economic historians have documented to be as a result of global technological changes, input costs and the nature of goods traded among other things. According to Behar and Venables (2010), econometric studies suggest that transport costs have a statistical and quantitative significant impact on trade flows, both domestically and internationally. Choi (2005) stated that a better understanding of the dynamics of international trade is required in any study aimed at understanding and enhancing the mechanisms of transport costs and its measurement which are factors of competitiveness. EconomyWatch (2010b:1) acknowledges that the premises of international trade may have undergone a number of changes from time to time, but

> "the basic principle behind international trade is not very much different from that involved in the domestic trade. The primary objective of trade is to maximize the gains from trade for the parties involved in the exchange of the goods and services. Be it domestic or international trade, the underlying motivation remains the same. The cost involved and factors of production separate international trade from domestic trade".

The nature of international trade as a cross-border trade is argued as reason enough for the increases experienced in the international cost of trading. Dynamics such as tariffs, restrictions, time and transport costs and costs related with the legal systems of the countries involved in the trade makes it a costly affair. The extent of these dynamics is considerably low in the case of domestic trade (EconomyWatch, 2010).

Although it is argued that there is no single theory that can adequately and completely explain international trade or its pattern: Bougheas, Demetriades and Morgenrothc (1999); Giuliano, Spilimbergo and Tonon, (2006); Baier and Bergstrand, (2001); Anderson and Van Wincoop, (2004); Brun, Carrere, Guillaumont, and De Melo, (2002), all suggested using the Gravity Model of trade to at least enlighten on international trade or its pattern. The Gravity Model

provides a crucial empirical explanation of international trade. It states economic size and distance between nations as the primary factors that determine the pattern of international trade. Economic size is measured by GDP, and is inhibited by distance. This increases transportation and other transactions costs, thereby providing the main link between trade barriers and trade flows. UNCTAD (2003), however, argues that the model is not able to explain the dynamic nature of today's trade patterns and that transport services and infrastructure need be incorporated in modern trade models and trade policies to better explain international trade.

2.3.1. INTERNATIONAL TRADE AND ITS ROLE IN THE ECONOMY

For a long time international trade has been hailed as an engine of growth and economic development because it enhances domestic competitiveness, increases sales and profits of a country by increasing its global market share while providing expansion opportunities for its local businesses and reduces the country's dependence on existing markets. In short, international trade extends the sales potential of existing specialized goods and capacity and maintains cost competitiveness in the domestic market.

Some of the logical questions being asked today of international trade and its role in the economy are:

- Why do countries trade?
- What determines with whom and where to trade in this modern world?
- Shouldn't developed nations such as the likes of the United States and United Kingdom produce all of their national residents' needs and demands rather than import such residents' needs from the likes of China, Japan and their other trading partners?
- Why do these trading partners equally depend on other nations to facilitate their own needs?

It is hoped that the literature review will help answer some of this question so as to gain a better understanding of international trade.

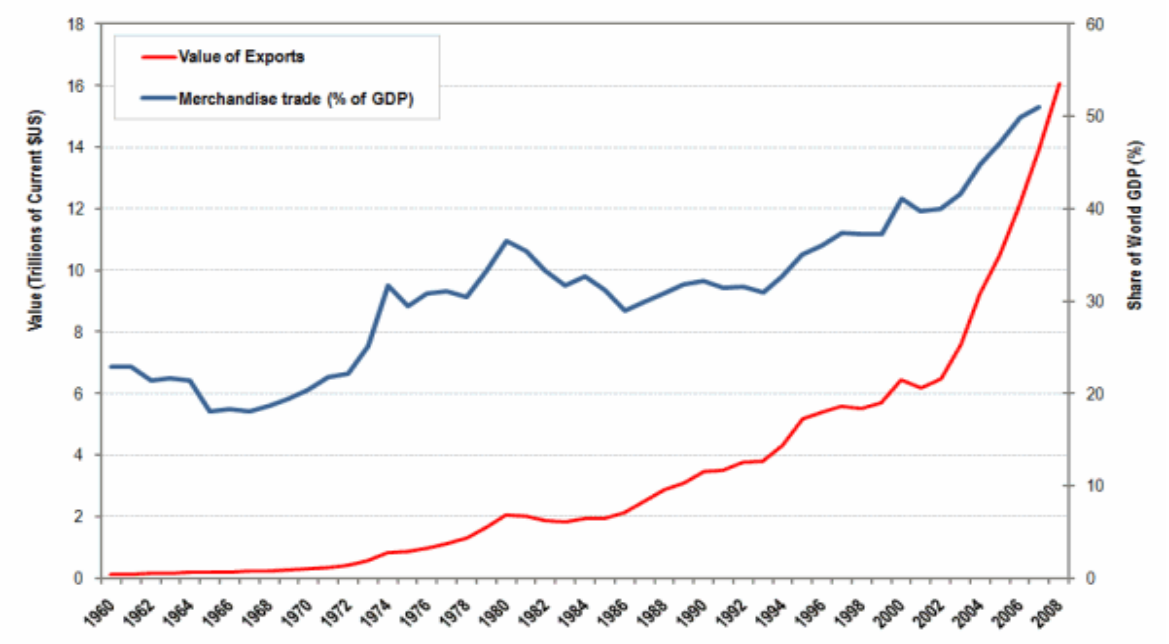
ECED, (2010:1) explains that:

> "Because countries have different natural, human, and capital resources and different ways of combining these resources, they are not equally efficient at producing the goods and services that their residents demand. The decision to produce any good or service has an opportunity cost, which is the amount of another good or service that might otherwise have been produced. Given a choice of producing one good or another, it is more efficient to produce the good with the lower opportunity cost, using the increased production of that good to trade for the good with the higher opportunity cost".

When a country can produce more of a certain product with the same resources than another country can, it is said to have an absolute advantage in the production of that product. If the other country has an absolute advantage in producing a product that the first country wants, both will be better off if they specialize and trade. This will save costs and improve access to quality in the highest order. This is hailed as the foundation of international trade.

As international trade is expressed as the exchange of capital, goods and services across international borders or territories, then international trade can be summed up as the world economy where prices, supply and demand affect and are being affected by global events. Trade also represents a significant share of the gross domestic product (GDP) in most countries, especially underdeveloped and developing countries. Figure 2.1 below shows that international trade surpassed 50% of the world's GDP for the first time in 2007. Most countries support trade expansion in anticipation of improving their market status and GDP, both of which indicate the growth and economic development of that nation. Although international trade might have been present throughout much of history, its economic, social and political importance has just begun emanating in recent century. This has further generated an examination of the trading systems in recent decades.

Figure 2.1. Relative Rate of World Merchandise Trade, 1960-2008



Source: Rodrigue, 2010a.
(http://people.hofstra.edu/geotrans/eng/ch1en/conc1en/ch1c1en.html)

The results of trade expansion and regenerated trading system such as industrialization, globalization, multinational corporations, advanced transportation, and outsourcing have all been judged to play a significant role in impacting on modern day international trade. However, international trade expectations are neither attainable nor sustainable by mere trade expansion alone, as without the adequate infrastructural support and enabling macroeconomic policies to operate upon, they could be rather disruptive and abrasive on economic growth. This notion is believed to have resulted in the reason for countries implementing trade tariffs, quotas and other trade barriers to regulate international trade flows and expansions, while at the same time pumping huge investment into infrastructures to ease and facilitate the flow of trade.

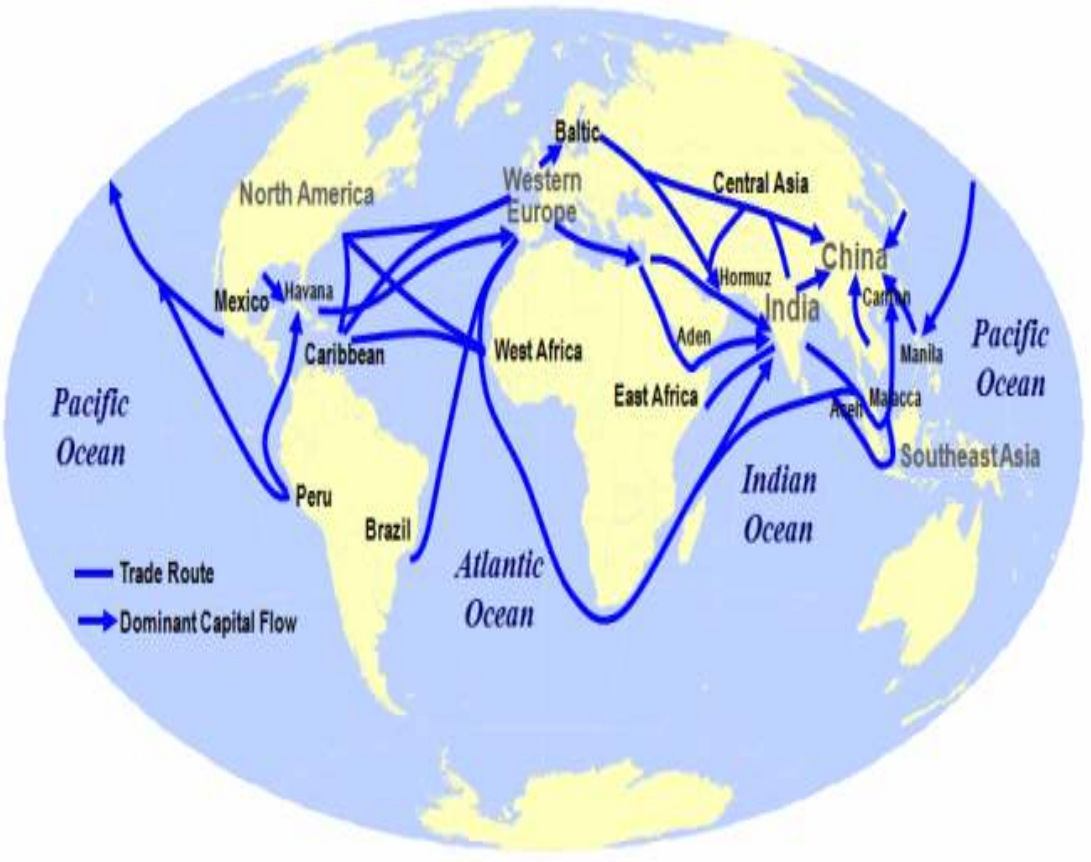
In principle, international trade is not different from domestic trade because the motivation and behaviour of parties involved in a trade do not change fundamentally regardless of whether trade is across a border or not (Leontief, 1953). However, the main difference is that international trade involves the movement of capital, goods and services over a longer

distance with imposed costs emanating from tariffs, distance (transport) and cost associated with time, language differences, legal system and culture (Mundra, 2010). Without international trade, nations would be limited to the goods and services produced within their own borders. Thus, transport costs are an impeding factor to be considered when engaging in international trade.

According to the UNCTAD (2006), most international traded goods are handled by liner shipping services, which provide regular transport services for seaborne trade, especially for containerized cargo. Access to international liner shipping networks (see Figure 2.4) is thus a crucial determinant of a country's trade competitiveness and economic growth. Since the price of shipping depends largely on the major global trade routes (see Figure 2.2) and the current economic situation (GFP, 2010), international transportation is becoming an integral part of international trade as increasing emphasis is being placed on the context of globalized production processes and just in time deliveries (GFP, 2010) in global market.

Economic growth and development is being piloted by international trade provided the policy measures and economic infrastructure are accurate and accommodative enough to cope with the changes in the social and financial scenario that results from it. While international trade might be motivated, influenced and predetermined by needs, specialization and costs, transport costs are justified as a major element of overall trade costs. They are a more important component of trade than tariff barriers imposed by trading countries to regulate and maintain international specialization and trade (Hummels, 1999). So, clearly transport costs drives differences between domestic and foreign goods prices (Chasomeris, 2006) and therefore plays an enormous role in economic growth and development.

Figure 2.2. Major Global Trade Routes



Source: Jean-Paul Rodrigue (2009) (http://people.hofstra.edu/geotrans/eng/ch3en/conc3en/img/Map_Main%20Maritime%20Routes.pdf)

2.4. INTERNATIONAL TRANSPORTATION

Transportation has an important macroeconomic and microeconomic role to play in any society. It is also a key aspect required in providing a solution to certain major economic problems, such as those that exist because individuals and society have unlimited needs and wants, yet possess limited resources (De Villiers, Nieman and Niemann, 2008: 150). Modern life is structured around accessing goods and services that lie outside of the immediate vicinity of the society and for this to be achieved, transportation is required. From a macroeconomic point of view, transport is central to the development and functioning of any society, economically, socially politically and environmentally (De Villiers et al., 2008: 150). It is perfectly logical therefore that, despite the major changes that have been experienced in society, transportation issues continue to feature strongly in debates worldwide over their influence on day to day life.

Previously, transportation was appraised primarily in terms of mobility (physical movement), but the growing importance of transportation in our day-to-day existence lies in the fact that it creates valuable links between regions and economic activities, and between people and the rest of the world. Increased globalization and integration means that transportation is increasingly vigorously and competitively evaluated in terms of accessibility (people's ability to obtain desired goods and services) and sustainability (balancing resources) (VTPI, 2008).

Rodrigue, (2010a: 1) defines transportation as

> "a strategic infrastructure that is so embedded in the socio-economic life of individuals, institutions and corporations that it is often invisible to the consumer, but always part of all economic and social functions and this is paradoxical, since the perceived invisibility of transportation is derived from its efficiency".

According to Matthee, Grater & Krugell, (2007: 3), Limao and Venables (2001) stated that "transport and other costs of conducting business on an international level as key determinants of a country's ability to participate fully in the world economy, and especially to grow exports". Rodrigue (2010a) stressed that if transport is disrupted or ceases to operate, the consequences will be dramatic and catastrophic to society due to the changes that have taken

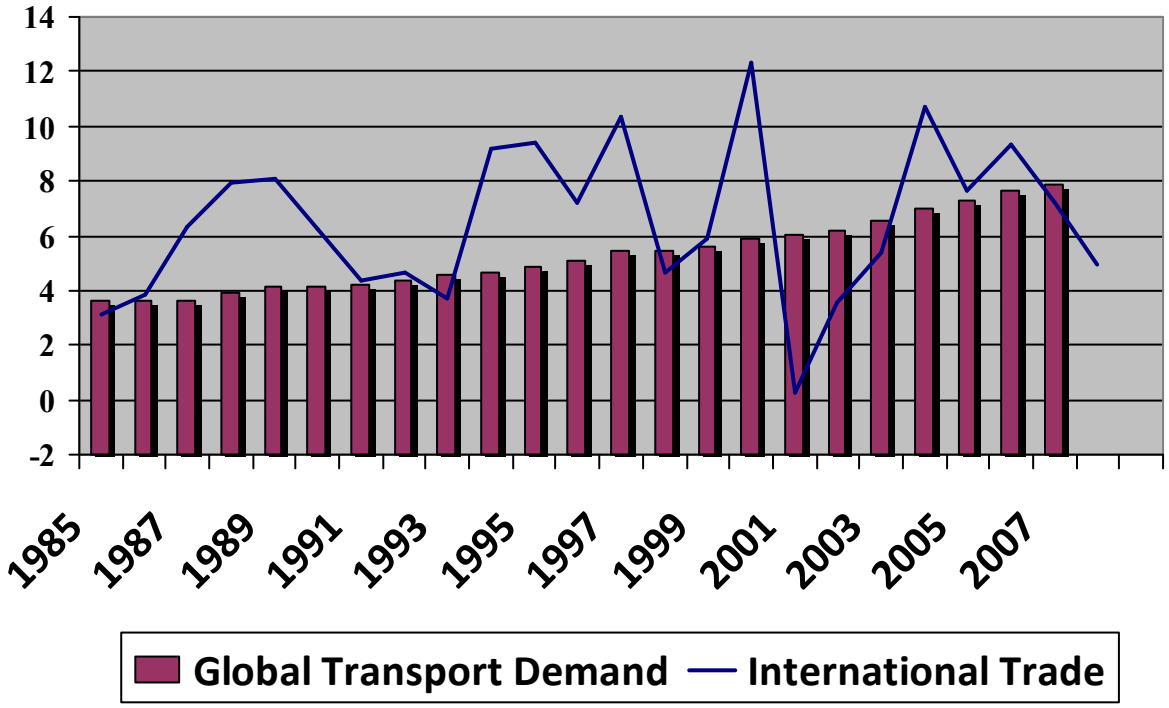
place. Transport and transportation costs therefore are an integral part of any society's development and communal integration. Effective integration is one of the results of efficient reduced costs of transportation in particular and other infrastructure services in general (Prabir De, 2007).

Dniprovia (2010) defines international transportation as the transportation of goods when the departure point and destination point (no matter whether an interruption in transportation took place or not) are located in the territory of different countries, or in the territory of one country if a stop is planned in the territory of another country. The demand for transport, according to Hummels (2009), is an indirect or derived demand that primarily depends on the demand for international trade itself. This is evident in Figure 2.3, where the flow of transport demand increases proportionately to the flow of trade. Therefore a growth in demand of international trade will concurrently absolutely result in a growth in demand for international trade. Rodrigue et al. (2009) emphasise this when they justified transportation as an enabling factor that is not necessarily the cause of international trade, but a means without which globalization could not have occurred.

The liner connectivity of countries within the global market is through the global transport system (liner shipping network) which largely depends on a number of factors that influence and impact on the country's integration and competitiveness in the market. These factors include the country's ports efficiency (administration, infrastructure, operations, inter-linkage) its inter-linkage with other modes of transport (domestic passage, especially in landlocked countries), the size of the deployed ships, the number of destinations served, and also the level of competition among the nation's shipping companies (UNCTAD, 2006). The lack of this connectivity in landlocked countries has made them the worst connected countries in the world due to the complexity of achieving connectivity to the liner shipping network.

In order to reach a meaningful conclusion about the level and measurement of international freight rates, the factors which determine their level, and their effects on national economies, as well as a detailed knowledge of the state of the global transport industry and of international transportation costs is needed.

Figure 2.3. International Trade and Transport Demand 1985-2008



Source: Author compilation using data from IMF, 2008a; 2009a

2.4.1. THE INTERNATIONAL TRANSPORT INDUSTRY

The global transportation industry is a challenging, complex and rapidly changing sector. Practitioners are faced with diverse market challenges in the competitive global economy. Worldwide, the transport industry has become an increasingly important contributor to a country's trade exports and gross domestic product as countries have integrated ways to use the transportation system to contribute more to their national economic development. Although transport efficiency may have increased significantly because of innovations and improvements in infrastructures and modes of transport, organisations in the global transportation sector still face unprecedented challenges to achieve competitive advantage.

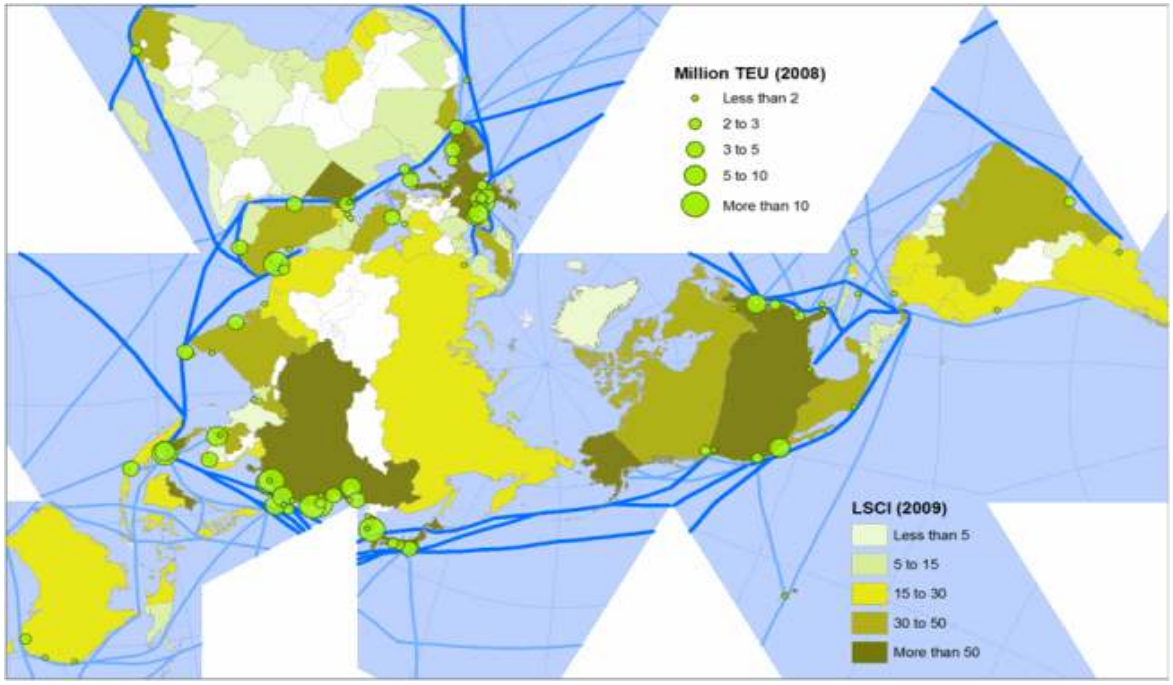
The modern international transport system consists of five major transportation modes (Air, Maritime (Deep-sea and coastal-sea shipping), Rail, River and Canal, and Road) which it uses to effect efficiency of trade through the cohesion (Intermodal) of these modes of transport.

Khalid (1997:3) expresses “a transport system featuring interconnectivity among the various transport modes (intermodal) as a catalyst for efficient movement of goods, greater trade and lower transport costs”

Of these modes of transport, the maritime with sea ports in particular have become of major significant to international transportation, flow of trade and trade efficiency. Because of a ship’s ability to efficiently move large quantities of cargo over long distances (Rodrigue et al., 2009a) this has led to the port being recognized and referred to as the gateway to international trade.

The maritime shipping networks are assessed through the Liner Shipping Connectivity Index (LSCI) which is an attribute of networks that refers to the quality and costs to moving freight between two points in space and also jointly considered as a measure of connectivity to maritime shipping and of trade facilitation (see Figure 2.4) (Rodrigue et al., 2009). This is acknowledged to have changed the world of goods movement from what it was known.

Figure 2.4. The Liner Shipping Connectivity Index (LSCI)



Source: Rodrigue, Comtois, and Slack, 2009. (http://people.hofstra.edu/geotrans/eng/ch3en/conc3en/img/Map_LSCI_2009.pdf).

Boodram (2008) stated that an efficient international transport industry is an industry that possesses a freight transportation system, integrating the various modes of transport with the ultimate aim of creating a seamless service that facilitates the flow of cargo to strategic points. These five major modes used in the modern international transport system in effecting effective trading both at a domestic and at the international level are the roads, railways, inland waterways, shipping lines and air freight sectors (Stopford, 2009). Each of these sectors uses different mediums or vehicles to influence its performance in international trade.

Based on operations, the system can be categorised into three zones. Table 2.1 presents this with the inter-regional transport: deep-sea shipping and air freight catering for long distance trade and transportation; the short-sea shipping, catering for cargo transport over short distances, usually on a national scale or redistributing cargoes brought in by the deep-sea services or transporting to landlocked countries without access to deep-sea shipping; and the inland transport zone which comprises road, rail, river and canal transport (Stopford, 2009). For the purpose of this study, the deep-sea inter-regional transportation (maritime) will be the only transportation means to be analysed.

Table 2.1. International Transport Zones and Transport Modes

Zone	Area	Transport Sector	Vehicle
1	Inter-regional	Deep-sea shipping	Ship
		Air freight	Plane
2	Short-sea	Coastal seas	Ship/ferry
3	Land	River and canal	Barge
		Road	Lorry
		Rail	Train

Source: Adapted from Martin Stopford, 2007: 50

2.4.1.1. MARITIME TRANSPORT

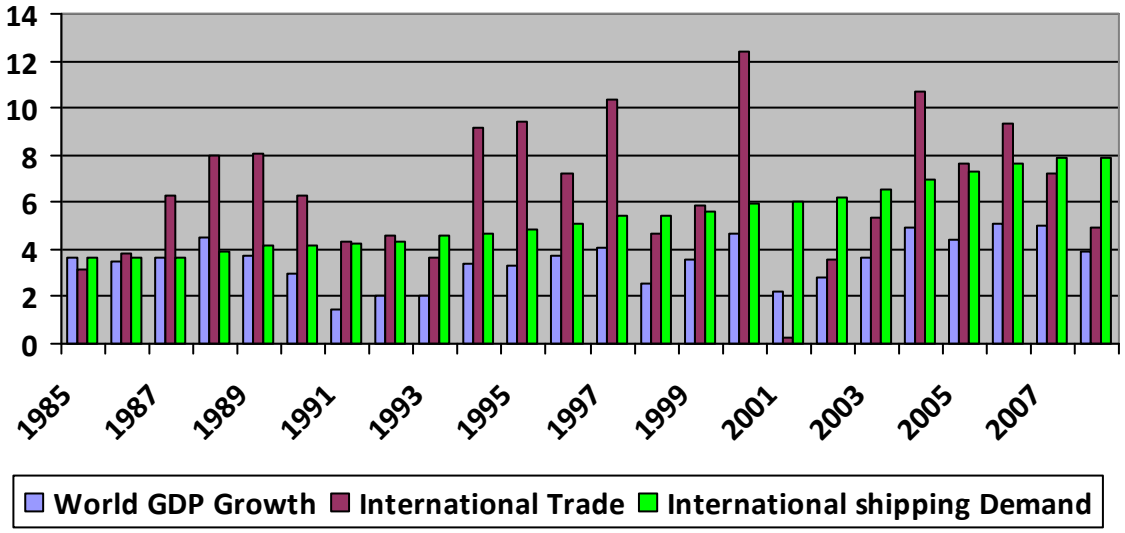
Maritime transport is an essential means of transportation for the prosperity of a nation. It plays an important role in meeting a nation's essential needs and affects the rate of development of the nation. Maritime transport is often considered as the most cost efficient means of transportation as it is able to transport a large number and volume of goods over a longer distance at a lesser cost compared to other means of transport. It is therefore regarded as being crucially important to the modern society.

According to Rodrigue (2010) maritime transportation is as old as global trade. Historically, the scope and extent of long distance trade; the physical properties of the waters confer buoyancy and limited friction, making maritime transport assertively the most effective mode to move large quantities of cargo over long distances (Rodrigue et al., 2009; 2009a). This feature of maritime transport is credited with a significant contribution to the growth and development of modern international trade. Though, maritime transport has not singlehandedly catered for the demands of internationally traded goods movement without the concomitant interface of one or two of the other modes of transport. With containerization being the order of the day, maritime transport, along with the rail and road transport sector are jointly credited with the effective movement of goods to accommodate the growing demands of international transport in international trade.

The growing demand for international shipping is evidenced in the increase in the volume of globally traded goods and the increase in the world's GDP (see Figure 2.5 and 2.6).

Figure 2.5. World GDP Growth for Selected Countries, 1985 – 2008,

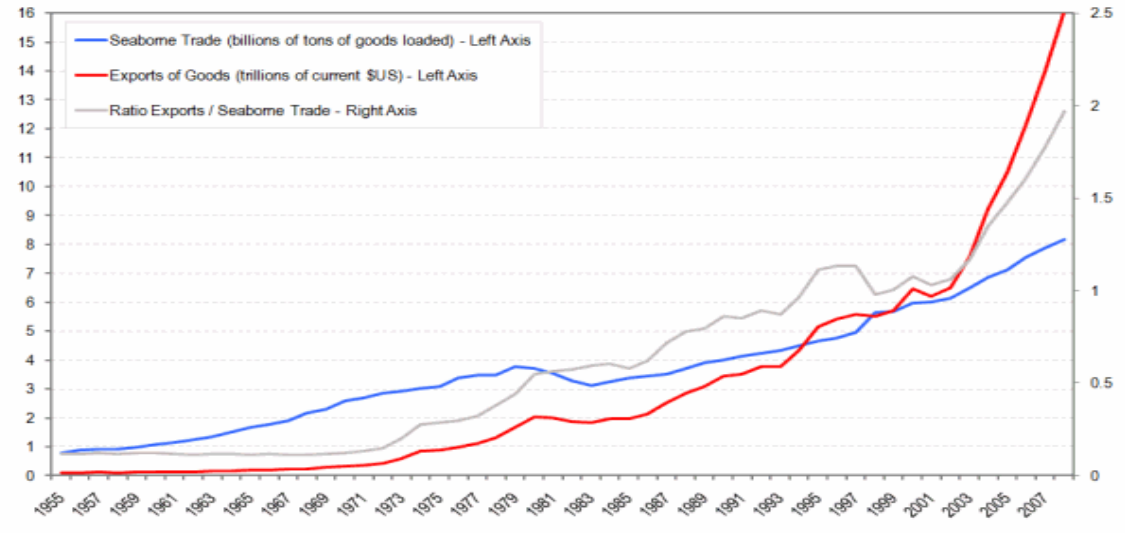
(Annual Percentage Change)



Source: Adapted from UNCTAD, 2003; 2005; 2006; 2008; and 2010.

Figure 2.6. International Seaborne Trade and the Export of goods, 1955 - 2008

(Millions of Tons Loaded)



Source: Rodrigue, 2010a.
(http://people.hofstra.edu/geotrans/eng/ch3en/conc3en/seabornetrade.html)

According to the recent reports by the UNCTAD, the volume of the world merchandise trade recorded has experienced a constant increase over the years with growth in the world economy (GDP) which has more than doubled over the same period (See Table 2.2). This fact alone highlights the effect of increasing globalization and deepening economic integration (UNCTAD, 2006; 2007; 2008; 2009). This further indicates the mounting important linkage between economic growth, trade and demand for maritime services.

Table 2.2. Economic Growth, Trade Volume and Maritime Service Demand, 1999–2008

(Annual Percentage Change)

Region/country		**'00**	**'01**	**'02**	**'03**	**'04**	**'05**	**'06**	**'07**	**'08**
World	Economic Growth	4.7	1.3	1.8	2.5	4.9	4.5	5.1	5.0	4.0
	Trade Volume	3.8	0.3	3.0	5.4	10.7	7.6	9.4	7.2	5.0
	Global Maritime Demand	3.6	-1.0	1.9	4.3	4.5	3.3	7.9	3.9	2.9
Developed Economies	Economic Growth	3.8	1.0	1.3	1.7	3.1	2.4	2.8	2.5	0.7
	Trade Volume	9.9	n.a	2	3	11	8.3	5.5	3.9	2.8
Emerging Economies	Economic Growth	5.1	2.4	3.5	4.7	7.1	6.5	7.2	7.3	5.4
	Trade Volume	15.7	0.5	9	12	16	14	9.6	8.7	4.2

Source: IMF 2008a; 2009a and UNCTAD 2003-2010

Sánchez and Ulloa's 2008 review of the Global Insight report on international maritime transport statistics, showed that in 1995 worldwide international trade represented almost 6 billion metric tons, with 66% of that (3.96 billion metric tons) being seaborne. By contrast, in 2005, the total international trade was 9 billion metric tons, of which 6.1 billion metric tons was seaborne, slightly more than the entire international trade in 1995. This translates into an average annual increase of 4.18% for total trade and 4.42% for international maritime trade. In 2006, international maritime trade increased even further to 7.4 billion metric tons, over 74% of the entire international trade according to the World Trade Organisation (Sánchez and

Ulloa's 2008). This further supported the fact that maritime freight is playing a growing part in international trade in terms of both volume movement and trade establishment. In the year 2007 more than 80% of world trade was carried by sea, a ratio that remains to the present day, making it by far the most important means of transporting of goods. In 2008, world seaborne trade (goods loaded) increased at approximately 3.6%, while maritime transport has grown by 3.1% annually for the past three decades (UNCTAD, 2006; 2007; 2008; 2009).

2.4.2. INTERNATIONAL TRANSPORTATION AND TRADE

From the Industrial Revolution in the 19th century to globalization and the economic integration processes of the late 20th and early 21st centuries, regions of the world have been affected differently by economic development. Transportation and trade have become fundamental components of this economic development with a growing share of the world's wealth accordingly being linked to global trade and its distribution protocols (Rodrigue et al., 2009a). Thisse (2009) describes transportation by its very nature as being linked to trade, which as an act, may be characterised as being one of the oldest human activities, but the act of effective transportation of tradable commodities is highlighted as the fundamental ingredient for trade sustainability and its integrating force for the modern society.

International trade depends on a successful market analysis with effective entry strategies and a keen knowledge of transportation alternatives along with sound logistics planning for support. Cowie (2010) stressed that for international trade to effectively materialise; it requires distribution infrastructures that can support its occurrence between several trading partners. Of these infrastructures, he stated that the transport system is the major contributor to the valuation of trading. While justifying that international transport availability paves the way for international trading, Francois and Manchin (2006), highlighted transportation and institutional quality as significant determinants of not only a country's export levels (volume of trade which pilots international transport demand) but also of the likelihood of the country's international trading opportunities. Rodrigue et al. (2009a: 197) considered transportation "as an enabling factor that is not necessarily the cause of international trade, but a means without which globalization could not have occurred". According to Hummels

(2007), econometric evidence subsequently substantiates this by linking transportation (shipping) cost declines to rapid growth in global trade.

History has shown that very few nations can maintain an adequate standard of living without internationally trading with an efficient transportation system at hand. Transportation makes the movement of a nation's commodities possible: this further evidencing trade's interdependence on the transport system. The international transportation system is therefore an essential element of the international trading system since it is the means through which the mobility of goods is established and a combination thereof, which is required in effecting the movement of goods to its required destination and the action thereof that influences the cost of both trade and the goods final price to the end user. In Prabir De's (2007) opinion a country's internal geography and associated transportation system as a factor of both its domestic and international capacity are the major explanatory factors in understanding trade and transport costs and their role in determining international trade volumes.

Drawing on the characteristics of transportation, Rodrigue et al. (2009a) acknowledge efficient transportation as being the heart of a successful global trade. They justify this by the growth experienced in the amount of freight being traded as well as the greater number of origins and destinations of trade as an advocate of the importance of international transportation and as a fundamental element supporting the global economy. With the increased dependency on global trade, the demand for international goods and international transportation services has increased dramatically. This in turn has re-positioned the international transportation systems, placing them under immense pressure to sustain the additional demands in volume and distance carried. The importance of transportation is on a par with the continuous growth and development of modern international trade.

According to UNCTAD's (2007) Review of Maritime Transport, the demand for transport services naturally grows in tandem with growth in world trade, and receives a boost from the fragmentation and globalization of international production. This proves a positive correlation between GDP, merchandise exports and maritime transport. Against this backdrop, growth in the world GDP and merchandise trade directly impacts on seaborne trade (transportation) and the demand for shipping services (UNCTAD, 2007).

2.4.3. INTERNATIONAL TRANSPORT COSTS

International transport costs are considered as the monetary value that must be paid for the provision of transportation services to secure the movement of goods from country of origin to country of use or destination. These costs vary based on the choice of transportation mode, the nature and composition of the goods, the availability of infrastructures at both sides of the border, origins and destinations of the goods and the distance over which the goods will travel.

According to Kuwamori's (2006) interpretation, the term "transport cost" varies depending on the particular literature being reviewed. Sometimes the term not only refers to freight costs but also includes costs incurred in the transactions such as tariffs, information costs, contract costs, etc. However, for the sake of this study, transport costs are defined as the direct shipping costs incurred in the movement of goods from point of origin to point of destination. In the case of international shipping trade, this definition covers freight and insurance from the exporting ports to the importing ports.

Until recently, neither international transportation costs nor their measurement was recognised as a role player in trade determination but modern day economists have acknowledged that distance, infrastructure, geographical characteristics and most especially transportation cost, are major and significant determinants of international trade and trade cost in particular. This has been attributed to the ability of international transport costs to impede international trade, thereby hampering a country's global integration and disrupting its economic growth and development.

Davis and Weinstein (2001) put forward trade costs as the primary explanation for the celebrated absence of factor content in trade which is said to include and be significantly influenced by transport costs. Limao and Venables (2001) explained that transportation costs and other related costs of international business transactions are the key determinants of a country's ability to grow its exports and fully participate in the global economy. Anderson and van Wincoop (2004) provided an extensive review of trade costs, which are estimated to amount to about 170% *ad valorem* tax-equivalent, including all transport, border-related and local distribution costs from the foreign producer to the domestic user.

Hummels (2007: 2) emphasised "that understanding modern changes in transportation costs can turn out to be unexpectedly complex" because of the factors influencing the determinants of costs and trade, a fact acknowledged by Korinek and Sourdin (2009b) who proposed that transport costs varied widely between different products and different countries of origin and destination.

Countries worldwide depend on the efficiency and cost effectiveness of their freight transporting systems to support the growth and development of their nation (Korinek and Sourdin, 2009b). However, greater distances, poor trade partner infrastructure and other geographical factors have notably been articulated as the major factors for transportation cost increases (Martínez-Zarzoso, Menendez and Burguet, 2003). Matthee, Grater and Krugell, (2007: 4) citing Redding & Venables (2003) said that "Apart from a country's external geography, its internal geography (whether it is landlocked or coastal) also affects its transport costs. These as landlocked countries also tend to have poor internal geography, which correlates negatively with transport costs".

Khalid (1997) analyses the effectiveness of the collaboration of various transporting systems as a reference point for economic growth and claims that a transport system featuring interconnectivity among the various transport modes is the catalyst for efficient movement of goods, greater trade and lower transport costs. Wilmsmeier, Hoffmann and Sanchez (2006), explained that the inclusion of infrastructure measures improves the fit of regression, corroborating the importance of infrastructure in determining transport costs

Hummels (1999; 2001) considered whether international transport costs have declined over time in explaining the changes in international trade, in so doing he proposed 'time' as another trade barrier. Limao and Venables (2002) elaborated on this by emphasizing longer distance between trade partners trading in both final and intermediate goods as a major cause for changes experienced in the costs of international transportation, thereby acknowledging distance and time as determinants of transport costs. Matthee, Grater and Krugell (2007) cited remoteness from economic benefiting activities as a major cause for the poor export performances of most developing countries which are situated far from the major markets. This implied the effects of high transport and trade costs.

UNCTAD (2006) as cited by De, (2007)attributed the lower transport costs experienced in developed countries compared to those experienced in developing countries to the differences in global trade structures, regional infrastructure facilities, logistics systems, and the more influential distribution strategies of shippers of developed countries. Wilson, Mann and Otsuki (2003) added that port efficiency has a strong and significantly positive impact on bilateral trade flows and consequently transport costs.

If one accepts the fact that international transport costs and the volume of trade are assumed to depend on the level of infrastructure in the trading countries, firms are relocating their production plants offshore closer to the their demand and supply market in order to save on transport costs. This is further said to account for the wider dispersion of transport costs across countries, most especially, transport cost variation between developed and developing countries UNCTAD, (2008).

2.4.3.1. INTERNATIONAL TRANSPORT COSTS' RELEVANCE TO TRADE

Trade costs are adjudged to comprise all costs, including costs incurred in the movement of products to their final consumers except the marginal cost of producing the product itself. The comprising costs are said to include international related transportation costs, product related barriers (tariffs and non-tariff barriers) costs, information, currencies, legal and regulatory, and finally local distribution costs (Prabir De, 2007). The international related transport costs which are calculated into trade costs are adjudged to depend on demand and supply factors.

Of what significance then are transportation and transportation costs to the nature, volume and composition of international trade and trade cost in general? And to what extent has the change in international trade been driven by changes in transport costs? Several researchers and authors have asked these questions over the years in order to quantify the relevance of transportation and transportation costs in trade and overall trade cost.

The relationship between transportation costs and trade goes beyond mere transportation costs. Transport costs indifferently impinge on a country's productivity as well as the competitiveness of that country within the international markets. Transport costs also affect

the price of goods to the final consumers. According to the ECMT (2006: 95), "the link between transportation cost and international trade has dramatically changed in character (nature and volume) over time, due to the shift in the composition of world trade" which basically determines the approach and participation of countries in the world market.

