South Africa's Seaborne Commerce and Global Measurement of Shipping Costs

UNIVERSITY OF
KWAZULU-NATAL

Mihalis Georgiou Chasomeris

Submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy in Economics, in the School of Economics and Finance,
University of KwaZulu-Natal.

September 2006

Acknowledgements

I extend my sincere gratitude to all those who helped me through the process and preparation of this Doctoral Thesis.

My sincere gratitude goes to my supervisors, Professor Merle Holden and Professor Trevor Jones, who meticulously read through the drafts and guided me with valuable criticisms, guidance and support through the various stages of the writing and completion of this thesis. Their combined efforts, knowledge and experience in international trade and maritime transport related issues, have contributed towards the success of this thesis.

The research and writing of this thesis, whilst at times difficult and daunting, has contributed towards my academic development, with which I hope to humbly contribute, through publications, teaching and research, back to society. I extend my thanks to colleagues in the Department of Economics and Finance at the University of KwaZulu-Natal for their support. Special thanks to Professor Bogdan Stefanski for encouraging me and providing the opportunity to publish in the *Africana bulletin* (Chasomeris, 2003c). Likewise, my heartfelt thanks to Professor Geoff Harris for reading this thesis, providing valuable editorial suggestions and encouraging me to submit an earlier version of Chapter Six for publication - it has recently been published in the *Journal of Interdisciplinary Economics* (Chasomeris, 2006). In addition, I am grateful for the support and interest shown by individuals in the freight industry, in particular Steve Pollington (SAECS, Conference Secretary), Mr. Botha (Union Transport International), Mr. R. Skinner (National Ports Authority), Mr. N. Walters (National Ports Authority) and Ms. Annette Swart (Impson Freight) for providing me with both data and valuable industry insights. Many thanks to Professor Willem Naudé (North-West University, Potchefstroom Campus) for showing interest in my study and providing me the opportunity to publish an earlier version of Chapter Five in the *Journal of Development Perspectives* (Chasomeris, 2005b).

My heartfelt thanks to my loving parents, Lyn and George; my brother, Andreas; and grandparents, Margaret and the late John Clark; for their prayers, patience, practical support and encouragement. My gratitude also goes to friends, particularly Melissa Robertson and Claire McGee for their help.

I am learning that economics is the study of scarcity, the continuous confrontation between unlimited wants and limited resources. Concurrently, I am also learning, from experience, that: "The LORD is my shepherd; I shall not want..." (Psalm 23, The Holy Bible ESV, 2001). Likewise, I am frequently reminded of the significance of God's Word:

Do not lay up for yourselves treasures on earth, where moth and rust destroy and where thieves break in and steal, but lay up for yourselves treasures in heaven, where neither moth nor rust destroys and where thieves do not break in and steal. For where your treasure is, there your heart will be also. No one can serve two masters, for either he will hate the one and love the other, or he will be devoted to the one and despise the other. You cannot serve God and money (possessions). But seek first the kingdom of God and his righteousness; and all these things will be added to you.
(Matthew 6:19-21, 24, 33 in The Holy Bible ESV, 2001)

Mihalis G. Chasomeris

ii

Table of Contents   **Page**

CHAPTER ONE

INTRODUCTION

Globalisation is breaking down the barriers that separate nations[1]. Significant reductions in the costs of transportation and communication, together with international liberalisation of trade and services are contributing to the wealth of nations[2]. Economic growth and social development have long been associated with technological improvements and progress made in international trade. Trade liberalisation has lowered import protection provided by tariffs and non-tariff barriers that, in turn, have reduced the anti-export bias and enabled resources to flow towards sectors with a comparative advantage (Cassim and Oyango, 2002:1). Furthermore, the reduction in both tariff and non-tariff barriers means that the effective rate of protection provided by transport costs is, for many countries, considerably higher than that provided by tariffs[3]. This implies that transport costs have become, by default, an increasingly important determinant of trade performance.

Despite the importance of transport costs and their ability to impede international trade, direct measures of transport costs are difficult to obtain (Micco and Perez, 2001; OECD,

---

[1] Stiglitz (2002: 9) defines globalisation as "the closer integration of the countries and the peoples of the world which has been brought about by the enormous reduction of costs of transportation and communication, and the breaking down of artificial barriers to the flow of goods, services, capital, knowledge, and (to a lesser extent) people across borders."

[2] Stiglitz (2002: 4), the Nobel Prize winner for Economics in 2001, explains: "Opening up to international trade has helped many countries grow far more quickly than they would otherwise have done. Export led growth was the centrepiece of the industrial policy that enriched much of Asia and left millions of people there far better off. Because of globalisation many people in the world now live longer than before and their standard of living is far better."

[3] This thesis uses the terms transport costs and shipping costs interchangeably. The thesis focuses solely on the costs of freight transportation. Jansson and Shneerson (1978: 569) define effective protection of transport costs as "the percentage increase in value added per unit in an economic activity made possible by transport charges relative to the situation in the absence of transport charges." Walters II (1970: 1013) explains that the extension of the theory of effective protection to include transport costs is straightforward: "The existence of freight costs causes divergence between domestic and foreign prices hence a difference in domestic value-added from what it would be in a world without transport costs." Micco and Perez (2001) show that in the cases of Chile and Ecuador, *ad valorem* transport costs are more than twenty times greater than *ad valorem* tariffs.

2002; Hummels and Lugovskyy, 2003)[4]. In the absence of direct measures, researchers have used an indirect measure of international transportation costs – a country's import cif/fob ratio[5]. In principle, the measure compares the "cost, insurance and freight" (cif) value with the "free on board" (fob) value of imports. The country import ratio (cif/fob) – 1 provides a measure of *ad valorem* shipping costs (see Section 2.1).

This thesis investigates developments in South Africa's seaborne commerce and global use of country cif/fob ratios as measures of shipping costs. This thesis has five important aims. First, it aims to contribute towards a better understanding of country cif/fob ratios and some consequences of their use worldwide as a measure (proxy) for direct international transport costs. Second, it investigates South Africa's port performance through the evolution in port policy, pricing and cargo growth. Third, it presents an overview and assessment of South Africa's shipping costs as revealed through the broad trends in the country's import cif/fob ratios and Europe-South Africa liner shipping freight rates. Fourth, it examines the question of whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures[6]. Finally, it initiates an investigation into South Africa's maritime policy and the transformation of the national shipping industry. It provides a constructive critique of the long-term vision of the Maritime Charter on Black Economic Empowerment.

---

[4] "Direct transport costs include freight charges and insurance which is customarily added to the freight charge" (Anderson and van Wincoop, 2004: 703). However, Radelet and Sachs (1998: 3) report that "surprisingly, more direct shipping cost data – e.g. from transport companies – is generally proprietary information and therefore hard to assemble for a large number of countries on a systematic basis."

[5] A country's import cif/fob ratio has received various names in the literature, for instance: freight factor, shipping costs (Radelet and Sachs, 1998); *ad valorem* transport costs, *ad valorem* shipping costs and *ad valorem* freight rate (Yeats, 1977); a country's average freight rate (UNCTAD, 2003b); CIF-FOB band and transport cost *rate* (Naudé, 1999a;1999b); c.i.f.-f.o.b. transport-cost factor and average c.i.f.-f.o.b. factor (Baier and Bergstrand, 2001).

[6] The phrasing of this specific research question for South Africa derives, in part, from the broader research question asked by Hummels and Lugovskyy (2003: 2). "The open question is whether the matched partner technique [cif/fob ratio] results in usable data, that is, a measure of shipping costs that approximates actual costs to a degree that researchers could be comfortable substituting them for direct measures. Were the matched partner cif/fob ratios usable in this sense, it would be a great boon for trade researchers and plug an important hole in the data record" (Hummels and Lugovskyy, 2003: 2).

This thesis is structured as follows. Chapter One provides an introduction and overview of the research questions and aims of this thesis. Chapter Two is a topical literature review of studies on international transport costs. The theoretical context points out that the inclusion of international transportation costs in empirical research is, surprisingly, relatively new. Furthermore, there are relatively few studies on international transport costs and hardly any usable sources of *direct* shipping cost data. The chapter defines "shipping costs" (the cif/fob ratio) and establishes the worldwide magnitudes of these shipping costs. The subsequent research on the definition, compilation and composition of country cif/fob ratios contributes towards a better understanding of their use as a measure of shipping costs. The chapter examines empirical determinants of these shipping costs and reviews the literature on the impact of international transport costs on trade and economic growth[7]. These studies on international transportation costs collectively suggest that a worldwide review of developments in shipping costs could commence with a measurement and analysis of country cif/fob ratios.

Mindful of the literature reviewed in Chapter Two, Chapter Three then begins the empirical section of this thesis. This chapter aims to contribute towards a better understanding of country cif/fob ratios and to assess their global use as a measure (proxy) for direct international transport costs. The case studies comparing a shipping cost perspective with that of a trade composition perspective on cif/fob ratios, for both developed and developing countries, each add additional insights into the usefulness of country cif/fob ratios as measures of transportation costs. This chapter explores the relationships between a country's evolving composition of imports and their respective cif/fob ratios. In particular, the chapter aims to show how the broad trends in a country's composition of imports may have a substantial and significant effect on that country's import cif/fob ratios[8]. The new insights and findings on country cif/fob ratios developed

---

[7] Radelet and Sachs (1998: 1) note: "Although interest in transport costs has recently risen in the theory of international trade, there continues to be almost no empirical work on the role of shipping costs in patterns of trade and development."

[8] In order not to confuse statistical significance with economic significance, Goldberger (1991, in Gujarati, 1995: 134) notes that it "may be a good idea to reserve the term 'significance' for the statistical concept, adopting 'substantial' for the economic concept." Furthermore, "a statistical relationship, however strong and however suggestive, can never establish causal connection: our ideas of causation must come from outside statistics, ultimately from some theory or other" (Kendall and Stuart, 1961:279 in Gujarati, 1995:

through this thesis demand a re-assessment of seminal studies that have measured determinants of shipping costs (as proxied by country cif/fob ratios). Accordingly, this chapter reassesses the impact of transport costs on trade and economic growth. Despite the new insights on country cif/fob ratios, the absence of direct measures of shipping costs limits the chapter's ability to answer the research question on whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can substitute them for direct measures with confidence.

Insights on developments in South Africa's seaborne commerce and *direct* shipping costs are provided in Chapter Four, which investigates South Africa's port performance through the evolution in port policy, pricing and cargo growth. Despite impressive growth in South Africa's international sea-trade, import-substitution and protectionist trade policies associated with more than forty years of apartheid have left in their wake a socio-economic and political environment that has permeated South African port policy and pricing[9]. Chapter Four probes beneath the veil of the aggregated trade statistics to reveal the role and evolution of South Africa's port policy and pricing.

Direct measures of transport cost are difficult to obtain – but not impossible. Chapter Five evaluates South Africa's shipping costs as revealed through the broad trends in the country's import cif/fob ratios and Europe-South Africa liner shipping freight rates[10]. Chapter Five provides evidence 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. In stark contrast to the rising shipping cost perspectives shaped by South Africa's rising cif/fob ratios, this chapter illustrates a marked decline in both *ad valorem* tariffs and real liner freight rates (direct shipping costs) for post-sanctions South Africa. Accordingly, researchers need to be sceptical of substituting

---

20). Section 2.1.2 and Chasomeris (2004) use economic theory to show the cause-and-effect relationship between a country's import composition and cif/fob ratio.

[9] Cassel (1928: 511, emphasis added) maintained: "Economic theory is in its essence a theory of price. Its main function is to explain the *whole process* by which prices are fixed at their actual heights."

[10] "A liner service is a fleet of ships, with a common ownership or management, which provide a fixed service, at regular intervals, between named ports, and offers transport to any goods in the catchment area served by those ports and ready for transit by their sailing dates" (Stopford, 1997: 343). The liner services have "a fixed itinerary, inclusion in a regular service, and the obligation to accept cargo from all comers and to sail, whether filled or not, on the date fixed by a published schedule" (Stopford, 1997: 343).

4

country cif/fob ratios for more direct measures of international transport costs. As a result, studies that have used cif/fob ratios to analyse a country's or region's transportation costs may have estimated the levels and trends in international transport costs incorrectly and consequently may also misinterpret their impact on trade.

More than 95 per cent of South Africa's trade volume is seaborne. Although South Africa is clearly an important sea-trading nation, it is not a significant shipowning or ship operating nation. Despite a decade of democracy, and the improved Ship Registration Act of 1998, tonnage on the South African register has continued to decline. South Africa's new Maritime Charter of December 2003 has the long-term vision "to develop South Africa to become one of the world's top 35 maritime nations by the year 2014". Currently, South Africa adopts a strongly market-driven shipping policy. In stark contrast, the Charter calls for "a clear strategy/plan for the majority of South African cargo, going through South African ports to be carried on South African ships". Chapter Six initiates an investigation into South Africa's maritime policy and the transformation of the national shipping industry. It provides a constructive critique of the long-term vision of the Maritime Charter on Black Economic Empowerment. This Chapter argues that although South Africa has a large volume of trade, it does not necessarily have a competitive advantage in the shipment of these goods. Thus policies to promote or protect the national shipping industry might not be in the broader economic interests of South Africa. Conclusions are drawn which may provide a way forward to ensure the successful and sustainable transformation of South Africa's shipping industry.

Finally, Chapter Seven presents the main conclusions of the research that shaped this thesis. This research should prove useful and effective in promoting a better understanding of developments in South Africa's seaborne commerce and global use of country cif/fob ratios as measures of shipping costs in future research.

CHAPTER TWO

INTERNATIONAL TRANSPORT COSTS

Transport costs are significant in their ability to impede international trade[11]. Trade liberalisation has reduced both tariff and non-tariff barriers which means that the effective rate of protection provided by transport costs is, for many countries, considerably higher than that provided by tariffs (see Micco and Perez, 2001 and appendix A on global declines in trade barriers). This implies that transport costs have become an increasingly important determinant of trade performance. This thesis researches the question of whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures. This chapter presents a topical and thematic review of theoretical and empirical studies on international transport costs with a particular focus on studies that use country cif/fob ratios as their measure (proxy) for shipping costs. Section 2.1 provides a theoretical context and explores the definition, source, composition and nature of "Shipping Costs" (that is, country cif/fob ratios) before Section 2.2 examines empirical evidence on shipping costs worldwide. Section 2.3 reviews the empirical determinants of shipping costs. Section 2.4 reviews studies that have aimed to compare the relative magnitudes of *ad valorem* tariffs with *ad valorem* transportation costs. Section 2.5 investigates the role of shipping costs and their effect on international trade and economic growth. Section 2.6 draws together some concluding remarks on international transport costs.

---

[11] This fact is well documented and is a recurring theme that is supported in this thesis (also see for instance Stopford, 1997; Fink, Mattoo, and Neagu, 2002; Limão and Venables, 2000; Micco and Perez, 2001). "The notion of transport costs may be broadened to include all costs of transfer, mainly freight, but also insurance, handling, freight-forwarders' commissions, etc., and even tariffs" (Kindleberger, 1968: 90). Transport costs are typically the most significant with ocean and port costs estimated to account for more than eighty per cent of the total international transport cost for general cargo (Department of Transport, 1998), and is always the inescapable one (Kindleberger, 1968: 90). This thesis will focus on these specific components of international maritime transport costs rather than the broader term of transfer costs.

2.1 A THEORETICAL CONTEXT

Is the world getting smaller? "It is a commonplace of international economics that the world is getting smaller. Indeed, it is the commonplace of international economics" (Frankel et al., 1997: 35). Trade liberalisation has reduced customs tariffs to such low levels where in many cases any additional reductions would no longer yield significant benefits (Sanchez et al., 2003: 200)[12]. At the same time, technological advances with improvements in transportation services and communications have lowered the costs of transport. Such developments that have lowered the barriers of time, distance and costs present an "impression of a 'shrinking world'" (Haralambides and Veenstra, 2002: 786)[13].

Until recently, most international trade economists ignored distance, transportation costs and other geographical factors as determinants of trade (Frankel et al., 1997; Krugman, 1996). Accordingly, most trade models "treated countries as disembodied entities that lacked a physical location in geographical space" (Frankel et al., 1997: 37). "How then could so many earlier studies have omitted these obvious geographical factors? The simplest answer is that earlier research did not try to explain quantities or composition of bilateral trade. Its goal, rather, was to explain the quantities and composition of the *total* trade undertaken by a country, regardless of which trading partner accounted for it" (Frankel et al., 1997: 37).

---

[12] Sanchez et al. (2003: 200) suggest this as a reason for the recently published studies that analyse the "impact of transport costs on trade patterns and global production."

[13] "Between 1920 and 1990 the average ocean freight and port charges per short ton of US import and export cargo fell from $95 to $29 (in 1990 dollars). Between 1930 and 1990, average air transport revenue per passenger mile fell from $0.68 to $0.11. Over this same period, the cost of a three minute telephone call from New York to London fell from $244.65 to $3.32. Where shipping costs were once a large fraction of the eventual price of an item, by 1988 the $200 price of a videocassette recorder imported to the United States from Japan included less than 1 percent allocated to ocean transportation" (Hufbauer, 1991: 26 in Frankel et al., 1997: 35).

Paul Krugman (1991; 1995; 1996; 1998) discusses the apparent inability of earlier research to deal effectively with geographical dimensions of trade and disinterest in explaining bilateral trade. In essence, Krugman explains that: "until recently, the standard theories of trade were based on the assumptions of perfect competition and constant returns to scale. It is difficult to analyse many geographical influences with such models. The assumptions of imperfect competition and increasing returns to scale are needed for modelling questions such as where industries choose to locate.... international economists did not investigate the important questions of geography because they lacked the analytical tools" (Frankel et al., 1997: 38). Nevertheless, transportation costs pose important trade barriers that deserve theoretical and empirical investigation.

Transport involves moving of goods or people from one place to another and thus reduces the natural barriers of distance. To avoid any needless complexity, the discussion for this section broadly defines the concept of transport costs as the cost divergence between domestic and foreign prices caused by transporting a product. Such a cost divergence explains why many goods and services are not traded internationally; they are referred to as non-traded goods and services. Changes in transport costs may result in previously non-traded goods and services becoming traded goods and services. Furthermore, low transportation costs may allow less expensive foreign goods to substitute for domestic goods. Conversely, high transportation costs may offer a degree of protection to local producers, whilst making foreign goods relatively more expensive than domestic goods (McConville, 1999). "In either case, transport costs, like all costs of production, are paid by the final consumer" (McConville, 1999: 174).