Goods traded in the world market incur transport costs domestically as well as internationally. The lack of effective and efficient transportation on all fronts and at a cost that is viable enough to make the exchange of goods feasible with trading partners makes it difficult for countries to compete in the international scene; distribute their products; balance their trade; acquire their nation's required needs; and grow their economy.

Transportation and transportation costs efficiency in countries can be classified as a comparative advantage when it comes to international trade. This in that transportation and transport costs in particular influence the ultimate cost competitiveness of a country's trade. For example, according to the World Bank Logistics Performance Index (2007; 2007a), as a result of domestic transport costs in South Africa significantly being higher than most of its trading partners, the country's domestic logistics system was observed to have consequently impacted negatively on the country's general trading system. This resulted to the country been ranked 124 of 150 countries in term of domestic logistics cost and 24 in term of logistics performance. However, the LPI in 2010 showed a considerable improvement in the country's domestic transport costs. So, indisputably, the inefficiency of a country's transportation system adversely becomes a suppressing tool of the country's comparative advantage.

According to Prabir De, (2007) the nature of goods determines the transportation mode in which the goods could be transported for trade. This in turn determines the costs of transportation of those goods and equally determines the volume of the particular goods to be transported. In his paper, "*Transportation costs and international trade over time*" Hummels (2007) analyses how the determination of transportation costs is being influenced by the composition of trade and, as a consequence, trade volumes and structure.

In a nut shell, the cost of transport is essentially the price of a service in trade, and this service cost is argued as the most controversial aspect of trade cost. It is considered a determinant of the product's end price, this as it is assumed the end user eventually pays the cost of transport.

2.5. INTERNATIONAL TRANSPORT COST MEASUREMENT

As the theoretical and empirical role of transportation and its costs in international trade have received renewed attention in recent years, so also has the measurement of the costs of transport in the world of international trade as a whole and the movement of traded goods in particular. According to Mattos and Acosta (2003), apart from the specific elements of each country that increase or decrease the competitiveness of their exports, one of the main elements that influence the evolution of international trade in countries is the cost of transport. Chasomeris (2006: 8) on the other hand, acknowledges "partial equilibrium analysis as showing that a product has to be cheaper before it can be exported from a country and that transport costs have an important influence on the final import price" of that product. Clark, Dollar and Micco (2002) consequently stated that the cost of transport and its measurement are of higher significance to trade and the economy as a whole than any other trade or global integration barriers. This is because transport costs have the ability to change trade on both the importing and exporting front.

Transport costs provide more protection to trade in many countries today than in the past. Both tariff and non-tariff barriers have decreased as a result of trade negotiations which have steadily reduced tariff rates and non-tariff barriers (Hummels, 2007). But the protection provided by transport costs must not be misconstrued, because a misrepresentation of international transport costs either through measurement or interpretation could be catastrophic to the nations involved in both the long and short terms.

It is evident from equilibrium analysis and Hummels's proposal (2009) that transportation costs measurement is a vital aspect of determining product prices, trade volume changes and the flow of trade (trade performance). In Hummels's (2009: 6) explanation, he stated that, "International trade economists typically express transportation costs in ad valorem terms, which is, the cost of shipping relative to the value of the goods. Which is useful because it describes the size of the wedge that transportation costs drive between origin and destination prices, and because it facilitates comparison with tariff barriers". However, the data required to effectively evaluate the *ad valorem* transportation cost of trade has become an area of intensified controversial debates over mismatched values of transportation costs and the

cumbersome assumptions in using the common measure of international transport cost. The intensity of this controversy, however, intensified the motivation for this study.

2.5.1. DIRECT AND INDIRECT MEASURES OF TRANSPORT COSTS

International transport costs can be measured directly (country's direct port-port shipping costs) or indirectly (as a proxy for direct shipping costs). Because very few countries report detailed information on shipping costs as part of their trade statistics, direct measures of transport costs have become difficult to come by, so many researchers have turned to the indirect measures of international transportation costs. Chasomeris (2009b: 450); Micco and Perez (2002); OECD (2006); and Hummels and Lugovskyy (2006), all show that despite the increasing importance of transport costs to international trade, direct measures are still difficult to obtain and this has consequently motivated for indirect measures.

There are various data and information sources used for the indirectly measure of international transportation costs:

- The use of shipping company quotes obtained from service providers for the costing of transporting goods;
- The use of trade flow data obtained from databases to draw on ratios of mirror trade reports as a proxy for shipping costs and;
- The use of data on international trade and transport costs from various primary sources including national data and shipping price indices obtained from shipping trade journals; etc.

But of these sources, the trade flow data from various databases used in drawing on ratios of mirror trade reports as a proxy for shipping costs is the most commonly used to indirectly measure international transport costs.

Gaulier et al., (2007) stated that most researchers are revisiting indirect measures of freight costs by drawing on ratios of mirror trade reports in a country's import cif/fob ratio. In principle, this measure compares the "cost, insurance and freight" (cif) value with the "free on

board" (fob) value of imports", because according to Hummels and Lugovskyy, (2006: 69) "exporting countries report trade flows exclusive of freight and insurance (fob.), and importing countries report flows inclusive of freight and insurance (cif.)". In other words, it is "comparing the valuation of the same flow reported by both the importer and exporter yields at a difference equal to transport costs" (Hummels and Lugovskyy, 2006: 69).

According to Chasomeris (2009b: 450) "The country's import cif/fob ratio, given by [(cif/fob) – 1], provides a measure of *ad valorem* shipping costs. In other words, it is a measure of shipping costs as a proportion of the value of the imported goods". Even though over the past decade the costs of transport have reportedly been measured by using import cif/fob ratios, certain features of the import cif/fob ratios as a measure of international transport costs are still being questioned (this is discussed in Sections 2.5.2 and 2.5.3). But as Hummels (2007) emphasised, transport costs have been relative to the value of the goods being moved and relative to other known barriers to trade. The variability of barriers which range from countries to products and time has raised questions about the use of a uniform/constant measurement (import cif/fob ratios) as a direct replacement for shipping costs.

On this issue, Redding & Venables (in Matthee et al., 2007:4) stated that "Apart from a country's external geography, its internal geography (whether it is landlocked or coastal) also affects its transport costs and measurement. This is because landlocked countries tend to have poor internal geography (access to shipping ports), which correlates negatively" with international transportation costs measurement, especially the comparing of valuation of trade flow. But in understanding the measuring of global transportation costs, the factors that influence the determination of the costs of transport need to be understood. These determinants vary from country to country, although there are some that are constant. Section 2.5.2 presents empirical evidence of these determinants of transportation costs.

2.5.2. EMPIRICAL DETERMINANTS OF INTERNATIONAL TRANSPORT COSTS

A nation's international transport costing structure directly and indirectly plays a significant role in configuring its economic development and stability. International transport costs shape the nation's costs of trade which has enormous potential to foster or frustrate the sustainability of that nation's trade flow. This in turn affects its income flow and GDP. But why do some countries have higher transport costs than others? And what are the main determinants of these transport costs?

According to Martínez-Zarzoso and Nowak-Lehmann (2006: 2), "a number of authors have recently investigated the determinants of transport costs from an empirical point of view (Radelet and Sachs, 1998; Limao and Venables, 2001; Mico and Pérez, 2002; Clark, Dollar and Mico, 2004; Egger, 2004; Combes and Lafourcade, 2005; Martinez-Zarzoso and Suárez-Burguet, 2005)". These studies analyse a host of factors arguably responsible for the determination of international transport costs. They state factors ranging from geographic conditions to the category of products being transported, economies of scale, energy prices, trade imbalances, transport modes, infrastructures, competition and regulations along the way as being important in explaining the variation in transport costs across countries.

Marquez, Gonzalez and Sanchez (2007) pointed out that the role and impact of distance in explaining international transport costs and international trade in general has been hyped in previous studies. Wilmsmeier and Martínez-Zarzoso (2010) elucidated the variables that determine and shape maritime transport costs in different countries as not as dependant on the distance between the importing and exporting countries as previously and mainly analysed by many researchers over the years. In addition to distance, Wilson, Mann & Otsuki (2005) as cited by Behar and Venables (2010: 4) evaluated four measures of trade facilitation as a determinant of transport costs: port facilities, customs handling, the regulatory environment and the availability of service sector infrastructure. They concluded that improvements in all four measures would have material impacts on both exports and imports costs of transportation.

Radelet and Sachs (1998: 3) were of the view that maritime shipping costs "will depend not only on the charges for shipping a standardized type of freight (e.g. a twenty foot equivalent

container) but also on the composition of trade". Although their study was essentially based on explanatory variables related to distance and geographical characteristics, such as land locked countries and border line countries, they expressed the measurement of international transportation costs across the world as apparently different for certain reasons as cited by Chasomeris (2006:25);

> "First, and most obviously, countries that are located further from major markets are likely to face higher shipping cost than proximate countries. Second, overland transport costs tend to be considerably higher than sea freight costs. Thus, for a given distance from the main markets, countries with a higher proportion of transit by land will tend to have higher overall shipping cost. Third, there are extra costs to inter-modal transport (e.g. in which freight must be shipped both by land and sea), because of the extra costs of transferring between transport modes. Fourth, shipping costs differ because of differences in the quality of ports' administration and/or ports' infrastructure. Countries with better functioning ports authorities, less red tapes for traders to work through, and more transparent and less corrupt customs clearance, are likely to have lower overall shipping costs. Variations in basic port and handling fees can differ widely across countries. Similarly, countries with adequate port capacity, stronger port infrastructure, and more sophisticated packaging and loading technologies are likely to have lower shipping and probably overall transport costs."

Geographical factors related to the movement of goods, particularly product characteristics and requirements (e.g. refrigerated transport and product unitary value), the number of available maritime service providers in the region, economies of scale, the use of open registries, and shipping opportunities-describing the number of direct regular service offered within a particular period between the importing and exporting countries were all analysed by Wilmsmeier and Martínez-Zarzoso (2010) as factors that shape international transport costs. Clark, Dollar and Micco (2004) on the other hand, analysed the determinants of maritime transport costs and explained the composition of trade as a determinant. They also argued the directional imbalance in trade between countries as another major factor that determines transport costs. According to these authors, this imbalance in trade (2004:422) "implies that

many carriers are forced to haul empty containers back and as a result, either imports or exports become more expensive".

Another factor raised by Sanchez et al. (2003) was that of port infrastructure playing a significant role in determining international transport costs. Wilson et al. (2003) likewise argued port efficiency has a major determinant in the differences in international transport costs between countries. Martínez-Zarzoso, Menendez and Burguet (2003) stated greater distance alongside poor infrastructures in trade partner countries as notably factors that increases maritime transport costs between countries. In further clarifying, they stated that the inclusion of infrastructure measurement will not only give a true cost of trade between nations, but would also improve the fit of the regression.

While analysing the use of distance as a proxy for international transport costs, Hummels (1999; 2001) also introduced time resulting from various factors as an unpredictable factor to be considered in transport costing. On the other hand, Korinek and Sourdin (2010) argued that if distance and time (which also affects other trade included costs) are proxies for transport costs, then the true effect of transport costs will be impossible to determine.

Another factor that is argued as influencing international transport costs, but which has not received much attention from previous authors, is the administrating factors in trade partners' point of entries and departures, most especially in developing countries. Because this factor is a human factor that is able to be addressed through policies and interventions, it is regarded as less of a barrier to trade. However, because of the high occurring nature of this factor in developing countries in the past decade, it is gaining momentum and is being factored into consideration more often when projecting international trade and transport costs.

Wilmsmeier and Martínez-Zarzoso (2010: 106) analysed Hoffmann (2001) and Wilmsmeier (2003) studies to prove "the effect of institutional factors on transport costs. Through the examination of the effects of port operator model on transport costs in the case of South America, they showed "the explanatory variables of port efficiency and prove that this does not only depend on infrastructure, but also on a series of variables related to administrative and political issues".

The difficulties experienced in effectively analysing maritime transport costs can be traced back to the complex and inconclusive nature of various factors that influence trade between various trade partners (Table 2.3 outlines the general trade conditions and their determining factors that influences transport costs). In their study Pomfret and Sourdin (2008) concluded that, despite distance and commodity characteristics being significant determinants of international trade costs, a large unexplained variation still remains after distance and commodity characteristics have been catered for (see Table 2.3).

Accordingly, Wilmsmeier and Martínez-Zarzoso (2010) stated that the main difficulty in analysing maritime transport costs is that of obtaining reliable data. Effective analysis of international transportation costs depends on the collection, accuracy, completeness, cost-effectiveness, and timely distribution of international trade data. De, (2007)concluded that the determining factors of international transport costs do actually drive to preciseness the relevancy and need of international transport cost measurement before the consideration, anticipation or participation in international trade.

Table 2.3. Conditions and Determinants of Transport Costs

Conditions	Determinants
Services/route	Capacity, limitations, operational conditions and time
Infrastructure and services	Connectivity measures
Geography	Distance, landlocked and time
Competition and regulation	Service providers in the region
Type of product	Containerized, type of packaging (Nature of Goods), weight, value (Composition)
Trade imbalance	Empty movements (Demand and Supply of goods)
Policies	Institutional and Administrating factors
Economies of scale	Shipment size

Adapted from Stopford, (2009: 46).

2.5.3. THE IMPORT CIF/FOB RATIOS AS A MEASURE OF INTERNATIONAL TRANSPORT COST

2.5.3.1 DEFINITION AND SOURCES

Prabir De (2007: 10) states that "the most straightforward measure in international trade for measuring international transport costs is the difference between the cif (cost, insurance and freight) and fob (free on board) quotations of trade", emphasizing "the difference between these two values as a measure of the cost of getting an item from the exporting country to the importing country".

Several world institutions and researchers use an indirect measure in the assessment of transport costs between countries. The use of import cif/fob ratios as a measure of a country's international transport costs was born out of difficulties surrounding the sourcing of information for direct measure. Hummels and Lugovskyy (2006) corroborated this, citing instances where the import cif/fob ratios were used as measures of international transport costs in cases where the information for the direct measures were not available. They, however, stressed that most of the uses have been typically exploited from different dimensions of variation. They cited Rose (1991) and Baier and Bergstrand (2001) as relying on panel variation in aggregate bilateral cif/fob ratios in order to relate trade growth to changes in transportation costs; and Limao and Venables (2001) as exploiting cross-sectional variation in relating trade volumes to cif/fob ratios.

According to economists, researchers and analysts, the fob (free on board) value measures the value of an item to be imported at the point of its shipment by the exporter, specifically as it is loaded onto the carrier for transport. On the other hand, the cif (cost, insurance and freight) value is the value of an imported item at the point of entry into the importing country. This value therefore includes the item's cost of handling, of insurance and of shipment to the importer's port of entry. It does, however, exclude the custom charges.

Hummels (1999, 1999b, 2009) and Brakman et al. (2003) for instance explained the "cif" (cost-insurance-freight) as the measures of the value of imports from the point at which they enter a country. Connoting these values to include the cost of transport, insurance, handling and freight; and articulated the "fob" (free-on-board) as the measures of the value of exports

from the point at which the merchandise is placed on the carrier. Matthee et al. (2007) then defined and justified the difference between the values of these two incoterms as a measure of the cost of transporting an item from the exporting country to the importing country. In the same light, Hummels (1999: 26) states that, because exporting countries report their costs of traded goods flows exclusive of freight and insurance (fob) and because importing countries report their flow inclusive of freight and insurance (cif), the comparison in valuation of the these two figures, is presumed to yield a difference equal to the cost of transport between the two countries. Yeats (1977); Naude (1999); Baier and Bergstrand (2001); and the UNCTAD (2003) all expressed the import cif/fob ratios in the same light.

Radelet and Sachs, (1998: 3) similarly describe the fob price as the exporter's costs of an item at the point of shipment, specifically at the point when it is loaded on to a carrier for transport. To them, the cif price is the cost of the imported item at the point of entry into the importing country, inclusive of the costs of insurance, handling, and shipping, but not inclusive of customs charges. Radelet and Sachs (1998) here referred to the yielded difference between the cif and fob as a ratios equivalent to the shipping costs between the two nations. They further highlighted data susceptibility and trade structure as a result of shipping costs being measured from a country's import point of view despite the costs applying to both direction of trade (import and export). Finally they signed off *ad valorem* shipping costs as SC = (CIF/FOB) - 1.

Chasomeris (2009b: 451) noted "a country's import cif/fob ratios have various names in different literatures, for instance: shipping costs (Radelet and Sachs, 1998), *ad valorem* transport costs, *ad valorem* shipping costs and *ad valorem* freight rate (Yeats, 1977), freight factor, a country's average freight rate (UNCTAD, 2003: 13), CIF-FOB band on imports and transport cost rate (Naudé, 1999a;1999b), and cif-fob transport-cost factor and average cif-fob factor (Baier and Bergstrand, 2001)". However, one notable concern with regards to these and what they represent (International transport costs) has been the import cif, fob and ratios term definitions which are used to qualify these names under various instances and the various components of transport that they present as a measure of international transport costs. This is because it seems that there is more than one definition and consequently interpretation of the concept import cif and fob.

For instance, the IMF that provides most of the import cif and fob data used in measuring a country's import cif and import fob ratios, defines and discusses the concept in the International Trade Statistics to include not only the maritime movement of goods, but the movement of goods across all modes of transport from the point of origin to the destination (point of delivery) of the goods. According to Chasomeris (2006: 12; 2009: 149) the International Chamber of Commerce that is charged with the responsibility of publishing the official rules for the interpretation of trade terms in their "INCOTERMS" publication defines and discusses it as:

> "Free on Board" means that the seller delivers when the goods pass the ship's rail at the named port of shipment. This means that the buyer has to bear all the costs and risks of loss of or damage to the goods from that point. The fob term requires the seller to clear the goods for export.
> This term can be used only for sea and inland waterway transport.
>
> (International Chamber of Commerce, 1999: 49). "

> "Cost, Insurance and Freight" means that the seller delivers when the goods pass the ship's rail in the port of destination. The seller must pay the costs and freight necessary to bring the goods to the named port of destination BUT the risk of loss of or damage to the goods, as well as any additional costs due to events occurring after the time of delivery, are transferred from the seller to the buyer. The cif term requires the seller to clear the goods for export.
> This term can be used only for sea and inland waterway transport.
>
> (International Chamber of Commerce, 1999: 65).

Chasomeris (2006: 13; 2009b: 451) pointed out that "inconsistencies in standard textbook definitions of imports cif and imports fob are exacerbating the potential for the misuse and misunderstandings of country cif/fob ratios; as on one hand, it appears that textbooks on international trade (see Salvatore, 2001) define and briefly discuss the concepts of import cif, import fob, and a country's cif/fob ratio, using the international trade definitions from the

IMF, while, maritime transport textbooks (see Stopford, 1997; Alderton, 1995; McConville, 1999) on the other hand, define and discuss these concepts using the official Incoterms (International Chamber of Commerce, 1999)" definition which distinctly states that the cif and fob terms should only be used for maritime transportation (sea and inland waterway transport, (see Table 2.1)).

The focus and use of the import cif, import fob and the import cif/fob ratio is as a result of their availability and coverage in providing costs of transport on a worldwide basis. Apart from the two tiers of a country's cif and fob definition focusing on the gap between the cif (cost-insurance-freight) and fob (free-on-board) in determining the costs of transportation between two countries, researchers and analyst use this gap to determine the state of affairs of a country's transportation systems. This is observed in Harrigan's (1993); Radelet and Sachs's (1998); Limao and Venables's (2002), and Clark, Dollar and Micco's (2004) studies. One major issue with regard to the use of the gap cross the board has been the general comment of measurement deficiencies by researchers and analysts. However, not all cif/fob applications are soiled or deterred by data, the bulk of its troubles are as a result of the mis-conceptualization of definition and application.

Chasomeris (2006: 12) elucidated the difference in definition and use of the international trade import cif and fob measures and the official Incoterm shipment cif and fob definition, indicating the basis under which Limao and Venables (1999; 2001; 2002) could use a country's cif/fob ratio to estimate the impact of a country's infrastructure on transport costs and trade flows of the country. Chasomeris (2006: 13) also analysed the understanding behind Radelet and Sachs' (1998) application of the cif and fob measures in their study, this as the authors used a landlocked country's infrastructure as their case study.

The Incoterm cif and fob definitions specifically states the use and representation of its data as applicable only to sea and inland waterways (maritime) transport measurements while the international trade statistics (IFS) definition and data are applicable to a broader measurement in maritime and other modes of transport costs. Studies and data that are defined as trade statistics data can be used to measure transportation costs beyond direct shipping costs while

data defined by Incoterms are intended to be used as measure of direct shipping costs between countries.

Limao and Venables (1999; 2001; 2002) study estimations were made on the basis of the trade statistic definition and application, thus, justifying their broader use of the cif and fob measures. This was also the case in Radelet and Sachs's (1998) study. According to Chasomeris (2006:13), the difficulty and potential challenge of this is their ability "to distinguish the international trade statistics use of cif and fob from the traditional Incoterm's - maritime trade use- of cif and fob. In other words, although many researchers, in various fields may be using the concept cif and fob, but not all have the same definition". This obviously alters the application and understanding of the concepts and is accordingly given as one of the drivers for the resulting misuse and misrepresentation of transport costs.

There are several sources that provide cif and fob data for the analysis of the import cif/fob ratios used as measure of international transport costs:

- the NBER database from the United Nations;
- the CHELEM and BACI database for International Trade Analysis (French acronyms of "Comptes Harmonisés sur les Echanges et L'Economie Mondiale" and "Base pour l'Analyse du Commerce International") dataset from CEPII;
- the Direction of Trade Statistics (DOTS) data tapes, yearbooks and International Financial Statistics (IFS) all from the International Monetary Fund (IMF);
- the GTAP (Global Trade Analysis Project) Project and
- the United Nations' COMTRADE database (Commodities Trade Statistics database).

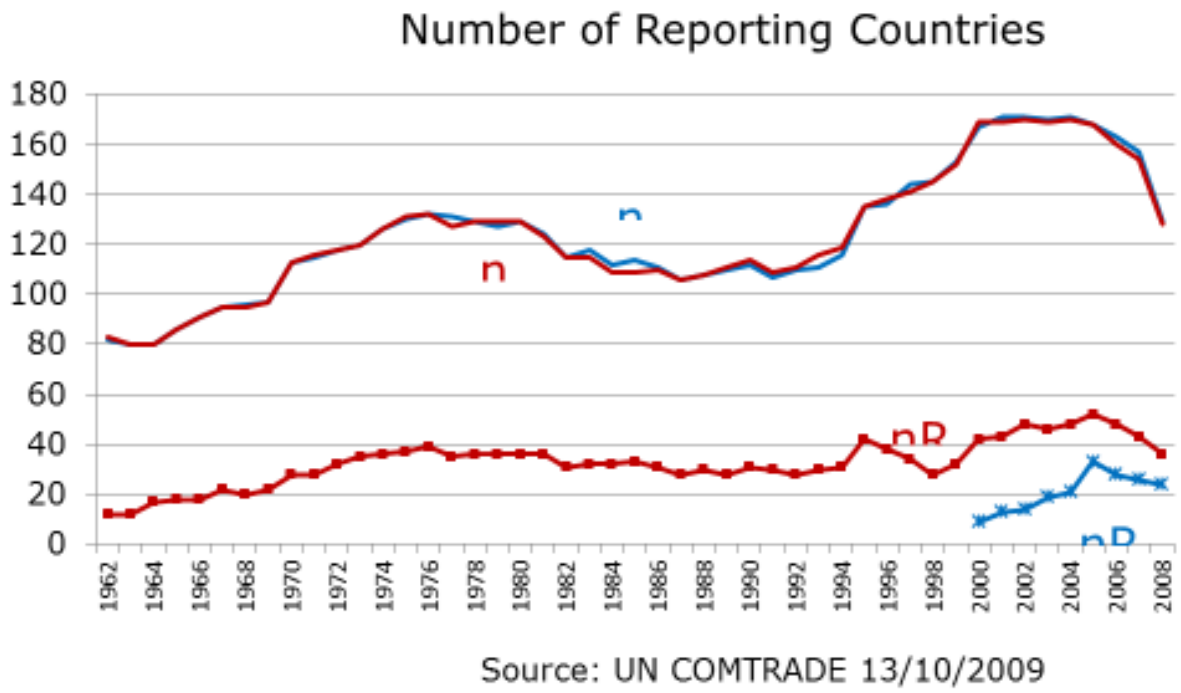
Notably, all of these databases take their cue from the United Nations' COMTRADE database which provides over one billion sets of global commodities trade data covering (on average) 130 reporting countries, which allows it to generate information for more than 200 partner countries (see Figure 2.7) (Gaulier et al., 2007). This is due to the increasing number of countries (See Figure 2.7) who are now reporting "to the United Nations Statistics Division

their annual international trade statistics (imports, exports, re-imports and re-exports, which corresponds to more Commodities Trade Statistics database) and world trade database. Commodities are reported in Standard International Trade Classification, although they can be converted all the way down to the earliest classifications" (Gaulier et al., 2007: 11).

> "Despite the possibilities the UN COMTRADE offers, important caveats have been expressed about the use of the database. Firstly, the values of the reported detailed commodities data do not necessarily sum up to the total trade value for a given country set. Due to confidentiality for instance, countries may not report some of its detailed trade. However, this trade will be included at the higher commodity level and in the total trade value (and sometimes via the use of a specific class trade declaration). Secondly, countries do not necessarily report their trade statistics for each commodity and every year. This means that aggregations of data into groups of countries may involve countries with no reported data for a specific year. And UN COMTRADE does not contain estimates for missing data. Therefore, trade of a country group could be underestimated due to unavailability of some of the country's data. Thirdly, imports reported by one country do not coincide with exports reported by its trading partner. Differences are due to various factors including trade flows valuation (imports are declared inclusive costs, insurance and freight and exports are declared Free On Board). "(Gaulier et al., 2007: 11).

However, according to Hummels and Lugovskyy (2006), the IMF databases offer broad coverage of data for years and countries and they are also readily available to researchers and so are ideal for drawing on ratios of mirror trade reports. In this perspective, Hummels and Lugovskyy (2006: 71) stated the three IMF databases as providing the most comprehensive import cif/fob ratios analysis; with the DOTS data tapes holding bilateral data aggregated over all commodities, and both the DOTS yearbooks and International Financial Statistics (IFS) containing trade data that are aggregated over all commodities and partners for a particular importer. Although, in principle as emphasised by Gaulier et al., (2007) and Hummels (1999) the compilation and publication of the three IMF databases are not primarily for the purpose of transportation costs measurement but because they provide the required information to this end, taking advantage of the mirror flows, they are often used to serve this purpose.

Figure 2.7. Number of Reporting and Partner Countries in COMTRADE



Hummels and Lugovskyy (2006: 3) established that "when comparing the three IMF sources one finds consistent reports on the level of trade for a given country. But the cif/fob ratios are not consistently reported" along the line of the three sources. "Indeed, there appears to be no correlation between cif/fob ratios obtained from the three IMF sources" (Hummels and Lugovskyy, 2006: 3), and as a result researchers and analysts consistently categorically use one of the sources in their analysis. For this paper, data from the International Financial Statistics database will be used in investigating the misrepresentation of international transport costs through the use of a country's import cif/fob ratio as a measure of transport costs. Accordingly, Chapter Three further investigates the data (import cif, import fob, and import cif/fob ratios) and source (IMF database)

2.5.3.2 NATURE AND COMPOSITION

The harmonisation process of the import cif, import fob and the import cif/fob ratios as a measure of international transport costs is characterised by various assumptions and drawbacks. As implied by Chasomeris (2006: 14), several authors use the import cif/fob ratios to assess the effect of transportation costs on trade. In so doing, they use the ratios' directional flow to predict the directional pattern of international trade and the costs of transport of those trades by assuming a rise in a country's cif/fob ratios to be parallel in movement (rise) to that country's (direct) international transport costs. According to Chasomeris (2006), this is not limited to authors, as organisations and authorities on international transportation and trade issues use these ratios as a measure of international transport costs, and in so doing acknowledging the underlining assumptions in monitoring and reporting *ad valorem* shipping costs in particular and international transport costs in general on a worldwide basis.

The IMF's published cif/fob ratios which are used in various empirical studies, are according to Radelet and Sachs (1998: 3) "of course, not a perfectly accurate measure of actual cif/fob measurements, since they are in many cases estimated by IMF staff based on incomplete information. This in that, they show little variance over time, indicating that IMF staff retain a constant cif/fob conversion factor once it is established for a country, and revise it only infrequently". Nevertheless, several researchers still hold the ratios in high regard as a true measure of international transport costs. Radelet and Sachs (1998: 3) supported this opinion when they stated that "these data are relatively consistent and complete, and provide a good point for examining the general costs of international shipping for almost all countries in the world".

However, the import cif/fob ratio as a measure of international transport costs is frequently criticised and questioned. This is largely because the nature of the ratios does not represent countries actual transport costs. There is widespread misunderstanding in the definition, nature, composition of the ratios and consequently misuse of the import cif/fob as a measure of international transport costs. In addition, the aggregated nature of individual country's cif/fob ratio measures are a further shortcoming.

According to Chasomeris (2006), in light of the use of the ratio as a measure of international transport costs, many analysts and researchers have had to in fact assume that a country's import composition is constant over time. This is done in order to uphold the conceptual idea that the use of the ratio as an indirect measure actually "reveals true differences in shipping costs rather than commodity mix effects" (Radelet and Sachs, 1998: 3)

The nature (pattern or movement) of import cif/fob ratios can also be analysed using three alternative scenarios of highly disaggregated or aggregated composite homogeneous import levels as emphasised by Chasomeris (2006: 16). Chasomeris argued accordingly that the rise or fall of a cif/fob ratio could be as a result of three possible scenarios: a fall or rise in the import fob value of the commodity; an increase in the costs of transport of homogeneous goods; or the result of both changes in transport costs and changes in the homogeneous import (fob) value. Chasomeris (2006: 16) ultimately stated that whatever the cause of change, a change in the cif/fob ratio is ultimately a change in the *ad valorem* transport costs of homogeneous imports and not direct shipping cost has it is widely assumed. He threw caution to the wind here, when he stated that a rise or fall in the cif/fob is not necessarily a rise or fall in direct transport cost but of the *ad valorem* shipping cost.

Another argued aspect of the nature of cif/fob ratio as a measure of international transport costs is the constant changes in the composition of goods being traded by a country. Countries differ in their average cif/fob ratio not solely because of the differences in shipping costs for a given composition of goods, but also because of differences in the commodity mix (Radelet and Sachs, 1998: 3). This fact is not usually recognized by most users of the ratios when accessing the ratio as a measure of international transport costs. The commodity mix causes changes to the ratio in cases where import measures are both aggregated and heterogeneous.

The composition of trade has more influence on the shaping of goods transportation cost and services than it's being acknowledged under the cif/fob ratios as a measure of international transport cost. Behar and Venables (2010) and Chasomeris (2006; 2007; 2009a; 2009b) argued respectively that trade composition's influence on modal choices and the cif/fob ratios is tantamount in its ability to influence transport costs measurements. Chapter Four's analysis covers this aspect of transport costs measurements mis-conceptualization in more detail.

2.5.3.3 ERRORS, PERSPECTIVES AND PERCEPTIONS

The analysis and measure of *ad valorem* shipping costs as well as international transportation and global trade issues over the years have come to rely heavy on data from the IMF's International Financial Statistics database through measures relating to cif/fob ratios. But this reliance on the IMF databases has been deemed by many as disastrous to measuring true and reflective movement of goods and services and consequently, economic growth anticipation.

This section outlines the perspectives and perceptions of analysts and researchers alike as well as the quality problems which emanate from data from the IMF sourced cif/fob ratios. It should be fittingly noted that the errors mentioned here are those pertaining to the inadequacy of using the cif/fob ratios as a measure of international transport costs.

As earlier mentioned, the state of use of the cif/fob ratios as a measure of international transport costs has been deemed disastrous because of the dark clouds (lack of conviction) surrounding the ratios' application as a mechanism of measuring international transport costs. This has produced different perspectives and perceptions of costing international movement of goods and services.

Geraci and Prewo (1977), Harrigan (1993), Limao and Venables (2000), Micco and Pérez (2002), and Matthee et al., (2007) all directly addressed this error and quality problems with the cif/fob ratios as a measure of international transport costs. This is evidence of the awareness amongst certain researchers and analysts of the presence of error with the cif/fob ratio. However, this has not stopped the majority of them in equally acknowledging the ratio as a true and direct measure of international transport costs.

Radelet and Sachs (1998), Hummels and Lugovskyy (2006), and Chasomeris (2006; 2009a; 2009b), on the other hand all equally gave their perspectives and perceptions of this view and the general usage and acceptability of the ratio as a measure.

The first of these errors according to Limao and Venables (2000) and Chasomeris (2006; 2009) is measurement errors. Limao and Venables (2000) linked this weakness to the fact that cif/fob factor is calculated for countries that report the total value of imports at cif and fob

values, both of which they maintained to involve some degree of measurement error. Chasomeris (2006) on the other hand justified this very point of measurement errors as being a result of incomplete information estimates by IMF staff based on incomplete data received while Radelet and Sachs (1998) suggested that these errors were the result of indifference in conceptualisation of data sources for the IMF databases (errors emanating from source countries).

The Organisation for Economic Co-operation and Development (OECD) (2003) highlighted these discrepancies (errors) in the international freight account to the IMF in their report "the IMF/Banque de France document (2002)", although, to an extent they tentatively stated this to be the "result of deficiencies in the import cif/fob ratios used by many countries to estimate their freight payments on imports". Radelet and Sachs (1998), triangulated unflinchingly on this very point when they said "countries differ in their average cif/fob ratios not only because of true differences in shipping costs for a given composition of goods, but also because of differences in the commodity mix" and policies which is assumed to influence the pattern or ways of import documentations. Although they also went further to assume, as a lot of researchers and analyst have done, that due to developing countries' imports basket being more homogeneous in nature, it should therefore suffice to assume that their import cif/fob ratios should reveal the true differences in shipping costs rather than commodity mix effect in such situation, this despite the fact that they have acknowledged the import cif/fob ratios as an inaccurate measure of a country's actual costs of international transport.

Radelet and Sachs as cited by Chasomeris (2006) indicated that, "for most countries, the ratio varies little over time, this indicating that the IMF staff retain a constant cif/fob conversion factor once it is establish for a country, and revise it only infrequently". This implies that the data in some cases may suffer not only from recording errors but also from lack of regular and concurrent updates by IMF databases staff with the real world trade activities. This is equally evidenced according to Chasomeris (2009a: 154) when he cited that "the evidence investigated in Chasomeris (2005; 2007; 2009b) shows that *ad valorem* transportation costs implied by IMF cif/fob ratios are significantly different from the explicitly collected data on South Africa's direct shipping costs."

Also based on this trend of the ratio, Hummels and Lugovskyy (2006: 70) gave insight into their scepticism of the use and acceptability of the cif/fob ratio as a measure of transport costs when they stated that the cif and fob ratio "relies on independent reports of the same trade flow that may differ for reasons other than shipping costs". This being that "Statistical offices of the exporter and importer may value goods differently because the goods' price or the exchange rate changes mid-shipment" and even "Importers may track shipments more carefully than exporters in order to levy tariffs" or benefit from the countries trade privileges. According to Hummels and Lugovskyy (2006: 70), this leads to valuation differences and erroneous computation of the cif/fob ratios. Although Hummels and Lugovskyy (2006) conjugated that data may contain errors and still be usable, they accept that this does have extensive effect on the measure of transport costs. Alejandro Micco and Natalia Pérez (2002) strongly disagree with the usable aspect of the erroneous ratio based on what it represents and the fact that the cif/fob is an aggregate measure for all products. Hummels and Lugovskyy's (2006) conjecture was that the dimension of variation would determine the acceptability and use of the ratio, thus, alluding to the possibility of the cif and fob ratio "co-varying with direct measures of shipping costs despite being systematically wrong in levels" Hummels and Lugovskyy (2006: 70).

Apart from the aforementioned probable errors, according to Limao and Venables (2000) another error of concern with the cif/fob ratio is that of the measure aggregates over all commodities imported. Limao and Venables (2000) branded the use of the ratio as biased when high transport cost countries systematically import lower transport cost goods. They argued that it would have been a different case if the calculations were using exports, which tend to be concentrated in a few specific goods. According to them, this is less so for imports that are generally more diversified and vary less in composition across countries. Hummels and Lugovskyy (2006: 70) touched on the inconsistencies in goods classification between the importer and exporter which is usually as a result of differences of opinion between the two about which commodity classification a particular good falls under. According to Hummels and Lugovskyy this difference could possibly yield inaccurate measures of commodity-level shipping costs.

Limao and Venables (2000) argued furthermore that measure aggregates over the different sources of supply, cause an import to have different commodity classification for a particular good traded from different exporter. Apathetically, for each importer there is a single cif/fob measure, not a full set of cif/fob measures for imports from each supplying country as appraised by the cif/fob ratio.

Chasomeris (2006; 2009a; 2009b) argues that the misuse of import cif/fob ratio as a measure of international transport costs and the erroneous assumption of the composition of trade has been stable in reflecting the true cost of transport as one potential disaster and misguidance in the determination of international transport costs. He argued the composition of trade as a vital component in determining the true measure of transport costs, which he maintained would truly influence the cif/fob ratio value if factored into the ratios calculations. Chasomeris (2006: 22) further argued using the UNCTAD annual publication "Review of Maritime Transport" as a major example of stretching the error ridden ratio usage across the board as a measure of international trade costs. He argued this based on the fact that UNCTAD is an annual publication which is an authority "on international transport and trade issues which relies greatly if not solely on the IMF trade data to calculate the *ad valorem* shipping costs on a worldwide basis".

Limao and Venables (in Matthee, Grater and Krugell, 2007: 3) on the other hand echoed the distance and infrastructure factors, saying that if a "country is situated far from its trading partners, it should be expected that its cif/fob ratio should be higher than a country located close to its foreign markets", they argued this not to be visible in the ratio. Matthee et al., 2007 further reverberated on the idea "that as exports and imports of both final and intermediate goods carry transport costs that increases with distance", this should reflect in the calculation and use of the ratio. But according to them this is not directly provisioned for in the use of cif/fob ratios as a measure of international transportation. They further argued the lack of provision for landlocked countries, infrastructural changes, access to seaport and differences in trade composition in the IMF self-adjusted cif/fob ratio. For instance, if a country's port infrastructure is improved over time, they argued this changes does not reflect on the cif/fob ratio.

2.6. THE EFFECT OF INTERNATIONAL TRANSPORT COSTS ON TRADE AND ECONOMIC GROWTH

It may seem obvious to say that, today, we live in a global world. It is certainly true that international trade among all the nations and regions of the world is nothing new, although the routes and mode at which trade takes place might have change over time. Thus, there is no doubt that we have entered a new era of global interdependence from which there can be no turning back (International Maritime Organisation (IMO), 2009: 2)

According to the IMO (2009: 3), "The process of globalization and economic growth development and the factors that have enabled them to evolve were recognized by the then Secretary-General of the United Nations, Mr. Kofi Annan, in 2000, when he observed, "Globalization and rapid economic development has been made possible by the progressive dismantling of barriers to trade and capital mobility, fundamental technological advances, steadily declining costs of transport, communication and computing". This highlights the importance of international trade to economic development.

According to Huan Chen (2009), the classical school of economics believes that international trade promotes economic growth in two ways. The first is through the optimal distribution of resources and productivity which stimulates economic growth while the other is the enhancing of a country's chance to gain raw material and equipment which it could not produce, thus providing the material basis for economic development.

It would appear obvious that for trade to effectively promote economic growth, an efficient transportation system must be in place. In his elucidation of freight transport efficiency Pinard (2006) explains that efficient transportation is central to economic growth as it affords access to the manufacturing hubs of the global markets, ports and landlocked countries.

Furthermore, an efficient transportation system is significant for economic development because it aids in the mapping and enhancement of trade by availing a platform for goods and people to interface. In a rapidly changing world and business environment such as ours that is characterised by globalization and increasing competition, the provision and maintenance of an efficient and effective transportation system is indispensable to enable regions to be globally competitive (Pinard, 2006). The absence of an efficient and effective global

transportation system will not only have an effect on the trading platforms, but also on the world's production hubs which will then have a devastating effect on the global economy as whole. Pinard (2006) linked this idea with the maritime shipping network as a particular supporting feature of economic development and global advancement.

Maritime transport is regarded as an economic activity undertaken within an environment of global trade and is maintained as the most common and resourceful of the modal of transports due to it versatile nature, goods transporting variety and ability to enhance efficiency in the transportation of goods. IMO (2009: 5) provided that, "more than 90 per cent of global trade is carried by sea and throughout the last century the shipping industry has seen a general trend of increases in total trade volume". It is then plausible to say that maritime (Seaborne trade) trading has been the bedrock of international trade, movement of goods and subsequently increased industrialization. IMO (2009: 5) identified, while analysing the increasing efficiency of maritime shipping as a mode of international transportation of goods and services that, "increasing industrialization and the liberalization of national economies have resulted and fuelled free trade and the growing demand for consumer products and advances in technology, which has made shipping the preferred and swift method of transport". They further stated that shipping is "truly the lynchpin of the global economy development: as without shipping, intercontinental trade, the bulk transport of raw materials and the import/export of affordable food and manufactured goods would simply not be possible" IMO (2009: 1).

If improved international transport services in general, and the maritime shipping network in particular are one of the main motivations behind the success of economic globalization and trade, then accordingly shipping transport costs have an important impact on economic activities and development. They affect countries' productivity and competitiveness within the global markets place, with a further aftereffect on the cost of the country's delivered goods. The measurement and maintenance of a realistic maritime shipping cost is therefore paramount to global trade and economic development.

A growing interest in maritime shipping demand and supply states that, the demand for shipping services is sensitive to changing patterns of trade and economic activity. However, the impact of the cost of maritime shipping services on trade and economic development are

more direct. In analysing the impact of international transport costs on foreign trade and economic development, ECLAC (2002) cited international transport costs as a factor affecting economic development. According to the authors, Sánchez et al., (2002: 3) the impact of the cost of transport on trade can be put as:

> The price of the vast majority of traded goods is exogenous for developing countries; so if the shipping of imports becomes more expensive, higher inflation will ensue as a result of the increased cost of imported goods; and in the case of intermediate and capital goods, this also increases the costs of local production. If exports become dearer to ship, the result is a drop in earnings for the exporting country or simply the loss of a market, depending on the elasticity of demand and the availability of substitutes. Econometric estimates suggest that the doubling of an individual country's transport costs leads to a drop in its trade of 80% or even more. (Limao and Venables, 2001; Hummels, 2000)

And further analysing transport costs impact on economic development, they affirm that since:

> Empirical studies have concluded that greater transport costs lead to lower levels of foreign investment, a lower savings ratio, reduced exports of services, and reduced access to technology and knowledge, and a decline in employment. It is estimated that a doubling of transport costs leads to a drop in the rate of economic growth of more than half a percentage point (Radelet and Sachs, 1998). This impact may appear low, but it should be noted that lower growth over the long term results in sizeable variation in per capita income. Geographical variables related to transport costs may account for 70% of the statistical variation in per capita income between countries (Redding and Venables, 2001).
>
> Sánchez et al., (2002: 3)

Chasomeris (2006: 40) concurred with these facts when he analysed the effect of shipping costs on foreign trade and economic growth. All this has led to the acquired sensitiveness of shipping costs issues globally. Furthermore, according to Kopp (2006: 6), the income effects

of high international transport costs "shows that countries suffer substantially from the double squeeze of reduced exporters' margins and high importers' full costs"; and "in relatively poor countries the negative income effects fall mainly on wages, with the consequence of negative income distribution effects between and within countries". Moreover, as a result of high international transport costs, low trade volumes ensue which consequently reduces "the potential of knowledge transfers accompanying trade, and leading to an increase in long-run income growth rates. It has also been shown that credit constraints or international coordination failures tend to lead to underinvestment in international transport infrastructure. This deficit implies high trade elasticity with respect to investment in infrastructure" (Kopp, 2006).

2.7. CONCLUSION

The review of the literature revealed that an efficient transportation costing system is critical to the emancipation of trade and economic growth, as it facilitates an inroad into the global market thereby paving the way for an optimal distribution of resources and productivity which stimulates economic growth.

Reviewing the empirical literature on the measure of international transportation costs and the uses of the import cif/fob ratios as an indirect measure in the field of international transport costing, this chapter of the study can be said to have uncovered a great deal of misrepresentation and misuse of import cif/fob ratios as a measure of determining and consequently reporting international transport costs. The imports cif/fob ratio is often used and reported as direct measures of transportation costs. There were several challenges that emerged in the course of this chapter that makes the use of the import cif/fob ratio as a measure questionable. The most arguable aspects of the use of imports cif/fob ratios as a measure of international transport costs observed in the review are the assumed definition under which the ratios are being used, the source and nature of the data used to project the

import cif/fob ratios, and the assumption that the composition of trade are constant in applying the ratios.

Furthermore, the measurement error, a general perspective and perception of the users and providers of the cif/fob ratios were reviewed. The ratios are often characterised by measurement errors in the values of import cif and import fob; IMF staff imputations (that is the process of constructing the ratios); concern of bias; data documentation error by source countries; the commodity classification error and the aggregates assumption error. Different reviews and opinions were collected on these errors to assess the conditions and views under which the ratios were applied with the associated errors.

The chapter then delved into the effects of international transport costs on trade and economic growth. While not the core objective of this study, the literature research elaborated on the impact of international transport cost on foreign investment in a country, the savings ratio amongst the citizens, access to technology and knowledge, and employment to compel a case in developing a concept that will aid to rectify the misuse and misrepresentation of international transport costs.

CHAPTER 3

RESEARCH METHODOLOGY AND DESIGN

3.1. INTRODUCTION

Chapters 1 and 2 presented a view and discussion on the need for this research undertaking, as well as a review of paramount literature that surrounds the general measurement of international transportation costs, specifically the use of import cif/fob ratios as a measure for international transportation cost. This chapter discusses the research methodology, data collection and analysis techniques that were used in this study. The rationale of the research approach and strategy in form of the design and nature of the study, variables, sampling and the choices of sample used in the study are discussed in the first four sections of this chapter. The latter part of this chapter discusses the measures, in term of research instrument and procedures used in analysing for the study. Through this entire chapter, theories behind research methodology are reviewed and their application in this research are discussed and elaborated upon. In the main, this chapter deals with data collection and covers how data is derived from secondary sources, detailing the approach used and conditions under which the various stages of investigations were carried out.

3.2 THEORETICAL FRAMEWORK

According to Darko-Ampem (2004: 134), “every type of empirical research has an implicit, if not explicit, research design. In the most elementary sense, the design is a logical sequence that connects empirical data to a study's initial research questions and ultimately, to its conclusions (Yin, 1994). In a sense the research design is a blueprint of research, dealing with at least four crucial problems: What questions to study, what data are relevant, what data to collect, and how to analyse the results (Yin, 1994). It is much more than a work plan because the main purpose is to help to avoid a situation in which the evidence does not address the initial research questions. Hence, the research design deal with a logical problem and not a logistical problem, as it also specifies how the researcher will address the two critical issues of representation and legitimisation".

Furthermore, according to Yin (1994), a research design describes a flexible set of guidelines that connects theoretical paradigms to strategies of inquiry and methods for collecting empirical material. It situates researchers in the empirical world and connects them to specific sites, persons, groups, institutions, and bodies of relevant interpretive material, including documents and archives. This chapter covers the methods used in this study.

3.3. RESEARCH DESIGN AND THE NATURE OF THE STUDY

It was crucial to establish a research design from which to approach the research problems, with the purpose of describing and understanding the problems from different points of view, so as to provide acceptable answers to the research problem and questions thereof.

Research may be approached from either a qualitative or a quantitative perspective, or alternatively a mixed approach. Blumberg, Cooper, and Schindler (2008: 191) suggested that the distinction "between a qualitative and quantitative study is based mainly on the kind of information used to study a phenomenon. As their names suggest quantitative studies rely on quantitative information (i.e. numbers and figures), while qualitative studies base their accounts on qualitative information (i.e. words, sentences, description, exploratory and narratives)". A third legitimate paradigm of research is the mixed research. This involves the mixing of quantitative and qualitative methods or paradigm characteristics.

The qualitative approach to research is typically used to answer questions about the nature of phenomena with the purpose of describing, probing and understanding them from the participants' or applicants' point of view. Creswell (cited in Leedy, 1997: 104) defined a quantitative study as "an inquiry into social or human problems, based on testing a theory composed of variables, measured with numbers and analysed with statistical procedures in order to determine whether the predictive generalizations of the theory hold true". By contrast, he defined a qualitative study as "inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting". Denzin & Smith (cited in Darko-Ampem, 2004: 135) added that: "Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter". This means that qualitative

researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them. Based on these analogies, an empirical qualitative-quantitative (Mixed Design) based approach of research was identified as ideally suited for this study.

Using secondary data, the inductive method of research was used to draw observation and irregularities in the use of the imports cif/fob ratios as a measure of the cost of international freight and the role of the composition of imports in its directional flow. Although the data was actually analysed in a quantitative manner, the whole study design did not qualify to be referred to as quantitative in nature, but probably of a mixed research methodology.

The research was designed as a Case and Time Series research (Descriptive and Longitudinal Design). Sekaran and Bougie (2009) state that a time series study is one in which data is gathered in describing changes over time, weeks, months or years with the aim of answering certain research questions i.e. irregular fluctuations. Such was the case in this study that is being reported here. While a case series study is a descriptive study that report data on a few subject.

The research was designed with the view to answering the research questions stated in Chapter One through testing certain theories, which were reviewed in Chapter One and discussed in Chapter Four. Data covering certain period of time on four cases were sourced secondarily and the research investigation took the direction of correlation and comparative analysis.

3.4. VARIABLES

As researchers are most interested in relationships among variables, so is the researcher of this study. Bless, Higson-Smith, and Kagee (2006: 30) defined variables as "an entity that varies from one observation to the next, an empirical property that is capable of taking two or more values"; Kumar (2005: 56) collaborated this as a property that takes on different values.

According to Blumberg, Cooper and Schindler (2008; 37) "There's nothing very tricky about the notion of independence and dependence of variables. But there is something tricky about

the fact that the relationship of independence is a figment of the researcher's imagination until demonstrated convincingly. Researchers hypothesize relationships of independence and dependence: they invent them, and then they try by reality testing to see if the relationships actually work out that way." This study is no different as the relationship between transport cost measurements, composition of imports and the imports cif/fob ratios were hypothesised with the impact of the composition of imports recognised.

3.4.1 TYPES OF VARIABLE

Variables may have peculiar roles in a certain problem as they tend to alter the steps and processes involved in research which can vary, depending on the type of research being done and the hypothesis being tested.

Sekaran (2003), Bless et al. (2006), Blumberg et al. (2008) all stated, independent and dependent variables as the two most important types of variables, but equally acknowledge the presence of extraneous variables. As suggested by Blumberg et al. (2008: 37), in each relationship, there is at least one independent variable (IV) and one dependent variable (DV) and if present any other variable, they are considered extraneous and ignored in simple relationships.

3.4.1.1 INDEPENDENT VARIABLES

Bless et al. (2006: 30) describe independent variables as variables influencing other variables, and in so doing determining the values of these affected variables. Leedy and Ormrod (2001: 233) on the other hand define an independent variable as a variable that the researcher manipulates. In this study, the composition of imports is the manipulated value which can influence, rather than completely determine the measurement of international transport cost.

3.4.1.2 DEPENDANT VARIABLES

As emphasised by Bless et al (2006: 30), dependant variables are variables whose values are influenced by the value of other values. In discussing the issue, Leedy and Ormrod (2001: 233) simplified a DV as a variable that is potentially influenced by the independent variable,

simply because to some extent it depends on the independent variable. Based on this fact, the imports cif/fob ratios is analysed as the dependent variable, because its value as a measure of international trade is influenced by the composition of imports.

3.4.1.3 EXTRANEOUS VARIABLES

Extraneous variables are generally defined as variables other than the independent variable that may bear any form of effect on the behaviour of the subject being studied. Kumar (2005) characterised extraneous variable as exceptional factors other than independent variable operating in real-life situation that may affect changes in the dependant variable. These factors are usually not measured or considered in the measurement of international transport cost using the imports cif/fob ratios, may increase or decrease the magnitude or strength of the relationship between independent and dependent variables i.e. re-importing and re-exporting.

3.5. DATA COLLECTION

Research studies of various kinds rely on a variety or mixture of sources for data and when conducting qualitative research, there are a few recognised ways of collecting data. Bless et al. as cited by Darko-Ampem (2004) identified several data collection methods, including participant observation, interviewing, past research and document study, physical artefact, field research and historical-comparative research. They further stated that no single source has complete advantage over any of the others. In fact, the various sources are highly complementary, and a good research study will therefore want to use as many sources as possible.

One common source used by researchers is secondary data sourcing. Secondary data sourcing is the gathering of information made available for purposes other than the completion of a research project. A variety of secondary information sources is available to researchers gathering data on industries, potential product or theory applications and the market place. As a general rule, a thorough research of secondary data is expected to be undertaken prior to conducting any primary research (if primary data is required in the study). Secondary

information is assumed to provide a useful background leading to identifying key questions and issues that will need to be addressed by the research (Steppingstones, 2004).

For this study, only secondary data were sourced. These data were sourced on trade reports, mainly the movement of goods (imports and exports) from the acclaimed benchmark database for transport costing. In addition to this, data were equally gathered from a detailed literature review of this area of study. The data were sourced and sorted in form of "Geographically and Time-series based".

According to Emory and Cooper (1991) secondary data are commonly used for three research purposes which were observed in this study: to fill a need for a specific reference on some points; as an integral part of the larger research study; and as the sole basis for this research study.

The data for imports cif/fob ratios measurements were sourced from the IMF International Financial Statistics database, journals, books, and articles. The data on the four nations used as a case study were sourced from the World Trade database and reports, as well as from economic international statistical sources. The information on the use of a country's import cif/fob ratios as a measure (proxy) of a country and groups of countries' international transport costs were sourced from journals, books, and articles.

3.6. SAMPLING THEORY AND CHOICE OF SAMPLE

Sekaran and Bougie (2009: 266) state that sampling is the process of choosing an adequate number of elements from a population, so that a study of that sample and a comprehension of its properties or characteristics, make it possible to generalise those properties or characteristics to the whole population from which it was drawn.

Bryman and Bell (2007: 183) define a population as "...the universe of units from which a sample is to be selected". Sekaran (2003: 266) added that what is critical to a population is that it contains those units that the researcher is keen on investigating.

A sample is therefore, "...the segment of the population that is selected for investigation" (Bryman and Bell 2007: 183). Sekaran and Bougie (2009: 263) on the other hand define an element as, "a single member of the population".

3.6.1 REASONS FOR SAMPLING

Sekaran (2003: 267) states that sampling is used for a number of reasons, not least is to save time and money since attempting a survey of the whole population may prove too costly both in terms of money (especially when dealing with destructive sampling) and time. The author also adds that working with a smaller number (the sample) ensures that there is less fatigue and fewer errors, ensuring that the results are more reliable.

3.6.2 CHOICE OF SAMPLE

For the purposes of this research, the researcher used judgement sampling (purposeful samples) which is a type of purposive sampling. Sekaran (2003: 277) states that purposive sampling is one of the non-probability sampling techniques in which the researcher chooses to get information from particular target groups because the researcher feels that these particular groups have the information he or she seeks or they possess certain criteria the researcher is after. Marshall (1996: 223) posits that the researcher actively selects a productive sample to answer the research questions. As with other non-probability sampling methods, purposive sampling does not produce a sample that is representative of a larger population, but it can be exactly what is needed in some cases.

Judgement sampling is that in which the data sources/respondents are chosen because they are the most favourably placed to provide the information being sought (Sekaran 2003: 277). For the purposes of this research, the researcher chose this method of sampling for exactly this reason – that the subjects were the most favourably placed to provide the information being sought. The researcher wanted to get trade (imports) information from developed and developing countries in the fastest manner possible. Therefore, the researcher identified two developed and two developing countries, each with different significant trends, data and

information. These countries were also identified for their accessibility in term of their trade report for a certain period of time that could be cross examined with similar graded countries and against the theory looming over the imports cif/fob ratios as a measure of international transportation cost and the threshold of the composition of imports on it. This strategy ensured that the researcher ended up with information from four different perspectives covering a period not less than 25 years.

3.7. LIMITATIONS

In today's world correct data and information is the key to success.

The most important limitation with secondary sources is that the information often does not meet one's specific needs as it was initially collected for other purposes. Emory and Cooper (1991) confirm one limitation of secondary data as that of it often out of date and or not up to the detailed requirements.

This research analysis is based on secondary data (trade reports) and past literatures, and the manner in which they are analysed (imports cif/fob ratio and the composition of import) to measure international transport costs. The data sourced for the study met the needs of the research analysis and was current to specification of the analogy.

Secondary use of large scale datasets always presents particular challenges, because it may take some time to identify the most appropriate source, to confirm the quality of the data, and to devise the process of obtaining the data and analysing it (SourceBook, 2009). The only major drawback to the data collection and assessment was the fact that the data on countries are at times estimated by the data provider to suit their original needs and some data provided by member bodies were at times equally incomplete, either by design or due to error. Hence the study was partially limited by incomplete and estimated data.

3.8. THE RESEARCH MEASURES AND PROCEDURE

3.8.1 THE MEASURE

Measures are at the core of doing any research. This is evidence in that in almost all research, everything has to be reduced to numbers eventually, and this gives precision and exactness in measurement which is very important.

Measures are the items in a research study to which the participant responds. It can also be expressed as what is actually used to test hypotheses in research studies. Coincidentally this gives researchers a need for good measures for both independent and dependent variables. Despite this, too often researchers still fall prey to the 'availability bias' and simply select whatever they can get their hands on, or they default to using research instruments that have commonly been used in the past, with this leading to poor instrument selection and thereby adding noise and error to research path (Neill, 2004).

Following the careful consideration of the nature, phenomenon and outcome expectation of this study, secondary data sourcing was selected as the most suitable research instrument for exploring the study.

The idea was to research method that was based on the three major elements that this study was instituted upon: concepts, categories (variables) and propositions. However, the concepts and categories are the key elements of this study, since the theory is to be examined from the conceptualisation of the data, rather than the actual data.

So, the research measure was structured:

- To examine the theory on the data's parameter.
- To explain the processes, actions and interactions between the variables
- To provide a step-by-step systematic procedure of analysis
- And to stay close to the data as much as possible so as not to generate another misconception of the measure. (As cited in Creswell, 2002, p. 146)

In order to achieve this, a mixed research design was employed with a descriptive and inductive measure of approach, meaning that the study approach measure is from a specific broad conceptual level, a process, an action, or interaction about a substantive topic to the more general study.

3.8.2 PROCEDURE

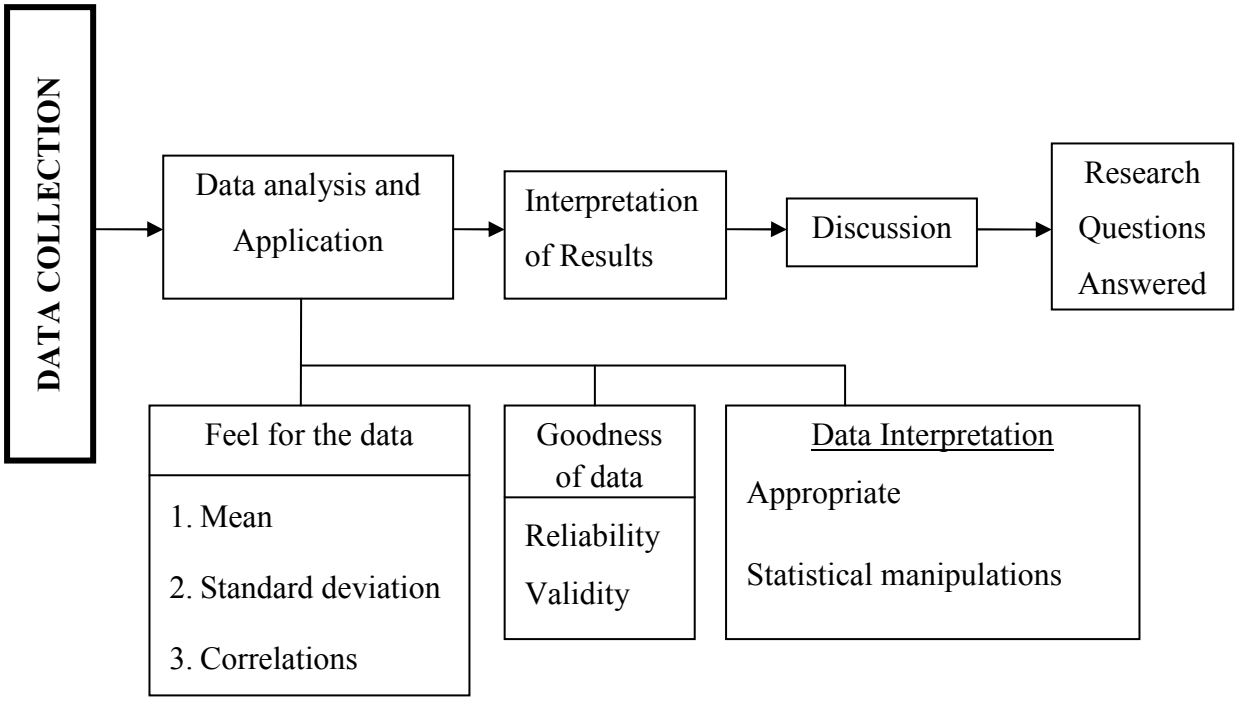
Traditional research designs usually rely on a literature review leading to the formation of a hypothesis and this hypothesis is then put to the test by experimentation in the real world. This study on the other hand, investigates the actualities in the real world and analyses the data with no preconceived hypothesis (Glaser & Strauss, 1967), through the lenses of the researcher (Moghaddam, 2006).

As earlier indicated, a mixed research method was chosen for this research study. And the procedure that Creswell (2002) and Davidson (2002) describe, allows for the research design, the examination of existing theories, on-going data collection and analysis, and the use of verbal and visual data. According Gay, Mills, and Airasian (2005) Mixed Method Research is "a style of research that uses procedures for conducting research that are typically applied in both quantitative and qualitative studies. The purpose of these designs is to build upon the synergy and strength that exists between quantitative and qualitative methods in order to more fully understand a given phenomenon than is possible using either quantitative or qualitative methods alone.

3.9 DATA ANALYSIS PROCESS

Sekaran (2003: 301) provides the following data analysis process, which was adopted for the purposes of this survey:

Figure 3.1 Flow Diagram of Data Analysis Process



Source: Adapted from Sekaran, 2003: 301.

Sekaran (2003: 301) states that data analysis and interpretation consists of two stages, namely:

- Preparing data for analysis, and
- Data analysis and interpretation

3.9.1 PREPARING DATA FOR ANALYSIS

This stage of the data analysis involves editing, dealing with blank trade report periods, and arranging the data into categories to make the next stage of interpretation easier. For the purpose of this research, as secondary data was being used, most of the data has been prepared for analysis. So, little was done in the trade report compatibility for analysis other than sourcing for appropriate data to fit into blank trade periods.

3.9.2 *FEEL FOR THE DATA*

The researcher used this stage of the analysis to get an understanding of how good and consistent the data are and how well the previous stages of editing, coding and categorising had been done. The achievement of this was achieved through the use of descriptive statistics such as mean, standard deviation, variance and correlation analysis. Sekaran (2003: 306) identifies this phase of a research as a point of assessing how good the ranges or scales assigned to the research data are in relative to the data preparation.

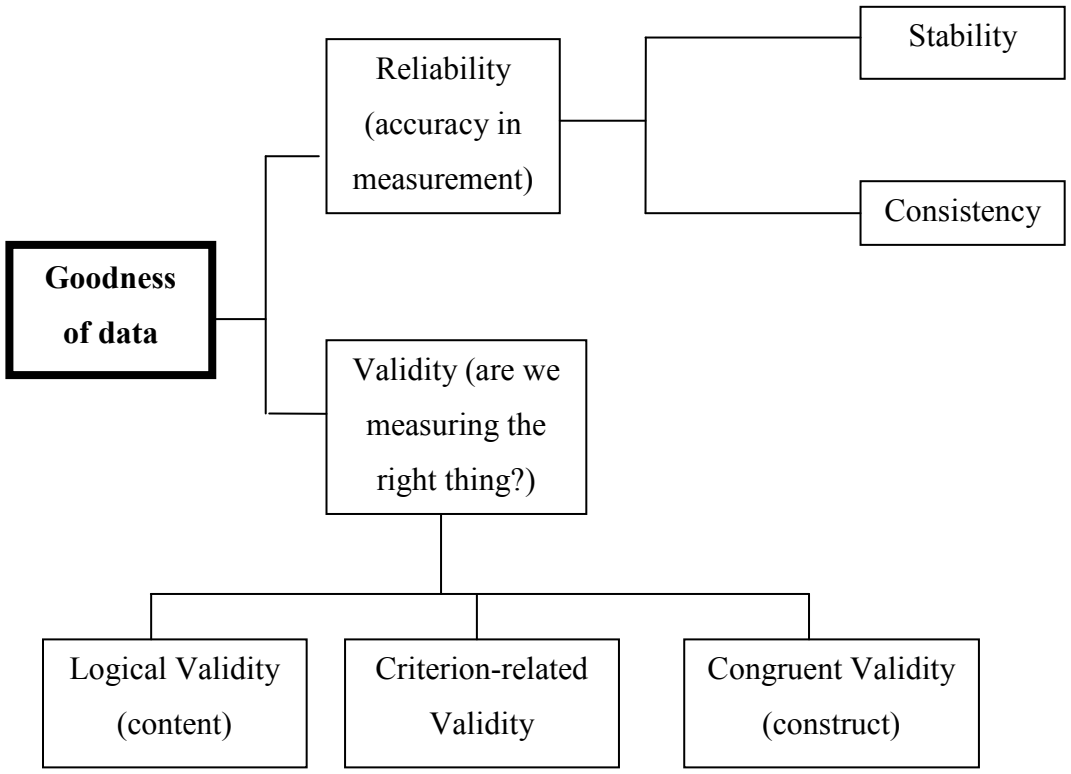
3.9.3 TESTING THE GOODNESS OF THE DATA

According to Sekaran (2003: 307), the test for the goodness of the data is done by checking for reliability and validity. Figure 3.2 on the next page shows the different forms of reliability and validity tests that are conducted when checking for goodness of data.

3.9.3.1 RELIABILITY

Sekaran (2003: 307) states that reliability is concerned with the consistency and stability of a measure over time. In other words, it checks the extent to which the measure is free of error and/or bias over time and within the various items in the instrument. The stability and consistency of this data analysis was established upon a computation using the Excel spread sheet to analyse the data over the extended period ensuring the uniformity of the test measure and with every probability that the analysis is provided with the same construct and thereby gives consistent results with bias in analysis of the four countries.

Figure 3.2 Testing Goodness of Measures: Forms of Reliability and Validity



Source: Adapted from Sekaran, 2003: 204

3.9.3.2 VALIDITY

According to Bryman and Bell (2007: 165) validity has to do with,"....whether or not an indicator (or set of indicators) that is devised to gauge a concept, really measures that concept".

Validity of the data can be checked through the use of three methods: Logical/content validity check, criterion related validity and congruent/construct validity (Sekaran 2003: 206). All Three data validity checks were applicable to the study but the criterion related validity method was used to validate the data.

3.9.4 DATA INTERPRETATION

Data interpretation and hypothesis testing can be achieved by the use of inferential statistics such as Pearson correlations, regression analysis, *t*-Test, chi-square test, ANOVA tests (Sekaran 2003: 307).

3.9.4.1 PEARSON CORRELATION

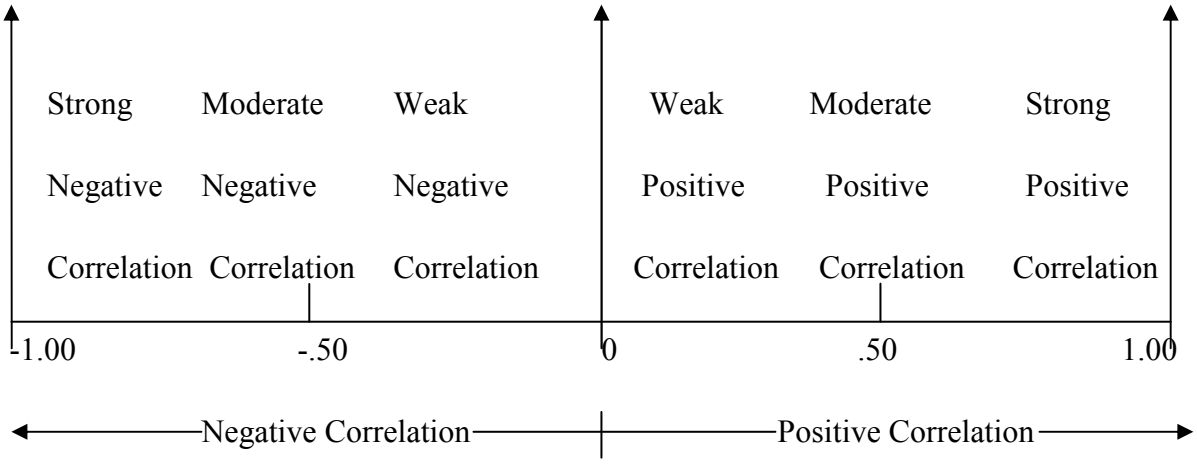
Lind, Marchal and Wathen (2008: 460), state that the Pearson correlation was derived by Karl Peterson around 1900. This is also referred to as the coefficient of correlation. The authors define correlation analysis as, "a group of techniques that measure the relationship between two variables". The authors further define the Coefficient of Correlation as, "a measure of the strength of the linear relationship between two variables". It is normally referred to as Pearson's *r* or as the Pearson product-moment correlation coefficient. The coefficient correlation helps to describe the type of relationship that exists between two variables and to determine if the correlation is significant.

Lind, Marchal and Wathen (2008: 462) provided the following characteristics of the coefficient of correlation:

- The sample coefficient of correlation is identified by the lower case letter *r*
- It shows the directions and strength of the linear (straight line) relationship between two interval- or ratio-scale variables
- It ranges for -1 up to and including +1
- A value near 0 indicates there is little association between the two variables
- A value near 1 indicates a direct or positive association between the two variables
- A value near -1 indicates inverse or negative association between the variables.

The diagram below sums up the strength and direction of the coefficient of correlation.

Figure 3.3. The Strength and Direction of the Coefficient of Correlation



Source: Adapted from Lind, Marchal and Wathen, 2008: 462.

3.9.4.2 t-Test

The t-test assesses whether the means of two groups are statistically different from each other (Trochim, 2006). This analysis is appropriate whenever one wants to compare the means of two groups, and especially appropriate as the analysis for the post-test-only two-group randomised experimental design. The data generated in this research is analysed further through the t-test to indicate the separateness of the sets of measures, and thus used to check whether the sets of measure are essentially different in Chapter 4 with the results discussed therein.

3.10. SUMMARY

This chapter covered the methods and nature of the study and dealt with the research design, extrapolating data collection and their derivation from secondary sources, sampling theory, the development and administration of the research instrument as well as the steps and processes that were used in the analysis and interpretation of the data.

The chapter also detailed the approach used and conditions under which the various stages of investigation were carried out. It further indicated how issues of validity and reliability are addressed through the use of several data gathering methods.

The method adopted for this study involved the use of observational, inductive and descriptive statistical approach to probe observations on irregularities through literature comparative analysis and synthesis as well as correlation analysis.

Chapter 4 will present, interpret and discuss the data collected as evidence on the misrepresentation of international transportation costs.

CHAPTER 4

DATA ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

4.1. INTRODUCTION

This chapter presents the analysis and discussion of data gathered on the four countries in the examination of the misrepresentation of the cif/fob ratio as a measure of international transport cost. A description of the IMF database sourced data gathered as part of this study is given here, as well as the analysis of data on the subject matter discussed. "As data analysis in qualitative research is considered as challenging and of a highly creative process" (De Vos, 1998: 334), this statement is observed in this chapter. Data from the IMF databases, reports from professional bodies, literature from previous research and notes taken during the course of this study were compiled, examined and evaluated to answer the research questions asked at the beginning of the study. As far as possible, data were tabulated and displayed through tables and figures, with the aim of identifying and discerning any patterns that provided the best interpretation of the results of the study. Details of the analytical instrument used were discussed in the previous chapter and in Sections 4.2 and 4.3 of this chapter. The data is presented in Section 4.4, while Section 4.5 provides a complete discussion of the findings as the data is interpreted in conjunction with the insights gained from the literature review presented in Chapter 2.

4.2. PRESENTATION AND ANALYSIS OF DATA

Description and analysis of results of qualitative research differs from quantitative data (Pope et al. as cited by Fathalla and Fathalla, 2004), so the description and analysis of the data in this study are prepared in a particular manner to deliver the sought after results within the manner of the research design. Qualitative studies are generally not designed to be representative in terms of statistical generalisation as they do not gain much from a larger sample size (Fathalla and Fathalla, 2004). The sample size for this study was limited to four countries with the data examined limited to a 28 year period time series.

The vast majority of the data presented here were sourced from the IMF databases International Financial Statistics (IFS) and Direction of Trade Statistics (DOTS) and only small amount of data were sourced from reports and journals where data were not available from the IMF database. Where data were sourced elsewhere apart from the IMF database, this is clearly indicated.

As emphasised by Hummels and Lugovsky (2003), it will also be stressed here, that considering the fact that the imports cif/fob ratios data are sourced from the IMF's IFS and DOTS databases, this study is not in any way aimed to denigrate the quality of trade data provided by the IMF, but rather to stress the disparagement of the continued use of the IMF data computed imports cif/fob ratios as a measure for international transportation costs. The purpose for IMF database compilation is to provide accurate statistics for balance of payments and not to be a source for international transportation costs measurements and comparisons.

Import trade data were sourced from the international merchandise trade statistics database adopted by the United Nations Statistical Commission under the Standard International Trade Classification (SITC) code to generate a country's evolution of composition of imports. These data are the same as that which are being used from the IMF to generate imports cif/fob ratios just that they are more disaggregated in nature. The SITC code is a system of classification of goods used to classify both exports and imports trade of a country in order to enable an even and fair comparison of trades by different countries over specific years. This classification system is maintained by the United Nations.

According to the United Nations Statistics Division, the code is a classification by Broad Economic Categories for "compiling international trade statistics on all merchandise entering and exiting the international market, which is aimed to promote international comparability of international trade statistics. The commodity groupings of SITC reflect (a) the materials used in production, (b) the processing stage, (c) market practices and uses of the products, (d) the importance of the commodities in terms of world trade, and (e) technological changes." (Asian Development Bank, 2004: 105)

The Standard International Trade Classification (SITC) system is defined coded from 0-9 with; Codes:

0-**Food and live animals**;

1-**Beverages and tobacco**;

2-**Crude materials, inedible, except fuels**;

3-**Mineral fuels, lubricants and related materials**;

4-**Animal and vegetable oils, fats and waxes**;

5-**Chemicals and related products**;

6-**Manufactured goods classified chiefly by material**;

7-**Machinery and transport equipment**;

8-**Miscellaneous manufactured articles**;

9-**Commodities and transactions not elsewhere classified**.

4.3. APPLICATION AND DISCUSSION

The researcher used correlation analysis between a country's imports cif/fob ratios and a country's composition of imports in analysing data for this study.

Correlation as clarified by Fathalla and Fathalla (2004) can be expressed as the correlation coefficient of variables at the point when the relationship between two variables can be expressed graphically by a straight line stating or determining the weight of their relationship.

Correlation may be positive or negative which occurs when one variable increases as the other increases. At this point correlation is regarded as being positive. On the other hand, when one

decreases as the other increases it is tagged as negative. The correlation coefficient (r) is measured on a scale that varies from +1 through 0 to –1 (Fathalla and Fathalla, 2004).

Complete correlation between two variables is expressed as 1 and it should be made clear here that correlation means association, and not necessarily causation, but this conclusion will be left to the interpretation of the results.

The researcher's choice of correlation coefficient and not regression analysis is due to the fact that, it has been long argued that regression analysis is more concerned with the statistical relationship of variables compared to correlation analysis which is more accustomed to the functional or deterministic and dependence relationship of variables which is of concern in this study.

The data collected on the four countries for this study were used to measure the strength and direction of the relationship between the imports cif/fob ratios and composition of imports. Each country's SITC imports data were cross-tabulated to factor in the imports cif/fob ratios across a stipulated period to examine if the imports cif/fob ratios of these countries indicate the accurate value of their transport cost and if the ratio could be used accurately as a measure (proxy) for international transport cost.

The analysis was later used to describe firstly what type of relationship or correlation exists between the variables (import cif/fob ratio and the composition of imports as international transport cost indicator) and secondly, whether the correlation is significant enough on which to base the theory that the weight of the composition of imports of a nation in high and low valued imports do have considerable impact on the flow of the imports cif/fob ratios as a measurement for international transport cost.

The analysis was further used to answer if there is a direct or reverse cause-and-effect relationship between the variables or if the relationship between the variables is as a result of a third variable or a combination of several variables or merely a coincidence of occurrences.

4.4. COUNTRY ANALYSIS

4.4.1. UNITED STATES OF AMERICA

Overview

The United State is known as one of the biggest traders in the world and also one with the most up-to-date and most accurate data. This is largely a result of the effectiveness of its trade statistics agency. The US trade weight in the world market and its data accuracy thus qualifies it to be adequate and significant enough to be used as a case study for this work in order to identify and weigh-up what type of relationship or correlation that exist between the variables.

It is widely believed that the ending of World War II in 1945 brought a big change to the level of world trade and goods transportation as developing countries demand for capital goods, consumer goods, agricultural products and commercial services increased. And the United States then was in a good position to provide these. These nations produced these goods for export, and the United States became a market for these goods (Thomas & Atkins, 2010). Over time, as the world economy became globalised and the economic system changing from distinct local and national markets, separated by trade barriers, distance, time, and culture, to one which is increasingly converging and integrating into a global economy, the United States began to lose its dominance of world goods movement.

According to the National Oceanic and Atmospheric Administration (NOAA) and the World Trade Reports, the United States was the world's leading trader by a large margin as far back as one could remember and in 1998 it accounted for about one billion tons of ocean-bound trade (about 20% of the world's total ocean-bound trade) out of about 2.4 billion tons of total foreign trade (about 41.6% of total foreign trade) (Thomas & Atkins, 2010). However in 2004, the United States lost its margin to 11.4% of the world total market share, this while the world exports grew at an average annual compound rate of 8.3% and the United State, China and Germany at an average of 4.3%, 21.5% and 8.8% respectively (The CIA World Fact Book, 2011).

By 2008, the United States had lost its leading international market trade and transportation margin to Germany and China, this while the United States still grew significantly in international trade and transportation. Despite this loss of market and transport margin, the United States still remains a vital stance point of argument and assessment for international transportation cost measurement.