Many introductory texts on the study of international trade use partial equilibrium analysis to consider the theoretical impact of transport costs on international trade (see for instance, Kindleberger, 1968: 88-93; McConville, 1999: 192-194; Salvatore, 2001: 185). Partial equilibrium analysis shows 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. A limiting assumption made in the partial equilibrium model is that the importing country and the exporting country share the total costs of transport equally.

This raises the question as to who bears the transport costs: the sellers, that is shippers or suppliers, or the buyers or purchasers? The answer is dependent upon the price elasticities of supply and demand. Price elasticity is centrally important to who bears the costs of transport (see McConville, 1999: 194-198). In short, the elasticities of supply and demand are the ratio of proportionate changes in the quantities supplied or demanded in relation to a small proportionate change in price. In an extreme case where the supply curve is perfectly inelastic (that is vertical), then the quantity supplied, at least in the short run, is fixed. Thus, the introduction of transport costs would have no effect on price. An attempt by the producer to increase the price and force the purchaser to pay would fail. Thus, the shipper or the supplier will bear all the transport costs. If, on the other hand, demand is perfectly inelastic, an increase in price will have no effect on the quantity demanded. The transport costs will be included in the purchasing price. The central point here is that the whole of the transport costs are borne by the purchaser of the product when demand is perfectly inelastic and supply is elastic or relatively inelastic. In general, the proportion of the transport costs borne by the supplier or the shipper and the purchaser will be dependent upon the price elasticity of demand and supply[14].

In certain sectors, transport costs can play a vital role in international trade. If the product price, inclusive of transport costs, is lower than the price of domestically produced goods, then trade will take place. Any modification in the product's price or transport costs could significantly change this situation (McConville, 1999: 187). The central point here is that the delivery price, inclusive of "cost insurance and freight" is less than the foreign domestic price of the good. A change in transport costs, within a free trade area, may affect the level of trade in three ways. Firstly, transport costs may

---

[14] The view was generally accepted that, whoever pays initially, the ultimate burden of freight rates (transport costs) falls disproportionately on the developing countries for both exports and imports (UNCTAD, 1969 and Rajwar, 1971 in Laing, 1977: 262). Laing (1977: 263) argues that the above view is oversimplified, mainly because it does not follow up the connection between freight rates and the market prices on the one hand, and volumes sold in the commodity market on the other. To summarise, Laing (1977: 267) explains that the "effect on price is attributable not to the absolute level of the elasticity of supply of, say the developing country's reduction in freight rates, nor to his share of the market, but to the level of his elasticity of supply relative to that of his competitors' elasticity of supply." Thus Laing (1977: 274) concludes that developing countries do not necessarily bear the burden of freight rates: "no such generalisation seems justifiable: the critical factor determining the incidence is the elasticity of supply of the country changing its freight rate relative to those of competitors, which could take any value."

add to the domestic price of imported goods. Secondly, transport costs may reduce the level of imports by encouraging increased domestic production. Thirdly, transport costs may cause consumers to reduce their consumption of a product because of the increase in its price (Salvatore, 2001; Kindleberger 1968). Indeed, if the costs of transport happen to be so high as to eliminate trade altogether, then all production will be supplied by domestic producers (McConville, 1999: 189).

Clearly, the existence of transport costs causes discrepancies between domestic and foreign prices. Frequently referred to as a trade-resistant factor, the effects of transport costs are very similar to those of tariffs or other impediments (McConville, 1999: 186, 187). Kindleberger (1968: 92) states that "a reduction in transport costs relative to production costs acts as a reduction in tariffs, expanding trade relative to output in already traded goods, and bringing goods into international commerce which had previously been home goods." Similarly, consider that when tariffs or transportation costs fall for a competitive market, the domestic price falls, encouraging consumption and discouraging domestic production. Imports rise, being merely the difference between consumption and domestic production. Simultaneously, production of exports rises and consumption of exports falls; thus exports and hence total trade also rise (adapted from Rose, 1991: 419)[15]. Thus, high international transport costs serve, on the one hand, to protect domestic producers from foreign competition, and yet on the other hand, they simultaneously provide a significant anti-export bias that reduces international competitiveness. Evidently, a reduction in the costs of transport may not only facilitate but also directly stimulate trade growth (see Section 2.5). Section 2.1.1 provides a definition of "shipping costs" as defined by a country's cif/fob ratio.

---

[15] "This analysis assumes that the income effect does not overwhelm the substitution effect" (Rose, 1991: 419).

2.1.1 SHIPPING COSTS: THE DEFINITION AND SOURCE OF COUNTRY CIF/FOB RATIOS

In the absence of direct measures, researchers have used an indirect measure of international transportation costs – a country's import cif/fob ratio[16]. Radelet and Sachs (1998: 3) state: "the FOB price measures the cost of an imported item at the point of shipment by the exporter, specifically as it is loaded on to a carrier for transport.... The CIF price measures the cost of the imported item at the point of entry into the importing country, inclusive of the costs of transport, including insurance, handling, and shipping costs, but not including customs charges." Similarly, Hummels (1999b: 26) explains that "exporting countries report trade flows exclusive of freight and insurance (fob), and importing countries report flows inclusive of freight and insurance (cif). Comparing the valuation of the same aggregate flow reported by both the importer and exporter yields a difference equal to transport costs." In principle, then, the measure compares the "cost, insurance and freight" (cif) value with the "free on board" (fob) value of imports; the difference constitutes a measure of transportation costs. The country import ratio (cif/fob)-1 provides a measure of *ad valorem* shipping costs (Yeats, 1977: 459; Radelet and Sachs, 1998: 4)[17]. Among others, Radelet and Sachs (1998), Naudé (1999a; 1999b) and Limão and Venables (1999; 2000; 2001) use this (cif/fob)-1 ratio as their basic measure of shipping costs. This thesis uses the cif/fob ratio both as a true ratio (1.12) and as a percentage (12 per cent *ad valorem*).

---

[16] A country's import cif/fob ratio has received various names in the literature, 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, 2003b:13), CIF-FOB band on imports and transport cost *rate* (Naudé, 1999a;1999b), c.i.f.-f.o.b. transport-cost factor and average c.i.f.-f.o.b. factor (Baier and Bergstrand, 2001).

[17] Yeats (1977) uses a similar *ad valorem* shipping cost measure. "The f.a.s. [free along side] value represents the transaction value of imports at the foreign port of exportation and is based on the purchase price plus all charges incurred in placing merchandise alongside the vessel at the port of exportation. The c.i.f. value measures the value of imports at the first port of entry in the United States and includes all freight, insurance, and other charges (excluding import duties) incurred in bringing the merchandise from the country of exportation and placing it alongside the vessel at the port of entry. Furthermore, (c.i.f./f.a.s.) - 1 provides the '*ad valorem* freight rate'" (Yeats, 1977: 459).

Probing further into the definition and use of country cif/fob ratios, this study uncovered that there is more than one definition of the concepts cif and fob. Charged with publishing the official rules for the interpretation of trade terms, the International Chamber of Commerce (1999) has defined the fob and cif terms as follows:

"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[18]. 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).

Thus according to the above definition, both the cif and fob terms of shipment should only be used for sea and inland waterway transport. How then has it been possible for researchers like Limão and Venables (1999; 2000; 2001) to use a country's cif/fob ratio to estimate the impact of a country's infrastructure, and particularly landlocked country infrastructure, on transport costs and trade flows? An answer to this question is essentially that there is a significant difference in the use and definition of the terms of shipment cif and fob, as compared to the imports cif and imports fob used by the international trade statistics. The differences in the definitions became clearer after having studied and compared the various views presented by the International Chamber of Commerce (1999) Radelet and Sachs (1998) and Hummels (1999b). For instance,

---

[18] Note however, that " in cif the seller also has to procure marine insurance against the buyer's risk of loss of or damage to the goods during the carriage. Consequently, the seller contracts for insurance and pays the insurance premium. The buyer should note that under the cif term the seller is required to obtain insurance only on minimum cover. Should the buyer wish to have the protection of greater cover, he would either need to agree as much expressly with the seller or to make his own extra insurance arrangements" (International Chamber of Commerce, 1999: 65).

Radelet and Sachs (1998: 3) use a trade statistic definition and understanding of the fob and cif measures that are significantly different from the official Incoterms (International Chamber of Commerce, 1999) definition and use of these terms. In particular, the Incoterms definition specifically states that both cif and fob terms of shipment are to be used only for sea and inland waterway transport. In contrast the definition of cif and fob in the international trade statistics (for instance the *International Financial Statistics*), is much broader, and includes costs for maritime and other modes of transport[19]. Furthermore, inconsistencies in standard textbook definitions of import cif and import fob are exacerbating the potential for misuse and misunderstandings of country cif/fob ratios. On the one hand, it appears that textbooks on international trade (see Salvatore, 2001) define and briefly discuss the concepts of imports cif, imports fob and a country's cif/fob ratio, using the international trade definitions from the IMF. On the other hand, maritime transport textbooks (see Stopford, 1997; Alderton, 1995; McConville, 1999) define and discuss these same concepts using the official Incoterms (International Chamber of Commerce, 1999).

Hummels and Lugovskyy (2003: 5) explain "there are actually three IMF sources that report cif/fob ratios: the DOTS [Direction of Trade Statistics] data tapes contain bilateral data aggregated over all commodities, while DOTS yearbooks and the *International Financial Statistics* (IFS) contain trade data that are aggregated over all commodities and partners for a particular importer. All report trade flows using as a primary source the UN's *COMTRADE* database, with COMTRADE supplemented in some cases by national data sources." "While the measurement of transportation costs are not the primary purpose of these publications, DOTS and IFS are sometimes used to this end" (Hummels, 1999b: 26)[20]. This thesis investigates country import cif/fob ratios using data from the *International Financial Statistics* (IFS).

---

[19] This finding was important for me and may be of assistance to other researchers. A difficulty and potential challenge to other researchers will be to distinguish the international trade statistics use of cif and fob from the traditional Incoterms – maritime trade use – of cif and fob. In other words, although many researchers, in various fields may be using the concepts cif and fob, they may not all have the same definition and therefore understanding of these concepts. Consequently, there is a potential for misunderstanding and misuse of the ratio.

[20] Section 2.3 discusses several papers that have used the IMF cif/fob data in analysing the role of transport costs in world trade. Among others, Radelet and Sachs (1998), Naudé (1999a; 1999b) and Limão and

One advantage of the cif/fob measure is that there are data available for many countries and this aids in international comparisons[21]. Because of their availability and coverage, several authors use IMF cif/fob ratios to assess the effect of transportation costs on trade[22]. Typically, these authors assume that "a decline in such shipping costs [that is, the cif/fob ratios] can be expected to lead to more international trade, all things remaining equal" (Rose, 1991: 421). In other words, a rise in a country's cif/fob ratios is supposed to measure (indicate) a rise in that country's (direct) international transport costs that can be expected to lead to a reduction in international trade. Even UNCTAD's *Review of Maritime Transport*, the principal annual publication on international transportation and trade issues, uses IMF cif/fob ratios to monitor and report *ad valorem* shipping costs on a worldwide basis (see Section 2.2).

The data, however, have several drawbacks, as summarised below by Limão and Venables (2000: 7)[23].

> The first is measurement error; the cif/fob ratio is calculated for those countries that report the total value of imports at cif and fob values, both of which involve some measurement error. The second concern is that the measure aggregates over all commodities imported, so it is biased if high-transport cost countries systematically import lower-transport cost goods. This would be particularly important if the study were analysing exports, which tend to be concentrated in a few specific goods. It is less so for imports that are generally more diversified and vary less in composition across countries. Finally, the measure aggregates over the different sources of supply, so for each importer there is a single cif/fob measure, not a full set of cif/fob measures for imports from each supplying country.

Venables (1999; 2000; 2001). The *Review of Maritime Transport* perhaps the most comprehensive source of data on international transport cites these data as a primary (and only systematic) source for *ad valorem* shipping costs (Hummels, 1999b: 26).

[21] "Forty one of the largest countries are available in every year of the data [that is, IMF DOTS data], and well over one hundred countries are represented in most of the available time series" (Hummels and Lugovskyy, 2003: 2).

[22] For instance, Radelet and Sachs (1998), Naudé (1999a; 1999b) and, Limão and Venables (1999, 2000, 2001).

[23] Radelet and Sachs (1998), Hummels and Lugovskyy (2003), and Hummels (1999b) mention these drawbacks of country cif/fob ratios. Further limitations and errors in country cif/fob ratios are analysed in Section 2.1.

Nonetheless, Radelet and Sachs (1998: 3) maintain that although subject to shortcomings, "these data are relatively consistent and complete, and provide a good starting point for examining the general costs of international shipping for almost all countries in the world." Accordingly, Section 2.2 and Chapter Three will investigate empirical evidence on these shipping costs worldwide. The next section investigates the theoretical composition and nature of IMF country (import) cif/fob ratios.

2.1.2. THEORETICAL COMPOSITION AND NATURE OF COUNTRY CIF/FOB RATIOS

The United Nations, World Bank, African Development Bank and many researchers worldwide, use country import cif/fob ratios as a measure (proxy) of country's and groups of countries' international transport costs. In using the ratio, many researchers have had to essentially assume that a country's import composition is constant (or reasonably stable), so that the ratio "reveals true differences in shipping costs rather than commodity mix effects" (Radelet and Sachs, 1998: 3, and see Chapter Three for a critique of these assumptions). Furthermore, using IMFs *International Financial Statistics* imports data to calculate a country's import cif/fob ratios results in a composite and aggregated ratio that is often riddled with errors (see Section 2.1.3). Having reviewed the empirical literature and the media use of the cif/fob ratio, this study has uncovered a great deal of misunderstanding and consequently misuse and reporting of the ratios (often used and reported as direct measures of transportation costs). There are a number of reasons for this, not least of which are the misunderstandings generated between the maritime (Incoterms) definition and international trade definition of the concepts cif and fob, as explained above. In addition to misunderstandings generated by conflicting definitions, there are various potential sources for errors (exposed in section 2.1.3). The complexity of the ratio's composite and aggregated nature presents a further challenge to its comfortable (reliable) use as a measure of transportation costs.

Towards a better understanding of the nature of import cif/fob ratios consider this simple example at a highly disaggregated import level, that is, import categories of homogeneous goods. A rise in the cif/fob ratio of these homogeneous imports may result from three alternative scenarios. First, the rise in the ratio could result from a fall in the import (fob) value of the commodity, *ceteris paribus*. Second, the rise in the ratio may be due to an increase in the costs to transport the homogeneous good, *ceteris paribus*. A third reason for the rise may result from both changes in the transportation costs and changes in the homogeneous import (fob) value. Whatever the cause, a rise in the cif/fob ratio is a rise in *ad valorem* transportation costs for these homogeneous imports. Unfortunately, misunderstanding may emerge for instance, when there is a rise in the ratio, and those who understand the ratios state "there is a rise in transport costs". While increases in the cif/fob ratios do indicate a rise in transportation costs, these costs are *ad valorem* costs and not *direct* costs of shipping[24]. Indeed, it is possible, in theory, that *ad valorem* shipping costs may rise despite a decline in direct shipping costs (Chapter Five presents empirical evidence of this phenomenon for South Africa).

The potential for misunderstanding and misuse of the ratio is even greater and more complex for country import cif/fob ratios that are composite, heterogeneous and aggregated. At a country cif/fob ratio level of aggregation, the above three reasons that may cause a rise in the ratio remain applicable. However, as a country's cif/fob ratio is both an aggregated and heterogeneous measure, there is a fourth potential reason for the rise in the ratio – the country's changing composition of imports. Radelet and Sachs (1998: 3) explain that shipping costs (as proxied by the cif/fob ratio) "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." As Radelet and Sachs (1998: 3) explain:

> Very high value added commodities per unit weight (e.g. precious metals) will have very low cif/fob markups. The costs of shipping agricultural exports, similarly, will differ depending on whether they are perishable or dry bulk and the extent to which

---

[24] "Direct transport costs include freight charges and insurance which is customarily added to the freight charge" (Anderson and van Wincoop, 2004: 703).

they have been processed (e.g., groundnuts vs. groundnut oil). Metals and minerals will also differ, depending on the specific commodity, for example whether the cargo is liquid (e.g., LNG, petroleum) or solid, etc. Thus, countries will 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.

Despite acknowledging that the composition of imports may influence the cif/fob ratios, Radelet and Sachs (1998: 3) continue to state: "We hope that since the import basket of developing countries is more homogeneous than the export mix, the measure of the cif/fob ratio will reveal true differences in shipping costs rather than commodity mix effects." Essentially, what Radelet and Sachs (1998: 3, authors imputed assumption added) are saying is: "We hope [assume]... the cif/fob ratio will reveal true differences in shipping costs rather than commodity mix effects." Consequently, Radelet and Sachs use the cif/fob ratio as a proxy for shipping costs. Likewise other researchers, for instance, Rose (1991), Naudé (1999a; 1999b) and, Limão and Venables (1999; 2000; 2001) have used country cif/fob ratios as their measure (proxy) for shipping costs. Thus, in practice, those researchers who assume that a country's cif/fob ratios "will reveal true differences in shipping costs rather than commodity mix effects" (Radelet and Sachs, 1998: 3), have generally associated a rise in the ratio with an increase in direct transport costs, and a fall in the ratio with a reduction in direct transportation costs (Rose, 1991: 421).

In the absence of direct measures of a country's shipping costs, Chapter Three investigates the relationships that exist between a country's composition of annual imports and annual cif/fob ratios. In essence, the case studies in Chapter Three will show that where the data are reliable, a country's evolving composition of imports has a substantial and significant effect on the measured cif/fob ratios. Thus, those who use country cif/fob ratios must be especially careful and aware that they are using, in essence, an aggregated and trade weighted average ratio where the weightings are, in large part, determined by the composition of imports that are not the same across countries and groups of countries. Furthermore, these trade weightings of the ratios change over time, adding a further element of non-comparability − not only between countries, but also, comparing changes in a particular country's ratios over time. Consequently, many have misunderstood and misused the cif/fob ratio measure. The misuse of the ratio has lead to

17

some interesting, but also probably incorrect results and conclusions that may have influenced policy decisions (see Chapter Three).

Section 2.1.3 investigates some severe quality problems from which the IMF imports cif and imports fob data may suffer and the consequent potential for errors in the IMF cif/fob ratios.

2.1.3. EXPOSING ERRORS IN COUNTRY CIF/FOB RATIOS

This thesis uses the IMF *International Financial Statistics* as the primary source of country cif/fob ratios. This section exposes several severe data quality problems evident in these data and shortcomings to using cif/fob ratios calculated from these IMF data.