According to the EconomyWatch (2010e), the US import and export statistics for the year 2010 looks like this: total exports: $994.7 billion (9.2% agricultural produces, 15% consumer goods, 26.8% industrial supplies, and 49% capital goods) with the major export partners as Canada 20.1%, Mexico 11.7%, China 5.5%, Japan 5.1%, Germany 4.2%, and the UK 4.1%. On the other hand, its total imports was $1.445 trillion (4.9% agricultural products, 31.8% consumer goods, 32.9% industrial supplies, and 30.4% capital goods) with its major import partners as China 16.5%, Canada 15.7%, Mexico 10.1%, Japan 6.6%, and Germany 4.6%:

Data Presentation

As indicated in the beginning of the chapter, data series of each of the four countries identified as suitable and with unique characteristic that centres around transportation measurements and trade were collected for the study. Providing the basis for the examination of the first country sample (United States) is Table 4.1 below. The United States' SITC imports are presented as a proportion of total imports for the periods 1980 to 2008 as collated by the United Nations (International Financial Statistics). In order to identify the international transportation measurement trends, the SITC imports data for the US were analysed as a percentage of the total imports to construct the nation's trade imports composition analogy over the period and observe its evolution as against the nation's equally computed ratios. The results shows that the United States' imports cif/fob ratios have steadily declined over time, and remarkably at that, when measured against the world imports cif/fob ratios. This is striking if it is considered a direct indicator of the country's cost of international transport, this considering applying similar depiction for some other nations. This decline of the import cif/fob ratios is evident in Figure 4.1 and Table 4.6.

Table 4.1. United States of America SITC Imports as a Proportion of Total Imports, 1980-2008

Percentage of Total Imports										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1980	6.4409032	0.010858	4.30858	34.020049	0.2229752	3.343665	13.315048	26.3763109	9.3895125	1.4971398
1981	5.6782842	0.011561	4.27589	31.659038	0.1760592	3.389349	14.47516	27.5101381	10.1917382	1.48823491
1982	6.0551424	0.013351	3.66266	27.283962	0.1664677	3.688292	13.411139	31.0484511	11.8955169	1.45330057
1983	6.1107883	0.011693	3.66946	22.46484	0.2059787	3.973554	13.64903	34.7413404	12.6543626	1.36133238
1984	5.5604682	0.010129	3.49097	18.797886	0.228208	3.981496	14.049617	38.0306111	13.3253505	1.52249325
1985	5.4651833	0.010409	3.0546	15.533174	0.1994626	4.098844	13.767263	41.020096	14.4676284	1.35283116
1986	5.7553654	0.010167	2.94166	10.283476	0.1417777	4.101399	13.405312	44.7685562	15.9270443	1.6587479
1987	5.1439714	0.010045	3.19001	11.107699	0.1572139	4.064037	13.415135	44.3016169	16.5841118	1.03166279
1988	4.6605283	0.009329	3.27734	8.881673	0.2071363	4.616912	14.264097	45.2531679	16.317794	1.58846692
1989	4.4580626	0.009027	3.07795	10.5207	0.1616071	4.464546	13.60702	44.2680134	16.9323588	1.60699119
1990	4.4920327	0.009401	2.79388	12.881531	0.1575361	4.508335	12.741847	42.7061617	16.278618	2.4999633
1991	4.6150817	0.00984	2.58014	11.813313	0.168747	4.863074	12.374981	43.0316392	16.7073379	2.86166315
1992	4.3420174	0.00987	2.57602	9.2805132	0.2117156	5.230218	12.031476	44.8111747	17.7001391	2.8296983
1993	3.9949763	0.009538	2.5556	9.5295362	0.1894854	5.150259	11.850174	45.2733787	17.9263904	2.57640935
1994	3.8980515	0.007909	2.68261	7.6392543	0.1838246	5.132522	12.425501	47.2430307	17.4022497	2.60210629
1995	3.7198062	0.007241	2.75443	8.191405	0.1908189	5.249999	12.415808	47.3967859	16.6936254	2.66317157
1996	3.6956196	0.008215	2.62776	10.005978	0.2122855	5.410474	11.99641	46.4081652	16.5330932	2.28870375
1997	3.7871313	0.008532	2.58415	8.8753239	0.190212	5.595789	12.05224	46.4279454	16.9883014	2.64574451
1998	3.7827964	0.008235	2.37676	5.6656379	0.1707625	5.831954	12.738479	47.827065	17.7771334	3.0058694
1999	3.4747205	0.00806	2.17945	7.5868448	0.143546	5.824718	11.875567	48.1279552	17.1202035	2.86103932
2000	3.1433594	0.007093	1.85618	11.634519	0.1196627	5.614505	11.312312	46.6944559	16.286395	2.62939179
2001	3.4136536	0.008203	1.84105	11.023804	0.1065276	6.344937	11.184975	45.6089607	16.7677104	2.88802993
2002	3.452513	0.009103	1.79746	9.979891	0.1292335	7.115648	11.348899	45.1174018	16.9880398	3.16054185
2003	3.5343662	0.009654	1.67478	12.517899	0.1280998	7.892586	10.832834	40.8997539	17.5694766	3.98476365
2004	3.3030741	0.008804	1.87397	14.193243	0.1568395	7.549475	11.861401	39.9258166	16.6029316	3.65281908
2005	3.1789598	0.0085	1.79954	17.21209	0.1448265	7.55399	11.663371	38.3152021	15.7576942	3.52432639
2006	3.1257764	0.008705	1.7172	17.988298	0.1550119	7.571592	12.231891	37.7729234	15.1062775	3.4605483
2007	3.2204724	0.009055	1.61709	18.461944	0.1782152	7.841873	11.826355	37.3944951	15.1591012	3.39494057
2008	3.2484343	0.008356	1.61554	23.189793	0.2506853	8.312873	11.069705	34.167984	13.914828	3.39458162

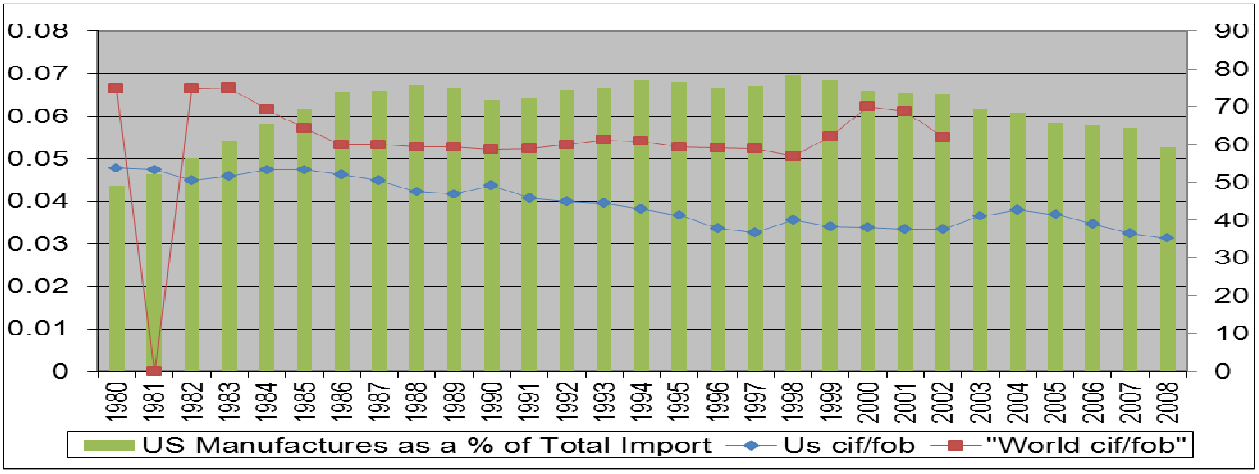
Source: Data from International Financial Statistics. Standard International Trade Classification Revision 2 data from World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005)

Employing these data from Table 4.1, the product classification for each period was divided by the total imports for the period and multiplied by 100 to arrive at what percentage of the total imports each class of products categories imported for the period weighs (see appendix Table A1.2). Also employing the data, the cif/fob ratios for each period of trade for the country was derived by the formula (cif/fob)-1 (Appendix Table A1.4). These cif/fob ratios levels of appropriateness were then examined as a proxy for direct shipping and international transport cost for the country.

The respective SITC imports class categories as a percentage of total imports for the series were further analysed through correlation analysis against the imports cif/fob ratios for the series to investigate the significance, magnitude and direction of the relationship between the country's composition of imports and the country's import cif/fob ratios (Appendix Table A1.3). This analysis was then used to examine each SITC group product categories (imports composition) influence, if any, on the directional flow of the import cif/fob ratios as a result of the category class weight on the total imports.

Figure 4.1 below gives an overview of the directional flow of the US import cif/fob ratio along with the country's manufactured imports as compared to the world imports cif/fob ratios for the same period while Table 4.6 shows the US ratios against the world ratios and the other three countries which were analysed.

Figure 4.1. United States, World cif/fob Ratio and Manufactured Import from 1980-2008



Source: Author's calculations from data sourced from UN Comtrade, 2008; WTO, 2008; Chasomeris, 2006 (TIPS, 2005).

The US data and its analysis show that US imports cif/fob ratios to have fallen consistently over the period from 1980 to 2008. Based on the common, but not ideal assumption of researchers and analyst alike that a country's imports cif/fob ratios reveals the actual difference in *ad valorem* shipping cost rather than changes in the composition of that country's imports, this decline is assumed to indicate that the US import shipping cost has generally decreased owing to certain factors. Few researchers have questioned this downward trend in the US imports cif/fob ratios and have adjudged it to be misleading if taken as a general indicator of a drop in its *ad valorem* shipping costs or international transport costs overall. Some have embraced the decline in the US imports cif/fob ratios as an indicator of a drop in its *ad valorem* shipping costs but have simultaneously cautioned against a general or similar assumption of other nations imports cif/fob ratios as indicative of their directional *ad valorem* shipping costs. Yet others have come to generally support the notion of the imports cif/fob ratios as an indicator of a country's *ad valorem* shipping costs.

This decline in the US imports cif/fob ratios is assumed to describe the size of the wedge that transportation costs drives between the US and its importing partners. However, some researchers have sought possible justification to back-up their assumption of the decline as a true indicator of a drop in the US's *ad valorem* shipping costs. Some have equally sought explanations for the high and rapid increase in the imports cif/fob ratios which have befallen some US trading partners. According to Chasomeris (2006; 73), some of this explanation might have included: "changes in distance from the international markets; improved infrastructures; improved technology; more efficient ports; the benefits derived from economies of scale and scope and a significant reduction in maritime related anti-competitive practices, partially caused by changes in the legislative environment like the Shipping Act of 1984 and the US Ocean Shipping Reform Act of 1998".

Some researchers tentatively state that the consistent decline in the US imports cif/fob ratios apart from the slight increase experienced in 2003 and 2004 is as a result of error-ridden data being used to access and measure the country's imports cif/fob ratios. Others boldly disagree by pointing out that the US, New Zealand and the ALADI countries of Latin America have the most complete data on international trade statistics as they collect freight expenditures as part of their

import customs declarations (Hummels, 2009:6) and thus their imports cif/fob ratios are true and accurate indicators.

The suggestion that the US data is utterly error-ridden as a result took a back seat, but the fact remains that there seems to be differences in all imports cif/fob ratios for the United States obtained from the three IMF sources with all using the UN's COMTRADE database which is at times supplemented in some cases by national data sources (Hummels, 2003: 5). These differences lead to Hummels asking if the IMF data are accurate measures for implied transportation costs.

Assessing the US data from a composition of imports point of view, the US composition of imports evolution was observed in Figure A1.1 with the constructed data retrieved from Table A1.2 and Figure A1.1, all of which can be found in the Appendix. The US had extensively maintained a significant decline in the importation of mineral fuels, lubricants and related materials (SITC 3) as a proportion of their total imports from the start point year of analysis (1980) till 2002. Then from 2003 a rise was experienced which lasted until 2008, the last year of the series analysed. It is also observed in Figure A1.1, that the US has equally maintained a significantly proportional rise and decline in the importation of machinery and transport equipment (SITC 7) as a proportion of their total imports during this period as observed with its SITC 3 imports classified goods.

A correspondingly observation in Figure A1.1, shows a very much lower and stable importation of food and live animals (SITC 0), beverages and tobacco (SITC 1), crude materials, inedible, except fuels (SITC 2), and animal and vegetable oils, fats and waxes (SITC 4) as a proportion of the US total imports over the period analysed. These classes of imports are all classified as lower-valued imports alongside mineral fuels, lubricants and related materials categoried as SITC 3 (SITC 0-SITC 4).

Also as a proportion of the US total imports for the period were a constant but a more slightly higher observation of imports in manufactured goods classified chiefly by material (SITC 6) and miscellaneous manufactured articles (SITC 8). A lower but rising importation was observed in chemicals and related products, n.e.s. (SITC 5) and commodities and transactions not classified

elsewhere in the SITC (SITC 9). Coincidentally all these categories (SITC 5-SITC 9) of imports classification are higher-valued imports along with machinery and transport equipment (SITC 7).

As a point of argument, the US composition of imports in its high-valued and lower-valued imports as a proportion of its total imports supports the economic theory that a rise in the proportion of a country's high-valued imports contributes and motivates for a decline in that country's imports cif/fob ratios, *ceteris paribus*. Furthermore, a rise in the proportion of a country's low-valued imports stimulate an increase or rise in that country's import cif/fob ratios, *ceteris paribus*.

The evolution of the US composition of imports particularly through its SITC-3 (low-valued imports) and SITC-7 (High-valued imports) emphatically gives a report on the adjustment of the country's imports cif/fob ratios. This report indicates that the country's imports cif/fob ratios declined through the period in which the country experienced consistent rise in its SITC-7 classified imported goods and a consistent decrease in its SITC-3 classified imported goods, which was between 1980 and 2002 (See Table A6.1 in the appendix).

Furthermore, when the country began to experience a slight increase in its imports cif/fob ratio in 2003, a corresponding decrease in its SITC-7 and increase in its SITC-3 were observed. This is a clear and further indicator of a relationship between the country's imports cif/fob ratios and its composition of imports. This factor is discussed further in Section 4.5 after further examination and observation of the other three countries.

It is worth mentioning here that based on what has been observed in the directional flow of the US imports cif/fob ratios and the evolution of its composition of imports along with the economic theory that a rise in the proportion of a country's high-valued imports contributes to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports contributes to a rise in that country's import cif/fob ratios, *ceteris paribus*. Hence, it will be wrong to ignore or assume a change in a country's composition of imports as insignificant to a change in the measure of that country's imports cif/fob ratios. This also provides evidence to question the common assumption by some analysts and researchers in their work that a country's composition of imports is constant over time.

4.4.2. GERMANY

Overview

Germany is referenced to be one of the biggest exporting and importing nations of the world. It is alluded by the CIA Factbook (2011) as the largest national economy in Europe, and the second largest trader in the world behind China, the fourth-largest by nominal GDP in the world, and fifth by GDP (PPP) in 2008. These are reasons enough to consider Germany, a developed country, as a case study for this study apart from the fact that over the years, international trade has come to be known to traditionally play a crucial role in Germany's economy, with a strong network of trade relationships with almost all the major trading countries in Europe and all over the world.

Based upon the classification made by the World Bank on the basis of economic, income and region for the year 2006, Germany is classed among the high-income Organisation for Economic Co-operation and Development (OECD) group. Germany is not only the largest economy in the European region, but also one among the most developed and industrialised economies in the world (EconomyWatch, 2007).

The service sector contributes around 70% of the country's total GDP, industry 29.6%, and agriculture 0.9% (Library of Congress, 2008). Exports account for more than one-third of Germany's national output and imports are a significant aspect of its economy. Germany does not possess extensive natural resources, with lignite and potash salt being the only raw materials available at an economically significant quantity in the country, so it depends largely on imports to acquire the majority of its raw materials to cater for its significantly high exports of manufactured goods.

The country's most important trading partners are the European Union (EU) with France in particular and the United States according to Zimmerman (2004). The EU and US together accounted for 74.4 percent of Germany's exports and 61.6 percent of its imports in 2003 and it has more or less remained the same to date. Germany's primary export commodities are machinery, vehicles, chemicals, metals, manufactures, foodstuffs, textiles with its primary imports more or less the same with the exception of manufactured goods. Like most major trading nations, the country's investments, profits, jobs, and standards of living are known to be

seriously affected by disruptions of world trade, movement of goods and changes in the global economy.

Data Application

Table 4.2 below shows Germany's SITC imports as a proportion of total imports for the periods 1980 to 2008 as sourced and calculated from the United Nations database (International Financial Statistics). In order to identify the international transportation and imports trends of Germany, a similar calculation to that of the US SITC imports data was applied for Germany's data. The SITC data was analysed as a percentage of the total imports to examine the relationship in trends and pattern of the nation's imports cif/fob ratios to that of the observed country's composition of imports.

Germany's imports cif/fob ratios and composition of imports are analysed here with cautiousness and anticipation in the mind of the researcher. Germany's trade report figures provided on the IFS database are being questioned in terms of their accuracy and reliability unlike the data of countries such as the US and New Zealand whose data on the IFS database are regarded to be more or less close to their actual trade figures.

Considering Germany's composition of imports make-up and flow pattern, it is observed from Germany's trade pattern in its high-valued SITC-5 to SITC-9 imports from Table A2.2 in the appendix and Figure 4.2 below; that Germany invested heavily in the importation of machinery and transport equipment (SITC-7) as significant mounting inflow was observed between 1980 and 1999. A more stable flow was evident thereafter until 2002 from which time there was a declining inflow of its SITC-7 categorised imports. Concomitantly, Germany's miscellaneous manufactured goods in SITC-8 followed in similar fashion to that of its machinery and transport equipment (SITC-7) only not as significantly as the SITC-7 imports flow.

Germany's manufactured goods classified chiefly by material (SITC-6) declined slightly all through the period of the analysis, but still presented a higher inflow compared to all other categories of imports except for the SITC-7 imports. However, Germany's SITC-5 (Chemicals and related products) merely changed in flow as it only slightly increased towards the end of the analysis. Germany's SITC-9 (commodities and transactions not elsewhere classified) was stable over the period until the year 2000 when a sudden increase was observed.

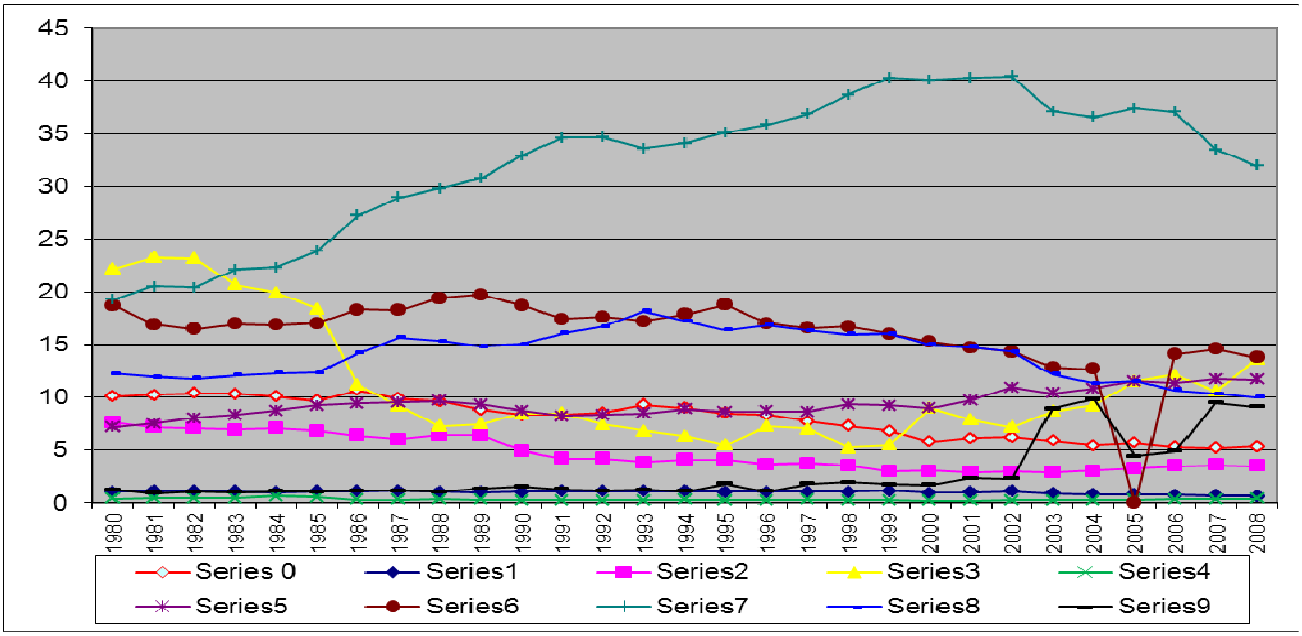
Table 4.2. Germany's SITC Imports as a Proportion of Total Imports, 1980-2008

Percentage of Total										
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1980	10.0829	0.0103205	7.6592851	22.146855	0.4231796	7.19205221	18.6993551	19.283728	12.24465	1.2359986
1981	10.2199	0.01115629	7.1773539	23.2560709	0.4402978	7.53650929	16.9113376	20.517649	11.92618	0.899083
1982	10.369	0.01151124	7.0653123	23.1539165	0.4417586	8.05274818	16.4933389	20.42918	11.77992	1.0636586
1983	10.345	0.01099292	6.9360551	20.6551562	0.4743859	8.31319321	16.9754551	22.129864	12.07646	0.995099
1984	10.0792	0.01005002	7.1063327	19.9173837	0.6757183	8.72896762	16.8494318	22.293328	12.25521	1.0894576
1985	9.69177	0.01086348	6.8376533	18.4051501	0.5613604	9.21173727	16.9985408	23.865137	12.30912	1.033169
1986	10.6705	0.01123185	6.3995438	11.1653146	0.3231829	9.41801622	18.3059244	27.23422	14.19731	1.1628144
1987	9.88253	0.01136506	6.0247812	9.17295189	0.2800312	9.53429433	18.263887	28.922023	15.64911	1.1339065
1988	9.62332	0.01052237	6.4167294	7.28950718	0.3298927	9.67166285	19.4347714	29.805662	15.30439	1.0718469
1989	8.81967	0.00999871	6.417167	7.47432249	0.3254753	9.34849374	19.7132103	30.760652	14.80569	1.3354643
1990	8.34547	0.01038338	4.9684651	8.43907399	0.2537241	8.74598581	18.7040617	32.902439	15.03243	1.5699906
1991	8.32267	0.01084641	4.2111481	8.47335788	0.2368812	8.26154327	17.4320842	34.585394	16.09269	1.2995952
1992	8.54811	0.01094706	4.1988522	7.46143001	0.2611775	8.33218049	17.6346313	34.606847	16.69871	1.163357
1993	9.29365	0.01101651	3.8690344	6.83240889	0.254654	8.48656425	17.2012861	33.568014	18.16123	1.2315102
1994	8.98805	0.01087968	4.1160488	6.32620035	0.3034684	8.88163318	17.891655	34.094503	17.19735	1.1131173
1995	8.47927	0.01047166	4.0735987	5.47907805	0.2776115	8.64100952	18.7608601	35.086597	16.35706	1.7977539
1996	8.31251	0.01076993	3.6249994	7.27746631	0.2622665	8.664997	17.0362663	35.813454	16.84479	1.0862494
1997	7.72388	0.01048951	3.7586326	7.02692788	0.2822703	8.6427733	16.5751444	36.814321	16.31782	1.809296
1998	7.29528	0.01057669	3.5276051	5.25976418	0.2616017	9.31232958	16.7045726	38.650448	15.96459	1.9661436
1999	6.8499	0.01160311	3.0170231	5.47946973	0.246456	9.22713411	15.9997596	40.267937	15.99622	1.7557953
2000	5.7748	0.00975505	3.0243536	8.96815478	0.1964961	8.98634347	15.2928134	40.091187	14.99032	1.7000373
2001	6.16051	0.00991861	2.8820611	7.89195308	0.2135617	9.74842273	14.7372919	40.269365	14.75431	2.3506599
2002	6.24557	0.01083041	2.9505157	7.21240438	0.2532957	10.9225059	14.3007851	40.436454	14.30541	2.2900377
2003	5.86785	0.00906323	2.9189337	8.6666253	0.2607527	10.3716387	12.8129967	37.088664	12.15905	8.9471711
2004	5.44376	0.00805423	3.0542096	9.21815169	0.2726482	10.8156442	12.6664117	36.542761	11.35568	9.8253084
2005	5.68785	0.00805262	3.2410297	11.5187049	0.2994675	11.5488909	0.01357847	37.356417	11.50787	4.4560336
2006	5.296	0.00741582	3.5054372	12.1096803	0.3709686	11.3521816	14.0683571	37.001328	10.68113	4.8733361
2007	5.21385	0.00704942	3.5806454	10.5831748	0.3742407	11.7102667	14.5586987	33.495558	10.31751	9.4611122
2008	5.32347	0.00674089	3.4954776	13.6357227	0.3980669	11.6983725	13.7554557	31.944656	9.966982	9.1077038

Source: Data from International Financial Statistics. Standard International Trade Classification Revision 2 data from World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005)

Further examination of Germany's composition of trade from a low-valued imports perspective, from 1980-2008, shows that the country's import of mineral fuels, lubricants and related materials (SITC-3) was on a downward trend in nature compared to that of the country's SITC-7 imports that was of an rising trend. The country's SITC-3 (low valued) imports declined during the same period when its SITC-7 (High-valued) imports were increasing and only slightly began to rise when the same SITC-7 imports began to decline.

Figure 4.2. Germany's SITC Imports as a Percentage of Total Imports, 1980-2008.



Source: Author's calculations from data sourced from Chasomeris, 2006 (Tips2005); UN Comtrade, 2008; WTO database, 2008.

The country's importation of food and live animals (SITC-0) was observed as declining all through the period, a similar trend to that of the importation of crude materials and inedible except fuels (SITC-2). The importation of animals, vegetable oils, fats and waxes (SITC-4) and Beverages and tobacco (SITC-1) were observed to be stable at a very low level all through the period of analysis.

Largely, it is observed in Germany's imports flow pattern through its composition of imports in the analysis above and Figure 4.2 that Germany experienced a general increase in its high-valued imports over its low-valued imports that declined overall over the period of analysis. Despite the major decline in SITC-7 (High-valued imports) and slight increase in SITC-3 (Low-valued imports) towards the end of the analysis period (2002-2008), it could still be observed that Germany's overall manufactured imports overshadowed its low-valued imports, although this will depend on the weight of the decline in comparison with the weight of the rise experienced over the period in question.

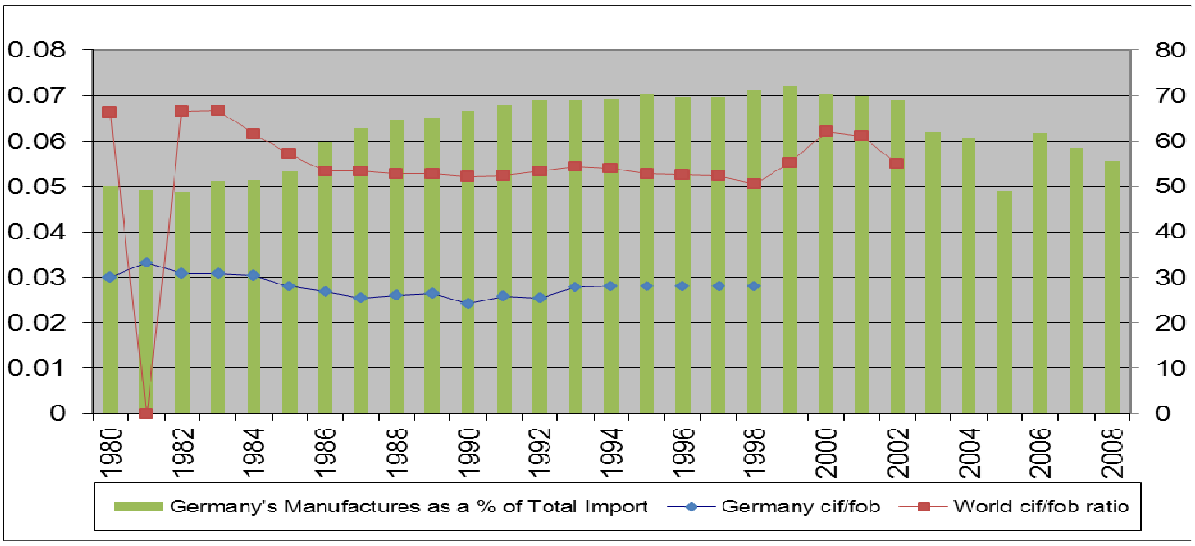
Based on the outcome of these analyses without any further computation or assessment of the country's imports cif/fob ratios and reasoning from the theory "that a rise in the proportion of a country's high-valued imports contributes to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports equally contributes to a rise in that country's import cif/fob ratios, *ceteris paribus*" (Chasomeris, 2006). Germany should experience a more constant/decline in its import cif/fob ratios over the periods 1982 and 2008 with the later years depending in general on the difference in weight experienced in the decrease and rise of its high-valued and low-valued imports respectively between 2003 and 2008.

Due to the unavailability of data in computing Germany's imports cif/fob ratios for the period 1999-2008, Germany's imports cif/fob ratios could only be analysed up to 1998. Figure 4.3 presents an overview of Germany's imports cif/fob ratios over the period and it is observed from merely looking at the figure that Germany experienced a stable pattern in its imports cif/fob ratios for the period. This is remarkable as Germany's trade pattern in the composition of its imports earlier indicated through the theory that the country should experience a stable decline in its imports cif/fob ratios between the period 1982 and 2002 except for the periods 1988 and 1989 when it experienced a slight increase in its SITC-2, a major aspect of imports for the country and 1993 and 1994 as a result of a surge in its SITC-0, SITC-2 and a drop in SITC-6 and SITC-7. Disappointingly there were not enough data to verify the expected change in the country's imports cif/fob ratios from 2003-2008 due to the un-weighed changes in the composition of the country's high-valued and low-valued imports.

Germany's imports cif/fob ratios evidences when compared as against its manufactured imports as a proportion of its total imports in Figure 4.3 that the country's cif/fob ratios directional flow

is proportionate in movement to the country's manufactured imports as a percentage of the total imports.

Figure 4.3. World and Germany cif/fob Ratio and Manufactured Import from 1980-2008.



Source: Author's calculations from data sourced from UN Comtrade, 2008; WTO, 2008; Chasomeris, 2006 (TIPS, 2005).

The analysis of the evolution of Germany's composition of imports and its imports cif/fob ratios shows that it would be wrong to speculate that a country's import cif/fob ratios is a direct reflector of changes in the cost of the country's transportation or *ad valorem* shipping cost as it shows here that it is partly a mirror reflection of the country's composition of imports. Although it is noteworthy to mention that, Germany's trade reports are categorised among those nations whose trade reports are not all that reliable or accurate enough to be used as a precise matched partner. It is believed that the country does not have an effective enough trade statistic reporting body to provide accurate and reliable enough data on its trade (Hummels, 2009).

However, based on what has being observed in the movement of the country's imports cif/fob ratios and the evolution of its composition of imports, it is clear that Germany's composition of import do as the theory suggest, play a role in determining the direction of the country's imports cif/fob ratios.

4.4.3. SOUTH AFRICA

Overview

South Africa is a nation located at the southern tip of the African continent and it is the region's most developed nation. Ranked 25th in the world in terms of total land area available, the country shares its international borders with Swaziland, Zimbabwe, Mozambique, Namibia and Botswana and has a large coastline of about 2,798 kilometres along the Atlantic and Indian Oceans (EconomyWatch, 2010d). This makes it a large contributor to the movement of goods for landlocked nations around it.

South Africa is classed as a middle-income country, with fully developed basic infrastructure. It exhibits several indicators of a developing economy, such as a well grown primary, secondary and tertiary sectors and non-dependency on agriculture. According to the EconomyWatch (2010c), the nation is considered by many as an emerging market with an abundant supply of natural resources. This indicates why mining, manufacturing and the service sector are the largest contributors to its GDP. Not only is the country seen as a key emerging market in Africa, it is also considered as a gateway to the African market as it plays a significant role in trade.

South Africa's trade, exports and imports are heavily dependent on the nation's natural resources and the government's highly liberal trade incentives. Most of its trade happens with the Far East nations, Germany and the US. Since 2001, Germany has been South Africa's largest source of imports with an annual growth of 18.5% between 2007 and 2008. Over the past decade, South Africa's trade is assumed to have evidently picked up with exports adding up to R144.9 billion in 1998, and resulting to an astonishing R663.099 billion in 2008, although an overall trade deficit of R64.5 billion was reported (Western Cape Business, 2010).

According to the World Trade Organisation, the country is generally considered a net importer as trade represented 67.5% of its GDP from 2006 to 2008. Its primary export commodities include machinery and equipment, gold, diamonds, platinum, minerals, and other metals. It is reported to have had an export and import worth of $86.12 billion and $90.57 billion respectively in 2008, while concentrating its import on machineries and equipment, chemical and petroleum products, scientific instruments and food materials (EconomyWatch, 2010d).

Data Application

South Africa's collated SITC data from the IMF's IFS database was used to examine the evolution of the country's composition of imports. Data from the IMF's Direction of Trade Statistics (DOT) were used to calculate the country's imports cif/fob ratios for the period 1980 to 2008. Like data for the US and Germany previously used to compute as a percentage of the total imports, data from Table 4.3 were used to construct and observe the evolution of the country's composition of imports as against the country's imports cif/fob ratios in order to further examine if the composition of imports do play a significant role in the direction and flow of a country's imports cif/fob ratios.

The application presented a very interesting and intriguing outcome for analysis. As Figure 4.4 shows, except for 1985 and 1986, South Africa imports cif/fob ratios between 1980 and 1992 show little variation over each year of the analysis and a huge variation each year between 1993 and 2008 of the analysis. Simply put, this would indicate (if assuming from the common assertion that a country's import cif/fob ratios reveals the actual difference in that country's *ad valorem* shipping cost rather than changes in its composition of imports), that South Africa's shipping costs between 1980 and 1992 were relatively stable (little rise or decline each year) while between 1993 and 2008 they fluctuated significantly with a compelling huge variation rate each year suggesting a huge difference in shipping costs each year during this period.

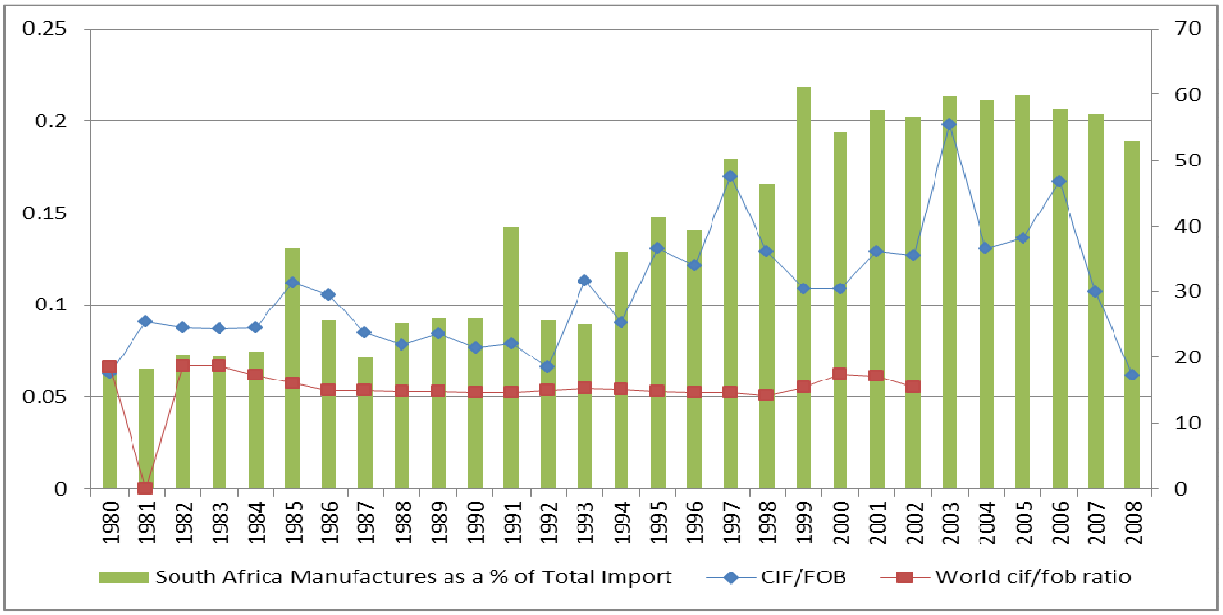
The South African data clearly demonstrate the earlier argument and caution in this study that the IMF data for such countries like South Africa are clearly unreliable and inaccurate. It is further believed that pre-1994 South Africa trade data is clearly inaccurate due to economic sanctions placed upon the nation due to apartheid regime which was then an unrecognised government. This called for back door trade with some nations that were never recorded. A further fact is that the largest category of South Africa imports by value was classified under SITC-9 (commodities and transactions not elsewhere classified) during this period. A further re-classification of a large portion of other earlier unclassified goods was witnessed after the change in its political agenda and the lifting of its economic sanctions (Chasomeris, 2009a: 157).

Table 4.3. South Africa's SITC Imports as a Proportion of Total Imports, 1980-2008

Percentage of Total										
	0 - Food	1 - Beverage	2 - Crude n	3 - Mineral	4 - Animal	5 - Chemic	6 - Manufac	7 - Machine	8 - Miscella	9 - Commo
1980	8.54483	0.00212902	7.6515611	1.8195543	0.1845197	2.2758071	16.2881897	2.02438145	0.7331226	60.265127
1981	9.52757	0.00184476	9.3707619	2.0539097	0.3544495	2.3479962	15.0704801	2.45351326	0.7314402	57.905422
1982	8.56175	0.00169882	9.5101737	1.7374456	0.2202651	2.6474022	16.9455232	2.6900093	0.7781437	56.739384
1983	6.39587	0.00186899	8.2330577	2.2973366	0.1657502	2.4682852	17.5888914	2.04870315	0.6330754	59.982091
1984	5.7772	0.00130734	10.138054	2.8392557	0.1585561	3.1884491	18.103526	2.08235182	0.7590306	56.822859
1985	9.14128	0.00384728	18.701153	14.19624	0.2057713	5.8731816	32.062807	2.51636209	2.044632	14.873883
1986	7.50214	0.00222957	10.926904	8.436718	0.1491997	4.2788314	23.0715849	1.84276973	0.85888	42.71003
1987	6.24485	0.00181236	8.4628822	5.177708	0.1006537	2.282016	18.298354	1.04067706	0.6481262	57.563495
1988	6.32076	0.00214578	11.355208	5.7741789	0.1129556	2.666781	23.1997896	1.16904122	0.8778717	48.308851
1989	7.28576	0.00234426	12.771358	6.6237526	0.1358548	2.8617318	23.794692	1.29746545	0.9021707	44.092814
1990	7.53859	0.00187486	11.088451	7.2402964	0.1105871	2.9424223	22.9499205	1.84585488	1.1877853	44.908615
1991	11.1878	0.00438272	16.563611	11.362103	0.2008674	4.6539314	33.9812451	3.65875339	2.3401831	15.613185
1992	7.04357	0.00732067	9.5998827	6.9038322	0.1988488	5.6123221	16.2464627	7.27322253	2.2282158	44.16159
1993	6.56236	0.00645544	9.0507257	7.8566865	0.1939611	5.1008644	14.4079624	7.98635145	2.6841667	45.511389
1994	7.50727	0.0074258	18.496195	5.4869154	0.1441820	6.1754416	26.7274525	6.7155498	2.6654331	25.338963
1995	6.7274	0.00769099	10.155285	8.0639778	0.1778739	7.6601138	29.297744	8.71709825	3.3506875	25.080709
1996	11.5825	0.01867715	12.867702	8.8628955	0.3251188	10.932679	19.6145296	14.1974866	5.6102114	14.139225
1997	8.8537	0.01503529	10.610564	7.4174796	0.2152648	9.0472162	30.8742436	14.5648343	4.8467128	12.066439
1998	9.94877	0.01719201	11.764513	7.7829212	0.2171265	8.8997327	24.4033539	16.8386212	5.1883348	13.237416
1999	8.20667	0.01632837	10.282961	9.7994475	0.1787693	7.9694914	39.0805993	17.3700005	4.7301214	0.749106
2000	7.76391	0.01627935	9.7917736	8.5518895	0.1667796	7.1550567	33.1818454	15.3294367	5.6934754	10.73789
2001	7.99005	0.01729874	8.5391322	7.0545355	0.1149757	6.6730082	39.0328407	13.6133927	5.0424056	10.209798
2002	8.29938	0.02064113	10.28624	11.620607	0.1399289	10.687584	28.0153964	21.7601429	6.9395098	0.1871167
2003	3.42852	0.00651896	3.1795026	11.944372	0.7979555	10.858249	12.2018198	39.3155609	8.2226097	9.3995094
2004	3.40016	0.00669252	3.1300016	14.46006	0.8193764	9.8215691	11.2087391	39.5199202	8.4069715	8.5639542
2005	3.1734	0.00594159	2.8178351	14.304987	0.6362796	9.8612383	11.4335407	39.3653083	9.0698813	8.7433665
2006	3.09414	0.00572081	2.9571518	18.373866	0.6313081	8.7613771	11.1307847	37.7882147	8.9610432	7.7300347
2007	3.54107	0.00667234	3.137066	18.640553	0.8699299	8.8265289	11.6253539	37.2785302	8.1141452	7.2995866
2008	3.62638	0.00638538	3.287156	22.380035	0.9397885	9.6197941	10.4107386	34.971621	7.4532283	6.6727165

Source: Data from International Financial Statistics. Standard International Trade Classification Revision 2 data from World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005)

Figure 4.4. World and SA's cif/fob Ratio and Manufactured Imports from 1980-2008.



Source: Author's calculations from data sourced from UN Comtrade, 2008; WTO, 2008; Chasomeris, 2006 (TIPS, 2005).

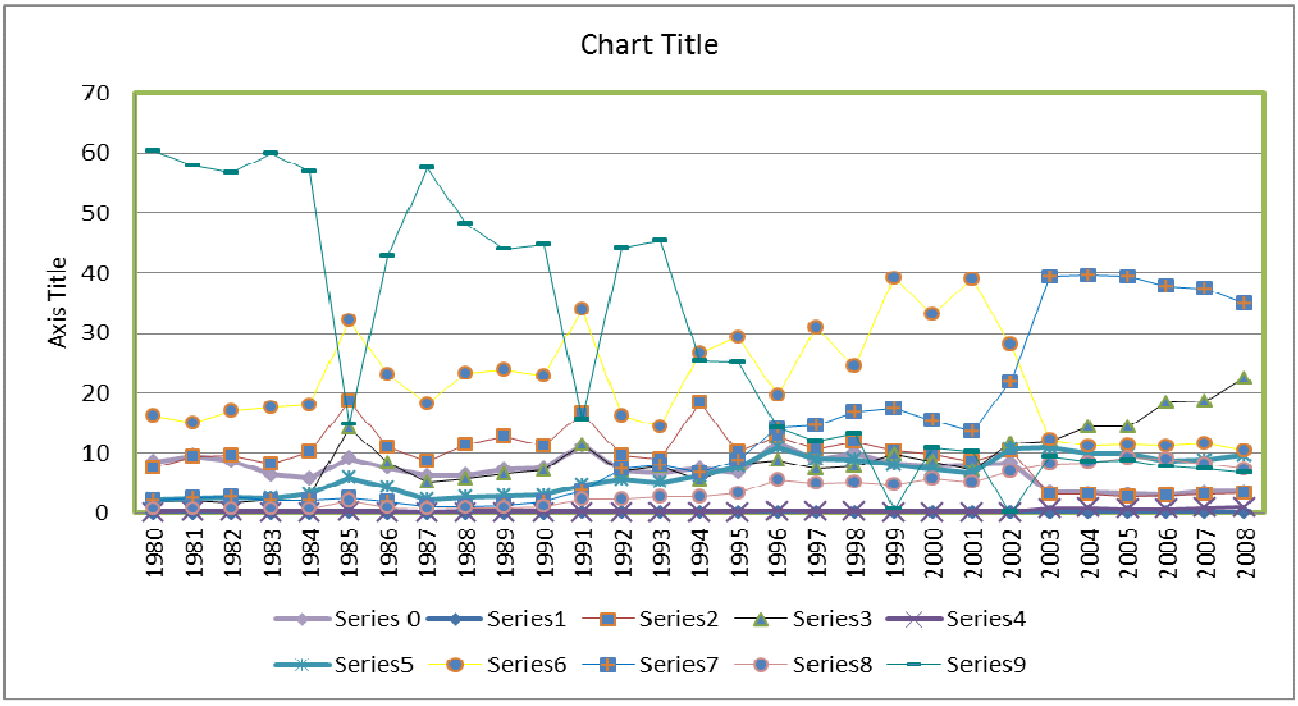
The variation of South Africa imports cif/fob ratios is also of great interest looking at it from a comparison point of view with the ratios of such countries like the US and Germany earlier analysed in this study (see Table A6.1 and Figure A6.1 in the appendix for closer comparisons). These countries are believed to present a more accurate or close to accurate trade report and consequently more accurate cif/fob ratios.

Despite the postulation of South Africa's data inconsistency as a result of trade record manipulation during the period of economic sanctions and the odd classification of goods under the SITC category of imports, Table 4.3 shows South Africa's evolution of composition of imports through the SITC data collated for the period 1980 to 2008. It was interesting to note in the graphing of the data (Figure 4.5) that the country's SITC-9 imports between 1980 and 1995 (period of economic sanction and unclassified imports) were very high. The SITC-9 evolution was observed during this period to be very high as it included non SITC-9 classified imports and thus will affect the evolution of other SITC categories where those imports should have been classified. The SITC-2 imports were also observed to be slightly higher than other low-valued imports during this period and remained so until 2003. This is also thought to be as a result of the

country's inclusion of fuels and petroleum imports in their SITC-2 instead of SITC-3 as structured under the Standard International Trade Classification, Rev.3. This is observed in the downward adjustment of the SITC-2 from 10% in 2002 to 3% in 2003.

In observing the country's overall SITC imports evolution during the period 1980 to 1994, high-valued imports such as SITC-6 and SITC-9 were observed to be consistently higher than other SITC imports categories which were equally observed to be constantly interwoven with each other. This is suggested to be the reason for the country's low imports cif/fob ratios during the period 1980 to 1994 as observed in Figure 4.4., if reasoned from the theory that a rise in the proportion of a country's high-valued imports do contribute to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports equally contributes to a rise in that country's import cif/fob ratios, *ceteris paribus* point of view.

Figure 4.5. South Africa's SITC Imports as a Percentage of Total Imports, 1980-2008.



Source: Author's calculations from data sourced from UN Comtrade, 2008; WTO, 2008; Chasomeris, 2006 (TIPS, 2005).

The country's imports cif/fob ratios evolution, witnessed some significant changes in the period 1995 to 2008. The period was moment after the lifting of economic sanctions and the significant re-enumeration and re-classification of the country's imports so as to align its reports with its matched partners. Significant changes were equally observed in the country's reported imports composition, with SITC-9 imports report dropping instantly and SITC-6 and SITC-8 rising almost simultaneously and SITC-7 rising significantly. This period also saw the country's SITC-0 and SITC-2 dropping and the SITC-3 imports maintaining its pattern at an average flow until 2001 when it was observed as making significant rise which was also reflected on the country's imports cif/fob ratios. According to Chasomeris (2010: 9), the rise in SITC-3 could be observed to be the result of the rise experienced in petroleum oil imports as a proportion of total imports during this period and the result of the rise in crude oil prices.

The question then is, what does SA's composition of imports pattern imply for South Africa's imports cif/fob ratios variation? The evolution of the country's composition of imports from 1995 to 2008 could be perceived to support the notion "that a rise in the proportion of a country's high-valued imports contributes to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports equally contributes to a rise in that country's import cif/fob ratios, *ceteris paribus"* (Chasomeris, 2006: 68) as the country's imports cif/fob ratios was observed as re-aligning with the change in the country's composition of imports (re-enumeration and re-classification of the country's imports) reporting.

But, due to the shortcomings in South Africa's imports data reports over time (inconsistency) and the fact that the country's time series data are unreliable, a fact that is evident from this study, the findings on this data cannot be completely established as proof of the composition of imports having a significant effect on the variation of the country's imports cif/fob ratios which equally cannot be approximated as a direct proxy for the nation's *ad valorem* shipping costs. But the fact remains that this is the closest that it is to trade and imports reports in the majority of countries, and that the accuracy of a country's trade composition data does have a significant effect on the accuracy of the country's imports cif/fob ratios.

4.4.4. MALAWI

Overview

Malawi is a landlocked country in the south-eastern region of Africa and it is bordered by Tanzania, Mozambique and Zambia. Ranked 99th in the world in terms of total land area available, Malawi's economy is considered to be one of the least developed in the world with the economy mostly depending on substantial inflows of economic assistance from the IMF, the World Bank and individual donor nations and organisations. The country is faced with the challenges to increase exports, improve education, health facilities and general standard of living among other things. In general, a densely populated country, it suffers from widespread poverty, under-employment and an increasing AIDS endemic. According to the EconomyWatch 2009 estimates, the country has a population exceeding 15 million with over 90% living in rural areas.

Malawi's economy depends heavily on agricultural produce which accounts for slightly less than 40% of its GDP and 85% of its export revenues. Approximately 90% of the population is engaged in farming and livestock activities. Unsustainable growth of the industrial sector is reflective of the conservative investment policies and trade barriers which have led to the country being ranked the 119th safest investment destination in the world due to its hostile investment environment. This makes it fall short of foreign investment, which is a prime requirement for infrastructure growth (CIA Factbook, 2011).

Practically no minerals are extracted in the country, although it is believed to have unexploited deposits of uranium, coal, and bauxite. Manufacturing or service industries are few in the country, so the country's setup is limited to the processing of agricultural products (tobacco, tea, sugar, and lumber) and the manufacture of basic consumer goods.

Since the country lacks a sound industrial sector, all major industrial products are imported, from small consumer goods to heavy machineries and its leading imports are foodstuffs (semi-manufactured), petroleum products, manufactured consumer goods, and transportation equipment. Its principal exports are tobacco, tea, sugar, cotton, coffee, peanuts, wood products, and apparel.

The country's biggest trading partner in term of import and export is South Africa as it exports more than 14% of its total export volume to South Africa and imports more than 40% of its total import volumes from there (EconomyWatch, 2010f). Other import and export partners are India, Mozambique, China, Tanzania, US, Egypt, Zimbabwe, Germany, Russia and the Netherlands. In terms of total import and export volumes, the country stands at 158th and 152nd in the world respectively.

Most of the country's foreign trade is conducted via Salima, a port on Lake Nyasa, which is connected by rail with the seaport of Nacala in Mozambique as Malawi possesses no waterways. Being a landlocked nation, Malawi's international transport and costs depends largely on its neighbouring nations. This and other factors are believed to be the reasons for Malawi's international transport cost (cif/fob ratio) being measured at 67% *ad valorem* cost in the Africa Development Report for 2004 (Africa Development Report 2004: 192).

Data Application

Malawi presents an intriguing analysis for the study of a nation's imports cif/fob ratios and the validation of the theory that a rise in the proportion of a country's high-valued imports contributes to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports equally contributes to a rise in that country's import cif/fob ratios, *ceteris paribus*. This nation has one of the highest imports cif/fob ratios in the world: is a landlocked country: has one of the most questioned trade data in the world based on accuracy, reliability and even existence: and is a poor under-developed country with little trading capacity.

The imports cif/fob ratio of Malawi as an indicator of its *ad valorem* shipping costs based on past reports is understood to constitute enough controversies that would require an entire study. However, providing the basis for the study of Malawi is a data source that is believed to have conjured and contrived data on the country in order to have an indicator of the nation's trade on its database. Data from Table 4.4 below were source and analysed from the IMF's International Financial Statistics database to provide assessment for Malawi's imports cif/fob ratios analysis.

Table 4.4. Malawi's SITC Imports as a Proportion of Total Imports, 1980-2008

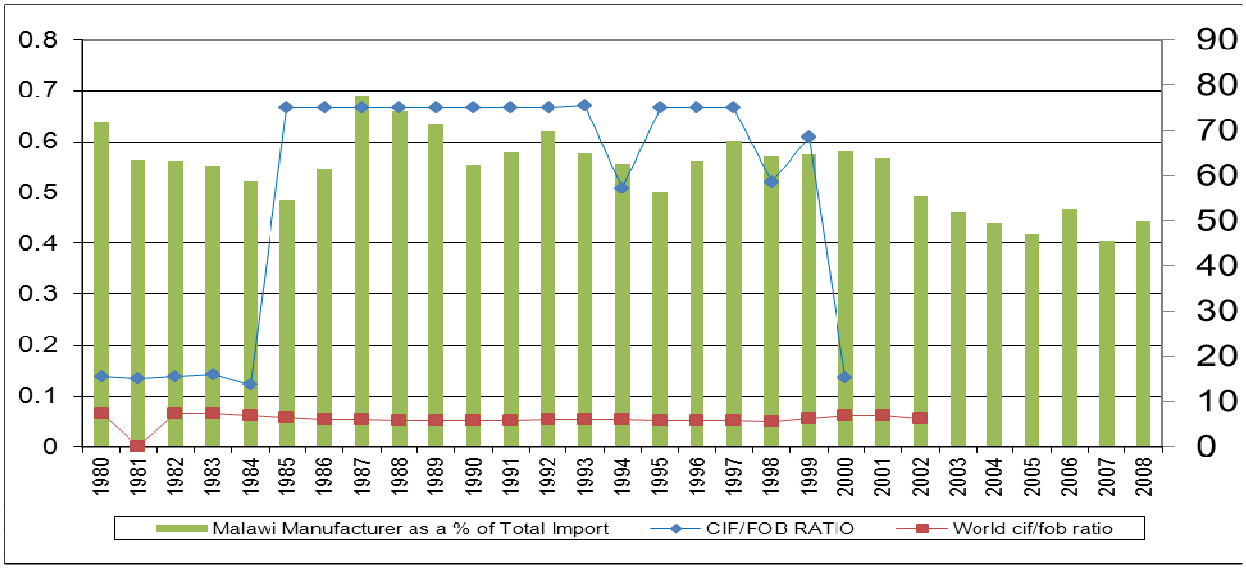
Percentage of Total Imports										
	0	1	2	3	4	5	6	7	8	9
1980	4.766925	0.00866092	1.88863	7.8245414	1.0327900	10.816425	23.9529460	42.3438654	5.39480292	1.11298376
1981	8.789715	0.01047094	1.49849	9.2142808	1.331346466	13.255091	24.45406456	31.2387831	7.94783384	1.22330146
1982	5.146752	0.00897932	2.716676	8.9391799	1.322211875	16.371102	28.28746668	27.4051893	7.57080697	1.34268328
1983	6.079281	0.01066738	2.942427	8.2696097	1.94599474	16.745797	23.97036741	31.8420116	6.52541858	0.61235472
1984	5.656804	0.00773286	4.473147	8.7536699	2.006727866	19.122772	21.80368218	29.3941664	7.59839387	0.4173510
1985	4.30232	0.00708073	2.684214	18.300067	1.17629883	17.877378	18.25348823	30.6435578	5.54084023	0.51376172
1986	3.86751	0.009300	2.40975	12.598215	0.943483775	16.96492	17.86819068	36.7610666	6.71536177	0.94155041
1987	4.423699	0.00110277	0.282006	0.391441	0.860327295	12.860294	9.773385413	56.5534716	11.4182773	3.32682336
1988	10.0309	0.00248292	0.511258	0.2741189	0.695569487	10.733488	12.74506351	51.2138715	10.1817285	3.36573454
1989	8.633784	0.00271715	0.38520	0.3109996	1.867088608	14.332169	12.7548014	51.8469009	6.82289393	2.77444347
1990	21.40985	0.01493836	0.509347	0.5581143	3.152600921	8.9128962	11.8104850	44.5610946	6.12842048	1.46335681
1991	7.32943	0.00357418	1.882265	4.4810525	0.9332010	18.56766	20.96411648	36.4134030	7.80193188	1.26952466
1992	8.591126	0.02414548	0.776399	0.4249224	0.8148620	16.22526	20.35451718	42.1433307	7.33943610	0.9155980
1993	10.01836	0.00990368	1.140917	0.9037666	1.1793800	19.95106	23.90238377	32.7552846	8.21460090	0.94388152
1994	16.33697	0.01571115	1.13883	2.8950739	1.083672577	13.160572	20.0029010	33.7810783	8.83542415	1.19436826
1995	10.73008	0.00919763	0.988261	12.571712	0.932619554	15.762851	19.60187156	27.7547579	9.05051953	1.68756718
1996	10.95929	0.02135327	2.41156	1.3785838	1.103637894	17.776407	20.41623037	34.0001413	8.86100886	0.95781379
1997	8.724361	0.01858543	2.077681	1.9423717	1.488128421	14.711425	20.76180723	39.6053314	7.51621167	1.31413949
1998	14.20966	0.01431712	1.896139	2.235809	0.8733060	13.532145	23.40022912	32.0362144	8.85563223	1.52915057
1999	11.80091	0.03351172	2.161706	1.1666889	0.889416787	13.821255	17.79718285	37.5977653	9.28871128	2.12518847
2000	6.636119	0.03910521	2.796157	4.6186444	0.838889311	13.799317	21.11525169	34.7085963	9.49269484	2.08380865
2001	6.727506	0.05147181	2.243947	4.7836495	1.618435376	13.790475	22.54650263	31.9636423	9.22750062	1.9511594
2002	18.2043	0.02187792	2.650527	2.1048743	1.78156183	16.24536	19.10920237	26.8284120	9.50595386	1.38201855
2003	8.023192	0.06220662	2.533118	11.563168	2.605563857	16.645983	18.36969333	26.0256695	7.74791150	0.26503823
2004	8.704323	0.06346748	2.05767	11.843175	2.163952158	19.26831	17.70358246	22.9481296	8.72255222	0.24155931
2005	7.868272	0.08260077	1.690825	10.53398	2.055962381	21.366564	15.49529961	21.8901355	9.78314775	1.05573228
2006	7.96686	0.0481989	1.541716	11.445928	2.299804514	18.475427	14.8661490	29.4365946	8.51245679	0.63517852
2007	5.862252	0.02598181	1.44608	13.81657	2.0691850	27.73683	14.64612844	22.1698679	8.58460077	1.07030252
2008	6.19957	0.03413144	1.663447	9.753071	1.96663636	27.240139	12.44107183	26.8145571	10.5051458	0.00322087

Source: Data from International Financial Statistics. Standard International Trade Classification Revision 2 data from World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005)

Malawi's cif/fob ratios collated from the data available will be considered simultaneously with its composition of imports evolution from the data above to effectively highlight with significant interest the situation surrounding its data.

Considering Malawi's imports cif/fob ratios from Figure 4.6, as calculated using data from the United Nations database, it is obvious that something is wrong somewhere as the Nation's imports cif/fob ratios does not in any way align (respond to the movement) with its manufactured goods as a proportion of its total imports like that of the United States and Germany. Neither does it look like the characteristics emanating from that of South Africa which, despite having questionable data, still provided an insight into its composition of imports impact in high-valued and low-valued imports on its imports cif/fob ratios level and variation.

Figure 4.6. World and Malawi's cif/fob Ratio and Manufactured Import, 1980-2008



Source: Author's calculations from data sourced from UN Comtrade, 2008; WTO, 2008; Chasomeris, 2006 (TIPS, 2005).

Malawi's imports cif/fob ratios between 1980 and 1984 was observed to be as low as 13.64 percent on average which is fair for a landlocked country at that time and giving its rate of development and involvement. Further observation of this variation in comparison to its trade

pattern and composition of imports in Figure 4.7 illustrates its imports as a proportion of total imports for the period with little or no question asked of this outcome.

A sudden jump was evidenced in the country's imports cif/fob ratios in 1985 at 66.67% ad valorem rate and was observed as remaining at that high rate until 1999 resulting in an average of 61.15% *ad valorem* rate over that period. The *ad valorem* rate further peaked at 67.01% in 1993 without any corresponding changes observed in the country's trade pattern, composition of imports or the witnessing of any major or significant crisis within the country that could motivate for such increase in its imports cif/fob ratios at that time.

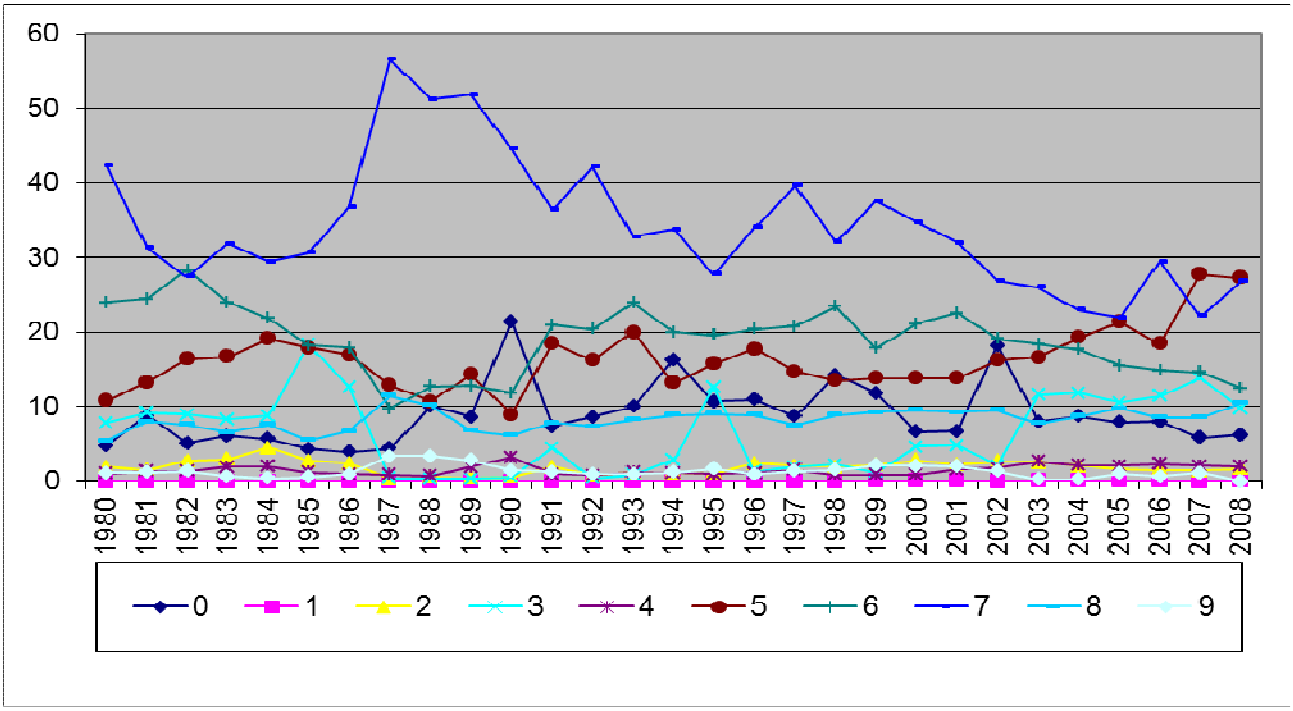
The civil war in Mozambique which forms the trade route of Malawi through the seaport in Nacala in Mozambique linking with Salima on Lake Nyasa by rail was the only relevant excuse that could be found for the sudden high hike in Malawi's imports cif/fob ratios. The war in Mozambique had begun as early as 1976. It intensified at the end of 1984 and then decelerated by 1987, negotiated an end by 1992 and ended in 1994. Analysing it historically, the war path in Mozambique does not justify the pattern in the rise of Malawi's imports cif/fob ratios over the period; this even if one assumes that the intensifying war in 1985 caused the rise in Malawi's import cif/fob ratios at the time. If so, the war decelerated in 1987 and practically ended in 1992, but Malawi's imports cif/fob ratio increased even more in 1993 and stayed that way at 66.67% *ad valorem* costs till 1999 before it fell to 60.91% and then astonishing dropping to 13.61% in 2000. All this despite no considerable change in the country's composition of import as observed in Figure 4.7.

It is believed that due to the war intensifying in Mozambique in 1985, there is a likelihood that Malawi's imports cif/fob ratio for that year increased as presented. But, further analysis of the country's imports cif/fob ratios for later years were probably based on that 1985 report by the IMF staff imputations due to the likelihood of unavailability of trade data from Malawi. It is believed that either Malawi's imports cif or import fob data was unavailable and that the IMF calculated the other data based on the available one. Generally, the IMF have a 10% imputation rule that in the absence of importer (cif) data, the IMF will imputes a value of 10% over the exporter's (fob) value and in the absence of the exporter data, a 9% reduction from the cif value is used to construct the fob number (Hummels, 2009). In the case of Malawi a 66.67% imputation rule appears to have been used for analysis for several years.

This is evidence as by the fact that Malawi's imports cif/fob ratios does not apparently reflect or concur with the observed changes in its composition of import over the entire period of the analysis, nor does the sudden change (amazing drop) in its ratio in the year 2000, when almost all developed and developing countries according to Chasomeris (2006) witnessed a rise in cif/fob ratios as a result of significant rise in the price of crude oil globally. This fact further confirms the earlier cautionary note that the IFS data are similarly unreliable and thus its imports cif/fob ratios output cannot be generally assumed to be a direct or accurate indicator of a country's direct shipping costs.

Based on Malawi's data and analysis, it would appear that only between 1980 and 1984 and for 2000 are the imports cif/fob ratios anywhere near to the nation's actual imports cif/fob ratios.

Figure 4.7. Malawi's SITC Imports Categories as a Percentage of Total Imports, 1980-2008



Source: Author's calculations from data sourced from UN Comtrade, 2008; WTO, 2008; Chasomeris, 2006 (TIPS, 2005).

4.5. CORRELATION ANALYSIS

Section 4.4 focussed on gaining a holistic understanding of a country's composition of imports as factors to be considered as indicative of the variation of the imports cif/fob ratios of a country. Using the data application and the insights gained from the literature review presented in Chapter 2, this section is focused on appraising the relationship between the composition of imports and the international transport costs measured by the imports cif/fob ratios.

In order to describe what type of relationship exists between the variables, the imports cif/fob ratios and composition of imports and the measurement of international transportation costs, the data and countries analysed in the previous section is used to provide substantial evidence of the existence of a relationship and a platform that the cif/fob ratios is not adequate enough as a standardize proxy for direct shipping costs.

The countries analysed have provided enough useful insight into the symptomatic of why imports cif/fob ratios measures are generally not appropriate as an interpretation or a direct proxy of a country's shipping cost (*ad valorem* cost) and that the composition of imports of a country does considerably influence the variation of that country's imports cif/fob ratios.

Coefficient may be positive or negative. The positive correlation coefficient sign equals positive association of variables and negative correlation signs symbolising a negative association of the variables involved. With that being said, this signs (+, -) indicates the associated variables relational direction, the level, strength and significant of relationship and furthermore, if it they will increase or decrease as per their relationship. According to Stockburger (1998: 149), "The sign of the correlation coefficient (+, -) defines the direction of the relationship, either positive or negative. A positive correlation coefficient means that as the value of one variable increases, the value of the other variable increases; as one decreases the other decreases. A negative correlation coefficient indicates that as one variable increases, the other decreases, and vice-versa".

Table 4.5 shows the imports cif/fob ratios of the countries analysed, while, Table 4.6 shows the resulting correlational analysis of the analysed countries import cif/fob ratios and their SITC as a proportion of total imports.

Observation from Table 4.6 shows that Germany and the US's imports cif/fob ratios and their composition of imports in SITC-0 through to SITC-4 for the period 1980 through to 2008 for the US and 1980 through to 1998 for Germany are positive and extremely statistically significantly coefficients. One exception is the SITC-1 imports for Germany that was were not significant for the period. On the other hand, the SITC-5 through to SITC-9 for both the US and Germany are all statistically significant coefficients and all negative except for the SITC-6 for the US that is positive for the period of analysis.

Table 4.5. Selected Countries cif/fob Ratios as a Proportion of Total Imports, 1980-2008

	Import cif/fob ratios using data from the *International Financial Statistics database*				
	USA	**GERMANY**	**SOUTH AFRICA**	**MALAWI**	**World**
1980	4.78	3.01	6.27	13.81	6.64
1981	4.74	3.32	9.11	13.51	0
1982	4.48	3.09	8.78	13.81	6.65
1983	4.58	3.09	8.72	14.71	6.67
1984	4.74	3.05	8.79	12.38	6.15
1985	4.74	2.81	11.18	66.66	5.72
1986	4.61	2.68	10.51	66.67	5.33
1987	4.48	2.54	8.48	66.67	5.33
1988	4.22	2.61	7.81	66.67	5.27
1989	4.17	2.65	8.44	66.67	5.27
1990	4.38	2.43	7.67	66.67	5.22
1991	4.08	2.59	7.88	66.67	5.24
1992	3.99	2.55	6.62	66.67	5.33
1993	3.95	2.79	11.28	67.01	5.44
1994	3.82	2.80	9.04	50.86	5.40
1995	3.67	2.80	13.04	66.67	5.27
1996	3.36	2.80	12.12	66.67	5.25
1997	3.27	2.80	16.99	66.67	5.24
1998	3.56	2.80	12.89	52.16	5.06
1999	3.40	N/V	10.88	60.91	5.52
2000	3.39	N/V	10.86	13.61	6.22
2001	3.35	N/V	12.89	N/V	6.11
2002	3.34	N/V	12.70	N/V	5.50
2003	3.65	N/V	19.77	N/V	N/V
2004	3.80	N/V	13.07	N/V	N/V
2005	3.68	N/V	13.63	N/V	N/V
2006	3.46	N/V	16.69	N/V	N/V
2007	3.24	N/V	10.72	N/V	N/V
2008	3.13	N/V	6.19	N/V	N/V

Source: Author's calculation using data from the International Financial Statistics database (see Appendix A1.4, A2.4, A3.4, and A4.4 for data used and computing of the imports cif/fob ratios for each country). **N/V**- Data not available

Table 4.6 Cross Correlation Analysis Results of Countries Import cif/fob Ratios and their SITC Imports as a Proportion of Total Imports.

Country / SITC	USA 1980-2008	Germany 1980-1998	South Africa 1980-2008	South Africa 1995-2008	Malawi 1980-2000
0	0.925*	0.470**	-0.244	-0.095	0.326***
1	0.757*	0.142	0.439*	-0.123	-0.122
2	0.856*	0.470**	-0.312**	-0.090	-0.578*
3	0.439*	0.773*	0.328**	-0.047	-0.321***
4	0.258***	0.657*	0.336**	0.225	-0.140
5	-0.825*	-0.601*	0.684*	-0.081	0.038
6	0.848*	-0.522**	0.017	0.129	-0.617*
7	-0.445*	-0.652*	0.592*	0.154	0.407**
8	-0.554*	-0.641*	0.653*	0.164	0.186
9	-0.800*	-0.325***	-0.590*	-0.309	0.282

Notes: SITC Codes: 0- Food and live animals; 1- Beverages and tobacco; 2- Crude materials, inedible, except fuels; 3- Mineral fuels, lubricants and related materials; 4- Animal and vegetable oils, fats and waxes; 5- Chemicals and related products; 6- Manufactured goods classified chiefly by material; 7- Machinery and transport equipment; 8- Miscellaneous manufactured articles; 9- Commodities and transactions not elsewhere classified.

Source: Author's calculation using data from the IMF trade databank and SITC imports reports from the World Trade database. (see Appendix A1.3, A2.3, A3.3, and A4.3 for the correlation analysis and SITC imports decomposition computation for each country).

Note:-
Correlation value tagged * indicates: - Significance at a probability level (p) = 0.010
Correlation value tagged ** indicates: - Significance at a probability level (p) =0.050
Correlation value tagged *** indicates: - Significance at a probability level (p) =0.100
Negative correlation value are highlighted for reference purposes

South Africa correlation coefficients are observed as not being consistent with those of the US and Germany where the data are considered more reliable. This because the low-valued imports for South Africa in SITC-1 through to SITC-4 for the period 1980 through to 2008 are statistically significantly coefficient and positive with the exception of SITC-2 which is negative. The country's low-valued import in SITC-0 is both negative and not significant. The country's SITC-1 through to SITC-4 are all statistically significant at a probability level of

0.050. South Africa's high valued imports in SITC-5 through to SITC-9 are statistically significantly correlated and positive except for the country's SITC-6 which is not significant and SITC-9 which is negative. Due to the earlier irregularities reported and analysed (South Africa's trade reports as a result of its economic sanctions and its SITC imports misclassification between 1980 of the analysed data through to 1994) it will be obscure to consider the correlation result for South Africa for the entire period, although reference might be made later to it for explanation purposes. Therefore, the 1995 through to 2008 trade data and imports cif/fob ratios were analysed as a more appropriate period for consideration for correlation analysis.

Interestingly, Table 4.6 above shows South Africa's correlation results for the period 1995 through to 2008 and the country's composition of imports and imports cif/fob ratios are entirely statistically insignificantly. The correlation result for South Africa low-valued imports in SITC-0 to SITC-3 indicates a negative correlation and its high-valued imports in SITC-6 to SITC-8 resulting to be positive. It is clear that South Africa correlation coefficient are not consistent in comparison to the US and Germany where data are adjudged to be more reliable.

Likewise for Malawi, several of the coefficients are statistically insignificant and in comparison to the US and Germany the figures do not show the expected direction (sign) of a country like the US and Germany where data are reliable.

This analysis shows the relationship and trends of the composition of imports and imports cif/fob ratios for the US and Germany with more accurate and close to accurate trade reports respectively, and South Africa and Malawi whose trade data are regarded as error ridden due to different circumstances.

The US and Germany's correlation results undeniably and evidently support the theory that a change in the proportion of a country's low-valued imports classified goods in SITC-0 through to SITC-4 and a corresponding opposite change in the proportion of the country's high-valued imports in SITC-5 through to SITC-9 do have a substantial statistical significant effect on the outcome of a country's imports cif/fob ratios. Furthermore, both countries have a more close to accurate trade data to support this theory. As the decrease in these countries'

low-valued imports and a corresponding increase in their high-valued imports, result in the decrease of their imports cif/fob ratios which is equally observed in the variation of their imports cif/fob ratios. It can then be said, that using these countries' imports cif/fob ratios as an indicator of their direct shipping cost could be a measurement misrepresentation of the country's actual direct shipping costs.

Despite the exclusion of the identified unreliable error reported period of 1980 through to 1994, South Africa's correlation result is still interpreted as statistically insignificant for the post economic sanction period. This would be indicative of the magnitude of error in the country's trade data even in the post-sanction period and therefore indicates that using these reported trade data for South Africa for computing any trends in shipping costs would result in a misleading outcome. Although the all-inclusive period correlation for South Africa (1980-2008) might show signs of statistical significance, it is believed that this is a mere coincidence as there are theoretical foundations and evidence that the country's trade report in the earlier period was incomplete and misclassified.

At this point, it would be accurate to say that it is obvious that a country's composition of imports do have a considerable impact on the country's imports cif/fob ratios and it would be obscure to conclude that the imports cif/fob ratios will reveal actual differences in shipping costs rather than commodity mix effects for a nation.

Further, based on the countries' analysis and the outcome of the correlation results, it is obvious that a variation in a country's composition of imports in terms of an alternative flow in the pattern of the country's low-valued and high-valued imports directly produces a variation in form of a rise or decrease in the country's imports cif/fob ratios. The observation of the presence of a statistically significance relationship between a country's composition of imports and their imports cif/fob ratios are not a mere coincidence. Therefore, in this event, from everything we know about the composition of imports and the imports cif/fob ratios, the possibility of a straightforward causal relationship is an entirely plausible one. So moving forward, it is therefore right to say that a shift in the pattern of a country's composition of imports will cause an effect in the form of a rise or fall in the country's imports cif/fob ratios and that a causal relationship does exist between the two variables.

What inevitable impact then does this fact have on a country's trade and economic growth?

It is compelling to note that transport costs, via their impact on trade, are likely to affect a country's long-term rate of economic growth (Radelet and Sachs, 1998). Many empirical studies point to the positive impact of increased trade and openness on economic growth as a result of reduced or positively anticipated transport costs. The damage or impact of a misrepresented cost of transportation, however, as a result of error ridden imports cif/fob ratios used in computing the cost of transportation for the trade from an error ridden trade data report, is likely to over-value the cost of trade for the country and potentially reduce trade.

In terms of the link between transport costs and economic growth, Radelet and Sachs (1998) found that for exporters of primary products, higher transport costs would reduce the revenues earned from natural resources, thereby possibly lowering aggregate saving rates and investment. Higher transport costs would also raise the price of all imported capital goods, which tends to reduce real investment and slow the process of technology transfer. Furthermore, "they found a strong negative relationship between transport costs and economic growth after controlling for the other variables. For example, doubling shipping costs from an 8 percent to 16 percent cif band [CIF/FOB ratios] is associated with slower annual growth of slightly above 0.5 percent. All else being equal, a landlocked country, with shipping costs 50 percent higher than a similar coastal economy, could expect slower growth of about 0.3 percent a year" (Radelet and Sachs, 1998: 11).

At this junction, it will suffice to say that directly interpreting cif/fob ratio as *ad-valorem* equivalents without a basic understanding of the trade data being used and their reliability would not only be misleading, but devastating to trade development in some countries which could have negative consequences on their direct foreign investment and economic growth.

4.6. CONCLUSION

This chapter presents the analysis of the IFS and DOTS data gathered on the US, Germany, South Africa and Malawi in presenting and contributing towards a better understanding of a country's imports cif/fob ratios and the composition of a country's imports thereby providing an insight into the misrepresentation of international transportation costs.

The United States is one of the world's largest global traders with an effective and efficient national statistical agency that provides it with quality trade reporting systems and reliable trade data. The United States provided evidence through the analysis of its trade data that a rise in the proportion of a country's high-valued imports contributes to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports equally contributes to a rise in that country's import cif/fob ratios, *ceteris paribus*. It would therefore be wrong to ignore or assume a change in a country's composition of imports as insignificant to a change in the variation of that country's imports cif/fob ratios.

Germany provided similar evidence that when a country's trade data are an accurate reflection of its actual trade or where the quality of the sourced data is reliable, a country's composition of imports has a substantial and significant effect on that country's imports cif/fob ratios. Hence the ratio cannot be used as a reliable measure of direct shipping costs (*ad valorem* shipping costs) outside the context of the country's composition of imports.

On the other hand, South Africa and Malawi provided evidence through the analysis of their available and provided trade data that the inaccuracy and unreliability of a country's trade data is tantamount to inaccuracy and unreliability of the country's imports cif/fob ratios, which, therefore will amount to, inaccuracies, inconsistencies and misinterpretation of the country's actual *ad valorem* shipping costs or direct costs of transportation if used as a proxy or measure.

Through the examination and analyses of both South Africa and Malawi, this chapter showed different scenarios under which a country's trade data could be considered unreliable, inaccurate and misleading. This as it could be by design, chance, or errors. The chapter also

provided and discussed the possible impact of such inaccuracies and shortcomings on the country's trade, direct foreign investment and economic growth.

The correlation analyses of the four countries provided insights into the nature of the imports cif/fob ratios and its shortcomings as a proxy for a country's direct *ad valorem* costs. The correlation result for the US and Germany indicated that changes in the proportion of the country's lower-valued imports and the country's higher-valued imports have a substantial and statistically significant effect on the variation of the country's cif/fob ratios with a fall or rise in the composition of imports amounting to a corresponding increase or decrease in the country's cif/fob ratios.

Through the analysis of the US and Germany the chapter affirmed that the composition of imports of a country do contribute to the variation in a country's imports cif/fob ratios and that it would be obscure to assume that a change in a country's imports cif/fob ratios will reveal true difference in direct shipping costs of a country rather than the commodity mix effect for the country. On the other hand, through the analyses of their data and the correlation thereof, it was established that *ad valorem* shipping costs and direct costs of transportation that have been estimated using some country's imports cif/fob ratios to determine the country's level and trends of its international transport cost might have been misrepresented and misinterpreted.