Country cif/fob ratios may suffer from measurement error. The calculations of country cif/fob ratios from the IMF imports cif and imports fob data are frequently not indicative of a country's true import cif/fob ratios. In some cases, these cif/fob ratios may be the results of incorrect (unrealistic) IMF staff estimates based on incomplete information. Radelet and Sachs (1998: 3) admit that the cif/fob ratios are not a perfectly accurate measure of actual cif/fob ratios, since they are in many cases estimated by IMF staff based on incomplete information. Furthermore, for most countries, Radelet and Sachs (1998: 3) mention that the ratio varies little 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." This sentiment that the data in some cases may suffer from recording error and in other cases may be the result of IMF staff imputation has been reiterated by Hummels (1999a; 1999b), Limão and Venables (1999; 2000; 2001) and Hummels and Lugovskyy (2003). Using these cif/fob ratios constructed from the *International Financial Statistics,* Hummels (1999b: 28-29) conducts numerous investigations into the trends in these ratios. Hummels (1999b: 29) explains that "a large fraction of these data are imputed. That is, a fixed cif/fob ratio is combined with a known cif flow to generate an imputed fob flow (or vice versa)." Hummels and Lugovskyy (2003: 5) explain, in

18

more detail, that with IFS data, "if no importer (cif) data are available, the IMF imputes a value of 10% over the exporter's (fob) value; if no exporter data are available, a 9% reduction from the cif value is used to construct the fob number... As a consequence, approximately half of the available cif/fob ratios from the IFS are exactly equal to 1.1." Aside from the obvious imputations like that of 1.1 (that is 10 per cent *ad valorem* costs), Hummels, (1999b: 26-28) explains: "Unfortunately, the documentation does not allow the user to carefully track where imputations have occurred, which countries they affect, or their time series properties. We know only that the data are pregnant with these corrections."

Discrepancies in data reported by importer or exporter may cause country cif/fob ratios to differ for reasons other than shipping costs. Hummels and Lugovskyy (2003: 3) explain:

> Statistical offices in the exporter and importer may value goods differently because the goods' price or the exchange rate changes mid-shipment. Importers may track shipments more carefully than exporters in order to levy tariffs, leading to valuation differences from missing exporter data. Comparing across exporters, one might see differences in cif/fob ratios if two exporters include different elements of inland shipping in the fob valuation. (Are goods valued at the factory gate? At dockside? After being placed on board?) When comparing across commodities, difficulties may exist if the importer and exporter disagree on the correct commodity classification of a particular good[25].

Interestingly, Hummels and Lugovskyy (2003: 3) show that even small discrepancies have a considerable impact on the measured cif/fob ratio: "For example, start with a cif/fob ratio of 1.06, which implies transportation costs of 6 percent ad-valorem. Now, increase the importer's cif value of trade by 1.5 percent and decrease the exporter's fob value by 1.5 percent. The cif/fob ratio becomes 1.09, changing implied transport costs by 50 percent!" Consequently, Hummels (1999b: 27) cites an example of the United States cif/fob ratio where for 1970 these *ad valorem* transport costs may be calculated at 13 per

---

[25] In addition to cif and fob there are many other Incoterms (a set of uniform rules codifying the interpretation of trade terms defining the rights and obligations of both Buyer and Seller in an international transaction) that may be used. In some countries, the frequent use of alternative terms of shipment to that of cif and fob may further distort the true values of the recorded imports cif and imports fob data (see International Chamber of Commerce, 1999 for a full discussion of each of the terms of shipment).

cent, 9 per cent or 6 per cent, depending on which edition of the DOTS yearbook is consulted.

Yeats (1978) decomposes variation in the COMTRADE cif/fob ratios into a transport cost component and residual factor. The objective of Yeats (1978) is to assess the quality of the official statistics, and to estimate the *ad valorem* incidence of shipping costs. Yeats (1978: 355) conducts separate tests that indicate cif/fob ratios "do not approximate nominal transportation costs in spite of the assumption often made in gravity flow and trade related models". Furthermore, Yeats (1978: 358) concludes, "the magnitudes of the discrepancies revealed in the official trade statistics are certainly sufficient to bias findings of the theoretical and empirical studies" (see Chapter Three that critiques seminal studies that have used cif/fob ratios as a proxy for transport costs). Some exporters and some commodities, however, report very little error and Yeats (1978 in Hummels, 1999b: 27) explains that these data quality problems are less severe in more aggregated data. Thus Hummels (1999b: 27) states, "this leaves open the possibility that a time series on transportation costs drawn from aggregate data may contain useful information." Additionally, Hummels (1999b: 29) asks, "is there any information on the time series properties of transportation costs that can be extracted from the IMF data? This is a hard question to answer, as it is not clear for which countries the IMF has accurate data and for which they have relied on wholesale imputation. The world cif/fob ratio accords well with conventional wisdom regarding transportation costs. And, in those cases where it is possible to verify the IMF data against national sources, they appear accurate."

The goal of Hummels and Lugovskyy (2003: 4) is to inform researchers under which conditions the matched partner data are usable.

Of course, data can contain errors and still be usable. The matched partner cif/fob data might strongly co-vary with direct measures of shipping costs despite being systematically wrong in levels. (Imagine a regression line with a slope of exactly one but a positive intercept.) Differences across exporters in valuation rules might mean that matched partner data are poor measures of cross-exporter variation. However, if those valuation rules change little over time, the matched partner technique may provide an excellent source of time series information. Finally, inconsistencies in goods classification could yield terrible measures of commodity-level shipping costs yet aggregate data would still closely match true costs (Hummels and Lugovskyy, 2003: 3).

Hummels and Lugovskyy (2003: 15) conclude:

It would be very unwise to use data constructed from the matched partner technique for any exercise where the level of (as opposed to the variation in) transportation costs matters. Examples include choosing parameters for model calibration, or the use of shipping costs in structural regressions where one wants to directly interpret the magnitude of the coefficient. It would also be unwise to try and exploit any cross-commodity variation in the matched partner data. However, the matched partner data may be useful as a rough control variable for aggregate bilateral transportation costs. They may be especially helpful if used in combination with an instrumental variables technique in which matched partner data are first fitted to plausible correlates and then employed as controls.

Furthermore, Hummels and Lugovskyy (2003: 13) state that they had "some (limited) ability to fit cross-section variation in the IMF data, but very limited ability to say anything about the time series." These findings continue to leave an "open question" on the usefulness of time series variation in the cif/fob ratios.

Mindful of the above data quality limitations and shortcomings of country cif/fob ratios, Section 2.2 presents empirical evidence on these *ad valorem* shipping costs worldwide.

2.2 A WORLDWIDE PERSPECTIVE ON SHIPPING COSTS

The United Nations Conference on Trade and Development's (UNCTAD) *Review of Maritime Transport* as the principal annual publication on international transportation and trade issues, relies greatly on IMF trade data to calculate *ad valorem* shipping costs (that is, import cif/fob ratios) on a worldwide basis. Table 2.1 presents estimates of shipping costs by country groups in 2003. The *Review of Maritime Transport*, published by UNCTAD, reports these values annually[26]. Table 2.1 shows the marked differences in shipping costs among country groups. Shipping costs are 3.9 per cent for developed countries and more than double for other country groups. Typically, Africa and Oceania experience the highest shipping costs; for 2003, these costs were 11.9 and 12.3 per cent of total import value respectively. These aggregated figures, however, conceal vast differences that persist within the country groups. For instance, in Africa, landlocked developing countries face the highest transport costs, of over 20 per cent, while North Africa faces the lowest transport costs of about 10 per cent (African Development Report 2004: 191). The determinants of these shipping costs typically include factors like distance from overseas markets, infrastructure constraints, access to seaports as well as differences in composition of trade. Alderton (1995: 21) notes: "the irony and implications of this [the differences between developed and developing nations transport costs] are obvious in that countries which most need to stimulate their economies face the greatest financial hurdles." Section 3.1 investigates Africa's international transport costs, as measured by cif/fob ratios, in a global context. Section 2.3 investigates the most important empirical determinants of these shipping costs.

---

[26] Partly due to the time lags in the compilation of the imports cif and imports fob data the *Review of Maritime Transport* 2005 publish the cif/fob ratios for 2003.

TABLE 2.1. SHIPPING COSTS BY COUNTRY GROUPS, 2003

Country group	Estimate of total freight costs of imports (billions of dollars)	Value of Imports (c.i.f) (billions of dollars)	Freight costs as percentage of import value (cif/fob ratio)
World total	379.2	7 052.9	5.4
Developed market-economy countries	195.1	5 029.3	3.9
Developing countries-total	184.1	2 023.6	9.1
of which in:			
Africa	17.9	150.2	11.9
America	39.2	398.2	9.8
Asia	122.7	1 430.3	8.6
Europe	3.5	38.4	9.1
Oceania	0.8	6.5	12.3

Source: UNCTAD (2005: 71) secretariat estimates based on data supplied by the IMF.

Note: 1. "The estimate for the world total is not complete, since data for countries that are not members of the IMF, the countries of Central and Eastern Europe and republics of the former Soviet Union, and the socialist countries of Asia are not included for lack of information or other reasons" (UNCTAD, 2005: 71).

2.3 EMPIRICAL DETERMINANTS OF COUNTRY SHIPPING COSTS

Radelet and Sachs (1998: 3) explain that shipping costs (as proxied by the cif/fob ratio) "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." (as explained in Section 2.1.2). Despite acknowledging that the composition of imports may influence the cif/fob ratios, Radelet and Sachs (1998: 3) continue to assume that: "since the import basket of developing countries is more homogeneous than the export mix, the measure of the cif/fob ratio will reveal true differences in shipping costs rather than commodity mix effects." Consequently, Radelet and Sachs use the cif/fob ratio as a proxy for shipping costs. Likewise other researchers, for instance, Rose (1991), Naudé (1999a; 1999b) and Limão and Venables (1999; 2000; 2001) have used country cif/fob ratios as their measure (proxy) for shipping costs. Thus, in practice, researchers who assume that a country's cif/fob ratios reveal true differences in shipping costs, have generally associated a rise in the ratio with an increase in direct transport costs, and a fall in the ratio with a reduction in direct transportation costs (Rose, 1991: 421). As a result of the investigation into the trends in South Africa's shipping costs as measured by the country's cif/fob ratios (Chapter Five), this thesis challenges these assumptions and questions whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures. An answer to this question is provided in Chapter Five. Additionally, the findings of Chapter Three show the use of country cif/fob ratios globally, and where data are reliable, this thesis shows that a country's composition of imports has an economically and statistically significant effect on that country's cif/fob ratios. Nonetheless, whether implicitly (Naudé, 1999a; 1999b) or explicitly (Radelet and Sachs, 1998; Rose, 1991), transportation cost studies that use country cif/fob ratios typically make the above-mentioned limiting assumptions, and then move on to analyse the determinants of such "shipping costs".

According to Radelet and Sachs (1998: 4), the measurements of shipping costs by the cif/fob ratio are likely to differ across countries for several reasons.

> First, and most obviously, countries that are located further from major markets are likely to face higher shipping costs than proximate countries. Second, overland transport costs tend to be considerably higher than sea freight costs. Thus, for a given distance from main markets, countries with a higher proportion of transit by land will tend to have higher overall shipping costs. 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 tape 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 costs.

Table 2.2 presents the results of Radelet and Sachs (1998) using Ordinary Least Squares (OLS) regressions. The dependent variable is the log of the cif/fob ratios and the independent variables are: shipping distance (the sea distance to the nearest major world market); log of GDP per capita (PPP-adjusted in 1965, in 1985 dollars); port quality (1997 World Competitiveness Report); and a dummy variable for whether a country was landlocked.

TABLE 2.2: DETERMINANTS OF SHIPPING COSTS

Dependent Variable: Shipping Cost (CIF/FOB band, log), 1965-1990 average

Independent Variable	Coefficients (t-statistics)	
	I	II
Shipping Distance (log)	0.13 (2.25)	0.21 (3.17)
Landlocked	0.43 (2.96)	0.19 (0.60)
GDP per capita (1965, log)	-0.30 (-4.38)	
Port Quality		-0.09 (-1.36)
Number of Countries	61	31
Adjusted R²	0.67	0.41

Note: Constant term not reported.

Radelet and Sachs, 1998: Table 4.

Briefly, the regression estimates in Table 2.2 indicate that each 10 per cent increase in sea distance is associated with a 1.3 per cent increase in shipping costs (see column I). "At the means for the other variables, a landlocked country pays about 5.6 percentage points more for shipping than a coastal economy (i.e., an increase in the cif/fob band from 8.9% to 14.5%). This represents an increase of 63% in freight and insurance costs for landlocked countries, after controlling for the other variables. The difference is statistically significant." Each 10 per cent increase in average income (GDP per capita) is associated with 0.29 per cent lower freight costs as measured by the cif/fob ratio (Table 2.2 shows -0.30 per cent lower freight costs; Radelet and Sachs, 1998: 5). The adjusted R-squared shows that these three variables alone captures 67 per cent of the variation in cif/fob ratios across countries, and each of the estimated coefficients is significant at the 5 per cent level or lower. The R-squared of column II with 31 countries is lower than column I with 61 countries. The results of column II are broadly consistent with the idea that higher quality ports are associated with lower shipping costs (Radelet and Sachs, 1998: 6).

Limão and Venables (1999; 2000; 2001), use three different data sets to investigate the dependence of transport costs on geography and infrastructure. The first source of transport cost data is shipping company quotes for the cost of transporting a standard container from Baltimore, Maryland, in the United States, to selected destinations. The second data set uses a cross section of the IMF cif/fob ratios constructed from the DOTS reports for bilateral trade between countries. Limão and Venables (2001: 452) note, "there are some questions, which we address, regarding the quality of the data." In addition to the determinants of transport costs, the authors wanted to know the extent to which transport costs "choke off" trade. Consequently, they undertook a gravity modelling exercise to compute estimates of the elasticity of trade flows with respect to transport costs (Section 2.5 reviews other studies that have specifically focused on the impact of transport costs on trade and economic growth).

Table 2.3 presents the regression results from their second set of experiments based on bilateral cif/fob ratios (that is, transport costs on trade between each pair of countries) as derived from the IMF Direction of Trade Statistics[27]. "The first two rows of the table are characteristics of the journey between i and j; the log of distance, (ln*distance*), and whether i and j share a common border (*border*). The remainder are characteristics of the importer country and its trading partner; a dummy for an island (*isldummy* and p*isldummy*); the per capita income of the importing and exporting countries, (ln*Y/cap* and ln*pY/cap*). Finally, the infrastructure measures (ln*inf* and l*npinf*) and the infrastructure of transit countries (ln(1+ *infran*) and ln(1+ p*infran*))" (Limão and Venables, 2000:9-10).

---

[27] "The log linear form fitted the cif/fob data considerably better than the linear one" (Limão and Venables, 2000: 8).

**TABLE 2.3. DETERMINANTS OF THE CIF/FOB RATIO: LIMÃO AND VENABLES (2001)
BILATERAL TRANSPORT COST FACTOR (1990)**

Dependent variable: ln Transport cost factor cif/fob. (ln r_{ij}):

	1	2	3	4
ln*Distance*	0.25***	0.23***	0.21***	0.38***
	(6.74)	(6.02)	(5.65)	(10.17)
border		-1.35***	-1.36***	-1.02***
		(-7.77)	(-7.78)	(-6.30)
isldummy		-0.12***	-0.09	-0.06
		(-1.73)	(-1.23)	(-0.94)
pisldummy		-0.16**	-0.12*	
		(-2.18)	(-1.65)	
ln*Y/cap*		-0.31***	-0.23***	-0.24***
		(-19.97)	(-9.64)	(-10.78)
lnp*Y/cap*		-0.45***	-0.30***	
		(-27.94)	(-12.84)	
ln*Inf*			0.34***	0.36***
			(3.92)	(4.47)
lnp*Inf*			0.66***	
			(7.64)	
ln(1−*Infran*)			0.21**	0.36***
			(2.15)	(4.07)
ln(1−p*Infran*)			0.24***	
			(2.51)	
				Partner fixed effects
Pseudo Rsq.	0.10	0.46	0.48	0.60
σ	1.92	1.70	1.69	1.53

Notes:
1) N=4516: Tobit estimates. Pseudo Rsq given by the correlation of actual and predicted ln r_{ij}: constants included but not reported: exporter fixed effects included in 4 but not reported: σ is the standard error of the Tobit estimate.
2) T-statistics in parenthesis: ***,**,* indicates significance at the 1%, 5% and 10% level respectively.
3) The original transit variables. *Infran*, ranges from 0 for the coastal economies to approximately 1.7. Before taking the log we add 1 to the measure to correctly reflect that coastal economies bear no extra infrastructure transport cost. To compare the own and transit elasticities we need to multiply the coefficient of ln*Infran* (reported above) by *Infran* /(1 + infran). This ratio ranges from 0.40 to 0.63 for landlocked countries in this sample.
4) The Tobit coefficients correspond to the marginal effects for the full sample, including the zeros.

Source: Limão and Venables, 2000: 11.

The first column of the table gives the effect of distance alone, and the second column gives a specification with journey and country characteristics, apart from infrastructure. Distance and border effects are as expected. Being or trading with an island reduces transport costs (although these effects are barely significant), and high per capita income reduces transport costs. The infrastructure variables are included in column 3, and all are significant with the expected sign. The final column gives results when partner country variables are replaced by dummies for each partner country. As expected, this increases the explanatory power of the equation. The own infrastructure effects continue to be highly significant (Limão and Venables, 2001: 458-459).

The Pseudo-Rsq shows that distance alone explains only 10 per cent of the variation of transport costs (column 1), compared to 48 per cent when the other geography and infrastructure measures are included (column 3). "Clearly, distance fails to explain a significant part of the variation in transport costs" (Limão and Venables, 2001: 460)[28].

Some of the main results on the impact of infrastructure are summarised in Table 2.4, where changes are all reported from the median level of infrastructure. Firstly, "The results are strongly consistent, although they come from different data sets and measure different things" (Limão and Venables, 2001: 470). Table 2.4 shows that an improvement in a country's infrastructure from the median to the top 25th percentile lowers costs, according to the shipping data, by an amount equivalent to 3989km of sea travel or 481km of overland travel. Using the cif/fob ratio, these *ad valorem* shipping costs would fall from 28 per cent to 11 per cent, equivalent to becoming 2358km closer to all its trading partners. The impact on trade volumes is equivalent to reducing distance by 2005km (Limão and Venables, 2001: 470). Conversely, deterioration in infrastructure from that of the median country to the 75th percentile raises costs by an amount equivalent to 3466km of sea travel or 419km of overland travel. Using the cif/fob ratio, these *ad valorem* shipping costs would rise from 28 per cent to 40 per cent, equivalent to becoming 2016km further from all its trading partners. The impact on trade volumes is equivalent to an extra 1627km distance (Limão and Venables, 2001: 470). In other words, "a deterioration of infrastructure from the median to the 75th percentile raises transport costs by 12 percentage points and reduces trade volumes by 28 per cent" (Limão and

---

[28] Repeating this finding by Limão and Venables (2001: 460), substituting the words "transport costs" with the actual measure used, the cif/fob ratios, produces the following informative statement: Clearly, distance fails to explain a significant part of the variation in the cif/fob ratios.

Venables, 2001: 451). Secondly, being landlocked raises transport costs by around 50 per cent (for the median landlocked country compared to the median coastal economy). Improving the infrastructure of the landlocked economy from the median for landlocked economies to the 25th percentile reduces this disadvantage by 12 percentage points, and improving the infrastructure of the transit economy by the same amount reduces the disadvantage by a further 7 percentage points (Limão and Venables, 2000: i). Thirdly, linking transport costs to trade volumes, the authors estimate a high elasticity of trade flows with respect to the transport cost factor (that is, the cif/fob ratio) in the range -2 to -3.5 (Limão and Venables, 2000: 20). This means that the median landlocked country only has 30 per cent of the trade volume of the median coastal economy. Improving infrastructure to the 25th percentile raises this to over 40 per cent. Finally, they used their results to study Sub-Saharan African trade. While a basic gravity model suggests that African trade, both internally and with the rest of the world, is lower than would be predicted, augmenting the model to include infrastructure moved the predicted values much closer to the actual. Limão and Venables (2000: i) conclude: "most of Africa's poor trade performance can be accounted for by poor infrastructure."

TABLE 2.4. IMPACTS OF INFRASTRUCTURE ON TRANSPORT COSTS AND TRADE VOLUMES

	Shipping data			Cif/fob		Gravity	
Infra-structure: percentiles	Transport costs US $	Sea km. equiv change	Land km. equiv change	Cif/fob ratio	Km. equiv change	Trade volume. % change	Km. equiv change
25th	4638	-3989	-481	1.11	-2358	-68%	-2005
Median	5980	0	0	1.28	0	0	0
75th	6604	-3466	-419	1.40	-2016	-28%	1627

Limão and Venables, 2000: 24.

Micco and Perez (2001; 2002), and Clark, Dollar and Micco (2003, 2004) examine literature on the importance of transport costs (particularly maritime) and infrastructure in explaining trade, access to markets, and increases in per capita income. Both studies used a database of more than 300 000 observations per year on shipments of products aggregated at six-digit Harmonised System (HS) level from various ports around the world to investigate the determinants of shipping costs to the United States of America. These authors find that for most Latin American countries, transport costs are a greater barrier to US markets than import tariffs. The studies confirm that besides distance, volumes and product characteristics, an important determinant of shipping costs is seaport efficiency. In particular, that inefficient ports increase handling costs and improving port efficiency from the 25th to the 75th percentile reduces shipping costs by 12 per cent, or the equivalent of 5000 miles in distance (Clark, Dollar and Micco, 2003: 22). Similarly, bad (inefficient) ports are equivalent to being 60 per cent further away from markets for the average country. In turn, factors explaining variation in port efficiency include excessive regulation, the prevalence of organised crime, and the general condition of the country's infrastructure. Reductions in country inefficiencies, associated to transport costs, from the 25th to the 75th percentiles imply an increase in bilateral trade of around 25 per cent. The cross-country analysis in Clark, Dollar and Micco (2003: 21) shows that:

> an increase in organised crime from the 25th to the 75th percentile implies a reduction in port efficiency from the 50th to the 25th percentiles. In other words, if countries like Brazil, China or India (all with indices around the 75th percentile) reduced their organised crime to levels attained by countries like Australia, New Zelanad or the United Kingdom (all around the 25th percentile), then they would be able to increase their port efficiency index roughly one point. This in turn would generate a reduction of maritime transport costs of around 6%.

Furthermore, Micco and Perez (2002:3) present success stories from Latin American to show that "private involvement in port management leads to efficiency and lower costs wherever it is accompanied by labour reform, and when monopoly power is reduced through either regulation or competition". The results from Clark, Dollar and Micco

(2003: 22) suggest that: "some level of regulation increases port efficiency, but excessive regulation can be damaging."

The paper by Fink, Mattoo, and Neagu (2002), examines why maritime transport costs are so high in some countries, and quantifies the importance of two explanations: restrictive trade policies and private anti-competitive practices. They find that both matter, but private anti-competitive practices have a greater impact. "Trade liberalisation and the break-up of private carrier agreements would lead to an average of one-third lower liner transport prices and to cost savings of up to US$3 billion on goods carried to the United States alone" (Fink, Mattoo, and Neagu, 2002: 81). These authors argue that there is a clear need for both further liberalisation of government policy and strengthening of international disciplines on restrictive business practices. Towards this end, they proposed an approach to developing such disciplines for the (then) current round of services negotiations at the WTO. Contrary to Fink, Mattoo and Neagu (2002), Micco and Perez (2001) concluded that maritime conferences have been exerting only mild - if any - monopoly power. This contemporary debate continues with renewed interest in the market structure of liner shipping and research on the controversial practices of liner carriers to commonly fix prices and regulate capacity (see for instance Veenstra, 1999 and OECD, 2002). "Proponents of these practices vigorously defend these as necessary in order to guarantee the regularity of maritime freight transport services. Opponents, on the other hand, vehemently attack these as one of the last bastions of cartel control of an entire sector" (OECD, 2002: 2). Unfortunately, for some, the empirical data that might inform an objective arbitration between shipper and carrier views are not available (OECD, 2002: 29).

Section 2.4 investigates the evolution and magnitudes of international transport costs relative to tariffs.

2.4 INTERNATIONAL TRANSPORT COSTS AND TARIFFS: A COMPARISON OF MAGNITUDES

This section investigates the evolution and magnitudes of international transport costs relative to tariffs. In order to compare the relative magnitude of tariffs and international transport costs, import customs duties may be divided by imports (fob) and total import transportation and insurance costs are divided by imports (fob) – creating the comparable measures of *ad valorem* tariffs and *ad valorem* transport costs (Yeats, 1977; see Section 5.2 for the comparisons of South Africa's *ad valorem* tariffs and *ad valorem* transport costs for the period 1990-2002).

Walters II (1970) explored the protection effect of international transport costs relative to tariffs, both on a nominal and effective basis, for the United States. Despite the gross level of aggregation, the study showed that (Walters II, 1970: 1020): "excluding transport costs from consideration not only underestimates the level of protection for domestic vis-à-vis foreign resources, but also significantly alters the pattern of protection among industries. The escalation in the United States' tariff structure (the increased tariff levels on more processed goods) is partially offset by de-escalation in the freight factors." The main point made by Walters II (1970: 1015) was that freight factors (that is, *ad valorem* transport costs) are, in general, not trivially small relative to *ad valorem* tariffs - they have a comparable level, range and dispersion (see Walters II, 1970: 1015). The results suggested (Walters II, 1970: 1018) that once the protection of transport costs is considered, it is no longer readily apparent that protection is higher for more highly processed industries. "The escalation in the tariff structure, among the groups investigated, appeared to be offsetting de-escalation in the freight factors. The latter implies that trade in processed goods relative to less or non-processed ones would be encouraged under free trade. Under escalated tariff structures, the opposite tendency exists" (Walters II, 1970: 1018). Walters II (1970: 1018) computed a mean effective tariff for all commodities of 10.41 per cent, slightly greater than the corresponding mean effective freight factor (*ad valorem* shipping costs) of 7.3 per cent. Walters II (1970: 1018) interprets these results to mean: "the impact on resource allocation resulting from

U.S. tariff policy is probably greater than the impact of freight factors. Bear in mind that the structure or pattern among industries is somewhat different". Albeit, Walters II (1970: 1019) calculated that if freight costs were eliminated among countries, US imports would rise by 21.75 per cent, "an underestimate relative to that for tariffs since no allowance was made for non-competitive imports nor for possible trade in what are non-tradables at present".

A survey of the literature by Finger and Yeats (1976: 169) indicated that there had been few attempts to measure nominal shipping rates, and apparently no studies comparing effective rates of protection from tariffs and transportation costs. It appears, then, that the authors were unaware of the findings of Walters II (1970) discussed above. Finger and Yeats (1976: 170) "compare nominal and effective protection for domestic products stemming from United States tariffs and from international transportation and insurance costs on imports". The study used cif/fob ratios (i.e., the *ad valorem* equivalent to transportation and insurance costs) computed from records of actual shipments. With the aim to estimate and compare the importance of transportation costs and tariffs as barriers to international trade, the study differed from most previous studies of international trade problems that either neglected or assumed away the influence of transportation costs (Finger and Yeats, 1976: 175). The overall results indicated that, "whether measured in terms of nominal or effective rates, transportation costs pose a barrier at least equal to post-Kennedy Round tariffs in the United States. And like effective tariffs, effective transport costs appear to increase with stage of processing" (Finger and Yeats, 1976: 175). While Finger and Yeats (1976: 175) expected further tariff reduction from the then current Tokyo Round, it seemed probable to them that the petroleum price increases at that time would have significantly adverse effects on trade barriers arising from transportation costs. They also noted that transportation charges tended to be higher on products exported by Less Developed Countries than on products exported by developed countries (Finger and Yeats, 1976: 175). Furthermore, they suggested an investigation into "the development of regional transportation groupings that would improve access of the developing countries to industrial markets and also improve their bargaining position for shipping rates" (Finger and Yeats, 1976: 176).

In spite of the fact that several studies including Finger and Yeats (1976) had shown that *ad valorem* freight rates frequently exceeded most favoured nations tariffs, there had been no systematic analysis of the structure of shipping costs. Yeats (1977), then, employed United States trade statistics to study the structure of international transportation and insurance costs on imports of primary and processed products[29]. While some economists had postulated that transportation charges should fall with increased fabrication, Yeats' (1977) investigation failed to uncover any such general tendency. Rather, the behaviour of *ad valorem* shipping rates for Less Developed Country exports varied on a product-by-product basis (see Figure 2.1 that compares *ad valorem* shipping costs with nominal tariffs for various commodities). The results of Yeats (1977: 467) show that on an overall basis, "the structure of transportation costs appears to somewhat intensify the competitive pressures on United States processing concerns... however, there are instances, like that of leather, wood, rubber, etc., where freight costs clearly rise with the stage of processing and reinforce the protective effect of the graduated tariffs." An important question, raised in the conclusion (Yeats, 1977: 469) centres on the reason(s) why transport costs behave as evidenced in the study. Yeats (1977: 469) briefly discusses that while "actual cost differentials in the handling and transport of processed commodities may be an important factor influencing the structure of freight rates, an alternative explanation might focus on an (alleged) arbitrary structure of shipping charges imposed by the liner conferences." Several empirical investigations into the structure of liner freight rates suggested the practice of 'charging what the traffic will bear' or subsidising shipments of primary products through higher rates on processed goods (see Heaver, 1973 and OECD, 2002 for a contemporary perspective on such pricing practices). Yeats (1977: 469) explains that if the freight factors revealed in the analysis did reflect such practices, then the rate-setting objectives of the liner conferences could run counter to the development plans of Less Developed Countries. More specifically, if freight rates for fabricated goods were artificially inflated, this might retard the growth of processing industries – or at least remove the natural incentive that

---

[29] The data used tabulated imports, by product by country, on a joint 'free-along-side' (f.a.s.) and 'cost-insurance-freight' (c.i.f.) basis.

decreasing transport costs would provide (Yeats, 1977: 470). Thus, based on the results of Yeats (1977: 470), "it seems that international freight costs may frequently reinforce the influence of tariffs. As such, the structure of these charges should be subject to considerable attention".

Although not the primary purpose of Rose (1991) and Baier and Bergstrand (2001), the analysis in Rose (1991: 418) for the period 1950 through 1985, shows that the average OECD country experienced an annual four per cent tariff rate decline and a 0.1 per cent decline in transportation costs (that is, the import cif/fob ratio). Similarly, Baier and Bergstrand (2001: 11) use the IFS to provide estimates of countries' multilateral gross cif/fob ratios. The average multilateral cif/fob ratio was 8.21 per cent in 1958-60 and declined 48 per cent to 4.27 per cent by 1986-88 (Baier and Bergstrand, 2001: 11). In comparison, the average bilateral tariff rate in the sample was 11.2 per cent in 1958-60 and declined 81 per cent to 2.1 per cent in 1986-88; "the low average tariff rate in the latter period, of course, reflects the large share of bilateral free trade arrangements" (Baier and Bergstrand, 2001: 11). The findings of this thesis show, however, that, where data are reliable, a country's composition of imports has a substantial and significant effect on these multilateral cif/fob ratios. As a result, much of the decline in the average cif/fob ratio is indicative of changes in the composition of imports (see Section 3.1) rather than purely reflective of declines in direct transportation costs.

Hummels (1999b) enters this debate on the causes of post-war trade growth and points out that there is remarkably little systematic evidence documenting the declines in transportation costs. Hummels (1999b: 1) provides an account of the time-series pattern of shipping costs.

> Direct evidence from an eclectic mix of data shows that ocean freight rates have increased while air freight rates have declined rapidly. Indirect evidence suggests that the cost of overland transport has declined relative to ocean transport. For all modes [of transport, that is, land, sea and air], the freight costs associated with increased distance have declined. Data on the changing composition of trade are broadly consistent with these changes in relative prices.

Also evident, however, is that the reduction in 'natural' international transaction costs, in particular transport costs, has been overstated. Hummels (1999b: 21) draws together various sources of data on the time-series pattern of shipping costs to show that, while air freight rates have fallen, ocean freight rates on average (despite containerisation) have actually increased until quite recently. Hummels (1999b: 22) notes:

> One is tempted to look at the evidence on ocean freight rates and conclude that transport costs cannot possibly lead to trade growth since they have not declined! But again, this is too simple. It may be that compositional changes in the price of transport – relative reductions in air, overland, and distance premia – can tell us a great deal about how trade had grown...This paper provides simple, suggestive correlations. Careful study is required.

Similar to the findings of the studies cited above, Hummels (1999a in Hummels 1999b: 3) concludes that transport costs still often pose a greater barrier to trade than tariffs. Indeed, transport costs tend to vary more across trading partners than tariff rates, implying a greater role for 'natural' than artificial barriers in fashioning variation in bilateral trade flows. Hummels (1999a) for example reports (unweighted) mean international freight rates for the US in 1994 of between 12 and 15 per cent *ad valorem* (these rates only capture the inter-country component and omit port and inland charges). He further shows that freight rates were substantially higher than tariff rates in the US for most manufactured goods. Likewise, although not the primary purpose of their study, Amijadi, Winters, and Yeats (1995: 475, 477 in Frankel et al., 1997: 41) find: "In general, US customs data show that transport costs for international trade exceed the cost of duties."

Similar to the results of Hummels (1999a, 1999b), Milner (2002) also challenges the view that 'natural' barriers have fallen significantly. Indeed, Milner (2002: non-technical summary) found, in nominal terms, that the simple average EU tariff on manufactured imports from the US was less than 5 per cent, whereas the average rate of international transportation cost (i.e. nominal 'protection' rate) on these same imports was 8 per cent. The divergence between these average international transport costs and average tariffs are even greater than this in some manufacturing sectors. This divergence is evident from

the information in Figure 2.1, where the evidence for the EU is in line with that identified by other authors for the US; for 10 of the 16 manufacturing sectors the nominal rate of natural protection (transportation costs) exceeds the average (nominal) tariff for that sector. Thus, similar to the findings of Amijadi, Winters, and Yeats (1995: 475, 477 in Frankel et al., 1997: 41), Milner (2002) also shows that transport costs now in general pose a significantly greater barrier to trade than tariffs.

FIGURE 2.1. RELATIVE RATES OF NOMINAL TARIFF (T_J) AND 'NATURAL' (Π_J) PROTECTION
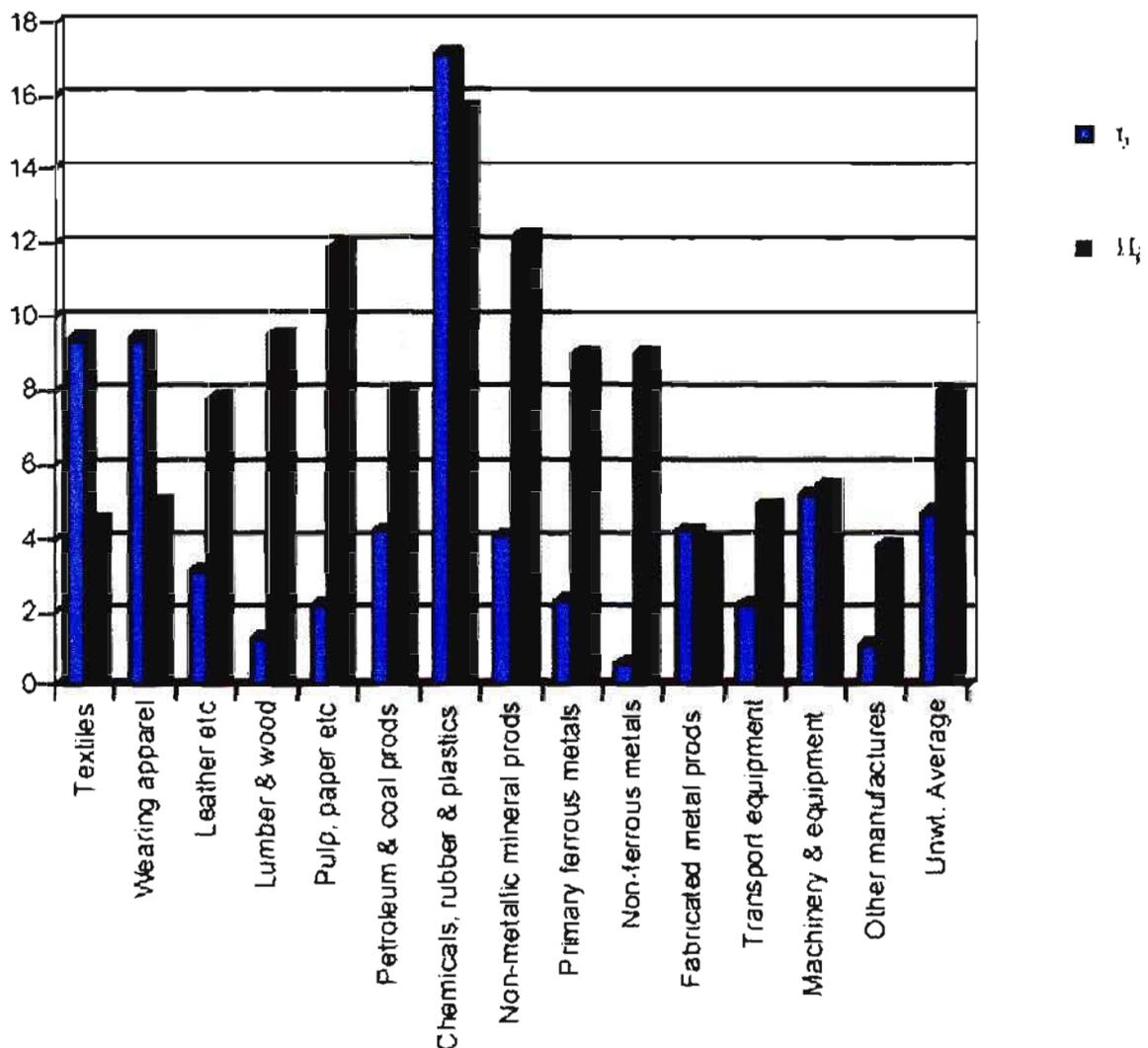
Source: estimated from Hertel, 1997 in Milner, 2002: 2.