Finally, the chapter established that the misrepresentation and misinterpretation of the imports cif/fob ratios and assumptions of some countries' transportation costs (mostly underdeveloped and developing countries) is more likely to contribute to the undermining of the competitiveness of these countries in the foreign markets, contributing to reduced trade opportunities and potential loss to attract export-oriented foreign direct investments.

Chapter 5 brings this study to an end by providing a conclusion and recommendation on the misrepresentation of international transport costs.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

As globalization highlights that no nation is self-sufficient and must get involved at various levels of trade to sell what it produces, acquire what it lacks and also produce more efficiently in some economic sectors than its trading partners (Rodrigue et al., 2009), so also does international transportation require a nation to monitor the movement and cost of transportation between itself and its trading partners in order to compete globally. The availability of efficient and cost effective transport services is fundamental to economic growth and development, as efficient transport services are indispensable in goods reaching and being received from the world markets, strengthening global integration and attracting foreign investment.

The measurement and interpretation of international transport costs figures to trade is therefore of paramount interest to both nations and merchants alike. However the absence of a direct measure for international transport costs has led to many analysts, authors and researchers (Radelet and Sachs 1998; Limao and Venables, 2001) having to use the imports cif/fob ratios as a proxy for direct shipping and international transport costs. Hence the objectives of this study are:

- To examine the use of imports cif/fob ratios as a measurement for international transport costs,
- To highlight and establish the level of inaccuracy in the use of the imports cif/fob ratios as a measurement for international transport costing, and
- To determine the reasons for the inconsistencies in results of transportation costs using the imports cif/fob ratios.

5.2 CONCLUSIONS

In analysing the misrepresentation of international transport costs, one of the main difficulties observed is that of obtaining reliable data. This is because data from the IMF databases, which is a bank for all trade data between nations and a major source for cif/fob ratio construction data, is believed to be error ridden and an unreliable source for cross-sectional variation of transport costs valuation among other things (Chasomeris, 2006; Hummels and Lugovskyy, 2006). But despite this drawback, the study was able to provide substantially significant evidence and clarifications on the misrepresentation of international transport costs.

This study was undertaken to examine the use of imports cif/fob ratios as a measure for international transport costs and to gain more insight into the structure of the imports cif/fob ratio and examine its impact on trade and economic development. In other words, this paper offers direct and indirect evidence of the misrepresentation of international transportation cost measurements.

The study showed that as a result of the absence of accessible direct information on international transport costs, indirect measures (imports cif/fob ratios) for international transport costs have become the standard by which many users measure the cost of transportation.

As shown in the literature review and analysis within this study, the degree of misrepresentation of international transport costs varies depending on various factors. These factors include the definition of terms, asymmetry of trade data, basis of comparisons, quality of trade data, and the assumption of trade and imports composition.

The definition aspect of the misrepresentation of international transport costs was appraised during the study of the relationship between transport costs and trade in the earlier part of the study as well as in the literature review chapter. The International Chamber of Commerce's (1999:49 and 65) definition of the term import cif and import fob clearly states the measures as that of sea and inland waterway costs and a port to port costing of the goods in question. The conclusion was that the imports cif/fob ratios by definition can be referred to as shipping costs, but the fact that the International Trade Statistics cif/fob ratio data were composed

across the various modes of transport on a door to door basis creates an entirely different understanding of the terms. Hence, users of the term are requested to be wary of referring to the ITS computed imports cif/fob ratios as that of direct shipping cost as this will be tantamount to a miscarriage of information.

The data and countries which were analysed provided substantial evidence that the cif/fob ratios are not adequate as a standardised proxy for direct shipping costs. The countries provided useful insight on why import cif/fob ratio measures are generally not appropriate to interpret or be used as a direct proxy of a country's *ad valorem* shipping costs. The study shows that the import cif/fob ratios are not only questionable because of their measurement errors, but also their data compilation, sources and the assumption of the composition of trade of the nations in question, in addition to the assumptions undertaken in collating the data and using the ratios. These discrepancies need not be large to have considerable impact on the resulting cif/fob ratios and subsequently, the measured transport costs valuated using the ratios.

According to Hummels (2003), it is not news that the IMF cif/fob ratios are badly error-ridden in levels, and contain no useful information for time series or cross-commodity variations. This should make all imports cif/fob ratios users wary because IMF databases are the major source of data for almost all computed imports cif/fob ratios.

There are some countries which exist on the IMF databases with more accurate data due to the effectiveness of the country's body charged with the trade data reporting systems. But this cannot be said of even 8% of the over 200 countries on the IMF databases as the IMF staff are equally prone to human errors even on countries with effective reporting systems. Many countries' data on the database are error-ridden due to variability in the composition of their imports, differences in legal frameworks (Hummels, 1999), dissimilarity in classification of imports to that of the database, costs understatement due to state endorsed incentives and so on. This results in an awkward situation where much of countries' data on the IMF databases are unreliable. To further prove this, reference was made to the differences in data for countries and the resulting imports cif/fob ratios computed thereof on all three databases of the IMF.

The study showed that in situations where there are reliable available data, a country's composition of imports in its low-valued and high-valued imports have a considerably significant cause and effect relationship with the country's imports cif/fob ratios, such as in the case of the United States and Germany. Although this relationship is a one-sided one and is not reciprocal in nature, the evidence showed that "a rise in the proportion of a country's high-valued imports contributes to a decline in that country's imports cif/fob ratios, *ceteris paribus* and a rise in the proportion of a country's low-valued imports equally contributes to a rise in that country's import cif/fob ratios, *ceteris paribus*" (Chasomeris, 2006: 68).

In the case of the United States and Germany their low-valued imports categories in SITC-0 through SITC-4 and their cif/fob ratios were positive and significantly statistically correlated while their high-valued imports in SITC-5 through SITC-9 were negative and significantly statistically correlated.

The study equally showed where trade data for countries are inaccurate and unreliable such as those of South Africa and Malawi, that the resulting imports cif/fob ratios computed from such data are equally inadequate, inaccurate, unreliable, and of no economic significance. Therefore, the resulting ratios are unable to show either the country's *ad valorem* shipping costs or its direct costs of transport. This was shown in the lack of correlation between the countries' (South Africa and Malawi) composition of imports and its imports cif/fob ratios as well as their lack of directional sign in comparison to countries such as the US and Germany. Hence, it is fair to say that analysts, researchers and data users might have misrepresented the facts on the compositions, pattern and measures of international transport costs in situations where they were unaware of the true nature of the data captured for the ratios or for what significance the data were originally intended.

It is important to stress that since international transportation requirements and documentation structures are uncertain and uneven in countries all over and since very few countries report detailed information on shipping costs as part of their trade statistics, the majority of imports cif/fob ratios used as a proxy for international transportation costs or *ad valorem* shipping costs are subject to massive errors, misrepresentation and misinterpretation.

This study has shown that uneven development and motives have potential impacts on trade patterns and key freight transportation flows and inevitably the outcome of each nation's imports cif/fob ratios. With increased uncertainty in these areas, combined with tight trade record configuration (as not all importer or exporter have consistent trade data, this owing to the quality of their national statistical agency), it is reasonable to say that using the import cif/fob ratios as a direct proxy for shipping cost is generally a misrepresentation of a country's *ad valorem* shipping costs and direct international transportation costs.

In sum, the study showed that:

- there is a difference between the IMF trade statistics definition and the INCOTERMS definition and measurement of imports cif/fob ratios
- the composition of imports of a country do contribute to the variation in the imports cif/fob ratios of the country;
- it would be obscure to assume that a change in a country's imports cif/fob ratios will reveal the true difference in direct shipping costs of that country rather than the commodity mix effect for the country;
- a cause and effect relationship does exist between a country's composition of imports and the country's imports cif/fob ratios; and
- the measurement of a country's imports cif/fob ratio results in the misrepresentation of that country's international transport costs.

5.3 RECOMMENDATIONS

The levels of transportation costs implied by the IMF imports cif/fob ratios are dramatically impaired from explicitly amassed data on shipping costs. Where there are accurate or closely monitored data which are true indicator of trade, the composition of a country's imports do have a direct impact and both an economic and statistically significant relationship with the country's imports cif/fob ratios. Based on these facts, it is recommended that it would be extremely unwise in general to make use of the import cif/fob ratios as a direct measure for *ad valorem* shipping and direct international transport costs.

Furthermore, it would be justly recommended that, if the imports cif/fob ratios is to be used, according to Chasomeris (2009a: 160), "it should be analyzed within the evolving context of a country's import composition, within its historical context and, where possible, compared with other more direct indicators of international transport costs like ocean freight rates" of the countries in question. This is very important to ensure that the quality of the data is of the highest standard and the imports cif/fob ratios outcomes thereafter are accurate enough to be used. This should be ensured along with the general issues of dealing with the asymmetric patterns of international trade among countries, such as the valuation system of trade flows, the trade system, and definition of trading partner and the transportation terms.

5.4. LIMITATIONS AND FUTURE RESEARCH

The results presented in this study provide a wealth of information on the misrepresentation of international transport costs, thereby providing an important baseline from which future research can base their study and improve on. Alternatively, several shortcomings of this research could be taken into consideration for future research as the analysis presented in this study can be revisited at an advanced level of disaggregation, and the definitions of some of the variables improved.

Similarly, the results shown in this study have presented a variety of issues that are ripe for further investigation and analysis. With the misrepresentation of international transportation

costs measurement paving the way for the costing thereof of goods movement (origins and destinations), goods transitory through many countries (re-importing and re-exporting) is noteworthy for researching.

Future research may examine the motivation behind why some countries fictitiously report their imports cif and fob data and why some researchers hesitate to compare the imports cif/fob ratios with a more direct indicator of transport costs, when available, in order to present a more accurate result. In defence of this study, there are far too many researchers who, despite the knowledge of the misfortunes of misrepresenting international transport costs, continue to use the imports cif/fob ratios as a proxy for direct shipping costs. However, accurate and more updated imports cif/fob time series data would have helped this study.

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APPENDICES

TABLE A1.1 USA'S SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2008

SITC	TOTL - Tota	0 - Food ar	1 - Beverage	2 - Crude m	3 - Mineral f	4 - Animal	5 - Chemica	6 - Manufactu	7 - Machiner	8 - Miscellane	9 - Commod
Year											
1980	249720100	16084230	2711521	10759380	84954900	556814	8349804	33250350	65866950	23447500	3738659
1981	266989100	15160400	3086662	11416160	84526180	470059	9049192	38647100	73449070	27210830	3973425
1982	249129400	15085140	3326078	9124774	67972370	414720	9188620	33411090	77350820	29635230	3620599
1983	272922400	16677710	3191281	10014780	61311580	562162	10844720	37251260	94816900	34536590	3715381
1984	336929900	18734880	3412746	11762130	63335700	768901	13414850	47337360	128136500	44897090	5129735
1985	353841200	19338070	3683276	10808450	54962770	705781	14503400	48714250	145146000	51192430	4786874
1986	380198100	21881790	3865382	11184140	39097580	539036	15593440	50966740	170209200	60554320	6306528
1987	416975300	21449090	4188643	13301560	46316360	655543	16946030	55937800	184726800	69151650	4301779
1988	441463900	20574550	4118296	14468270	39209380	914432	20382000	62970840	199776400	72037170	7012508
1989	477555200	21289710	4311129	14698910	50242150	771763	21320670	64981030	211404200	80861360	7674270
1990	510905900	22950060	4802907	14274120	65812500	804861	23033350	65098850	218188300	83168420	12772460
1991	500599800	23103090	4925995	12916200	59137420	844747	24344540	61949130	215416300	83636900	14325480
1992	555140100	24104280	5479335	14300530	51519850	1175318	29035040	66791550	248764800	98260570	15708790
1993	621848000	24842680	5931209	15891920	59259230	1178311	32026780	73690070	281531600	111474900	16021350
1994	693522400	27033860	5484785	18604500	52979940	1274865	35595190	86173630	327641000	120688500	18046190
1995	780636900	29038180	5652943	21502090	63945130	1489603	40983430	96922380	369996800	130316600	20789700
1996	828021100	30600510	6802257	21758390	82851610	1757769	44799870	99332810	384269400	136897500	18950950
1997	895057700	33897010	7636297	23129630	79439270	1702507	50085540	107874500	415556900	152055100	23680940
1998	933536900	35313800	7688045	22187960	52890820	1594131	54443440	118918400	446483300	165956100	28060900
1999	1.05E+09	36501140	8466532	22894620	79698060	1507918	61187320	124750100	505573100	179843800	30054560
2000	1.235E+09	38817000	8758490	22921740	143673400	1477701	69332910	139694500	576624700	201118900	32470070
2001	1.162E+09	39662320	9531219	21390640	128082600	1237716	73720110	129955200	529918200	194819500	33555240
2002	1.189E+09	41033980	10819400	21363320	118613500	1535973	84571250	134884500	536231600	201907100	37563830
2003	1.305E+12	#########	#######	2.186E+10	1.634E+11	1.67E+09	1.03E+11	1.4138E+11	5.3378E+11	2.293E+11	5.2E+10
2004	1.525E+12	5.04E+10	1.343E+10	2.858E+10	2.165E+11	2.39E+09	1.151E+11	1.8092E+11	6.0898E+11	2.5324E+11	5.572E+10
2005	1.732E+12	5.51E+10	1.472E+10	3.117E+10	2.982E+11	2.51E+09	1.309E+11	2.0205E+11	6.6374E+11	2.7297E+11	6.105E+10
2006	1.919E+12	6E+10	1.67E+10	3.295E+10	3.452E+11	2.97E+09	1.453E+11	2.3473E+11	7.2486E+11	2.8989E+11	6.641E+10
2007	2.017E+12	6.5E+10	1.827E+10	3.262E+10	3.724E+11	3.59E+09	1.582E+11	2.3855E+11	7.5429E+11	3.0578E+11	6.848E+10
2008	2.165E+12	7.03E+10	1.809E+10	3.497E+10	5.02E+11	5.43E+09	1.8E+11	2.3964E+11	7.3968E+11	3.0123E+11	7.349E+10

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Standard International Trade Classification Revision 3 data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A1.2 USA'S CIF/FOB RATIOS AND SITC IMPORTS AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Percentage of Total Imports											
	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	4.78	6.440903	0.0108582	4.3085759	34.020049	0.222975	3.3436652	13.3150475	26.3763109	9.3895125	1.4971398
1981	4.74	5.678284	0.011561	4.2758899	31.659038	0.176059	3.3893489	14.4751602	27.5101381	10.1917382	1.4882349
1982	4.48	6.055142	0.0133508	3.6626645	27.283962	0.166468	3.6882921	13.411139	31.0484511	11.8955169	1.4533006
1983	4.58	6.110788	0.011693	3.6694606	22.46484	0.205979	3.9735544	13.6490299	34.7413404	12.6543626	1.3613324
1984	4.74	5.560468	0.0101289	3.4909725	18.797886	0.228208	3.9814959	14.0496168	38.0306111	13.3253505	1.5224933
1985	4.74	5.465183	0.0104094	3.0546047	15.533174	0.199463	4.0988443	13.7672634	41.020096	14.4676284	1.3528312
1986	4.61	5.755365	0.0101668	2.9416612	10.283476	0.141778	4.1013987	13.4053116	44.7685562	15.9270443	1.6587479
1987	4.48	5.143971	0.0100453	3.1900115	11.107699	0.157214	4.0640369	13.4151351	44.3016169	16.5841118	1.0316628
1988	4.22	4.660528	0.0093287	3.2773393	8.881673	0.207136	4.6169121	14.2640972	45.2531679	16.317794	1.5884669
1989	4.17	4.458063	0.0090275	3.0779499	10.5207	0.161607	4.4645457	13.6070197	44.2680134	16.9323588	1.6069912
1990	4.38	4.492033	0.0094008	2.7938844	12.881531	0.157536	4.5083351	12.7418474	42.7061617	16.278618	2.4999633
1991	4.08	4.615082	0.0098402	2.5801449	11.813313	0.168747	4.8630743	12.374981	43.0316392	16.7073379	2.8616631
1992	3.99	4.342017	0.0098702	2.5760218	9.2805132	0.211716	5.2302185	12.0314764	44.8111747	17.7001391	2.8296983
1993	3.95	3.994976	0.009538	2.5555956	9.5295362	0.189485	5.1502586	11.850174	45.2733787	17.9263904	2.5764093
1994	3.82	3.898051	0.0079086	2.6826098	7.6392543	0.183825	5.132522	12.4255006	47.2430307	17.4022497	2.6021063
1995	3.67	3.719806	0.0072414	2.7544291	8.191405	0.190819	5.2499991	12.4158082	47.3967859	16.6936254	2.6631716
1996	3.36	3.69562	0.0082151	2.6277579	10.005978	0.212286	5.4104744	11.9964105	46.4081652	16.5330932	2.2887038
1997	3.27	3.787131	0.0085316	2.5841496	8.8753239	0.190212	5.595789	12.0522398	46.4279454	16.9883014	2.6457445
1998	3.56	3.782796	0.0082354	2.376763	5.6656379	0.170763	5.8319537	12.7384788	47.827065	17.7771334	3.0058694
1999	3.40	3.474721	0.0080597	2.1794499	7.5868448	0.143546	5.8247177	11.875567	48.1279552	17.1202035	2.8610393
2000	3.39	3.143359	0.0070925	1.8561782	11.634519	0.119663	5.6145054	11.3123123	46.6944559	16.286395	2.6293918
2001	3.35	3.413654	0.0082033	1.841048	11.023804	0.106528	6.344937	11.1849746	45.6089607	16.7677104	2.8880299
2002	3.34	3.452513	0.0091032	1.7974649	9.979891	0.129234	7.1156475	11.3488988	45.1174018	16.9880398	3.1605418
2003	3.65	3.534366	0.0096544	1.6747766	12.517899	0.1281	7.8925857	10.8328342	40.8997539	17.5694766	3.9847637
2004	3.80	3.303074	0.0088043	1.8739713	14.193243	0.15684	7.5494753	11.8614012	39.9258166	16.6029316	3.6528191
2005	3.68	3.17896	0.0085	1.7995422	17.21209	0.144827	7.5539903	11.6633713	38.3152021	15.7576942	3.5243264
2006	3.46	3.125776	0.0087049	1.717196	17.988298	0.155012	7.5715921	12.2318912	37.7729234	15.1062775	3.4605483
2007	3.24	3.220472	0.0090551	1.617092	18.461944	0.178215	7.8418729	11.8263545	37.3944951	15.1591012	3.3949406
2008	3.13	3.248434	0.0083557	1.6155429	23.189793	0.250685	8.3128729	11.0697054	34.167984	13.914828	3.3945816

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A1.3 USA IMPORT CATEGORY CORRELATION RESULTS AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

USA	Correlation Analysis							5&6&7&8	3+9	6+7+8
	Import Category	n	r	r2	t					
							1980	52.42453611	35.51718864	49.08087094
ImportsSITC	0	29	0.925360127	0.856291364	12.68385388		1981	55.56638529	33.14727268	52.17703644
	1	29	0.756601027	0.572445114	6.012469294		1982	60.04339913	28.73726224	56.35510702
	3	29	0.439439351	0.193106943	2.541984142		1983	65.01828725	23.8261722	61.04473286
	4	29	0.257842578	0.066482795	1.38667713		1984	69.38707428	20.3203797	65.40557843
	5	29	-0.8252006	0.68095603	-7.591299867		1985	73.35383217	16.88600536	69.25498783
	6	29	0.847807801	0.718778067	8.307200563		1986	78.20231085	11.9422238	74.10091213
	7	29	-0.444795846	0.197843345	-2.580554344		1987	78.36490075	12.13936149	74.30086386
	8	29	-0.553826881	0.306724214	-3.456232079		1988	80.45197127	10.47013991	75.83505922
	9	29	-0.799719226	0.63955084	-6.921455167		1989	79.27193757	12.12769121	74.8073919
	3+9	29	0.357225743	0.127610232	1.987327072		1990	76.23496225	15.38149393	71.72662715
	5+6+7+8	29	-0.526901843	0.277625552	-3.221294361		1991	76.97703235	14.6749759	72.1139581
	6+7+8	29	-0.391441894	0.153226757	-2.210373287		1992	79.77300865	12.11021146	74.54279019
	2	29	0.855656226	0.732147577	8.590796013		1993	80.20020166	12.1059455	75.04994307
							1994	82.20330302	10.24136063	77.07078099
							1995	81.75621854	10.85457656	76.50621947
							1996	80.3481433	12.29468186	74.93766886
							1997	81.06427552	11.52106842	75.46848656
							1998	84.17463091	8.671507254	78.34267719
							1999	82.94844342	10.44788415	77.1237257
							2000	79.90766862	14.26391117	74.29316319
							2001	79.90658273	13.91183374	73.56164572
							2002	80.56998801	13.14043289	73.45434046
							2003	77.19465044	16.50266281	69.30206476
							2004	75.93962467	17.84606252	68.39014942
							2005	73.29025791	20.73641673	65.73626761
							2006	72.68268416	21.44884612	65.11109204
							2007	72.22182384	21.85688481	64.37995091
							2008	67.46539037	26.58437479	59.15251749

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

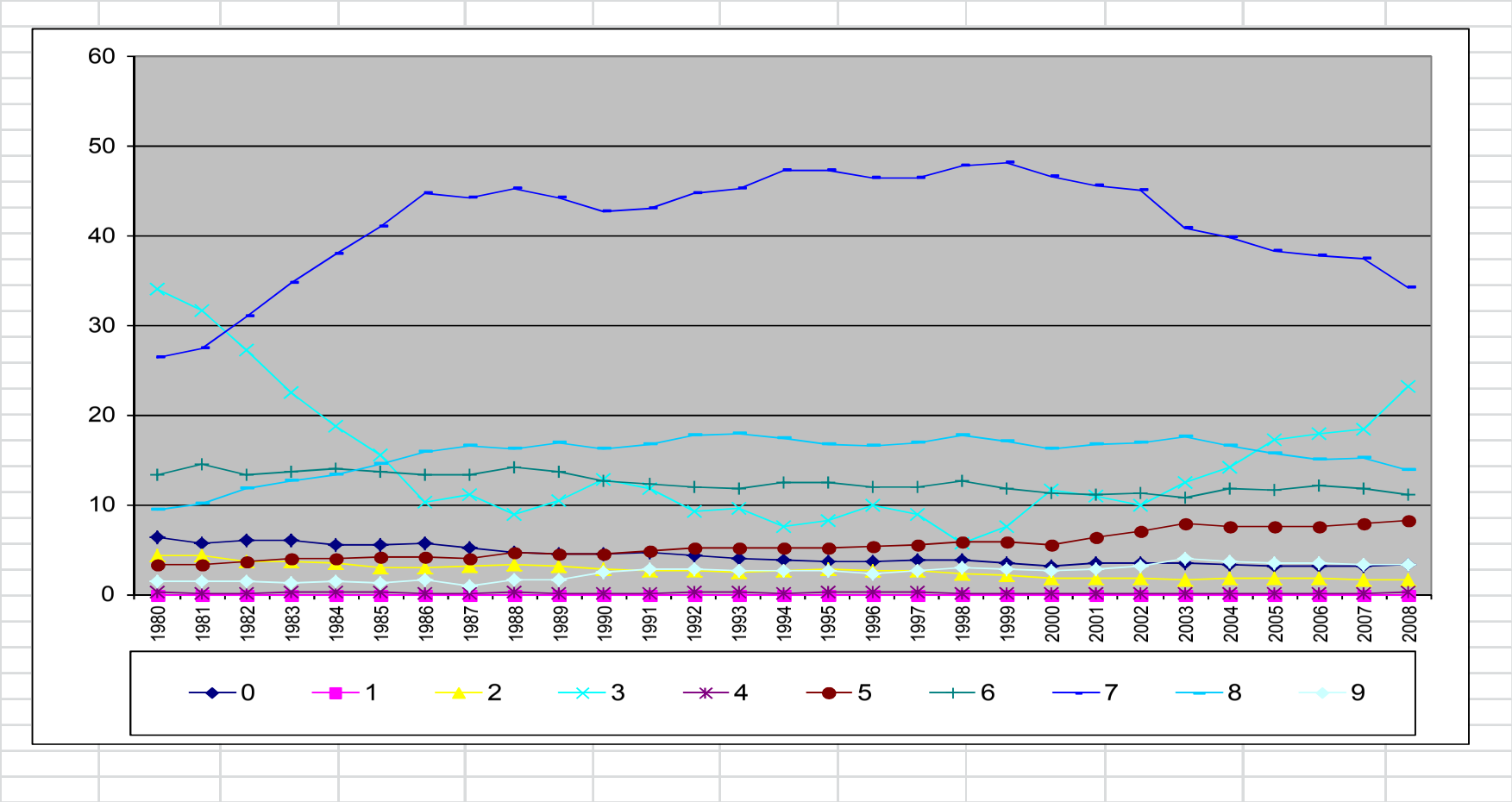
Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A1.4 USA'S IMPORTS CIF/FOB RATIOS FOR THE PERIOD, 1980-2008

Soruce: IFS DATABASE				
United States Imports cif/ fob ratios calculation				
DESCRIPTOR	IMPORTS, CIF	IMPORTS,C.I.F.	IMPORTS, FOB	CIF/FOB RATIOS
SERIESCODE	11171...ZF...	11171..DZF...	11171.V.ZF...	
1980	256985	256985	245262	0.047797865
1981	273352	273352	260982	0.047397905
1982	254884	254884	243952	0.044812094
1983	269878	269878	258048	0.045844184
1984	346363	346363	330678	0.04743285
1985	352463	352463	336526	0.047357411
1986	382294	382294	365438	0.046125471
1987	424443	424443	406241	0.044805916
1988	459543	459543	440952	0.042161052
1989	492922	492922	473211	0.041653723
1990	516987	516987	495311	0.043762404
1991	508363	508363	488453	0.040761342
1992	553923	553923	532665	0.039908761
1993	603438	603438	580511	0.039494514
1994	689215	689215	663829	0.038241776
1995	770852	770852	743542	0.0367296
1996	822025	822025	795291	0.033615368
1997	899020	899020	870569	0.032680925
1998	944353	944353	911898	0.035590603
1999	1059440	1059440	1024620	0.03398333
2000	1259300	1259300	1218020	0.033891069
2001	1179180	1179180	1141000	0.033461876
2002	1200230	1200230	1163560	0.031515349
2003	1303050	1303050	1257120	0.036535892
2004	1525370	1525370	1469550	0.037984417
2005	1735060	1,735,060	1,673,450	0.036816158
2006	1918080	1918080	1853940	0.034596589
2007	2020400	2020400	1956960	0.032417627
2008	2169490	2169490	2103640	0.031302885

Source: Author's construction of Standard International Trade Classification Revision 3 data from the IMF IFS, (2008).

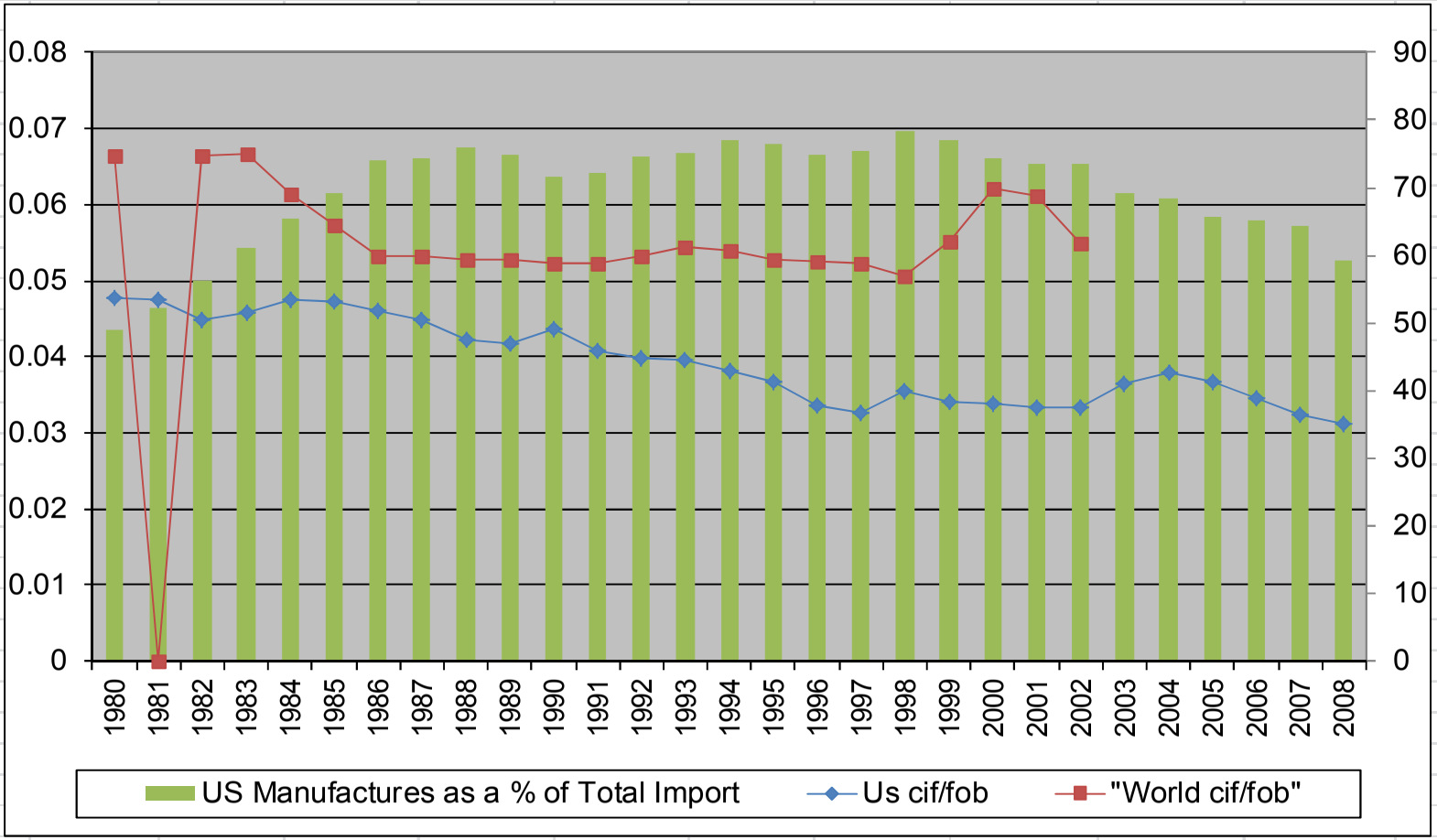
FIGURE A1.1 USA SITC IMPORTS CATEGORIES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008



Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

FIGURE A1.2 UNITED STATES, WORLD CIF/FOB RATIO AND US'S MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS FROM 1980 TO 2008



Source: Own construction of imports cif/fob ratios and Manufactures imports using imports reports from IMF trade data.

TABLE 2.1 GERMANY'S SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2008

SITC	TOTL - To	0 - Food and	1 - Beverag	2 - Crude ma	3 - Mineral fi	4 - Animal ar	5 - Chemical	6 - Manufac	7 - Machir	8 - Miscella	9 - Commodi
Year											
1980	1.8E+08	17726420	1814420	13465590	38935810	743981	12644160	32874850	33902220	21527000	2172977
1981	1.5E+08	15809500	1725805	11102900	35975630	681112	11658490	26160740	31739470	18449020	1390823
1982	1.5E+08	15155600	1682510	10326830	33842320	645685	11770090	24107060	29859780	17217810	1554669
1983	1.4E+08	14963570	1590070	10032650	29876630	686175	12024610	24554130	32009720	17467990	1439360
1984	1.5E+08	14753460	1471076	10401930	29154170	989086	12777070	24663440	32631970	17938620	1594699
1985	1.5E+08	14877940	1667664	10496550	28253930	861750	14141030	26094630	36635610	18895850	1586028
1986	1.8E+08	19487420	2051260	11687410	20391080	590225	17200010	33431890	49737530	25928370	2123634
1987	2.2E+08	21431060	2464604	13065220	19892280	607270	20675880	39606700	62719720	33936340	2458967
1988	2.4E+08	23322250	2550113	15551040	17666230	799500	23439420	47100460	72234470	37090420	2597637
1989	2.6E+08	22953800	2602233	16701120	19452440	847072	24330100	51304990	80056720	38532830	3475638
1990	3.3E+08	27476440	3418601	16358070	27784630	835356	28795100	61580860	1.08E+08	49492460	5169004
1991	3.7E+08	30991350	4038909	15681170	31552480	882081	30763740	64912340	1.29E+08	59924800	4839339
1992	3.9E+08	33354160	4271468	16383640	29114000	1019097	32511610	68809150	1.35E+08	65157230	4539341
1993	3.6E+08	33597780	3982612	13987070	24700060	920608	30680050	62184920	1.21E+08	65655250	4452072
1994	3.9E+08	35479350	4294633	16247650	24971980	1197908	35059270	70625340	1.35E+08	67884660	4393908
1995	4.7E+08	39495460	4877580	18974350	25520910	1293082	40248820	87385910	1.63E+08	76189300	8373729
1996	4.6E+08	38397790	4974929	16744880	33616640	1211482	40026030	78695250	1.65E+08	77810780	5017688
1997	4.5E+08	34909350	4740905	16987760	31759360	1275767	39062440	74914100	1.66E+08	73751060	8177412
1998	4.7E+08	34596840	5015848	16729170	24943690	1240609	44162410	79219080	1.83E+08	75709810	9324159
1999	4.7E+08	32480720	5501940	14306060	25982440	1168640	43753040	75867340	1.91E+08	75850550	8325595
2000	4.9E+08	28272840	4775973	14806930	43907180	962025	43996230	74872070	1.96E+08	73391070	8323211
2001	5E+08	30581510	4923719	14306900	39176610	1060146	48392350	73157700	2E+08	73242200	11668960
2002	5E+08	30944910	5366144	14618920	35735300	1255004	54117740	70856100	2E+08	70879000	11346450
2003	6E+11	##########	#########	##########	#########	##########	##########	#########	########	#########	##########
2004	7.2E+11	##########	#########	##########	#########	##########	##########	#########	########	#########	##########
2005	7.8E+11	4.4355E+10	6.28E+09	2.5274E+10	8.983E+10	2335305000	9.006E+10	105887531	2.91E+11	8.974E+10	3.4749E+10
2006	9.2E+11	4.884E+10	6.839E+09	3.2328E+10	1.117E+11	3421122000	1.0469E+11	1.297E+11	3.41E+11	9.85E+10	4.4943E+10
2007	1.1E+12	5.5231E+10	7.468E+09	3.793E+10	1.121E+11	3964361000	1.2405E+11	1.542E+11	3.55E+11	1.093E+11	1.0022E+11
2008	1.2E+12	6.4106E+10	8.117E+09	4.2093E+10	1.642E+11	4793559000	1.4087E+11	1.656E+11	3.85E+11	1.2E+11	1.0968E+11

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A2.2 GERMANY'S CIF/FOB RATIOS AND SITC IMPORTS AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Percentage of Total Import											
	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	3.00836	10.0828634	1.0320498	7.6592851	22.146855	0.42317957	7.19205221	18.699355	19.28373	12.24465	1.2359986
1981	3.31627	10.2198864	1.1156286	7.17735393	23.256071	0.44029775	7.53650929	16.911338	20.51765	11.926177	0.89908303
1982	3.09168	10.3690142	1.1511237	7.06531228	23.153916	0.44175862	8.05274818	16.493339	20.42918	11.779917	1.06365864
1983	3.08577	10.3450381	1.0992921	6.93605513	20.655156	0.47438589	8.31319321	16.975455	22.12986	12.076465	0.99509903
1984	3.04688	10.0791867	1.0050015	7.10633269	19.917384	0.67571827	8.72896762	16.849432	22.29333	12.255207	1.08945759
1985	2.80616	9.69177453	1.0863482	6.83765333	18.40515	0.56136042	9.21173727	16.998541	23.86514	12.309118	1.03316896
1986	2.68027	10.6705076	1.1231854	6.39954377	11.165315	0.32318287	9.41801622	18.305924	27.23422	14.197306	1.16281441
1987	2.54073	9.88253143	1.1365059	6.02478119	9.1729519	0.28003117	9.53429433	18.263887	28.92202	15.649107	1.13390652
1988	2.61193	9.62331572	1.0522373	6.41672942	7.2895072	0.32989274	9.67166285	19.434771	29.80566	15.304391	1.07184688
1989	2.64899	8.8196701	0.9998709	6.41716704	7.4743225	0.32547533	9.34849374	19.71321	30.76065	14.80569	1.3354643
1990	2.42542	8.34546691	1.0383376	4.96846505	8.439074	0.25372413	8.74598581	18.704062	32.90244	15.032431	1.56999058
1991	2.58575	8.3226675	1.0846413	4.21114808	8.4733579	0.23688116	8.26154327	17.432084	34.58539	16.09269	1.29959519
1992	2.55157	8.54811192	1.0947056	4.19885221	7.46143	0.26117747	8.33218049	17.634631	34.60685	16.698705	1.16335698
1993	2.787	9.29365235	1.1016505	3.86903438	6.8324089	0.25465405	8.48656425	17.201286	33.56801	18.161232	1.23151022
1994	2.80004	8.98805287	1.0879677	4.11604883	6.3262004	0.30346837	8.88163318	17.891655	34.0945	17.197353	1.11311727
1995	2.80001	8.47927084	1.0471665	4.07359866	5.4790781	0.27761146	8.64100952	18.76086	35.0866	16.357063	1.79775387
1996	2.80006	8.31250901	1.0769928	3.6249994	7.2774663	0.26226653	8.664997	17.036266	35.81345	16.844793	1.08624941
1997	2.79998	7.72387998	1.0489505	3.75863255	7.0269279	0.28227026	8.6427733	16.575144	36.81432	16.317816	1.80929604
1998	2.79996	7.29528068	1.0576694	3.52760514	5.2597642	0.26160166	9.31232958	16.704573	38.65045	15.964589	1.96614364
1999		6.84990025	1.1603111	3.01702314	5.4794697	0.24645597	9.22713411	15.99976	40.26794	15.996219	1.75579529
2000		5.7748005	0.9755048	3.02435365	8.9681548	0.19649609	8.98634347	15.292813	40.09119	14.990315	1.70003732
2001		6.16050858	0.9918612	2.88206109	7.8919531	0.21356168	9.74842273	14.737292	40.26936	14.754314	2.35065987
2002		6.24556684	1.0830412	2.95051567	7.2124044	0.25329566	10.9225059	14.300785	40.43645	14.305407	2.29003774
2003		5.86785031	0.9063226	2.91893366	8.6666253	0.26075268	10.3716387	12.812997	37.08866	12.159045	8.94717106
2004		5.44376203	0.8054234	3.05420963	9.2181517	0.27264819	10.8156442	12.666412	36.54276	11.35568	9.82530839
2005		5.68784637	0.8052617	3.24102966	11.518705	0.29946755	11.5488909	0.0135785	37.35642	11.507874	4.45603357
2006		5.29600149	0.7415819	3.50543716	12.10968	0.37096859	11.3521816	14.068357	37.00133	10.681127	4.87333608
2007		5.21385043	0.7049417	3.58064545	10.583175	0.3742407	11.7102667	14.558699	33.49556	10.317511	9.46111223
2008		5.32347397	0.6740889	3.49547763	13.635723	0.39806693	11.6983725	13.755456	31.94466	9.9669815	9.10770382