Milner (2002: 3-11) uses a simple model of effective protection and extends the analysis to allow for exports. The results (Milner, 2002: 16) show that "there may be significant measurement error if policy sources only are incorporated into the effective protection modelling framework." With the decline in trade policy barriers, particularly in industrial countries like the EU, natural barriers (transportation costs) are now in general a more important source of protection in the local and regional market and of anti-export bias (Milner, 2002: 16). Evidently, "where tools such as effective protection are used to comment on allocation and distributional issues they should not omit natural barriers" (Milner, 2002: 16). For analytical reasons, Milner (2002: 16) explained that it is also important to recognise the "relative importance of natural and policy barriers and of potential differences in the relative importance of each across sectors, between domestic and export markets, and between developed and developing countries." Contemporary gravity modelling, like Baier and Bergstrand (2001), attaches a relatively minor role to transport costs in accounting for the growth of world trade post 1950. Accordingly, Milner (2002: 16) "identifies considerable scope for lowering trade barriers and anti-export bias through the lowering of natural barriers" – in particular, transport costs. Section 2.5, then, investigates the impact of the costs of transport on international trade and economic growth.

investment in export sectors and reduce the competitiveness of domestic firms in international markets (Radelet and Sachs, 1998: 7). Furthermore, for exporters of primary products, such as South Africa, higher shipping costs would reduce the rents earned from natural resources thereby possibly lowering aggregate saving rates and investment, and thus lowering economic growth (Radelet and Sachs, 1998: 10).

- Third, relatively higher shipping costs would increase the price of all imported capital goods, which may reduce investment, the rate of technology and knowledge transfer and thus reduce economic growth (Radelet and Sachs, 1998: 10).

Evidently, reductions in international transport costs have the potential to make *significant contributions towards increasing world trade and global prosperity.*

Radelet and Sachs (1998: 8) explain that four broad sets of variables appear to be most closely associated with economic growth across countries between 1965-90: initial conditions (income level, health, and education), government policies, demographic characteristics, and geographic and resource endowments (including shipping costs). The eleven specific variables accounted for 83 per cent of the variance in growth rates across countries. Radelet and Sachs (1998: 11) "find a strong relationship between shipping costs and economic growth, after controlling for the ten other variables. The estimated coefficient is highly significant, and remained so across alternative specifications. The results imply that doubling shipping costs (e.g., from an 8% to 16% cif band) is associated with slower annual growth of slightly more than one-half of one percentage point. All else being equal, a landlocked country with shipping costs 50% higher than a similar coastal economy could expect slower growth of about 0.3 percentage points per year." Furthermore, the paper (Radelet and Sachs, 1998: 1-2) finds that "geographical considerations - specifically access to the sea and distance to major markets - have a strong impact on shipping costs, which in turn influence success in manufactured exports and long-run economic growth. Countries with lower shipping costs [cif/fob ratios] have had faster manufactured export growth and overall economic growth during the past

thirty years than country's [sic] with higher shipping costs" (Section 3.2 returns to critique these findings of Radelet and Sachs)[32].

International trade, of the OECD countries, has grown faster than income during the post war period. "The ratio of nominal exports plus imports to nominal GNP (hereafter, the 'trade ratio') for an average OECD country grew by over 1 per cent per annum from 1950 through 1985" (Rose, 1991: 417). The paper by Rose (1991) is a quantitative attempt to explain why the trade ratio grew so quickly after the Second World War. The analysis focuses on seven factors including declines in tariff rates and declines in transportation costs[33]. During the period in question, Rose (1991: 418) explains that the average OECD country experienced an annual four per cent tariff rate decline and a 0.1 per cent decline in transportation costs (that is, the import cif/fob ratio)[34]. The three economic factors that significantly helped to explain the growth in the trade ratios of small open economies were: (1) increases in real output; (2) increases in international reserves; and (3) declines in tariff rates. The standard economic theory only predicts a decline in tariffs (Rose, 1991: 426). The findings show no satisfying economic explanation that explains most of the growth in the trade ratio. The results show that tariffs seem to have played an important role in the growth of the trade ratio, that is, "increases in tariff rates are strongly associated with declines in the trade ratio" (Rose, 1991: 424)[35]. The elasticity was estimated to be -0.08, consistent with the prediction of neoclassical theory (Rose, 1991: 424).

---

[32] Additionally, Sanchez et al. (2003: 200) mention other econometric estimates that suggest a doubling of an individual country's transport costs leads to a drop in its trade of 80 per cent or even more (Hummels, 2000; Limão and Venables, 2001 in Sanchez et al., 2003: 200). Furthermore, Redding and Venables (2001 in Sanchez et al., 2003: 201) show that geographical variables related to transport costs may account for 70 per cent of the statistical variation in per capita income between countries.

[33] Rose (1991, 420-421) calculates the tariff rate as the ratio of tariff revenues to total imports and the cif/fob ratio as the proxy for transportation costs (Section 5.2 compares South Africa's ad valorem tariffs with ad valorem transport costs). The other five factors include: convergence of national capital/labour ratios; convergence in national levels of real income per capita; declines in the price of tradeable goods relative to non-tradeables; growth in international reserves; and the growth of real income (Rose, 1991: 418).

[34] Rose (1991) uses ordinary least squares (OLS) regressions and Natural Logarithms of the raw variables.

[35] "The average country in the sample experienced an average annual decline in its tariff rate of almost 7 per cent" (Rose, 1991: 424).

42

addition to these two sources, Feenstra (1998 in Baier and Bergstrand, 2001: 16) argues that: "increased convergence in economic size and greater vertical specialization and outsourcing may have contributed as well." The purpose of Baier and Bergstrand (2001: 1) "is to disentangle from one another (and from income growth) the relative effects of transport-cost reductions, tariff liberalisation, and income convergence on the growth of world trade among several OECD countries between the late 1950s and the late 1980s."

Baier and Bergstrand (2001: 16) used both a standard theoretical general equilibrium model of international trade in final goods and a gravity model to "estimate the relative contributions of income growth, income convergence, tariff reductions, and transport-cost declines in explaining the mean growth in real bilateral trade flows among a group of 16 OECD countries for which data was available." In the context of their model, the empirical results from their sample showed that "the mean logarithmic growth of trade was 148 percentage points" (Baier and Bergstrand, 2001: 16)[36]. The authors find that:

> Approximately 67-69% of this growth could be explained by real GDP growth, 23-26% by tariff-rate reductions and preferential trade agreements, 8-9% by transport-cost declines, and virtually none by real GDP convergence. Thus the relative contribution of trade liberalisation was three times that of transport costs, giving economists the edge in the debate articulated by Krugman (Baier and Bergstrand, 2001: 16).

In South Africa, only one academic, Naudé (1999a; 1999b), has investigated the country's international transport costs, as measured (proxied) by the country's cif/fob ratio. Naudé (1999a; 1999b) investigated the possible extent to which international transport costs may be adversely impacting on developing countries' exports, by taking South Africa as a case study. Naudé (1999a: 53) justifies the use of the cif/fob ratio by quoting Radelet and Sachs (1998: 3) who maintain that "these data are relatively consistent and complete, and provide a good starting point for examining the general costs of international shipping for almost all countries in the world." The investigation into South Africa's transport system and transport costs established that apart from high

---

[36] The model explained about 40 per cent of the variation in trade flow growth in the sample. Baier and Bergstrand (2001: 16) suggest that future research might incorporate a fourth variable for increased vertical specialisation and outsourcing of intermediate production, which was beyond the scope of their particular final-goods model.

ad valorem wharfage and weak logistical management at South African ports, domestic transport costs could not be claimed to be high in comparison to other countries (Chapter Four investigates South Africa's ports performance, policy, pricing and cargo growth). Naudé (1999a; 1999b) established that international transport costs, rather than domestic transport costs, are an obstacle to exports, and noted that South Africa's cif/fob ratio on imports has been on average seven per cent over the period 1988-91. This compared very unfavourably with the world average of three per cent, and even the average for developing countries of five per cent (Naudé 1999b: 12). In addition, "...international transport costs to and from South Africa are almost 50% higher than the average for developing countries!" (Naudé 1999b: 12).

In order to determine the significance of international transport costs on South Africa's merchandise exports, Naudé (1999a) estimated an export supply equation for South Africa, using quarterly data over the period 1975 to 1998. Naudé (1999a: 54) decided on a time series econometric model and on the following general export supply function for South Africa.

$$\text{EXPt} = \phi \ (\text{REERt, QSAt, QUSt, IMPt, CIF/FOBt, DUMMIES}) \quad \text{(equation 1)}$$

Where the six relevant variables are:

EXPt = Real value of merchandise exports FOB (excluding therefore gold and other mining exports) from South Africa in year t.

REERt = Real effective exchange rate of the Rand in year t.

QSAt = Real GDP in South Africa in year t.

QUSt = Real GDP of the United States as proxy for the world demand in year t.

IMPt = Real value of imports FOB of South Africa in year t.

CIF/FOBt = A proxy for international shipping costs given by the imports CIF/imports FOB differential.

DUMMIES = Various indicator variables to account for structural breaks in the data as well as seasonal and trend dummies.

Based on the above time series econometric model (equation 1), Naudé (1999a: 57) generated the following results presented in Table 2.5.

TABLE 2.5. REGRESSION RESULTS: EXPORT SUPPLY EQUATION FOR SOUTH AFRICA, 1975(2)-1998(1)

Table A2: Regression Results: Export Supply Equation for South Africa. 1975(2) – 1998(1) (Dependent Variable : First difference of Real Merchandise Exports)

VARIABLE	COEFFICIENT	STD. ERROR	t-VALUE
Constant	0.0309	0.01228	2.518*
ΔREER₁	-0.76044	0.19652	-3.869*
ΔIMP₁	-0.34705	0.088477	-3.915*
ΔQSA₁	0.10721	0.084773	1.265
ΔQUS₁	0.06639	0.80419	0.083
ΔCIF.FOB₁	-0.0484	0.023477	-2.064*
ΔCIF.FOB₁₋₁	-0.0114	0.0209	-0.545
ΔCIF.FOB₁₋₂	-0.03206	0.022759	-1.435**
R²=0.27 SE = 0.0034			

*(An asterisk * indicates significance at a 95% level of confidence and ** significance at a 90% level of significance)*

Source: Naudé, 1999a: 57; Naudé, 1999b: 20.

The regression results indicate that the significant determinants of export supply for South Africa were the real exchange rate, the value of imports (fob) and international transport costs (cif/fob ratios). Reviewing the results from Table 2.5, "the changes of the coefficients for the real exchange rate and international transport costs were of the right sign (negative) – indicating that an appreciation of the real exchange rate and an increase in international transport costs to South Africa will have a significant negative effect on South African exports" (Naudé, 1999b: 20). Evidently, the value of imports has a significant negative effect on exports (Naudé, 1999b: 20). Naudé (1999a: 57) explains:

This may seem counterintuitive when one considers the anti-export biases of import restrictions in other countries. However, in the present case it may be reflecting increases in domestic demand. Increases in domestic demand would give rise to increased import demand, and a shifting of production for foreign markets towards domestic markets. In other words, the finding provides some indication of the possible validity in the South African case of the vent-for-surplus theory of Adam Smith (Naudé, 1999a: 57).

46

2.6 CONCLUDING REMARKS

Transport costs are significant in their ability to impede international trade. This chapter presents a topical and thematic review of the literature on international transport costs with a particular focus on studies that use country cif/fob ratios as their measure (proxy) for shipping costs.

Of the many important insights that emerge from the scholarly transport cost literature, consider the following four main areas of findings. First, all of the studies acknowledge that transport costs have the ability to impede international trade to a significant extent. High international transport costs serve, on the one hand, to protect domestic producers from foreign competition, and yet, on the other hand, they simultaneously provide a significant anti-export bias that reduces international competitiveness. More specifically, high transport costs may reduce profits from exported products, and as a result may reduce employment and the country's level of income. In addition, high transport costs may also reduce the level of investment, both directly through increasing the costs of imported resources, which is particularly harmful for economies highly dependent upon imported intermediate goods for production, and indirectly through reducing the aggregate level of savings that is available for investment. Both have a negative impact on economic growth in the long run (Radelet and Sachs, 1998; Chowdhury, 2003).

Second, in contrast to many studies of international trade that either neglected or assumed away the influence of transportation costs, some of the studies reviewed had the specific aim to estimate and compare the relative importance of transportation costs with that of tariffs. In many countries, both *ad valorem* tariffs and *ad valorem* transport costs (cif/fob ratios) have declined significantly. The decline, however, has been asymmetrical with the result that transport costs, for many commodities and countries, now pose a relatively larger *ad valorem* barrier to trade than tariffs. Consequently, international transport costs have become an increasingly important determinant of trade performance[37].

---

[37] Finally, the impact of these transport cost studies becomes clearer as one reads policy documents like the World Bank (2001) that is literally saturated with the above research findings that are used to support the

48

Third, analyzing the definition, source, composition and nature of country cif/fob ratios show numerous insights and limitations to using these data. In particular, the Incoterms (International Chamber of Commerce, 1999) definition specifically states that both cif and fob terms of shipment are to be used only for sea and inland waterway transport. In contrast, the definition of cif and fob in the international trade statistics (for instance the International Financial Statistics), is much broader, and includes costs for maritime and other modes of transport. Additionally, the ratios are often characterised by: measurement errors in the values of imports cif and imports fob; IMF staff imputations, that is, constructed ratios; concerns of bias "if high transport cost countries systematically import lower transport cost goods"; aggregation over the different sources of supply, so for each country there is a single cif/fob ratio; misunderstanding, misinterpretation and misuse of these country cif/fob ratios (see Section 2.1; Limão and Venables, 2001: 7; Hummels and Lugovskyy, 2003). Consequently, researchers who use country cif/fob ratios must be especially careful and aware that they are using, in essence, an aggregated and trade weighted average ratio where the weightings are, in large part, determined by the composition of imports that are not the same across countries and groups of countries. Furthermore, these trade weightings of the ratios change over time, adding a further element of non-comparability – not only between countries, but also, comparing changes in a particular country's ratios over time (also see Hummels 1999b).

Finally, despite the rising importance of international transport costs, a lack of reliable and comparable data has hindered research. Consequently, there are few studies on the impact of shipping costs on international trade and economic growth. In essence, these studies show that high and rising shipping costs are associated with significant reductions in foreign trade and economic growth[38]. Although growing in number, it appears that there are still relatively few empirical studies that focus directly on transport costs and their impact on international trade and economic development (as re-confirmed by Micco

---

policy analysis and reform suggestions. It is pleasing to see academic research findings making a difference in practice.

[38] For instance, across economies, Radelet and Sachs (1998) conclude that a doubling of shipping costs is associated with slower annual growth of more than one-half of a percentage point.

and Perez, 2002). The existing studies show that a country's geography, infrastructure, income, type of trade (that is, differences in composition, values and volumes), government policies and market structure are important determinants of shipping costs. These facts present an opportunity to implement measures that aim to improve the efficiency and effectiveness of transport, reduce international transport costs and promote international trade.

These studies on international transportation costs collectively suggest that a review of developments in worldwide shipping costs could commence with a measurement and analysis of country cif/fob ratios. Chapter Three, then, begins the empirical section of this thesis that aims to contribute towards a better understanding of country cif/fob ratios and to assess their global use as a measure (proxy) for direct international transport costs.

CHAPTER THREE

GLOBAL USE OF COUNTRY CIF/FOB RATIOS AS MEASURES OF INTERNATIONAL TRANSPORT COSTS

The United Nations, World Bank, African Development Bank and many other researchers worldwide, use import cif/fob ratios to measure (proxy) country's and groups of countries' international transport costs. To use the ratios as a measure of (direct) shipping costs, many authors have essentially assumed that a country's import composition is reasonably stable so that the ratio "reveals true differences in shipping costs rather than commodity mix effects" (Radelet and Sachs, 1998: 3). The econometric use of the cif/fob ratio, however, has extended this assumption to an extreme by essentially assuming a country's composition of imports as constant. Consequently, a rise in a country's cif/fob ratios is supposed to indicate a rise in that country's (direct) international transport costs that may lead to a reduction in international trade.

The purpose of this chapter is to contribute towards a better understanding of country cif/fob ratios and to assess their global use as a measure (proxy) for international transport costs. In particular, the chapter aims to show how the broad trends in the composition of imports have an effect on these import cif/fob ratios.

This chapter proceeds as follows. Section 3.1 contrasts a shipping cost perspective with that of a composition of imports perspective on Africa's cif/fob ratios in a global context. The analyses and case studies on the United States (Section 3.1.1) and Malawi (Section 3.1.2) each add additional insights on the use and misuse of country import cif/fob ratios as measures of transportation costs. Additionally, the US case study demonstrates how a developed country's composition of imports has both a substantial and significant effect on the cif/fob ratios. Section 3.2 re-examines some seminal cross-sectional and time series econometric studies that use country cif/fob ratios as a measure (proxy) for shipping costs. This analysis leads towards a reassessment of these transportation cost studies that reconsiders what we actually know about the determinants of transport costs and the impact of transport costs on trade and economic growth. Section 3.3 concludes.