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A2.3 GERMANY'S IMPORT CATEGORY CORRELATION RESULTS AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Germany	Correlation Analysis							5&6&7&8	3+9	6+7+8
	Import Category	n	r	r2	t					
							1980	57.4197844	23.3828536	50.22773217
ImportsSITC	0	19	0.4695692	0.2204952	2.1928788		1981	56.8916729	24.1551539	49.3551636
	1	19	0.1420801	0.0201868	0.5918153		1982	56.7551846	24.2175751	48.70243647
	3	19	0.7727661	0.5971674	5.0200753		1983	59.494977	21.6502552	51.1817838
	4	19	0.6473235	0.4190277	3.5016124		1984	60.1269338	21.0068413	51.39796619
	5	19	-0.6007407	0.3608894	-3.0983005		1985	62.3845327	19.4383191	53.17279543
	6	19	-0.5222916	0.2727885	-2.5252661		1986	69.1554673	12.328129	59.73745105
	7	19	-0.6516191	0.4246074	-3.5418984		1987	72.3693108	10.3068584	62.83501646
	8	19	-0.6405404	0.4102920	-3.4391606		1988	74.2164872	8.36135407	64.54482436
	9	19	-0.3249101	0.1055666	-1.4164905		1989	74.6280464	8.80978679	65.27955263
	3+9	19	0.7771867	0.6040192	5.0922853		1990	75.3849177	10.0090646	66.63893191
	5+6+7+8	19	-0.7280979	0.5301265	-4.3794924		1991	76.3717114	9.77295307	68.11016809
	6+7+8	19	-0.7075850	0.5006766	-4.1286887		1992	77.2723647	8.624787	68.94018426
	2	19	0.4699449	0.2208482	2.1951305		1993	77.4170957	8.0639191	68.93053144
							1994	78.0651443	7.43931763	69.18351113
							1995	78.8455294	7.27683193	70.20451991
							1996	78.3595099	8.36371571	69.69451287
							1997	78.3500547	8.83622392	69.7072814
							1998	80.6319387	7.22590782	71.31960908
							1999	81.4910498	7.23526503	72.26391566
							2000	79.3606588	10.6681921	70.37431532
							2001	79.5093935	10.2426129	69.76097077
							2002	79.9651523	9.50244213	69.04264638
							2003	72.4323444	17.6137964	62.06070572
							2004	71.3804967	19.0434601	60.56485248
							2005	60.4267604	15.9747385	48.8778695
							2006	73.1029944	16.9830164	61.75081281
							2007	70.0820347	20.044287	58.371768
							2008	67.3654661	22.7434265	55.66709351

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

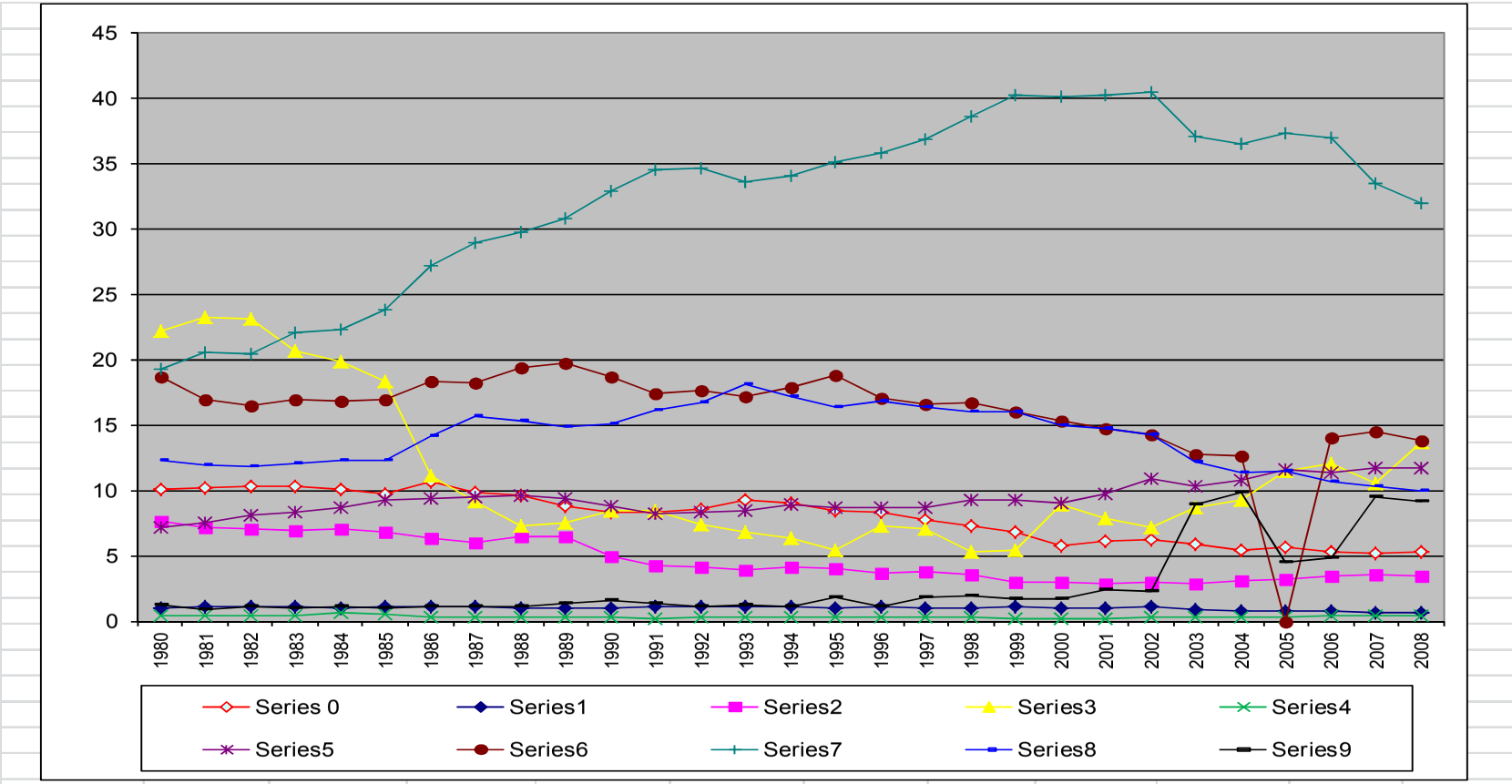
Source: Author's calculation and construction of correlation analysis using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A2.4 GERMANY'S IMPORTS CIF/FOB RATIOS FOR THE PERIOD, 1980-2008

Soruce: IFS DATABASE				
Germany Imports cif/ fob ratios calculation				
DESCRIPTOR	IMPORTS, CIF	IMPORTS,C.I.F.	MPORTS, FOI	CIF/FOB RATIOS
SERIESCODE	13471...ZF...	13471..DZF...	13471.V.ZF...	
1980	341.38	188002	331.41	0.030083582
1981	369.179	163941	357.329	0.033162716
1982	376.464	155323	365.174	0.030916768
1983	390.192	152877	378.512	0.030857674
1984	434.255	153022	421.415	0.030468778
1985	463.81	158488	451.15	0.02806162
1986	413.744	190872	402.944	0.026802732
1987	409.642	228441	399.492	0.025407267
1988	439.609	250467	428.419	0.02611929
1989	506.466	269702	493.396	0.026489878
1990	556.084	346153	542.916	0.024254212
1991	645.409	389908	629.141	0.025857479
1992	628.193	402441	612.563	0.025515743
1993	571.912	346027	556.405	0.027869987
1994	622.923	385351	605.956	0.028000383
1995	664.233	464271	646.141	0.02800008
1996	690.397	458783	671.592	0.028000631
1997	772.326	445616	751.29	0.02799984
1998	828.285	471418	805.725	0.027999628
1999	n.a.	473539	n.a.	#VALUE!
2000	n.a.	495350	n.a.	#VALUE!
2001	n.a.	485967	n.a.	#VALUE!
2002	n.a.	490022	n.a.	#VALUE!
2003	n.a.	604626	n.a.	#VALUE!
2004	n.a.	715679	n.a.	#VALUE!
2005	n.a.	780444	n.a.	#VALUE!
2006	n.a.	922343	n.a.	#VALUE!
2007	n.a.	1056000	n.a.	#VALUE!
2008	n.a.	1186680	n.a.	#VALUE!

Source: Own construction of imports cif/fob ratios using IMF source trade data, (IFS, 2008).

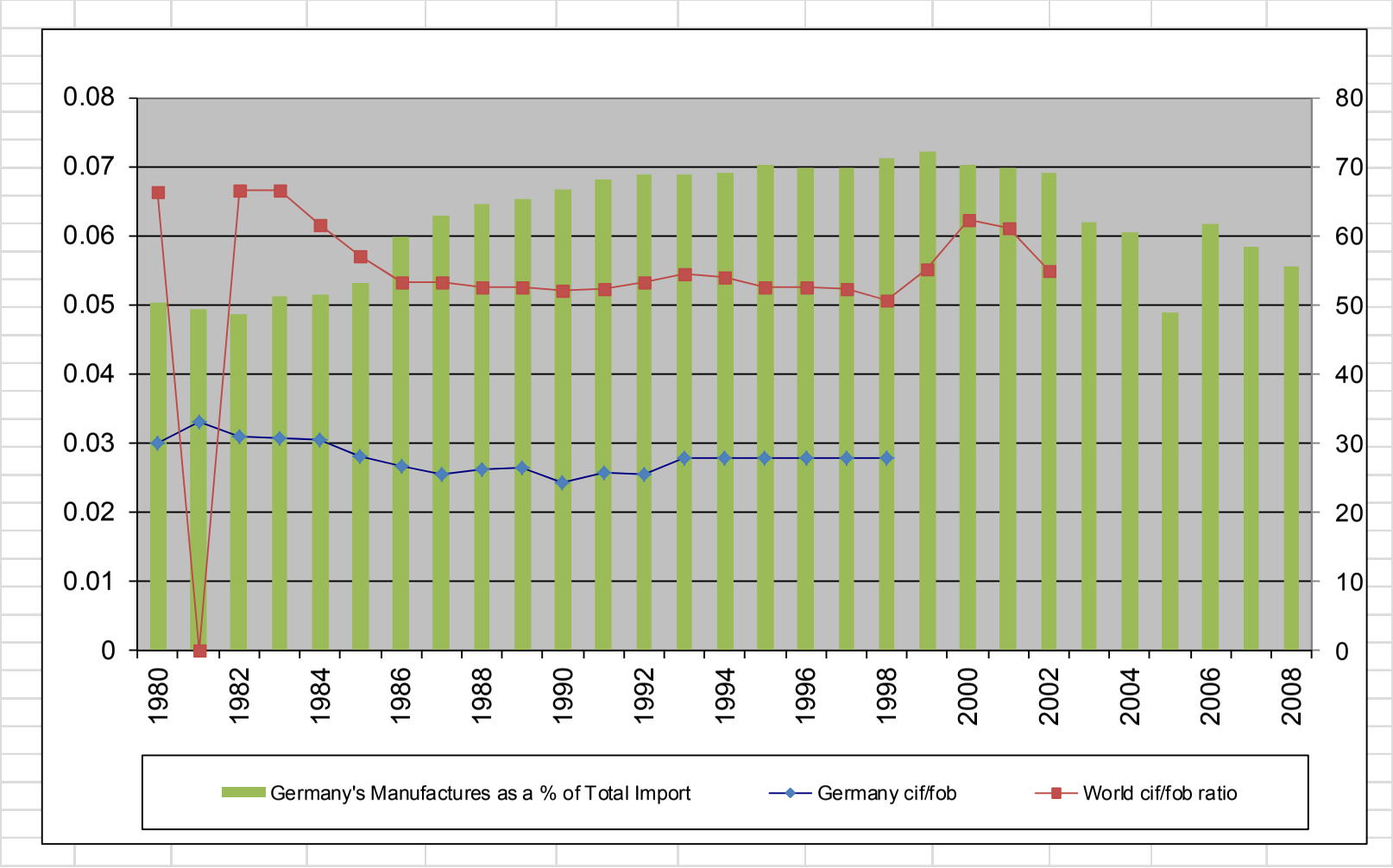
FIGURE A2.1 GERMANY'S SITC IMPORTS CATEGORIES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008



Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

FIGURE A2.2 GERMANY, WORLD CIF/FOB RATIO AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORT FROM 1980 TO 2008



Source: Author's calculation and construction of Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A3.1 SOUTH AFRICA'S SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2008

SITC	TOTL - To	0 - Food and	1 - Beverag	2 - Crude m	3 - Mineral	4 - Animal a	5 - Chemical	6 - Manufact	7 - Machine	8 - Miscella	9 - Commodit
Year											
1980	2.7E+07	2320565	57819	2077975	494146	50111	618053	4423470	549772	199098	16366520
1981	2.1E+07	1994596	38620	1961769	429986	74204	491553	3155005	513643	153127	12122500
1982	1.8E+07	1567985	31112	1741678	318193	40339	484841	3103376	492644	142508	10391160
1983	1.9E+07	1188531	34731	1529931	426909	30801	458676	3268505	380706	117643	11146340
1984	1.7E+07	958931	21700	1682769	471275	26318	529236	3004921	345640	125988	9431765
1985	1.2E+07	1092930	45998	2235908	1697301	24602	702197	3833426	300856	244456	1778320
1986	2E+07	1465384	43550	2134339	1647934	29143	835779	4506545	359946	167764	8342499
1987	2.4E+07	1528302	44354	2071122	1267141	24633	558478	4478158	254685	158616	14087520
1988	2.2E+07	1389324	47165	2495911	1269183	24828	586167	5099388	256959	192959	10618440
1989	2.3E+07	1672742	53822	2932185	1520752	31191	657027	5463040	297886	207130	10123300
1990	2.5E+07	1891139	47033	2781660	1816308	27742	738139	5757240	463053	297969	11265820
1991	1.6E+07	1826212	71540	2703713	1854660	32788	759671	5546830	597226	381993	2548573
1992	2.2E+07	1563126	162462	2130429	1532115	44129	1245500	3605454	1614091	494491	9800446
1993	2.2E+07	1413390	139036	1949329	1692159	41775	1098615	3103161	1720086	578111	9802161
1994	2.5E+07	1901627	188099	4685175	1389862	36522	1564269	6770192	1701081	675167	6418481
1995	2.7E+07	1847943	211263	2789545	2215086	48860	2104149	8047768	2394491	920397	6889395
1996	1.9E+07	2205884	355707	2450659	1687942	61919	2082133	3735595	2703917	1068467	2692821
1997	2.3E+07	2048160	347817	2454581	1715913	49798	2092926	7142253	3369337	1121208	2791374
1998	2.1E+07	2042158	352896	2414871	1597580	44569	1826825	5009213	3456420	1064996	2717210
1999	2.5E+07	2015202	400954	2525050	2406320	43898	1956962	9596503	4265320	1161513	183948
2000	3.3E+07	2589544	542975	3265909	2852363	55627	2386469	11067340	5112919	1898979	3581473
2001	3.6E+07	2916360	631402	3116773	2574897	41966	2435640	14246940	4968872	1840472	3726564
2002	2.7E+07	2239302	556930	2775388	3135421	37755	2883677	7558991	5871226	1872388	50487
2003	3.5E+10	1184316544	225184768	1.098E+09	4.126E+09	275638272	3750771712	4214882304	1.358E+10	2.84E+09	3246878464
2004	4.8E+10	1618585234	318586066	1.49E+09	6.883E+09	390050008	4675388449	5335726802	1.881E+10	4.002E+09	4076722589
2005	5.5E+10	1746407893	326981438	1.551E+09	7.872E+09	350161452	5426899621	6292179158	2.166E+10	4.991E+09	4811705285
2006	6.8E+10	2118529311	391699004	2.025E+09	1.258E+10	432251137	5998838243	7621150885	2.587E+10	6.136E+09	5292687122
2007	8E+10	2828345946	532936866	2.506E+09	1.489E+10	694835488	7049977029	9285470934	2.978E+10	6.481E+09	5830368664
2008	8.8E+10	3176460698	559315209	2.879E+09	1.96E+10	823189580	8426272773	9119085328	3.063E+10	6.529E+09	5844837047

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Standard International Trade Classification Revision 3 data form the World Trade Database in TIPS, 2008.

TABLE A3.2 SOUTH AFRICA'S CIF/FOB RATIOS AND SITC IMPORTS CATEGORIES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Percentage of Total Imports											
	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	6.27	8.54483084	0.002129	7.6515611	1.8195543	0.1845197	2.27580712	16.2881897	2.0243815	0.7331226	60.2651272
1981	9.11	9.52756628	0.0018448	9.3707619	2.0539097	0.3544495	2.34799618	15.0704801	2.4535133	0.7314402	57.9054215
1982	8.78	8.56174893	0.0016988	9.5101737	1.7374456	0.2202651	2.64740218	16.9455232	2.6900093	0.7781437	56.739384
1983	8.72	6.39587295	0.001869	8.2330577	2.2973366	0.1657502	2.46828515	17.5888914	2.0487032	0.6330754	59.9820909
1984	8.79	5.77720089	0.0013073	10.138054	2.8392557	0.1585561	3.1884491	18.103526	2.0823518	0.7590306	56.8228591
1985	11.18	9.14127563	0.0038473	18.701153	14.19624	0.2057713	5.87318156	32.062807	2.5163621	2.044632	14.8738833
1986	10.51	7.50213998	0.0022296	10.926904	8.436718	0.1491997	4.27883139	23.0715849	1.8427697	0.85888	42.7100305
1987	8.48	6.24484687	0.0018124	8.4628822	5.177708	0.1006537	2.28201598	18.298354	1.0406771	0.6481262	57.5634955
1988	7.81	6.3207633	0.0021458	11.355208	5.7741789	0.1129556	2.66678101	23.1997896	1.1690412	0.8778717	48.3088508
1989	8.44	7.28575678	0.0023443	12.771358	6.6237526	0.1358548	2.86173177	23.794692	1.2974654	0.9021707	44.0928139
1990	7.67	7.53859309	0.0018749	11.088451	7.2402964	0.1105871	2.9424223	22.9499205	1.8458549	1.1877853	44.9086147
1991	7.88	11.187824	0.0043827	16.563611	11.362103	0.2008674	4.65393143	33.9812451	3.6587534	2.3401831	15.6131852
1992	6.62	7.04357018	0.0073207	9.5998827	6.9038322	0.1988488	5.61232215	16.2464627	7.2732225	2.2282158	44.1615898
1993	11.28	6.56236332	0.0064554	9.0507257	7.8566865	0.1939611	5.10086443	14.4079624	7.9863515	2.6841667	45.5113888
1994	9.04	7.50726792	0.0074258	18.496195	5.4869154	0.144182	6.1754416	26.7274525	6.7155498	2.6654331	25.3389632
1995	13.04	6.72740081	0.007691	10.155285	8.0639778	0.1778739	7.6601138	29.297744	8.7170982	3.3506875	25.0807095
1996	12.12	11.5824593	0.0186771	12.867702	8.8628955	0.3251188	10.9326785	19.6145296	14.197487	5.6102114	14.1392247
1997	16.99	8.85370355	0.0150353	10.610564	7.4174796	0.2152648	9.04721621	30.8742436	14.564834	4.8467128	12.0664391
1998	12.89	9.94876926	0.017192	11.764513	7.7829212	0.2171265	8.89973274	24.4033539	16.838621	5.1883348	13.2374162
1999	10.88	8.20666673	0.0163284	10.282961	9.7994475	0.1787693	7.96949136	39.0805993	17.37	4.7301214	0.74910601
2000	10.86	7.76391154	0.0162794	9.7917736	8.5518895	0.1667796	7.15505673	33.1818454	15.329437	5.6934754	10.7378904
2001	12.89	7.99005367	0.0172987	8.5391322	7.0545355	0.1149757	6.67300824	39.0328407	13.613393	5.0424056	10.209798
2002	12.70	8.29937928	0.0206411	10.28624	11.620607	0.1399289	10.6875844	28.0153964	21.760143	6.9395098	0.18711668
2003	19.77	3.42852208	0.006519	3.1795026	11.944372	0.7979555	10.8582488	12.2018198	39.315561	8.2226097	9.39950942
2004	13.07	3.40015527	0.0066925	3.1300016	14.46006	0.8193764	9.82156909	11.2087391	39.51992	8.4069715	8.5639542
2005	13.63	3.17340388	0.0059416	2.8178351	14.304987	0.6362796	9.86123825	11.4335407	39.365308	9.0698813	8.74336648
2006	16.69	3.09413814	0.0057208	2.9571518	18.373866	0.6313081	8.76137709	11.1307847	37.788215	8.9610432	7.73003469
2007	10.72	3.54107216	0.0066723	3.137066	18.640553	0.8699299	8.82652895	11.6253539	37.27853	8.1141452	7.29958659
2008	6.19	3.62638367	0.0063854	3.287156	22.380035	0.9397885	9.61979412	10.4107386	34.971621	7.4532283	6.67271647

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A3.3 SOUTH AFRICA'S SITC IMPORTS CORRELATION RESULTS AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

South Africa	Correlation Analysis							5&6&7&8	3+9	6+7+8
	Import Category	n	r	r2	t					
							1980	21.32150089	62.0846815	19.04569377
ImportsSITC	0	29	-0.24381794	0.059447189	-1.3063392		1981	20.60342966	59.9593313	18.25543348
	1	29	0.43935632	0.193033974	2.54138892		1982	23.0610784	58.4768295	20.41367621
	3	29	0.32764771	0.10735302	1.80197659		1983	22.7389551	62.2794275	20.27066994
	4	29	0.3358644	0.112804892	1.85283301		1984	24.13335751	59.6621149	20.94490841
	5	29	0.6838127	0.467599805	4.86967458		1985	42.49698268	29.070123	36.62380112
	6	29	0.01662905	0.000276525	0.08641904		1986	30.05206605	51.1467485	25.77323467
	7	29	0.59242863	0.350971676	3.82107966		1987	22.26917326	62.7412035	19.98715728
	8	29	0.6530058	0.42641658	4.48023329		1988	27.91348352	54.0830297	25.2467025
	9	29	-0.59042519	0.348601901	-3.8012245		1989	28.85605994	50.7165665	25.99432817
	3+9	29	**-0.61580248**	0.379212689	-4.0611768		1990	28.92598291	52.1489111	25.98356062
	5+6+7+8	29	**0.66954992**	0.448297095	4.68394955		1991	44.6341130	26.9752886	39.98018159
	6+7+8	29	**0.65396786**	0.427673957	4.49175986		1992	31.36022321	51.065422	25.74790107
	2	29	-0.31212128	0.097419695	-1.7071133		1993	30.1793450	53.3680753	25.07848055
							1994	42.2838770	30.8258785	36.10843537
							1995	49.02564355	33.1446873	41.365530
							1996	50.35490605	23.002120	39.42222752
							1997	59.33300682	19.4839187	50.28579061
							1998	55.33004267	21.0203374	46.430310
							1999	69.15021256	10.5485536	61.18072119
							2000	61.35981423	19.2897798	54.20475751
							2001	64.36164722	17.2643335	57.68863898
							2002	67.4026335	11.8077235	56.71504909
							2003	70.59823911	21.3438816	59.739990
							2004	68.95719988	23.0240144	59.13563079
							2005	69.7299686	23.0483537	59.868730
							2006	66.64141969	26.103901	57.8800426
							2007	65.84455822	25.940140	57.01802928
							2008	62.4553820	29.0527516	52.83558787

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

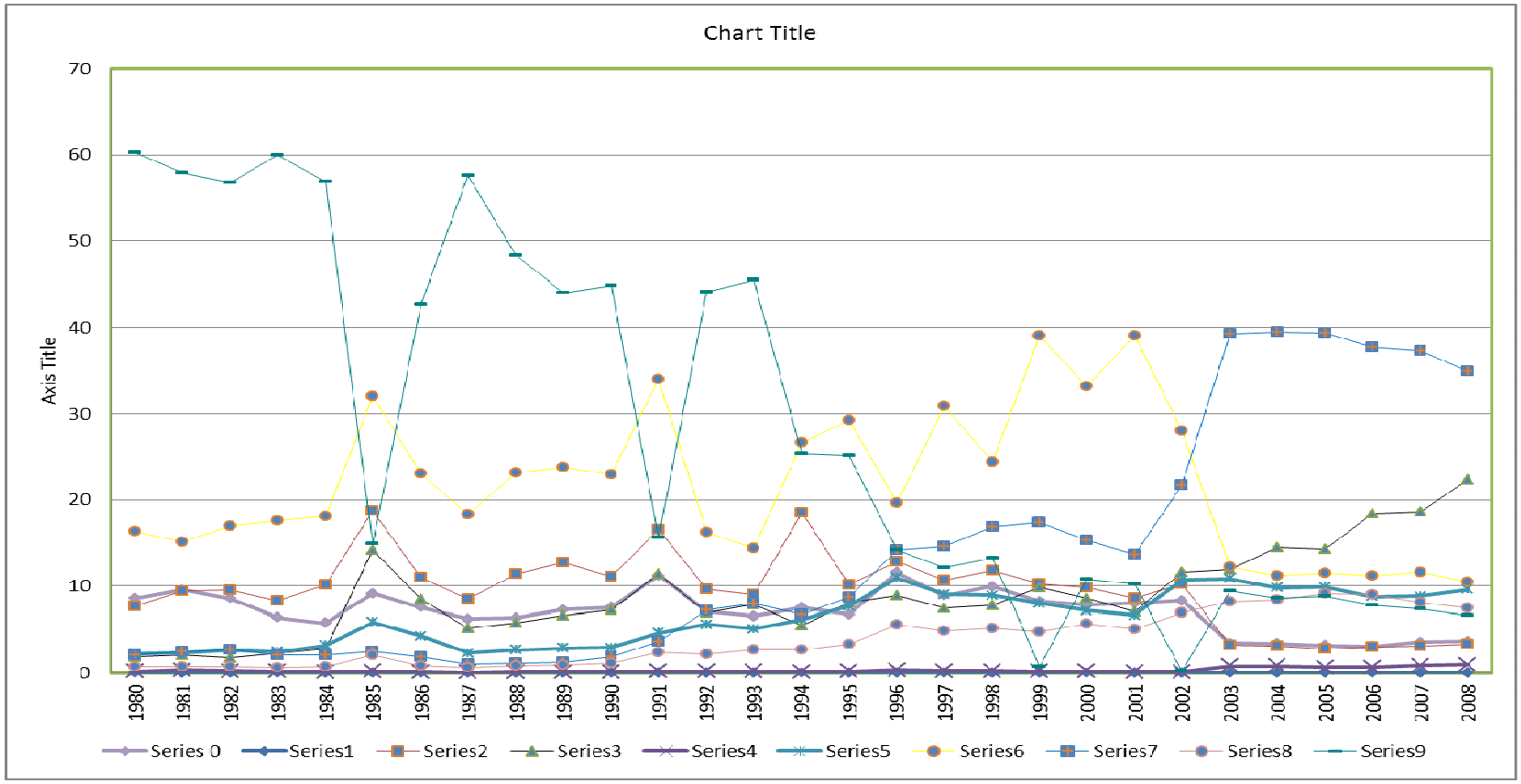
Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A3.4 SOUTH AFRICA'S IMPORTS CIF/FOB RATIOS FOR THE PERIOD, 1980-2008

Soruce: IFS DATABASE				
South Africa Imports cif/ fob ratios calculation				
DESCRIPTOR	IMPORTS, FOB	IMPORTS, CIF	IMPORTS,C.I.F.	CIF/FOB RATIOS
SERIESCODE	19971.V.ZF...	19971...ZF...	19971..DZF...	
1980	14362.7	15263.7	19699.5	0.062731938
1981	18438.7	20118.3	22918.4	0.091091021
1982	18373.7	19986.5	18498.7	0.087777639
1983	16204	17617	15765.1	0.087200691
1984	21635.8	23537.9	16242.6	0.087914475
1985	22690.6	25226.3	11439.8	0.111751122
1986	26863.6	29687.5	12974.3	0.105119939
1987	28672.6	31104.8	15294.6	0.084826629
1988	39483.9	42565.9	18670.5	0.078057132
1989	44741.3	48515.4	18490.2	0.08435383
1990	44211.7	47604.8	18399	0.076746653
1991	48209.1	52006.3	18828.5	0.078765212
1992	52857.3	56357.8	19737.9	0.066225479
1993	58779	65411	19991.2	0.112829412
1994	76154	83042	23362.8	0.090448302
1995	98039	110826	30545.6	0.130427687
1996	115524	129522	30181.7	0.121169627
1997	129735	151779	32998	0.169915597
1998	143326	161802	29241.8	0.128908921
1999	147091	163092	26695.5	0.108782998
2000	186382	206620	29695.3	0.108583447
2001	213763	241311	28247.8	0.128871694
2002	272682	307312	29267	0.126997748
2003	256833	307611	41083.7	0.197708238
2004	304432	344225	53579.7	0.130712277
2005	349181	396777	62304.3	0.136307531
2006	461042	537969	78714.6	0.166854647
2007	561678	621892	88449.6	0.107203772
2008	777808	825922	101077	0.061858454

Source: Author's construction of imports cif/fob ratios using IMF trade data (IFS, 2008).

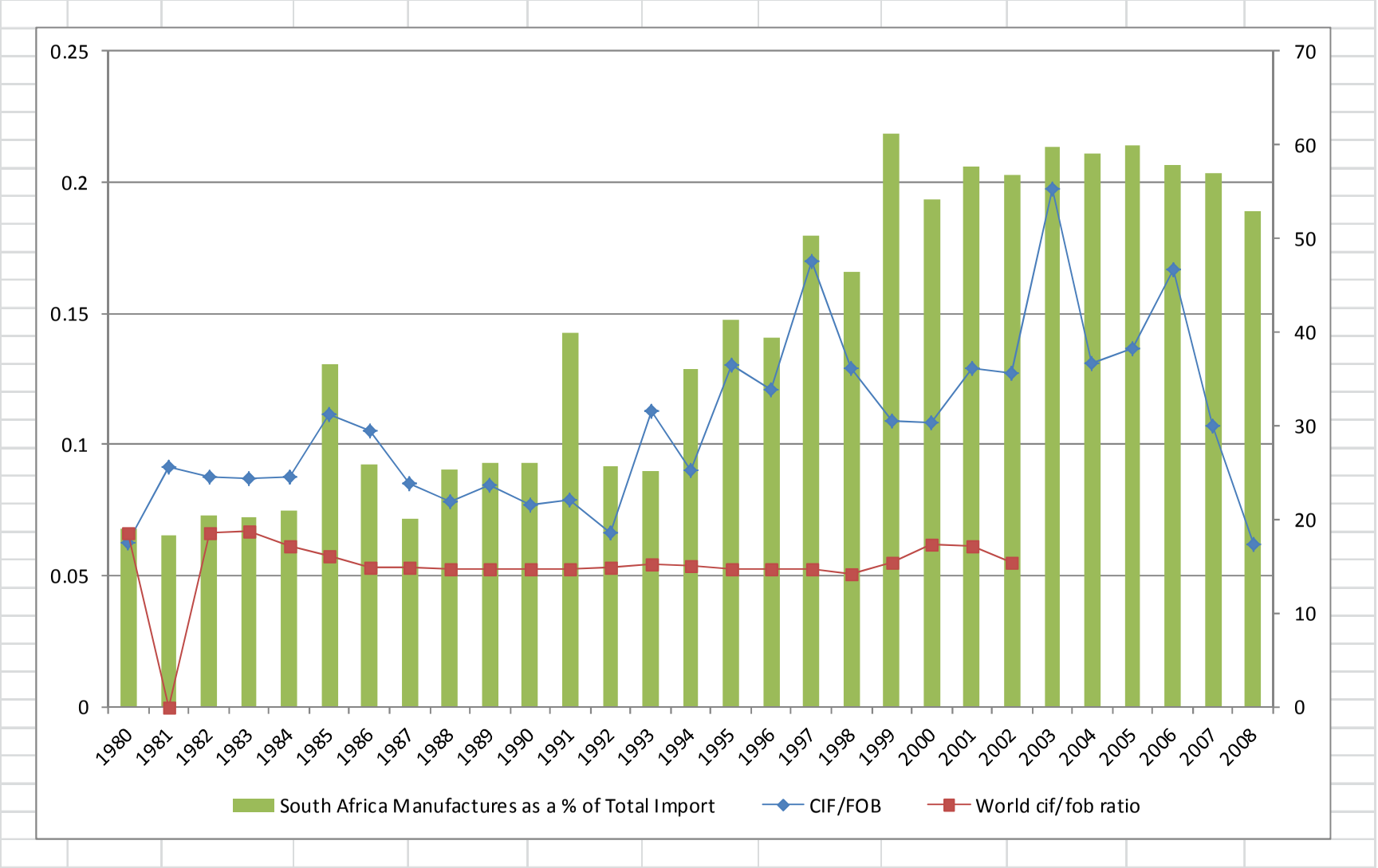
FIGURE A3.1 SOUTH AFRICA'S SITC IMPORTS CATEGORIES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008



Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

FIGURE A3.2 SOUTH AFRICA, WORLD CIF/FOB RATIO AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS FROM 1980 TO 2008



Source: Own calculation of imports cif/fob ratios and Manufactures data using trade data from IMF (IFS, 2008) trade data.

TABLE 4.1 MALAWI SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2008

SITC Year	TOTL - To	0 - Food and	1 - Bevera	2 - Crude m	3 - Mineral fue	4 - Animal a	5 - Chemicals	6 - Manufactu	7 - Machine	8 - Miscella	9 - Commodi
1980	380329	18130	3294	7183	29759	3928	41138	91100	161046	20518	4233
1981	275811	24243	2888	4133	25414	3672	36559	67447	86160	21921	3374
1982	249128	12822	2237	6768	22270	3294	40785	70472	68274	18861	3345
1983	230422	14008	2458	6780	19055	4484	38586	55233	73371	15036	1411
1984	214927	12158	1662	9614	18814	4313	41100	46862	63176	16331	897
1985	287682	12377	2037	7722	52646	3384	51430	52512	88156	15940	1478
1986	258616	10002	2405	6232	32581	2440	43874	46210	95070	17367	2435
1987	118792	5255	131	335	465	1022	15277	11610	67181	13564	3952
1988	170364	17089	423	871	467	1185	18286	21713	87250	17346	5734
1989	183280	15824	498	706	570	3422	26268	23377	95025	12505	5085
1990	295280	63219	4411	1504	1648	9309	26318	34874	131580	18096	4321
1991	592584	43433	2118	11154	26554	5530	110029	124230	215780	46233	7523
1992	545982	46906	13183	4239	2320	4449	88587	111132	230095	40072	4999
1993	423782	42456	4197	4835	3830	4998	84549	101294	138811	34812	4000
1994	523959	85599	8232	5967	15169	5678	68956	104807	176999	46294	6258
1995	474470	50911	4364	4689	59649	4425	74790	93005	131688	42942	8007
1996	467001	51180	9972	11262	6438	5154	83016	95344	158781	41381	4473
1997	726483	63381	13502	15094	14111	10811	106876	150831	287726	54604	9547
1998	549063	78020	7861	10411	12276	4795	74300	128482	175899	48623	8396
1999	531247	62692	17803	11484	6198	4725	73425	94547	199737	49346	11290
2000	473364	31413	18511	13236	21863	3971	65321	99952	164298	44935	9864
2001	438201	29480	22555	9833	20962	7092	60430	98799	140065	40435	8550
2002	598183	108895	13087	15855	12591	10657	97177	114308	160483	56863	8267
2003	7.9E+08	63012204	48855573	19894497	90814316	20463467	130733519	144271119	204399300	60850219	2081546
2004	9.3E+08	80833437	58939617	19108699	109982649	20095725	178936794	164405818	213109749	81002720	2243261
2005	1.2E+09	91680476	96245755	19701356	122741138	23955909	248961498	180549990	255062106	113992454	12301308
2006	1.2E+09	96135736	58161417	18603825	138117565	27751650	222942241	179389231	355210221	102719479	7664674
2007	1.4E+09	80772766	35798916	19924773	190370965	28510168	382170604	201800992	305466482	118282518	14747113
2008	2.2E+09	136619142	75215051	36657191	214927298	43338538	600287798	274162461	590909293	231500683	70978

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's construction of Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE 4.2 MALAWI'S CIF/FOB RATIOS AND SITC IMPORTS AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Percentage of Total Imports											
	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	13.81	4.76692548	0.008661	1.8886280	7.824541384	1.0327900	10.81642473	23.9529460	42.3438654	5.39480292	1.1129838
1981	13.51	8.7897147	0.010471	1.4984899	9.214280794	1.3313465	13.25509135	24.4540646	31.2387831	7.94783384	1.2233015
1982	13.81	5.14675187	0.008979	2.7166758	8.939179859	1.3222119	16.37110241	28.2874667	27.4051893	7.57080697	1.3426833
1983	14.17	6.07928062	0.010667	2.9424274	8.269609673	1.9459947	16.74579684	23.9703674	31.8420116	6.52541858	0.6123547
1984	12.38	5.6568044	0.007733	4.4731467	8.753669851	2.0067279	19.12277192	21.8036822	29.3941664	7.59839387	0.4173510
1985	66.66	4.30231992	0.007081	2.6842138	18.30006744	1.1762988	17.87737849	18.2534882	30.6435578	5.54084023	0.5137617
1986	66.67	3.86751013	0.009300	2.4097504	12.59821511	0.9434838	16.9649210	17.8681907	36.7610666	6.71536177	0.9415504
1987	66.67	4.42369857	0.001103	0.2820055	0.39144050	0.8603273	12.86029362	9.77338541	56.5534716	11.4182773	3.3268234
1988	66.67	10.030875	0.002483	0.5112582	0.274118945	0.6955695	10.7334883	12.7450635	51.2138715	10.1817285	3.3657345
1989	66.67	8.63378437	0.002717	0.3852030	0.310999564	1.8670886	14.33216936	12.7548014	51.8469009	6.82289393	2.7744435
1990	66.67	21.4098483	0.014938	0.5093471	0.558114332	3.1526009	8.912896234	11.8104850	44.5610946	6.12842048	1.4633568
1991	66.67	7.3294250	0.003574	1.8822648	4.481052475	0.9332010	18.5676630	20.9641165	36.4134030	7.80193188	1.2695247
1992	66.67	8.59112571	0.024145	0.7763992	0.424922433	0.8148620	16.22526017	20.3545172	42.1433307	7.33943610	0.9155980
1993	67.01	10.0183585	0.009904	1.1409168	0.903766559	1.1793800	19.95105974	23.9023838	32.7552846	8.21460090	0.9438815
1994	50.86	16.3369653	0.015711	1.1388296	2.895073851	1.0836726	13.16057172	20.0029010	33.7810783	8.83542415	1.1943683
1995	66.67	10.7300778	0.009198	0.9882606	12.57171159	0.9326196	15.76285118	19.6018716	27.7547579	9.05051953	1.6875672
1996	66.67	10.9592913	0.021353	2.4115580	1.378583772	1.1036379	17.77640733	20.4162304	34.0001413	8.86100886	0.9578138
1997	66.67	8.72436107	0.018585	2.0776811	1.942371673	1.4881284	14.71142477	20.7618072	39.6053314	7.51621167	1.3141395
1998	52.16	14.2096626	0.014317	1.8961394	2.235809006	0.8733060	13.53214476	23.4002291	32.0362144	8.85563223	1.5291506
1999	60.91	11.8009137	0.033512	2.1617063	1.166688941	0.8894168	13.82125452	17.7971829	37.5977653	9.28871128	2.1251885
2000	13.61	6.63611935	0.039105	2.7961569	4.618644426	0.8388893	13.79931723	21.1152517	34.7085963	9.49269484	2.0838087
2001	NA	6.72750633	0.051472	2.2439474	4.783649512	1.6184354	13.79047515	22.5465026	31.9636423	9.22750062	1.9511594
2002	NA	18.2042953	0.021878	2.6505267	2.104874261	1.7815618	16.2453630	19.1092024	26.8284120	9.50595386	1.3820185
2003		8.02319183	0.062207	2.5331183	11.56316764	2.6055639	16.6459834	18.3696933	26.0256695	7.74791150	0.2650382
2004		8.70432345	0.063467	2.0576670	11.84317513	2.1639522	19.26831012	17.7035825	22.9481296	8.72255222	0.2415593
2005		7.86827207	0.082601	1.6908249	10.5339840	2.0559624	21.36656447	15.4952996	21.8901355	9.78314775	1.0557323
2006		7.9668560	0.048199	1.5417159	11.44592842	2.2998045	18.47542659	14.8661490	29.4365946	8.51245679	0.6351785
2007		5.86225218	0.025982	1.4460820	13.81657036	2.0691850	27.73682971	14.6461284	22.1698679	8.58460077	1.0703025
2008		6.1995670	0.034131	1.6634471	9.753071019	1.9666364	27.24013925	12.4410718	26.8145571	10.5051458	0.0032209