3.1 ALTERNATIVE PERSPECTIVES ON AFRICA'S CIF/FOB RATIOS IN A GLOBAL CONTEXT

Transport costs are significant impediments to Africa's trade growth and socio-economic development. The problems posed by Africa's high transportation costs – not only for the 15 landlocked countries but also as most countries with sea-coasts have large interiors (Africa Development Report, 2004: 171) – have been of concern for centuries. Two and a quarter centuries ago, Adam Smith, in the *Wealth of Nations* (1776), stressed the relationship between geographic location and international trade. Shipping, as today, was viewed as a catalyst, a means to greater markets and hence greater levels of efficiency that are a consequence of the division of labour and degree of specialisation (Adam Smith 1776 in Radelet and Sachs, 1998: 1). Smith (1776: 16) first stressed the importance of sea-based trade and shipping as a source of cheap transport and then drew implications for Africa and Central Asia:

> As by means of water-carriage, a more extensive market is open to every sort of industry than what land-carriage alone can afford it, so it is upon the sea-coast, and along the banks of navigable rivers, that industry of every kind naturally begins to subdivide and improve itself, and it is frequently not till a long time after that those improvements extend themselves to the inland parts of the country (Smith, 1776: 14). All the inland parts of Africa, and all that part of Asia which lies any considerable way north of the Euxine [Black] and Caspian seas, the ancient Scythia, the modern Tartary and Siberia, seem in all ages of the world to have been in the same barbarous and uncivilized state in which we find them at present.... There are in Africa none of those great inlets, such as the Baltic and Adriatic seas in Europe, the Mediterranean and Euxine seas in both Europe and Asia ... to carry maritime commerce into the interior parts of that great continent.

Today, only around 19 per cent of Africa's population lives within 100km of the coast – Smith's concerns about inland Africa remain significant (Bloom et al., 1998: 239)[39]. In short, efficient and effective shipping is an important means to economic development.

---

[39] If African populations close to rivers navigable by ocean-going vessels are included, this percentage rises to 21 per cent, as compared with 67 per cent in the United States and 89 per cent in western Europe (Bloom et al., 1998: 239).

The United Nations Conference on Trade and Development's (UNCTAD) *Review of Maritime Transport* as the principal annual publication on international transportation and trade issues, relies greatly on IMF trade data to calculate *ad valorem* shipping costs (that is, import cif/fob ratios) for groups of countries on a worldwide basis. Figure 3.1 and Table 3.1 present these import cif/fob ratios by country groups for 1970, 1980, 1990 and 1997-2003. As stated in Section 2.2, the *Review of Maritime Transport* reports these values annually[40].

Figure 3.1 and Table 3.1 exhibit the marked differences in shipping costs between country groups. The developing countries' costs, in all regions, are consistently and substantially higher than the average for developed countries. In 2003, import freight costs represented 5.4 per cent of world imports (fob). This percentage is largely driven by developed countries, which typically account for more than 70 per cent of total imports and had relatively low transport costs of 3.9 per cent (Micco and Perez, 2001). Compared with 1970, the contraction in the world cif/fob ratios of both developed and developing market economies has been substantial (see Figure 3.1). Radelet and Sachs (1998: 11) explain that shipping costs are undoubtedly falling over time for all countries as improved technologies reduce port and transit times. "Unfortunately, this trend is not evident in the IMF's published CIF/FOB bands, which do not show a significant time trend" (Radelet and Sachs, 1998: 11)[41]. The authors' explanation for this is merely that "this is most likely due to the IMF's tendency to update these estimates only infrequently" (Radelet and Sachs, 1998: 11).

---

[40] Partly due to the time lags in the compilation of the imports cif and imports fob data the *Review of Maritime Transport* 2005 publish the cif/fob ratios for 2003.

[41] "By contrast, the implicit cif/fob band from the US Department of Commerce import data shows a significant downward trend over time.... Hence, shipping costs are much less of a barrier to international trade than they once were. There are reasons to believe that these costs will continue to fall in the future" (Radelet and Sachs, 1998: 11). Hummels (1999b: 3) with reference to the cif/fob ratios states that "the time series derived from IMF sources accords well with conventional wisdom – transportation costs have declined". In contrast, Hummels (1999b) offers evidence from an eclectic mix of data including ocean freight rates that reveal that transport costs had increased. Chapter Five shows South Africa's rising cif/fob ratios have not been indicative of the declines in the country's real direct shipping costs.

FIGURE 3.1. ESTIMATES OF THE CIF/FOB RATIO FOR IMPORTS BY COUNTRY GROUPS
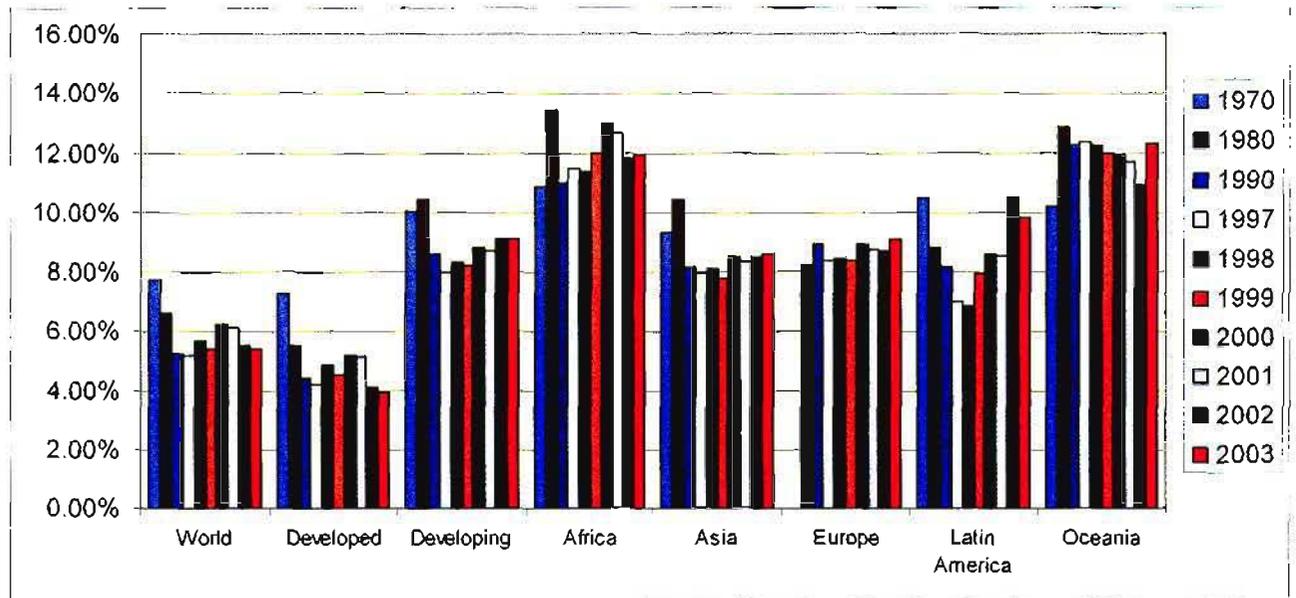
Source: Author compiled from: UNCTAD 1999; 2000; 2001, 2002; 2003a; 2004; 2005;

McConville, 1999: 177; ISL, 2001; 2002.

TABLE 3.1. ESTIMATES OF THE CIF/FOB RATIO FOR IMPORTS BY COUNTRY GROUPS

	1970	1980	1990	1997	1998	1999	2000	2001	2002	2003
World	7.75	6.64	5.22	5.20	5.69	5.39	6.21	6.11	5.50	5.40
Developed	7.26	5.49	4.40	4.20	4.83	4.50	5.21	5.12	4.10	3.90
Developing	10.04	10.44	8.60	8	8	8.21	8.83	8.70	9.10	9.10
- Africa	10.88	13.42	11	11.50	11.36	12.00	12.97	12.65	11.80	11.90
- Asia	9.30	10.41	8.19	7.95	8.11	7.80	8.51	8.35	8.50	8.60
- Europe	NA	8.23	8.96	8.39	8.46	8.38	8.92	8.78	8.70	9.10
- Latin America	10.48	8.85	8.17	7.02	6.86	7.94	8.58	8.57	10.50	9.80
- Oceania	10.21	12.84	12.26	12.36	12.26	12.00	11.94	11.70	10.90	12.30

Source: Author compiled from: UNCTAD 1999; 2000; 2001, 2002; 2003a; 2004; 2005;

McConville, 1999: 177; ISL, 2001; 2002.

Note:

This thesis uses the cif/fob ratio both as a true ratio (1.1) and as a percentage (10 per cent *ad valorem*).
"The estimate for the world total is not complete, since data for countries that are not members of the IMF, the countries of Central and Eastern Europe and republics of the former Soviet Union, and the socialist countries of Asia are not included for lack of information or other reasons" (UNCTAD 2005: 71). I am interested, in future research, to gain access to and analyse the raw data used to compile these country group ratios. I have concerns that the changing composition of imports and "missing" partner trade data with the consequent IMF staff imputations may be introducing biases that in turn provide a distorted perspective on the actual *ad valorem* shipping costs.

54

Shipping costs, in 2003, are 3.9 per cent for developed countries and more than double for other country groups. Latin America had the lowest transport cost in 1997 relative to other developing countries (7.02 per cent, compared to 7.95 per cent for Asia and 11.5 per cent for Africa). These low average transport costs were led by Mexico, which is close to its main trading partner (the United States). Excluding Mexico, Latin American average transport costs rise to 8.3 per cent, more similar to the rest of developing countries (Micco and Perez, 2001: 4). Figure 3.1 illustrates a significant rise in Latin America's ratio from a low of 6.86 per cent in 1998 to a high of 10.5 per sent in 2002[42]. Furthermore, Alderton (1995: 21) notes: "the irony and implications of this [the differences between developed and developing nations transport costs] are obvious in that countries which most need to stimulate their economies face the greatest financial hurdles."

Africa and Oceania typically experience the highest shipping costs: for 2003, these costs were 11.9 and 12.3 per cent of total import value, respectively. These sub-groups have been consistently and significantly higher than both the developed and world market economies by two or three times in percentage terms. Figure 3.1 and Table 3.1 show developing countries in Africa typically experience the highest cif/fob ratios of all the country groups. Most evident, and arguably a cause for concern, is Africa's significant rise in shipping costs from 11 per cent in 1990 to 12.97 per cent in 2000 (also see Chasomeris, 2003c)[43]. Likewise, the African Development Report (2004: 172) compared the ratios for various regions of the world in 1980, 1990 and 1994. Two interesting patterns emerged. The first was that for all regions except sub-Saharan Africa (SSA), shipping costs declined between 1980 and 1994 - SSA is the only region in which transport costs increased. In most regions except for Central and Eastern Europe, this decline was moderate, but by 1994 transport costs were less than 10 per cent. The second observation is that, by 1994, SSA had the highest transport costs of any region.

---

[42] Though not the primary focus of this chapter, visual observation of the changes in Latin America's composition of imports suggests that the rise in SITC-3 (oil imports) is partly responsible for this rise in Latin America's cif/fob ratios (see Appendix C, Figure C2).

Interestingly, 28 per cent of the sub-Sahara African population lives in landlocked economies where the cif/fob ratio for 2001 was 13.84 per cent (Bloom et al., 1998: 239; UNCTAD, 2003a).

The factors underlying Africa's remarkable disadvantages in transport costs include: "great distance from major world markets in the northern midlatitudes...; a very small coastline relative to land area; very few natural coastal ports; populations generally far from the coast; the highest proportion of landlocked states, of any continent; and the absence of rivers leading into the interior of the continent that are navigable by ocean-going vessels" (Bloom et al., 1998: 236-237)[44]. Africa's economic performance rates well below those of other developing regions largely because of poor transport infrastructure and inefficient transport corridors, and unless such issues are addressed it remains unlikely that the continent's developing countries will rise among the trading nations of the world (Drewry Shipping Consultants, 2004)[45]. Likewise, Limão and Venables (2000: 25) found that most of Sub-Saharan Africa's poor trade performance is explained by poor infrastructure, "and by a particular penalty on long distance (typically cross-continental) trade in Africa."

The aggregated ratios, however, conceal vast differences, both apparent and subtle, that persist within the country groups, particularly in Africa. Significant diversity in terms of geographical location and infrastructure; international trade composition; income and development; government bureaucracy and market structure; result in enormous variances in transport costs. Both importers and exporters in Africa face high costs for sea and land transport where "the average freight rate[46] is 47 per cent higher than in other

---

[43] According to John Fossey (Drewry Shipping Consultants, 2004), Africa provides about 12 per cent of the world's population but merely 6 per cent of all shipping and only 3 per cent of the world's container throughput which is predicted to drop to less than 2.8 per cent by 2012.

[44] "In regard to length of coastline relative to land area, note that while western Europe has about one-eighth the land area of Africa (3.5 million km^2 compared with 29 million km^2), its coastline is about 50 percent longer (54, 000km compared with 35,000 km). In regard to water-borne access to the interior, all of Africa's major rivers, including the Nile, the Niger, the Congo, and the Zambezi, have sharp cataracts." (Bloom et al., 1998: 237).

[45] This was the underlining message of the second Intermodal Africa conference held in Cape Town in 5-6 February 2004 (Drewry Shipping Consultants, 2004).

[46] UNCTAD's Review of Maritime Transport (2002, Table 14, in UNCTAD, 2003b: 29) state: "Freight and insurance costs for Africa, excluding South Africa, were 12.97 per cent of imports CAF in 2001". This

developing countries and twice the rate in developed countries, estimated at 5.21 per cent. Those hardest hit by excessive transport costs are the continent's 15 landlocked countries" (UNCTAD, 2003b: 13)[47]. Lack of territorial access to the sea as well as remoteness and isolation from world markets imposes serious constraints on landlocked developing countries and their ability to participate in world trade. The impact of this directly hinders their overall level of socio-economic development. Landlocked developing countries are generally among the poorest of the developing countries, with the weakest growth rates, and are typically heavily dependent on a very limited number of commodities for their export earnings[48] (Chowdhury, 2003: 2). Limão and Venables (2000: 25) show that the representative landlocked economy had transport costs 50 per cent higher and trade volumes 60 per cent lower than the representative coastal economy. These authors suggest that a substantial proportion of this disadvantage may be overcome through improvements in their own and their transit countries' infrastructure. Figure 3.2 shows that in 1998, the average freight costs of the 15 landlocked African countries constituted a higher proportion of total import value (18.08 per cent) than the ratio for all African developing countries (11.36 per cent). Some extreme cases recorded for West Africa include Mali and Burkina Faso with a much higher transport cost percentage of 29.57 per cent and 21.67 per cent respectively. Rwanda registered the highest ratio in East Africa (29.91 per cent) while Malawi in southern Africa represented as much as 39.41 per cent (UNCTAD, 2000 and UNCTAD Media Summary, 2000). These landlocked African countries continue to suffer from excessive transport costs and are estimated to have paid 20.8 per cent in freight charges in 2001, that is, four times the world average rate (UNCTAD, 2003b: 29). The existence of a well-functioning transport system is a prerequisite not only for trade to take place, but also for foreign direct investment to be channelled to a specific country. Some of the main economic factors for

---

statement, however, is incorrect as the freight and insurance costs for Africa actually declined from 12.97 in 2000 to 12.65 in 2001 (UNCTAD, 2003a: 3).

[47] It is important to note that in the above quotation, UNCTAD in 2003 have essentially referred to the cif/fob ratio as "the average freight rate". The conceptualisation of the cif/fob ratio as a country's or group of countries "average freight rate" is misleading as the ratio is essentially total import freight costs (transport costs) as a proportion of imports fob.

[48] Of the 30 landlocked developing countries, 16 are included in the list of least developed countries. The bottom ranked country according to the 2002 UNDP Human Development Index was Sierra Leone (not landlocked), ranked 172. The next nine countries ranked 162-171 were landlocked countries (in Chowdhury, 2003: 2).

selecting a host country for FDI are physical infrastructure and the availability of reliable and efficient transport and communication services (Chowdhury, 2003: 5). The World Investment Report (2001 in Chowdhury, 2003: 5) revealed that for the 30 landlocked developing countries, inward flows of FDI stood at only US$4.6 billion or 0.34 per cent of world flows in 2001. The 15 landlocked developing countries in Africa received only US$984 million. The international community is undertaking measures to address transit transport problems of landlocked and transit developing countries. These efforts include financial assistance in transport infrastructure by the World Bank, regional development banks, and bilateral assistance programmes; multilateral and bilateral assistance projects; trade facilitation measures promoted by UNCTAD, regional commissions, WTO and other relevant international, regional and professional organisations (Chowdhury, 2003: 4).

FIGURE 3.2. FREIGHT COSTS AS A PERCENTAGE OF IMPORT VALUES FOR AFRICAN COUNTRIES, 1998
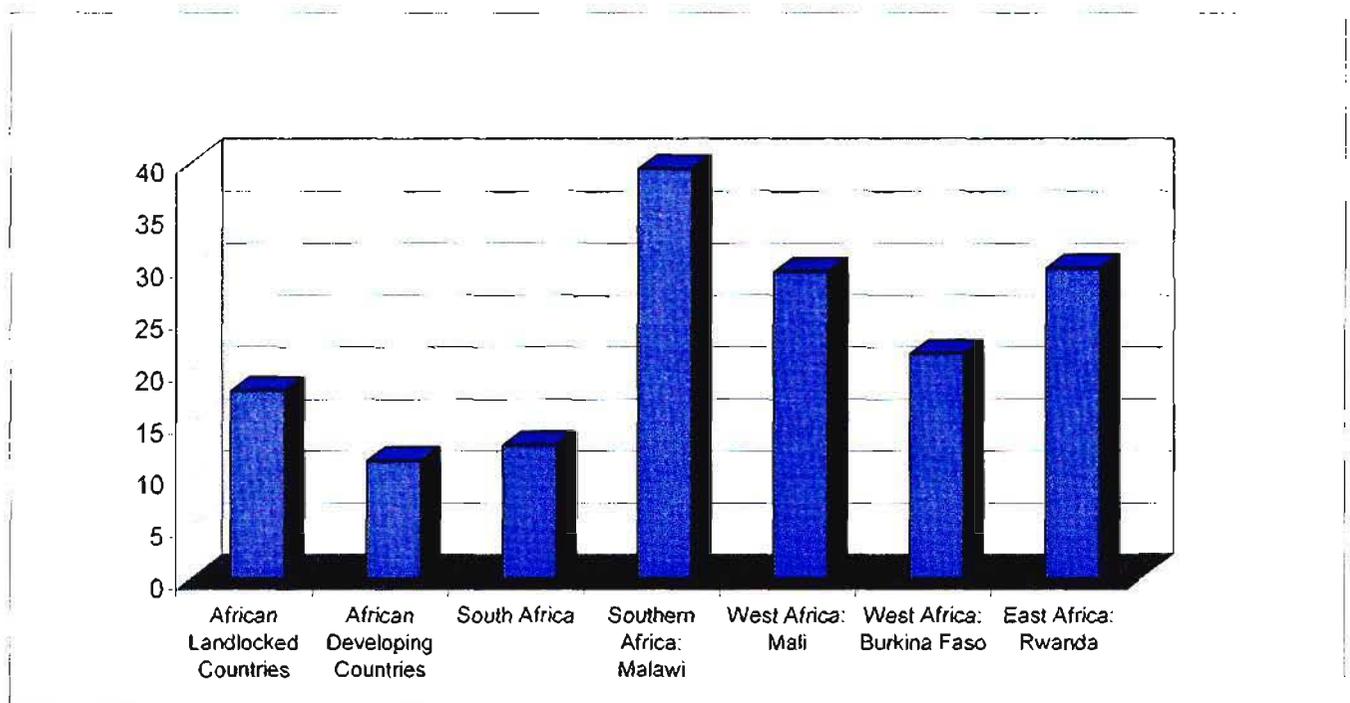
Source: UNCTAD, 2000 and *International Financial Statistics*, 2001 in Chasomeris, 2003c: 139.

Figure 3.3 illustrates the diversity in the level of transport costs, reporting the cif/fob ratio for groups of African countries. Decomposing the composite cif/fob ratio for Africa into the different regions presents a fascinating perspective on what is happening to transportation costs within the various regions of the African continent. Interestingly, transportation costs have declined in all African groups represented in Figure 3.3 except landlocked developing countries and Southern Africa. Landlocked developing countries face the highest transport costs, of over 20 per cent unit values, while North Africa faces the lowest transport costs of about 10 per cent. The African Development Report (2004: 191) showed that, in general, transport costs declined slightly between 1980 and 1994 for all African groups except landlocked, Southern Africa and agriculture groups. The African Development Report (2004: 191) went on to explain, "The increases in all of these groups are largely due to Malawi, where the ratio in 1994 rose to 1.67[49] (because the war in Mozambique denied the shortest route to the sea)". The war in Mozambique, however, does not explain why Africa's cif/fob ratios have continued to increase post-1994 (as evident in Figure 3.1).

---

[49] A cif/fob ratio of 1.67 implies transportation costs of 67 per cent *ad valorem*.

FIGURE 3.3. AVERAGE CIF/FOB RATIO BY REGIONS, AFRICA
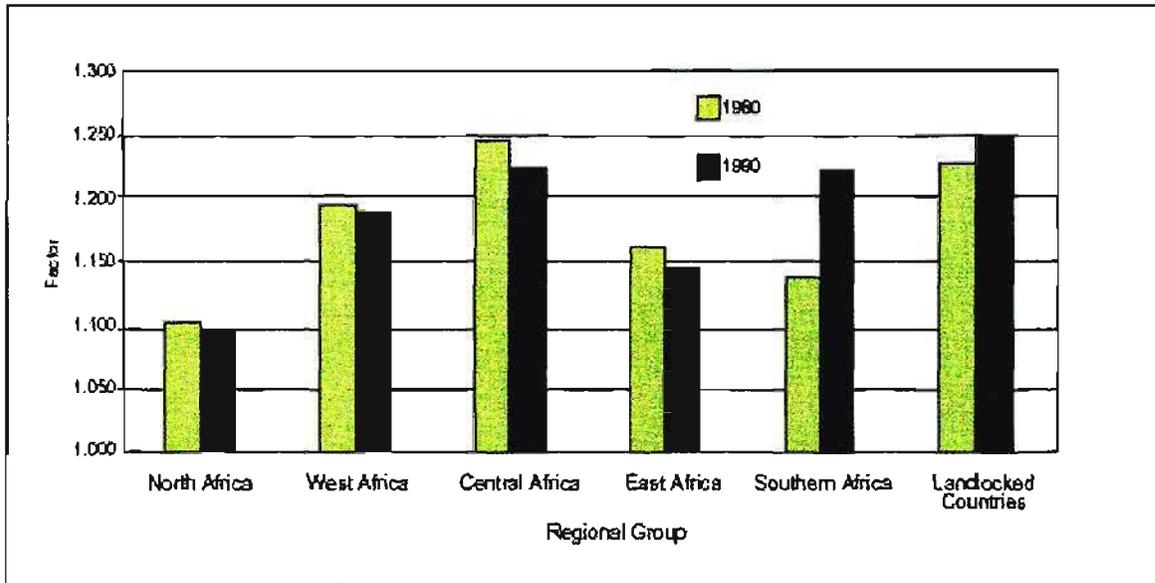
Source: World Trade Organisation International Trade Statistics, 2002 in African Development Report, 2004: 193.

Note:

1.   A cif/fob ratio or factor of 1.2 suggests that transport and related costs are 20 per cent of the import fob value.

If researchers use country and country group cif/fob ratios as a proxy for *direct* shipping costs, then the analysis above presents a dismal perspective on both the level and trends in worldwide shipping costs, particularly for groups of developing countries (see Figure 3.1). For example, in 2003 then, Africa's cif/fob ratio is 31 per cent higher than in other developing countries and three times the rate in developed countries, estimated at 3.9 per cent (own calculations using data in UNCTAD 2005). Furthermore, from Figure 3.1 and Table 3.1 it is evident that developing countries in Africa experienced a considerable rise in the cif/fob ratio from 11.36 per cent in 1998 to 12.97 per cent in 2000[50]. On the one hand, if researchers use the cif/fob ratio as an indicator or proxy for direct shipping costs, then African countries appear to face extremely high and rising international transport

---

[50] This thesis uses the cif/fob ratio both as a true ratio (1.12) and as a percentage (12 per cent *ad valorem*).

costs. Accordingly, promoting this dismal scenario of extremely high and rising costs of transport may encourage additional development aid from various sources. On the other hand, this dismal perspective on Africa's transportation costs is likely to undermine the competitiveness of these countries in foreign markets, and reduce trade opportunities together with the potential to attract export-oriented foreign direct investment (FDI)[51].

Chapter Two, however, found that those who use the cif/fob ratios must be especially careful and aware that they are using, in essence, an aggregated and weighted average ratio where the weightings are, in large part, determined by the composition of imports that are not the same across countries and regions. Furthermore, these weightings of the ratios change over time, adding a further element of non-comparability – not only between countries, but also, between a country's ratios over time (see Section 2.1). Consequently, some may have misunderstood and misused the ratio measure. The misuse of the ratio has lead to some rather interesting, but also probably incorrect results and conclusions that may have influenced policy decisions (see Section 3.2). Chapter Five will present evidence 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. Unfortunately, direct measures of shipping costs that are reliable and comparable are difficult to obtain (Micco and Perez, 2001; OECD, 2002; Hummels and Lugovskyy, 2003). This, in part, is an important reason for the widespread use of country and country group import cif/fob ratios to proxy for direct shipping costs. UNCTAD (2003b: 13) explains that both importers and exporters in Africa face high costs for sea and land transport where "the average freight rate is 47 per cent higher than in other developing countries and twice the rate in developed countries." Statements like the

---

[51] Bloom (et al., 1998) for instance labels their Table 2 as "Indicators of Accessibility for Trade, by Region". These indicators were actually cif/fob ratios, labelled as shipping costs, and shows that the situation looks dismal for Sub-Saharan Africa with 20 per cent "Shipping costs", as compared with only 5 per cent for Western Europe – there is no mention of the shortcomings and most importantly no explanation of how the composition of imports is likely to affect these "Indicators of Accessibility for Trade". Interestingly, if South Africa were included in these indicators of accessibility for trade, potential investors may be confused as South Africa's mean cif/fob ratio was 8.87 per cent for the period that included economic sanctions (1985-1993), significantly lower than the post-sanctions (1995-2002) mean of 12.9 per cent. Clearly, as Chapter Five has shown, cif/fob ratios should not be used as indicators of direct shipping costs. The ratios may be misleading and thus to a country's detriment – especially when considered as an indicator of accessibility for trade!

above may be misleading for a number of reasons[52]. Consider that UNCTAD (2003b: 13) explains how both land and sea transport costs, for importers and exporters in Africa, are high. The next sentence then explains that the "average freight rate is 47 per cent higher than in other developing countries and twice the rate in developed countries..." (UNCTAD, 2003b: 13). Although the statement is presumably made to support their assertion that African importers and exporters continue to face high costs for both sea and land transport, the use of the concept "average freight rate" is potentially misleading. The concept of "freight rate" is commonly used to refer to direct costs of transportation. However, the measure UNCTAD (2003b) is reporting is the indirect or *ad valorem* transportation cost measure, the cif/fob ratio. Additionally, the ratio's aggregated and composite character, as discussed in Section 2.1.2, is often more indicative of changes in the import composition rather than reflecting direct shipping costs! Furthermore, there are multitudes of potential meanings implied by the word "average". In the case of a country or country group cif/fob ratio, the ratio is more than a simple "average". Rather, the cif/fob ratio is a measure that is an aggregated and import trade weighted mean (or in some instances median), where the *ad valorem* trade weighted measure continuously changes determined by both the evolution in transportation costs and the evolving composition of imports. Consequently, a meaningful and useful comparison of a country or country group "average cif/fob ratio" is very difficult to justify, especially without a sound contextual understanding of the evolution and composition of imports.

Although some informed academics may agree that it is possible that changes in the composition of imports may affect the cif/fob ratios, their assumptions and subsequent econometric use of the ratios show that they essentially assume a constant composition of imports. For example, despite acknowledging that the composition of imports may influence the cif/fob ratios, Radelet and Sachs (1998: 3) state: "We hope that since the import basket of developing countries is more homogeneous than the export mix, the measure of the cif/fob ratio will reveal true differences in shipping costs rather than commodity mix effects." To be fair, keep in mind that the study by Radelet and Sachs

---

[52] Even though "average freight rate" is qualified with a footnote on page 29 that states "freight and insurance costs for Africa, excluding South Africa, were 12.97 per cent of imports CAF in 2001", the statement made by UNCTAD (2003) on page 13 remains misleading.

was in 1998. Figure 3.4 illustrates the actual changes in Africa's composition of imports over the period 1980 to 2002. Visual analysis of Figure 3.4 indicates that much of the period between 1980 and 1998 was relatively stable in comparison with the marked changes from 1998 to 2000. Theory suggests that a fall in the proportion of high-valued imports, like manufactured imports, may cause a rise in the country's cif/fob ratio, *ceteris paribus*, while a rise in the proportion of low-valued imports (like oil, mining and agricultural products) may cause a rise in the country's cif/fob ratio, *ceteris paribus*. Analysis suggests that the substantial changes in the composition of imports appear to be an important factor contributing to the rise in Africa's cif/fob ratios from 11.36 per cent in 1998 to 12.97 per cent in 2000. A simple observation of SITC-3 (essentially petroleum oil imports, the light blue line in Figure 3.4) shows that SITC-3 (oil) as a proportion of total imports to the African region increased substantially from 4.1 per cent in 1998 to 10.3 per cent in 2000. Indeed, correlation analysis between Africa's cif/fob ratio and Africa's composition of imports, discussed below, confirms a significant relationship between SITC-3 and Africa's cif/fob ratios. The question is, then, why did Africa's petroleum imports, as a proportion of total import (by value) rise so significantly from 1998 to 2000? The answer may be primarily due to the rise in crude oil prices. In 1998, the average annual crude oil price was 13US$ per barrel - by 2000 it stood at just over 28US$ per barrel, an increase of more than 116 per cent! Indeed, from 1999 to 2000 the average annual increase in crude oil prices rose from just under 18US$ per barrel to more than 28US$ per barrel, an increase of more than 57 per cent (these calculations use data sourced from TIPS, 2005)[53].

---

[53] Interestingly, this 57 per cent rise was the highest average annual increase in crude oil prices since the oil crises of 1979 where annual average oil prices rose by 134 per cent.

FIGURE 3.4. AFRICA'S SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002
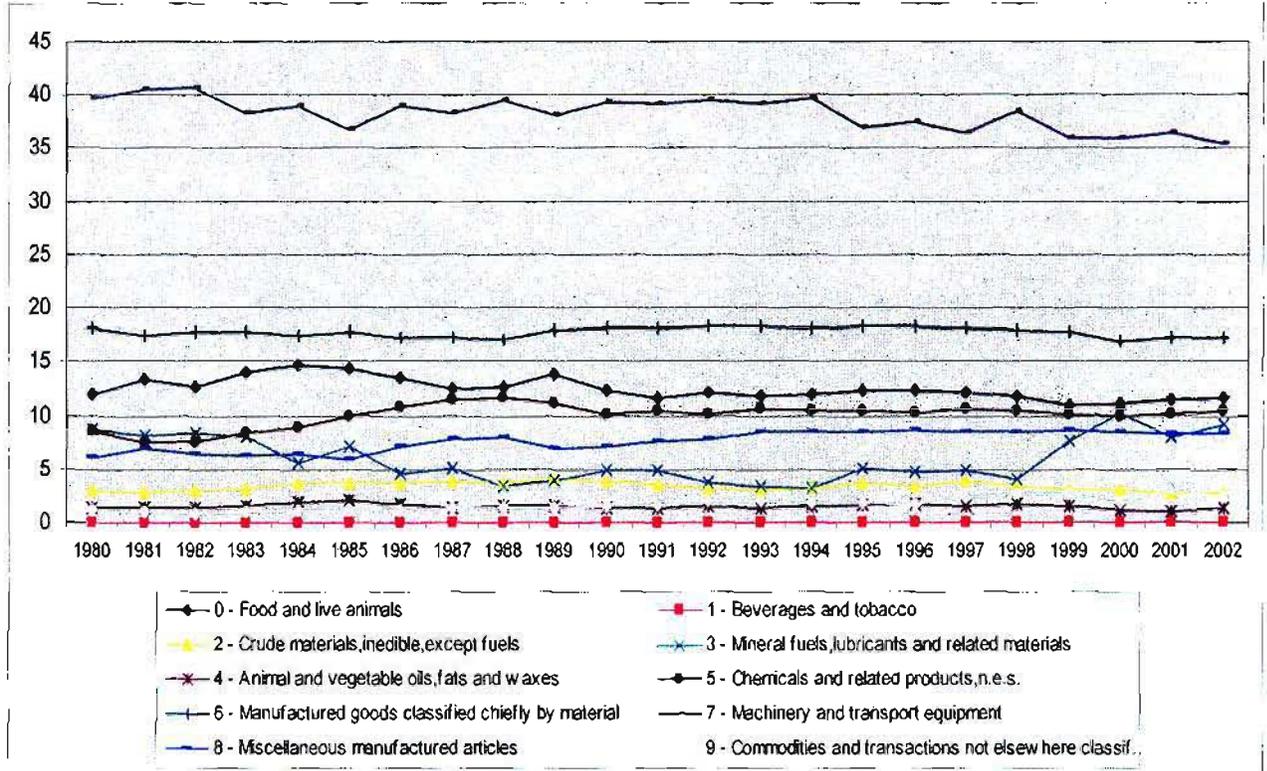
Source: own calculations based on SITC data in TIPS, 2005.

The world's cif/fob ratio has declined: 7.75 per cent in 1970; 6.64 per cent in 1980; 5.22 per cent in 1990 (see Table 3.1). In contrast to these declines, 2000 witnessed a significant increase to 6.21 per cent. Rather than view the trends in these ratios as indicative of changes in direct measures of shipping costs, reconsider these trends in the context of the evolving composition of world trade (Figure 3.5). Most evident in Figure 3.5 are the substantial decline in oil imports (SITC 3) as a proportion of total imports and the substantial rise in machinery and transport equipment (SITC 7). The economic theory suggests that the rise in manufactured goods (in this case SITC 7) as a proportion of total imports would contribute to a decline in the world cif/fob ratio. Likewise, a decline in oil imports (SITC 3) as a proportion of total imports would also contribute to a decline in the cif/fob ratio. Hence, even if there was no information on the actual levels of the world cif/fob ratios, a simple observation of the evolution in the composition of world imports (in particular SITC 3 and SITC 7) suggests that the ratio (*ad valorem* shipping costs) may

64

be substantially lower in 1990 as compared with 1980, as is evidently the case. In 2000, however, the world experienced an increase in the cif/fob ratio to 6.21 per cent. On the one hand, the evident increase in the ratio for all groups except Oceania may partially be explained through an understanding of supply and demand in the freight markets. World seaborne trade boasted its fifteenth consecutive increase in absolute terms in 2000 (UNCTAD, 2001, and UNCTAD Media Summary 2001). The increase in demand for sea transport resulted in a general increase in freight rates for tanker, time- and trip-charters and main containerised routes (UNCTAD, 2001). On the other hand, an analysis of the world's composition of imports also suggests that the rise in oil (SITC-3) as a proportion of total imports, primarily because of the 57 per cent average annual rise in crude oil prices, have contributed to the higher ratio in 2000.

The visual analysis in Figure 3.4 and Figure 3.5 suggests that to ignore, or assume constant, the composition of imports appears to be an unrealistic and unacceptable practice. Table 3.2 uses correlation analysis to investigate the significance, magnitude and direction of the relationships between the composition of imports and various country and country group cif/fob ratios.