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A4.3 MALAWI'S IMPORT CATEGORY CORRELATION RESULTS AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Malawi	Correlation Analysis							5&6&7&8	3+9	6+7+8	
	Import Cate	n	r	r2	t						
							1980	82.5080391	8.93752514	71.6916144	
ImportsSITC	0	21	0.326118	0.1063526	1.503723049		1981	76.8957728	10.4375823	63.6406815	
	1	21	-0.12168	0.0148053	-0.53434769		1982	79.6345654	10.2818631	63.2634630	
	3	21	-0.32121	0.1031758	-1.47846866		1983	79.0835944	8.8819644	62.3377976	
	4	21	-0.1402	0.0196551	-0.61719791		1984	77.9190144	9.17102086	58.7962424	
	5	21	0.038396	0.0014743	0.16748855		1985	72.3152648	18.8138292	54.4378863	
	6	21	-0.61726	0.3810057	-3.41978821		1986	78.3095400	13.5397655	61.3446190	
	7	21	0.406454	0.1652048	1.939091112		1987	90.6054280	3.71826386	77.7451344	
	8	21	0.1857	0.0344846	0.823777243		1988	84.8741518	3.63985349	74.1406635	
	9	21	0.281586	0.0792908	1.279166304		1989	85.7567656	3.08544304	71.4245962	
	3+9	21	-0.29682	0.0881017	-1.35486402		1990	71.4128962	2.02147115	62.5000000	
	5+6+7+8	21	0.161776	0.0261716	0.714579389		1991	83.7471143	5.75057713	65.1794514	
	6+7+8	21	0.12357	0.0152696	0.542789705		1992	86.0625442	1.34052038	69.8372840	
	2	21	-0.57785	0.3339053	-3.08617417		1993	84.8233290	1.84764808	64.8722692	
							1994	75.7799752	4.08944211	62.6194034	
							1995	72.1700002	14.2592788	56.4071490	
							1996	81.0537879	2.33639757	63.2773806	
							1997	82.5947751	3.25651116	67.8833503	
							1998	77.8242205	3.76495958	64.2920758	
							1999	78.5049139	3.29187741	64.6836594	
							2000	79.1158601	6.70245308	65.3165429	
							2001	77.5281207	6.73480891	63.7376455	
							2002	71.6889313	3.48689281	55.4435683	
							2003	68.7892577	11.8282059	52.1432743	
							2004	68.6425744	12.0847344	49.3742643	
							2005	68.5351474	11.5897163	47.1685829	
							2006	71.2906269	12.0811069	52.8152003	
							2007	73.1374268	14.8868729	45.4005971	
							2008	77.0009140	9.75629189	49.7607747	

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

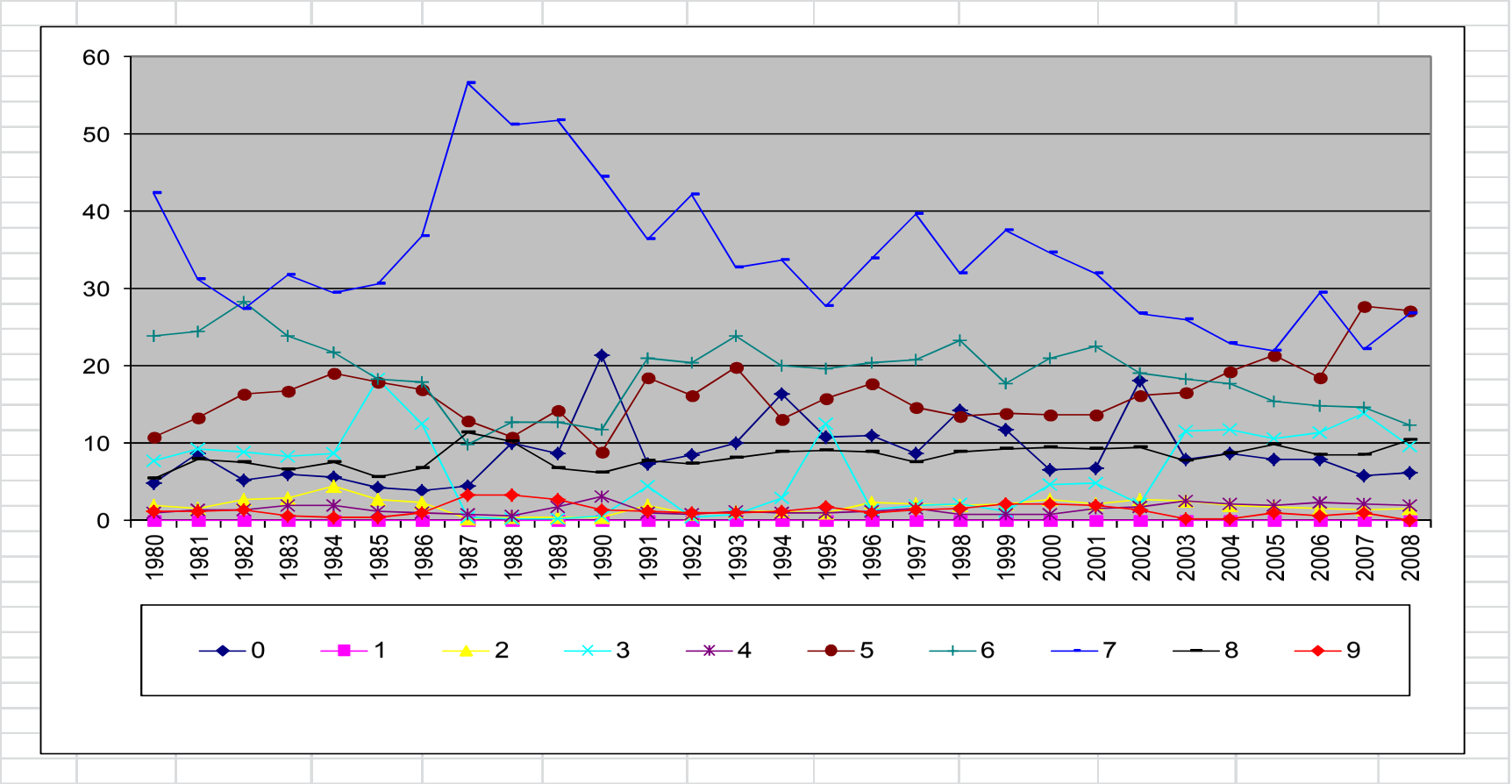
Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A4.4 MALAWI'S IMPORTS CIF/FOB RATIOS FOR THE PERIOD, 1980-2008

SOURCE: IFS DATABASE				
Malawi's Imports cif/ fob ratios calculation				
DESCRIPTOR	IMPORTS, CIF	IMPORTS,C.I.F.	IMPORTS, FOB	CIF/FOB RATIOS
SERIESCODE	67671...ZF...	67671..DZF...	67671.V.ZF...	
1980	356.21	438.997	313	0.138051118
1981	321.14	359.21	282.91	0.135131314
1982	322.12	304.198	283.04	0.138072357
1983	363.77	311.299	318.61	0.141740686
1984	381.57	270.521	339.53	0.123818219
1985	506.19	294.051	303.72	0.666633742
1986	477.97	258.35	286.78	0.66667829
1987	653.94	295.479	392.36	0.666683658
1988	1080.15	419.588	648.09	0.666666667
1989	1398.8	507.047	839.28	0.666666667
1990	1572.47	575.44	943.47	0.666687865
1991	1975.81	702.967	1185.46	0.666703221
1992	2653.83	735.435	1592.3	0.666664573
1993	2404.86	546.079	1439.93	0.670122853
1994	4214	491.479	2793.3	0.508609888
1995	7254.95	474.716	4352.9	0.666693469
1996	9544.83	623.497	5726.9	0.666666085
1997	12847.7	781.292	7708.6	0.666670991
1998	16431.1	515.267	10798.9	0.521553121
1999	29695.9	673.472	18454.8	0.609115244
2000	32282.7	532.332	28389	0.137155236
2001	40647.1	579.38	n.a.	#VALUE!
2002	53301.5	690.186	n.a.	#VALUE!
2003	76568.4	785.024	n.a.	#VALUE!
2004	101549	932.462	n.a.	#VALUE!
2005	137982	1163.88	n.a.	#VALUE!
2006	164463	1,209	n.a.	#VALUE!
2007	193141	1380	n.a.	#VALUE!
2008	n.a.	1700	n.a.	#VALUE!

Source: Own construction of imports cif/fob ratios using IMF trade data (IFS, 2008).

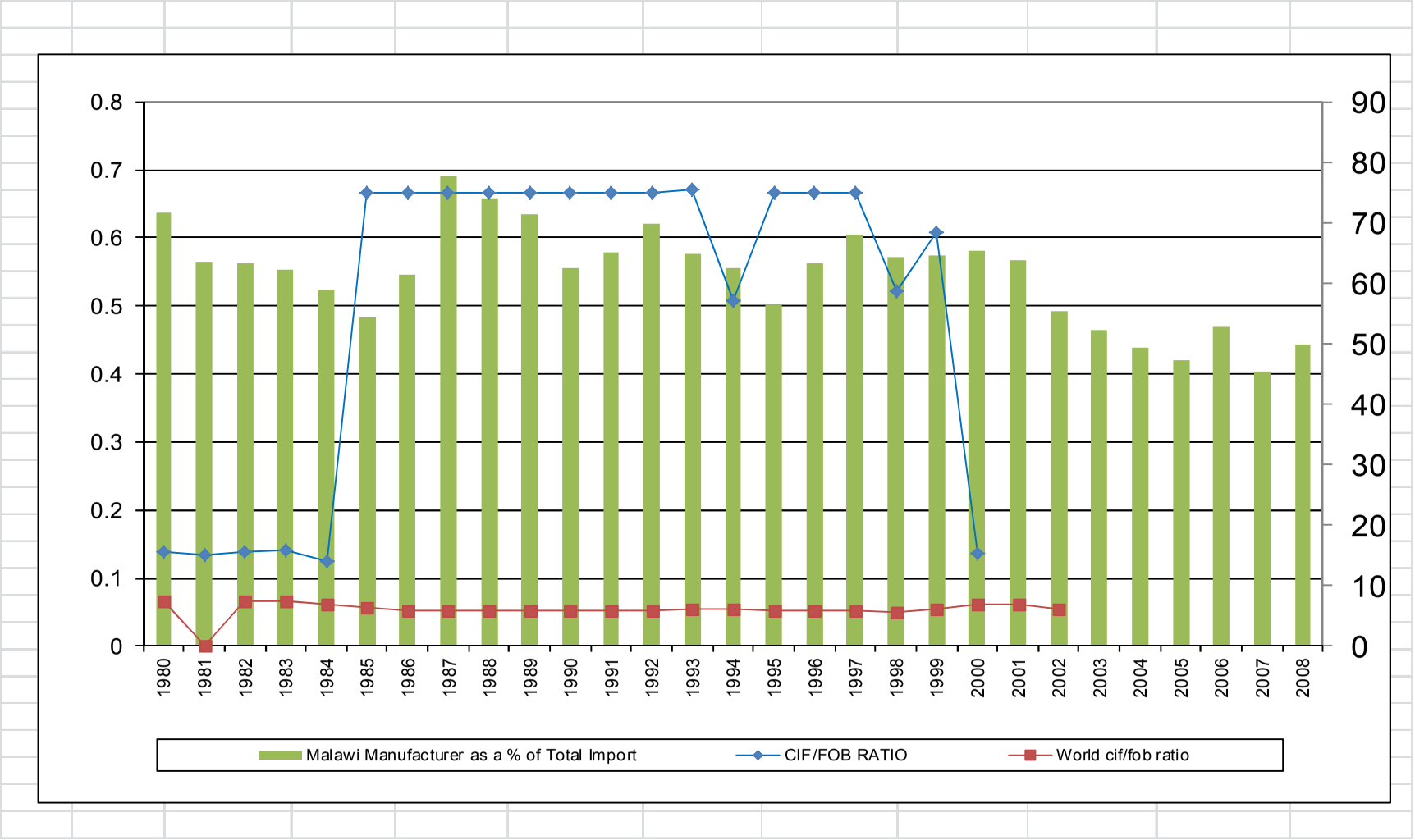
FIGURE A4.1 MALAWI'S SITC IMPORTS CATEGORIES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008



Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

FIGURE A4.2 MALAWI, WORLD CIF/FOB RATIO AND MALAWI'S MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORT FROM 1980 TO 2008



Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A5.1 WORLD SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2008

SITC	TOTL - T	0 - Food and	1 - Beverag	2 - Crude m	3 - Mineral	4 - Animal	5 - Chemic	6 - Manufac	7 - Machiner	8 - Miscellan	9 - Commodities
Year											
1980	2E+09	179128300	18046100	128438900	472560800	11293660	1.44E+08	323572100	507265000	165553200	64260560
1981	2E+09	180435900	18417800	116090400	464952300	10380170	1.39E+08	298045300	524748600	167945700	56022350
1982	1.9E+09	166780900	18883520	103665000	417673500	9430852	1.36E+08	277612100	515942100	166314100	54401160
1983	1.8E+09	162908900	17501310	102408900	373014900	9955393	1.37E+08	271084400	515807500	165973300	55382090
1984	1.9E+09	165810700	17590740	112049700	372112200	13722320	1.49E+08	285937800	565142300	181761100	52469570
1985	2E+09	161260100	19093230	108669000	326417700	13208580	1.6E+08	300108400	618223600	197609800	66068120
1986	2.1E+09	183215900	21599660	114649400	240020000	9405509	1.84E+08	339360900	728488900	246174300	75328580
1987	2.5E+09	198524900	25492660	134908100	261336300	10127210	2.21E+08	399148800	851652400	299272600	99850980
1988	2.9E+09	226931400	28742590	159593100	211105700	12394590	2.6E+08	476351200	990543900	342701500	151968300
1989	3.1E+09	239314700	31771070	167972700	257709400	12880220	2.69E+08	522005400	1079113000	377692300	107128600
1990	3.5E+09	256577400	39670800	163232600	351815600	13272120	2.98E+08	566901800	1229945000	437603700	114388600
1991	3.6E+09	269613500	42760500	152894000	325106500	13812820	3.13E+08	576534300	1298857000	466269200	111794100
1992	3.9E+09	293689000	47904000	156549500	303994300	15099270	3.41E+08	614370600	1436382000	530420800	125021400
1993	4E+09	294889400	47793150	151074500	294879000	15441540	3.55E+08	626240500	1495271000	547173100	136371300
1994	4.4E+09	319180800	52587590	178878800	282086700	20936280	4.03E+08	707792600	1697248000	593415000	157356200
1995	5.3E+09	369622600	57681260	215848100	358460900	26413720	4.85E+08	858028500	2006793000	671393100	217570700
1996	5.5E+09	385723000	62717910	205791600	450739200	24758600	4.96E+08	846236300	2135270000	708101900	201693000
1997	5.7E+09	378330600	62879620	209371700	452037400	26729510	5.17E+08	872054500	2253265000	752890800	208365000
1998	5.6E+09	364129300	61120250	189016100	311168400	28465360	5.25E+08	859530200	2329432000	758920400	202334800
1999	5.9E+09	355305400	61059420	180431200	419326000	24895390	5.44E+08	854296300	2459364000	789732800	193501500
2000	6.6E+09	352604800	58552930	199748700	688330500	19654750	5.87E+08	925755500	2752262000	846911900	208771200
2001	6.5E+09	368591000	59770480	193037300	622725400	19630590	6.14E+08	900618700	2627150000	843156700	223163900
2002	6.7E+09	378273800	63446320	198839900	607432600	25895210	6.74E+08	930013800	2714420000	866622500	247232400
2003	7.5E+12	4.322E+11	6.87E+10	2.475E+11	7.675E+11	3.11E+10	8.03E+11	1.014E+12	2.8618E+12	9.468E+11	2.80433E+11
2004	9.1E+12	4.9145E+11	7.8E+10	3.249E+11	1.022E+12	3.74E+10	9.72E+11	1.258E+12	3.4517E+12	1.0958E+12	3.4514E+11
2005	1E+13	5.3264E+11	8.36E+10	3.653E+11	1.41E+12	3.85E+10	1.1E+12	1.399E+12	3.8089E+12	1.2019E+12	3.37109E+11
2006	1.2E+13	5.8828E+11	9E+10	4.37E+11	1.733E+12	4.41E+10	1.23E+12	1.627E+12	4.3286E+12	1.3281E+12	4.76143E+11
2007	1.4E+13	7.0081E+11	1.05E+11	5.403E+11	1.908E+12	5.7E+10	1.45E+12	1.917E+12	4.8834E+12	1.5107E+12	5.23908E+11
2008	1.6E+13	8.295E+11	1.13E+11	6.517E+11	2.744E+12	8.23E+10	1.65E+12	2.097E+12	5.2311E+12	1.617E+12	6.75554E+11

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A5.2 World's CIF/FOB RATIOS AND SITC IMPORTS AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

Percentage of Total Imports											
	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	6.64	8.8948758	0.008961	6.3778201	23.465693	0.560803	7.136526	16.067442	25.18898	8.2207845	3.190951403
1981	0	9.1302579	0.00932	5.8743038	23.527105	0.525248	7.043807	15.081425	26.5528648	8.49823984	2.834793429
1982	6.65	8.93485222	0.010116	5.5535823	22.37577	0.505233	7.282069	14.872345	27.6402539	8.90984462	2.91440042
1983	6.67	8.99486619	0.009663	5.6544139	20.595677	0.549678	7.56957	14.967678	28.4798402	9.16406424	3.057871541
1984	6.15	8.65359213	0.009181	5.8478277	19.420382	0.716162	7.802072	14.922976	29.4945438	9.48603694	2.738365245
1985	5.72	8.18501908	0.009691	5.5156721	16.567862	0.670423	8.097083	15.232491	31.3789459	10.0300073	3.35339506
1986	5.33	8.55422356	0.010085	5.3529011	11.206368	0.439137	8.570962	15.844526	34.0126425	11.4937077	3.517039263
1987	5.33	7.93797639	0.010193	5.394272	10.449477	0.404934	8.822108	15.959881	34.0531422	11.966352	3.992520445
1988	5.27	7.93460053	0.01005	5.5801334	7.3812588	0.433374	9.080014	16.655502	34.6341236	11.9824736	5.313534192
1989	5.27	7.80883209	0.010367	5.4809446	8.4090506	0.420281	8.780086	17.033022	35.2114275	12.3240894	3.495603274
1990	5.22	7.39218445	0.011429	4.7028518	10.136067	0.38238	8.571751	16.33286	35.4356241	12.6076859	3.295620076
1991	5.24	7.55075218	0.011975	4.2819247	9.1048802	0.38684	8.767015	16.146327	36.3755796	13.05826	3.130887527
1992	5.33	7.60061356	0.012397	4.0514703	7.8673127	0.390766	8.814291	15.89979	37.1732837	13.727186	3.235529243
1993	5.44	7.43889869	0.012056	3.8110149	7.4386363	0.389529	8.955767	15.797583	37.719801	13.8030233	3.440111055
1994	5.40	7.23280355	0.011917	4.053487	6.3922319	0.474427	9.143056	16.03895	38.4605257	13.4470937	3.565773638
1995	5.27	7.0181382	0.010952	4.0983744	6.8062076	0.501525	9.206245	16.291652	38.103597	12.7479477	4.13108192
1996	5.25	6.99094856	0.011367	3.7298229	8.1693198	0.448732	8.997458	15.337417	38.7002142	12.8338314	3.655538787
1997	5.24	6.5995197	0.010969	3.6522361	7.8852457	0.466264	9.014517	15.211936	39.3054825	13.1332693	3.634675395
1998	5.06	6.46915796	0.010859	3.3580791	5.5282493	0.505718	9.319748	15.2705	41.3849244	13.4830566	3.594700514
1999	5.52	6.0404844	0.010381	3.067479	7.1288873	0.423242	9.251112	14.523741	41.8112133	13.426108	3.289684852
2000	6.22	5.31059878	0.008819	3.0084253	10.366981	0.296021	8.841609	13.942851	41.4519576	12.7553831	3.144313633
2001	6.11	5.6951277	0.009235	2.9826341	9.6217777	0.303314	9.490002	13.915528	40.5922954	13.0276786	3.44812247
2002	5.50	5.64085052	0.009461	2.9651172	9.0580857	0.386152	10.04768	13.868444	40.4776579	12.9231471	3.686750211
2003		5.79897016	0.009215	3.3207427	10.297164	0.416967	10.77506	13.605805	38.3976868	12.7034842	3.762632337
2004		5.41413904	0.008591	3.5795328	11.261981	0.411915	10.70974	13.862706	38.0263924	12.0721822	3.802314696
2005		5.18215955	0.008136	3.5541154	13.715659	0.374678	10.71528	13.61375	37.0572056	11.6938218	3.279773535
2006		4.94940322	0.007574	3.6766358	14.577791	0.371228	10.38046	13.688861	36.4185522	11.1737248	4.005987276
2007		5.15408324	0.007711	3.9737825	14.033311	0.419268	10.67253	14.097575	35.9150391	11.1103008	3.853063104
2008		5.28564114	0.007224	4.1525357	17.488243	0.524317	10.52568	13.359505	33.3333458	10.3035986	4.304704844

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

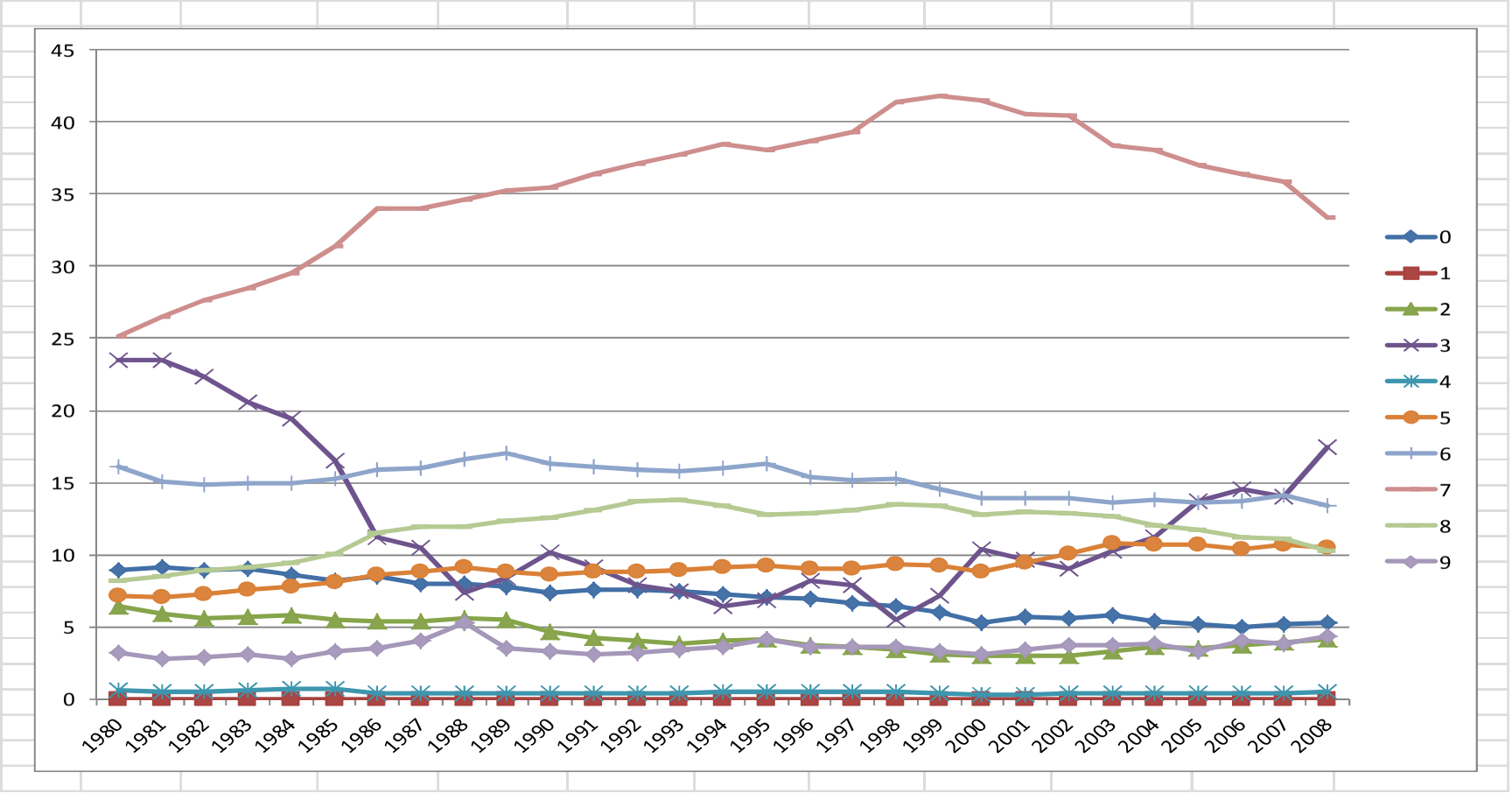
TABLE A5.3 WORLD IMPORT CATEGORY CORRELATION RESULTS AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008

World	Correlation Analysis							5&6&7&8	3+9	6+7+8
	Import Category	n	r	r2	t					
							1980	56.6137329	26.65664401	49.4772069
ImportsSITC	0	21	0.231915	0.0537847	1.0392285		1981	57.1763363	26.36189868	50.1325294
	1	21	-0.602763	0.3633229	-3.292786		1982	58.7045123	25.29017005	51.4224435
	3	21	0.824342	0.6795399	6.3474208		1983	60.1811519	23.65354872	52.6115821
	4	21	0.227572	0.051789	1.0186923		1984	61.7056288	22.15874768	53.9035568
	5	21	-0.628623	0.3951663	-3.523293		1985	64.7385272	19.92125718	56.641444
	6	21	-0.583841	0.3408703	-3.134628		1986	69.9218374	14.72340694	61.3508758
	7	21	-0.50942	0.2595083	-2.580431		1987	70.8014831	14.44199746	61.979375
	8	21	-0.707952	0.5011961	-4.369339		1988	72.352114	12.69479301	63.2720996
	9	21	-0.508309	0.2583781	-2.572844		1989	73.3486248	11.90465392	64.5685388
	3+9	21	0.810895	0.6575511	6.0400932		1990	72.9479206	13.43168743	64.3761697
	5+6+7+8	21	-0.672294	0.4519786	-3.958558		1991	74.3471811	12.23576771	65.5801662
	6+7+8	21	-0.670197	0.4491644	-3.936121		1992	75.6145509	11.10284194	66.8002599
	2	21	0.223081	0.0497651	0.9975248		1993	76.2761739	10.87874739	67.3204068
							1994	77.0896253	9.958005521	67.9465692
							1995	76.3494413	10.93728948	67.1431962
							1996	75.8689202	11.82485864	66.8714625
							1997	76.6652043	11.51992107	67.6506877
							1998	79.4582299	9.12294977	70.1384814
							1999	79.0121739	10.41857218	69.7610619
							2000	76.9918006	13.51129421	68.1501912
							2001	77.025504	13.06990021	67.5355023
							2002	77.31693	12.74483591	67.2692486
							2003	75.4820332	14.05979609	64.7069764
							2004	74.67102	15.06429572	63.9612806
							2005	73.0800534	16.9954329	62.364777
							2006	71.6615968	18.58377827	61.2811377
							2007	71.7954406	17.8863741	61.122915
							2008	67.5221269	21.7929479	56.9964497

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

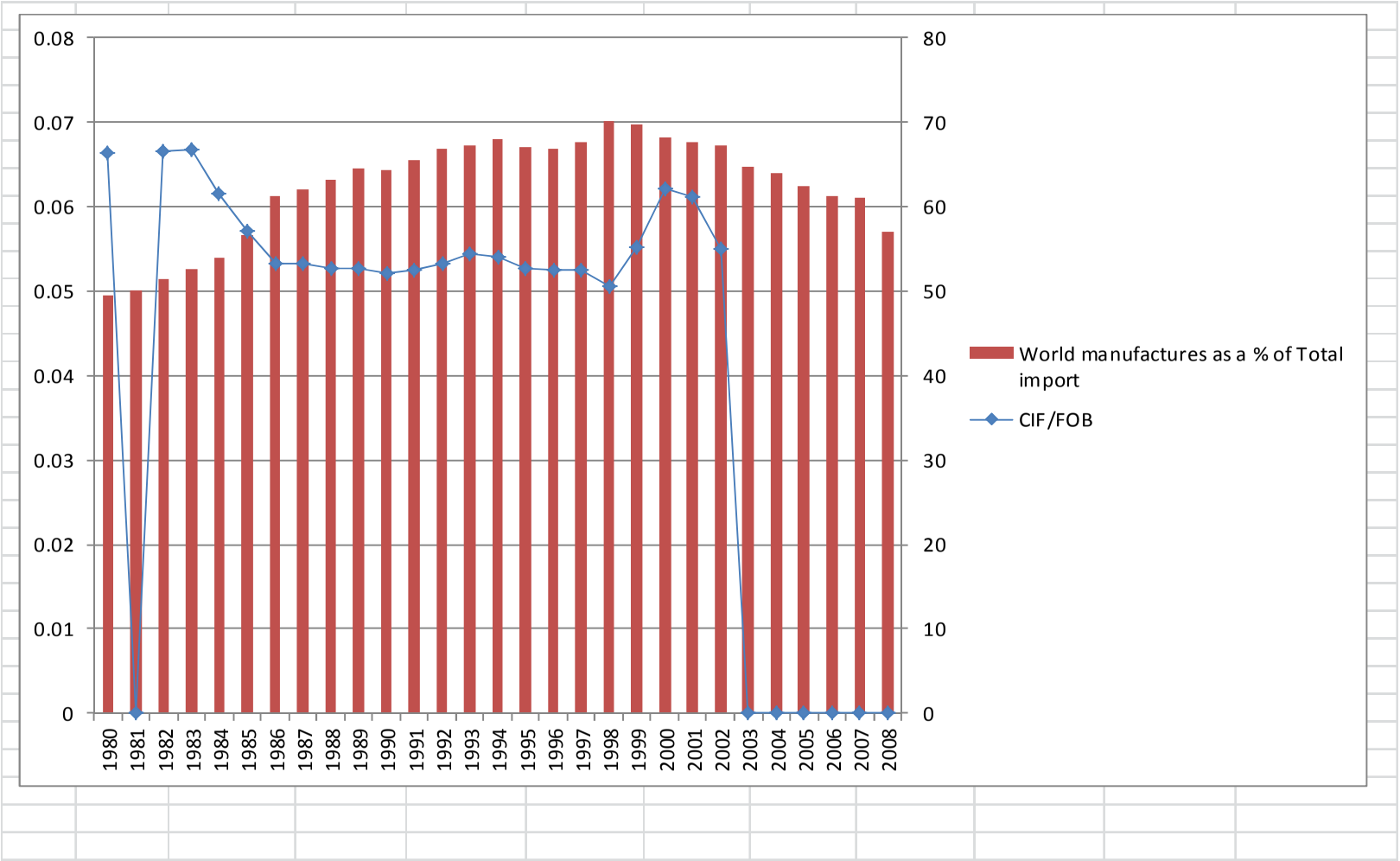
FIGURE A5.1 WORLD SITC IMPORTS CATEGORIES AS A PERCENTAGE OF TOTAL IMPORTS, 1980-2008



Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

FIGURE A5.2 **WORLD CIF/FOB RATIO AND MANUFACTURES AS A PERCENTAGE OF TOTAL IMPORT FROM 1980 to 2008**



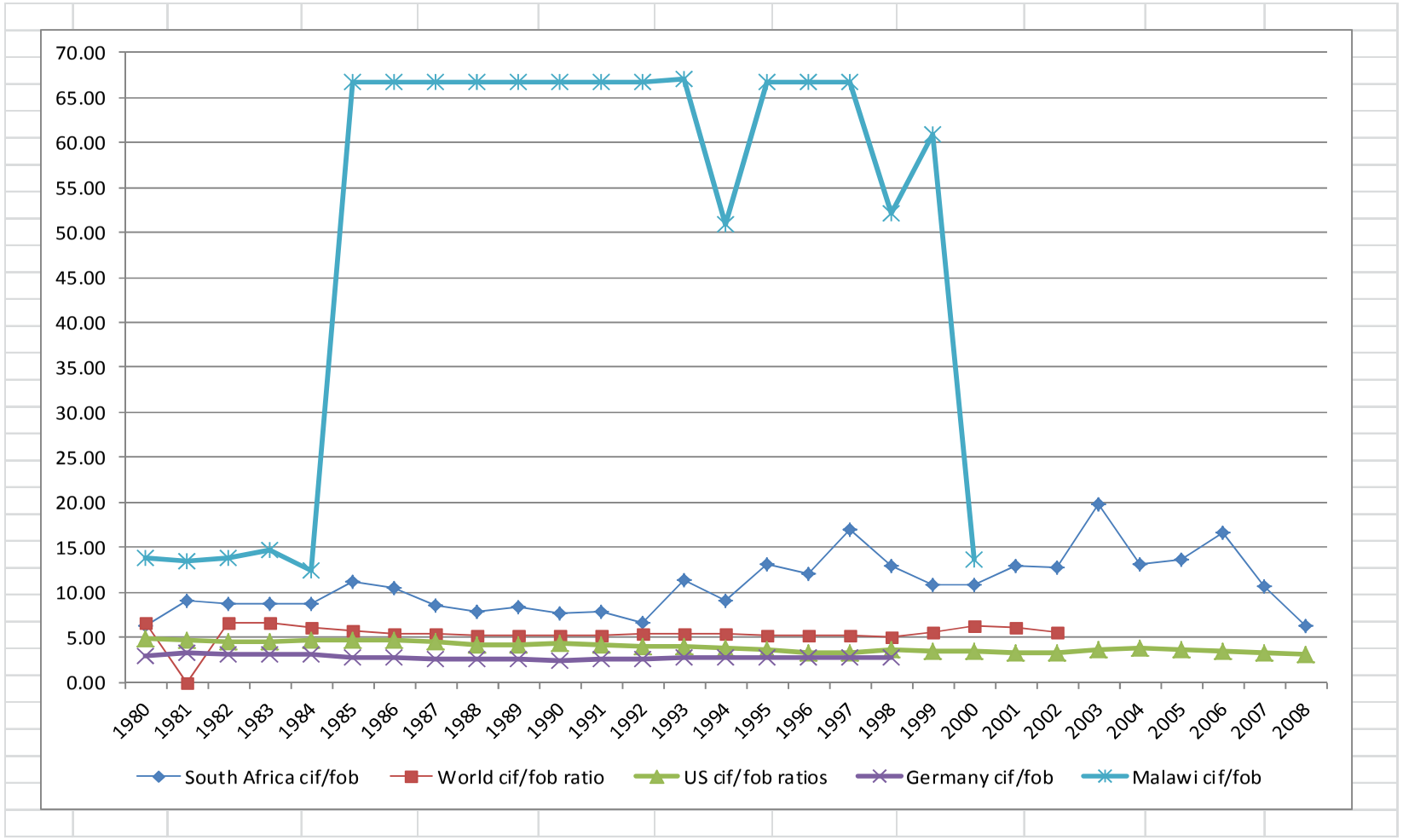
Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A6.1 USA, GERMANY, SOUTH AFRICA, MALAWI AND THE WORLD CIF/FOB RATIOS FOR THE PERIOD 1980 TO 2008

	Import cif/fob ratios using data from the *International Financial Statistics database*				
	USA	**GERMANY**	**SOUTH AFRICA**	**MALAWI**	**World**
1980	4.78	3.008358	6.27	13.81	6.64
1981	4.74	3.316272	9.11	13.51	0
1982	4.48	3.091677	8.78	13.81	6.65
1983	4.58	3.085767	8.72	14.71	6.67
1984	4.74	3.046878	8.79	12.38	6.15
1985	4.74	2.806162	11.18	66.66	5.72
1986	4.61	2.680273	10.51	66.67	5.33
1987	4.48	2.540727	8.48	66.67	5.33
1988	4.22	2.611929	7.81	66.67	5.27
1989	4.17	2.648988	8.44	66.67	5.27
1990	4.38	2.425421	7.67	66.67	5.22
1991	4.08	2.585748	7.88	66.67	5.24
1992	3.99	2.551574	6.62	66.67	5.33
1993	3.95	2.786999	11.28	67.01	5.44
1994	3.82	2.800038	9.04	50.86	5.40
1995	3.67	2.800008	13.04	66.67	5.27
1996	3.36	2.800063	12.12	66.67	5.25
1997	3.27	2.799984	16.99	66.67	5.24
1998	3.56	2.799963	12.89	52.16	5.06
1999	3.40		10.88	60.91	5.52
2000	3.39		10.86	13.61	6.22
2001	3.35		12.89		6.11
2002	3.34		12.70		5.50
2003	3.65		19.77		
2004	3.80		13.07		
2005	3.68		13.63		
2006	3.46		16.69		
2007	3.24		10.72		
2008	3.13		6.19		

Source: Own construction of imports cif/fob ratios using imports reports from IMF trade data.

FIGURE A6.1 CROSS COMPARISON OF THE UNITED STATES, GERMANY, SOUTH AFRICA, MALAWI AND WORLD IMPORTS CIF/FOB RATIOS



Source: Author's calculation and construction of imports cif/fob ratios and Manufactures imports using data form the World Trade Database, 2008; UN Comtrade, 2008; Chasomeris, 2006 (TIPS, 2005).

TABLE A6.3 CROSS CORRELATION ANALYSIS RESULTS OF ANALYSED COUNTRIES IMPORT CIF/FOB RATIOS AND THEIR SITC AS A PROPORTION OF THEIR TOTAL IMPORTS

Country	USA	Germany	South Africa	South Africa	Malawi
SITC	1980-2008	1980-1998	1980-2008	1995-2008	1980-2000
0	0.925*	0.470**	-0.244	-0.095	0.326***
1	0.757*	0.142	0.439**	-0.123	-0.122
2	0.856*	0.470**	-0.312**	-0.090	-0.578*
3	0.439*	0.773*	0.328**	-0.047	-0.321***
4	0.258***	0.657*	0.336**	0.225	-0.140
5	-0.825*	-0.601*	0.684*	-0.081	0.038
6	0.848*	-0.522**	0.017	0.129	-0.617*
7	-0.445**	-0.652**	0.592*	0.154	0.407**
8	-0.554*	-0.641*	0.653*	0.164	0.186
9	-0.800*	-0.325***	-0.590*	-0.309	0.282

Notes: SITC Codes: 0 - Food and live animals; 1 - Beverages and tobacco; 2 - Crude materials, inedible, except fuels; 3 - Mineral fuels, lubricants and related materials; 4 - Animal and vegetable oils, fats and waxes; 5 - Chemicals and related products; 6 - Manufactured goods classified chiefly by material; 7 - Machinery and transport equipment; 8 - Miscellaneous manufactured articles; 9 - Commodities and transactions not elsewhere classified.

Source: Own construction using SITC imports reports from IMF trade data and SITC Rev 3 data from the World Trade Database in TIPS, 2008.

ETHICAL CLEARANCE APPROVAL

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09 April 2010

Mr A O Ola
P O Box 770
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Dear Mr Ola

PROTOCOL: The Misrepresentation of International Transport Costs
ETHICAL APPROVAL NUMBER: HSS/0171/2010 M: Faculty of Management Studies

In response to your application dated 07 April 2010, Student Number: **204520965** the Humanities & Social Sciences Ethics Committee has considered the abovementioned application and the protocol has been given **FULL APPROVAL.**

PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor Steve Collings (Chair)
HUMANITIES & SOCIAL SCIENCES ETHICS COMMITTEE

SC/sn

cc: Dr. M Chitsomeris (Supervisor)
cc: Ms C Haddon