FIGURE 3.5. WORLD SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002
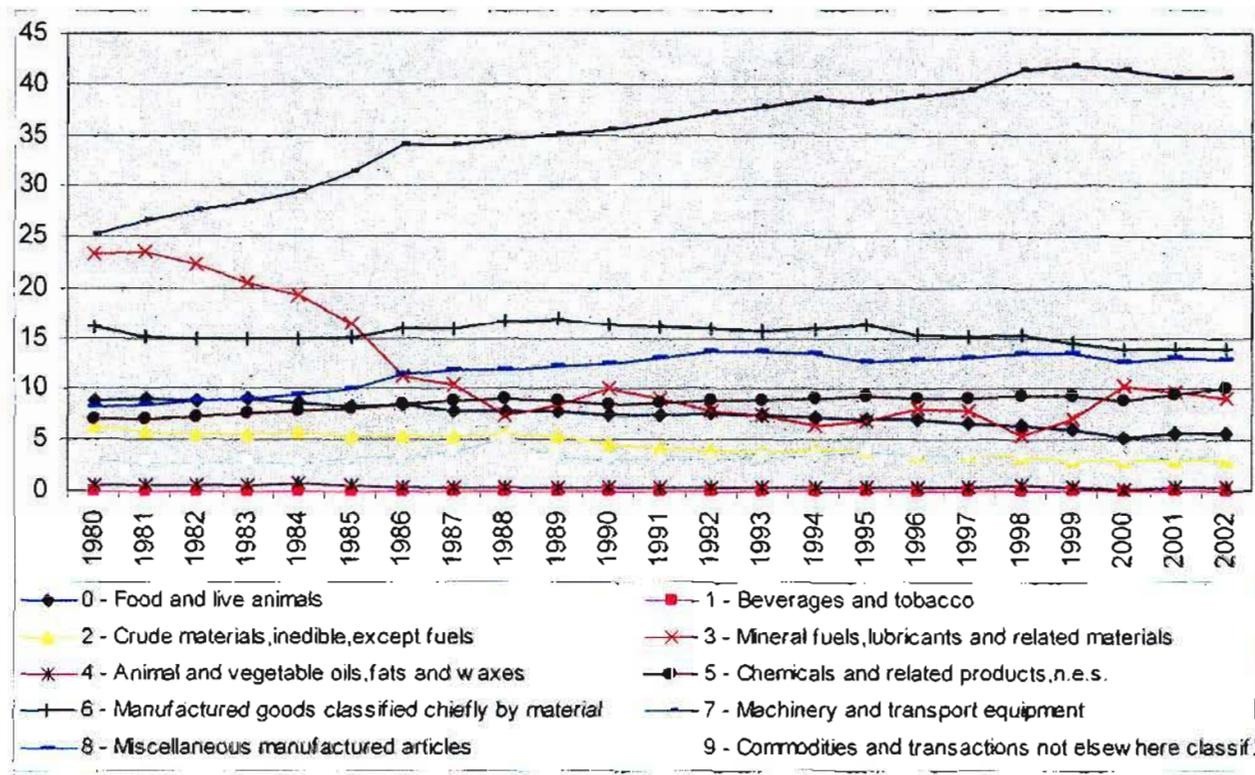
Source: SITC data proportions, author calculated from raw data in TIPS, 2005.

Table 3.2 shows the results of correlation analysis between various country and country group SITC imports as a proportion of total imports, and their respective cif/fob ratios. Table 3.2 uses the annual cif/fob ratios for each country calculated from the IMF's IFS trade statistics. Furthermore, the World Trade Analyser is used to decompose and then calculate the SITC import categories as a proportion of total imports (SITC Revision 2, in TIPS, 2005). The correlation results between a particular country's annual cif/fob ratio and that country's annual composition of imports are summarised in Table 3.2. The shading of the negative correlation coefficients is to aid the visual analysis of trends in these correlations. To begin a reasonable analysis of the results in Table 3.2, one must be cognisant of the limitations of these correlations (see Gujarati, 1995: 21; 78-80). Firstly, consider the case studies using country groups. Here the limitations include that the SITC data for the world and African continent include all the countries for which data are available using the World Trade Analyser (TIPS, 2005).

TABLE 3.2. CORRELATION RESULTS BETWEEN VARIOUS COUNTRY AND COUNTRY GROUP CIF/FOB RATIOS AND THEIR RESPECTIVE SITC IMPORTS AS PROPORTION OF TOTAL IMPORTS

SITC	World	USA	GERMANY	AUSTRALIA	NEW ZEALAND	MAURITIUS	AFRICA	SOUTH AFRICA	SOUTH AFRICA	MALAWI
	1982-2002	1980-2002	1980-1998	1980-2002	1981-2002	1980-1998	1982-2002	1980-2002	1995-2002	1980-2000
0	0.232	0.933*	0.470**	0.300***	-0.457**	0.806*	-0.624*	0.251	0.053	0.326***
1	-0.603*	0.779*	0.142	0.458**	-0.412**	-0.400**	0.550*	0.706*	-0.182	-0.122
2	0.223	0.845*	0.470**	0.739*	0.341***	0.822*	-0.458**	0.015	0.030	-0.578*
3	0.824*	0.666*	0.773*	0.475**	0.578*	0.777*	0.511*	0.429**	-0.403	0.321***
4	0.228	0.417**	0.647*	0.433**	0.584*	0.848*	-0.548*	0.180	0.092	-0.140
5	-0.629*	-0.925*	-0.601*	-0.530*	-0.090	-0.128	0.231	0.766*	0.178	0.038
6	-0.584*	0.853*	-0.522**	0.812*	0.571*	-0.732*	-0.447**	0.478**	-0.139	-0.617*
7	-0.509*	-0.716*	-0.652**	-0.496**	-0.663*	-0.756*	-0.722*	0.706*	-0.174	0.406**
8	-0.708*	-0.686*	-0.641*	-0.487*	-0.634*	-0.825*	0.584*	0.727*	-0.181	0.186
9	-0.508*	-0.829*	-0.325***	-0.812*	-0.169	-0.626*	0.646*	-0.675*	0.257	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.

*: significant at probability level (p) = .010

**: significant at p = .050

***: significant at p = .100

1. For South Africa, the end of economic sanctions witnessed the largest portion of other unclassified goods (HS99), which mainly consisted of crude oil, included under HS27 (that is within SITC category 3) as from 1995.

Source: Own calculations of cif/fob ratios using IMF trade data; Own decomposition of SITC imports using World Trade Analyser from TIPS, 2005. Own correlation analysis using Microsoft Excel (see Appendix C for the data used in the correlation analyses).

The IMF cif/fob data from UNCTAD exclude some countries (non-IMF members, Central and Eastern Europe and republics of the former Soviet Union, and the socialist countries of Asia) from the world cif/fob data, and only include developing countries in Africa's cif/fob ratio. Hence, these results may be biased.

Of the many interesting relationships and trends demonstrated through the results in Figure 3.2, consider the following six observations. One, as mentioned above, theory suggests that a rise in the proportion of high valued imports like manufactured imports may cause a decline in the country's cif/fob ratio, *ceteris paribus*. A rise in the proportion of low valued imports (like oil, mining and agricultural products) may cause an increase in the country's cif/fob ratio, *ceteris paribus*. Mindful of this theory, consider the numerous correlation coefficients exhibited in Table 3.2. Indeed, the results of the correlation analysis between import categories SITC-0 through SITC-4 and the country cif/fob ratios for the US, Germany and Australia show positive and statistically significant coefficients (only SITC-1 for Germany was not significant). Interestingly, except for SITC-6 in the US and Australia, all the other correlation coefficients between SITC-5 through SITC-9 and the country cif/fob ratios for the US, Germany and Australia show negative and significant coefficients. In other words, changes in the proportion of lower-valued imports categories (SITC0-SITC4) and the proportion of higher-valued imports (SITC 5-SITC9), appear to have a substantial and significant effect on the variation in the cif/fob ratios of the US, Germany and Australia, essentially as the theory predicted. More specifically, the theory suggests and observation of these correlation coefficients shows that a fall in the proportion of the lower-valued imports (SITC0-SITC4) and a rise in the proportion of higher-valued imports (SITC 5-SITC9) will cause a decline in these countries cif/fob ratios[54].

Two, the direction of the relationships between the composition of imports and the cif/fob ratio for the World and Mauritius appear similar. In particular, note how SITC-1 and SITC-5 through SITC-9 show negative coefficients.

---

[54] Some of the unexpected or insignificant correlation coefficients may be due to measurement errors and imports classification errors (see Section 2.1 and Yeats, 1995 for a fuller discussion).

Three, in New Zealand's case, SITC-2 through SITC-4 and SITC-6 show significant positive correlation coefficients. Similar to Africa, the correlation results for SITC-0 for New Zealand exhibits a significant negative correlation. In contrast, all the other cases investigated show a positive correlation.

Four, Africa exhibits some odd results. Presumably, these partly unexpected results may be somewhat affected by the limitation explained earlier in which the SITC data are for the entire African continent (available from the World Trade Analyser in TIPS, 2005) whereas the the IMF cif/fob data from UNCTAD only include developing countries in Africa's cif/fob ratio. Furthermore, there are likely to be, on the one hand, problems caused by measurement errors and imports classification errors in the SITC data (see Section 5.1 and Yeats, 1995 for a fuller discussion). On the other hand, the quality of the aggregated cif/fob ratios is also not reliable for many of the developing countries in Africa (as Section 3.1.2 will show for Malawi). Despite these data drawbacks, the correlation coefficient for SITC-3 is positive, with both economic and statistical significance, adding support for the earlier observations made between Africa's rising oil (SITC-3) imports and Africa's rising cif/fob ratios, particularly evident for the period 1998 through 2000[55].

Five, analysing South Africa's SITC data (from DTI, 2003), for the then available period 1988-2001, shows a substantial and significant ($p = .010$) correlation between the cif/fob ratio and the proportion of manufacturing (-0.76 coefficient) and mining (+0.76) imports. Using World Development Indicators data (in TIPS, 2004), as an alternative to the SITC import data for the same period 1988-2001, confirms a substantial and significant ($p = .010$) correlation between the country's cif/fob ratios and manufactures as a proportion of merchandise trade (-0.69). In other words, when the proportion of manufacturing import increases and the proportion of mining import decreases, South Africa's cif/fob ratios typically increase and vice versa. However, an essential assumption commonly asserted by studies that use country cif/fob ratios as a measure of shipping costs is that "the cif/fob ratio will reveal true differences in shipping costs rather than

---

[55] An attempt to remove South African imports from the total imports for the Africa region results in a negative value for SITC-9. This is indicative that South Africa's classification and total values of imports are not accurately captured in the aggregated data for the Africa region. These data problems require further investigation that might

commodity mix effects" (Radelet and Sachs, 1998: 3). If South Africa's recorded trade data were reliable, then these correlation results might imply that South Africa's composition of imports has a substantial and significant effect on the country's cif/fob ratios. Accordingly, South Africa's cif/fob ratios might then rather be indicative of changes in the country's composition of imports than changes in the country's direct shipping costs. South Africa's trade data, however, are not reliable. Using the more disaggregated analysis of the SITC data from TIPS (2005 in Table 3.2 and Appendix C) reveals serious data quality problems. South Africa's correlation results only show a strong, negative and statistically significant correlation coefficient between the cif/fob ratio and SITC-9 (that is, -0.675). Evidently, there appear to be problems with the data. With foresight on the trends in the country's aggregated cif/fob ratios (Chapter Five), South Africa's odd correlation results for the period 1980 to 2002 are likely to be caused by shortcomings in the disaggregated SITC data. The shortcomings in these SITC data are, in turn, most probably the consequences of non-disclosure of imports and misclassification, largely by design rather than chance or mistake, resulting from South Africa's most controversial political economy. Indeed, Figure C1 in Appendix C illustrates that before 1994, the year in which South Africa became a recognised democracy, by far the largest proportion of South Africa's imports, by value, were classified under SITC-9 (that is, commodities and transactions not elsewhere classified). Due to the end of economic sanctions, 1995 witnessed a significant re-enumeration and re-classification of the largest portion of other unclassified goods (HS99), which primarily consisted of strategically sensitive petroleum imports, included under HS27 (that is, as SITC-2 excludes fuels, petroleum is recorded under SITC-3). The correlation coefficients for post economic sanctions (1995-2002), though interesting to observe the change in magnitude and sign, are statistically insignificant. Hence, using import cif/fob ratios computed from these trade data are neither likely to accurately indicate South Africa's actual *ad valorem* shipping costs nor direct costs of transportation. Despite these analyses and findings on South Africa's cif/fob ratios, the absence of direct measures of shipping costs limits the Section's ability to answer the research question on whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures. Chapter Five provides an answer to this research question.

---

begin through a discussion with those responsible for compiling the data for the World Trade Analyser (TIPS, 2005).

With this understanding of the cif/fob ratio, researchers have then sought to find possible explanations for the impressive decline. The explanations may have typically included: changes in distance from international markets; improved infrastructure; 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. Many researchers consider the declines in the US cif/fob ratios as indicative of declines in direct measures of shipping costs (see for instance, Rose, 1991; Radelet and Sachs, 1998). In other words, the declines in the US cif/fob ratios are meant to be indicative of the fall in the country's direct international transport costs that have contributed to the rise in the country's international trade.

Table 3.2 presented the correlation results between the US cif/fob ratios and SITC composition of imports (Revision 2, in TIPS, 2005). Figure 3.7 illustrates the evolution in the composition of US imports between 1980 and 2002. The evolution of the US composition of imports appears rather similar to the evolution of world imports, in Figure 3.5, and is dominated by the clear trends in SITC-3 and SITC-7. Briefly, recall from Section 3.1 that a decline in SITC-3 and a rise in SITC-7 are expected to lead to a decline in the US cif/fob ratio, *ceteris paribus*. Indeed, the evolving composition of US imports has directly contributed to the observed declines in the US cif/fob ratios. Additionally, the literature review showed that Yeats (1978) decomposed variation in the COMTRADE cif/fob ratios into a transport cost component and residual factor[56]. The objective of Yeats (1978) was to assess the quality of the official statistics, and to estimate the *ad valorem* incidence of shipping costs. Yeats (1978: 355) conducted tests that indicate cif/fob ratios "do not approximate nominal transportation costs in spite of the assumption often made in gravity flow and trade related models". Furthermore, Yeats (1978: 358) concludes, "the magnitudes of the discrepancies revealed in the official trade statistics are certainly sufficient to bias findings of the theoretical and empirical studies." Likewise, Chapter Five will present

---

[56] Although the evolving composition of imports affects transportation costs (cif/fob ratios), transportation costs may also affect the composition of imports. This problem of simultaneity could be a focus for future research. Nonetheless, Yeats (1978: 355) concludes that cif/fob ratios "do not approximate nominal shipping costs" and

evidence that *ad valorem* transportation costs implied by IMF cif/fob ratios are significantly different from the explicitly collected data on South Africa's real (GDP deflated) direct shipping costs. Accordingly, researchers need to be sceptical of substituting country cif/fob ratios for more direct measures of international transport costs.

FIGURE 3.7. USA SITC IMPORTS AS PROPORTION OF TOTAL IMPORTS, 1980-2002
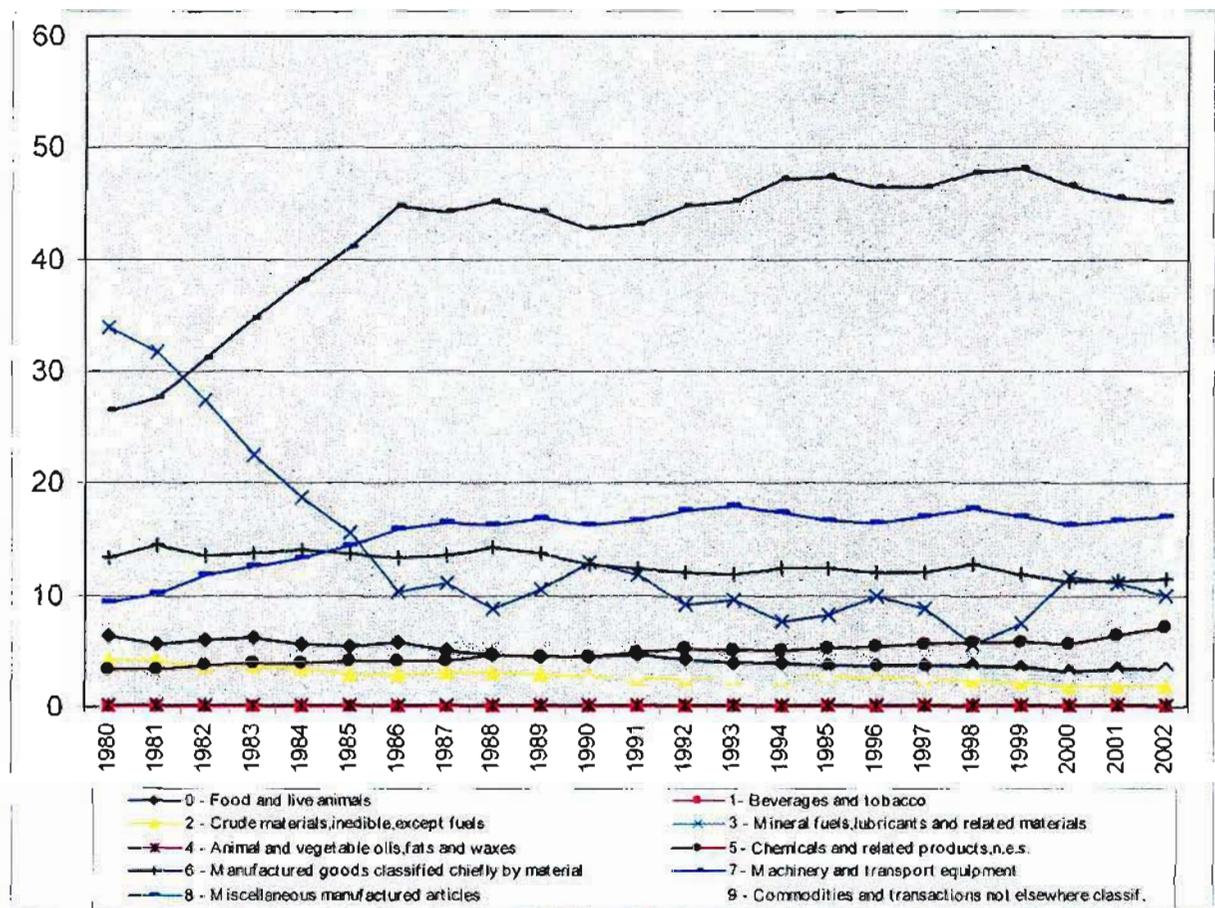
Source: Own calculations with SITC data from TIPS, 2005.

Chapter Five shows that South Africa's cif/fob ratios do not approximate the country's real Europe-South Africa freight rates.

Using Word Development Indicators data, as an alternative to the SITC data and source, Figure 3.8 illustrates the annual variation in the US cif/fob ratio and manufactured imports as a proportion of total merchandise imports for the period 1962-2001.

TABLE 3.3. CORRELATION RESULTS: UNITED STATES CIF/FOB RATIOS AND IMPORT MANUFACTURES

Years (Inclusive)	Number of observations (n)	Correlation coefficient (r)	Coefficient of determination (r^2)	t statistic (t)
1962 - 2001	40	- 0.876	0.767	-4.062 *
1962 - 1974	13	- 0.925	0.851	-8.074 *
1975 - 2001	27	- 0.859	0.738	-8.389 *

Source: Author calculations from *World Development Indicators*, 2003 and *International Financial Statistics*, 2003 in TIPS, 2004.

Note: *: significant at p = 0.010

1. Hummels (1999b: 29) taking the national data as the accurate source notes that "the IMF data taken from IFS seems quite accurate for the US beginning in 1974 – the year that US national sources began reporting both cif and fob values of the flow". Hence, the reason for the periods analysed.

Observation of Figure 3.8 reveals what appears to be a negative correlation between manufactures as a proportion of imports and US cif/fob ratios. In other words, it appears that as the US proportion of manufactured imports has risen, so the country's cif/fob ratios have declined. Interestingly, the correlation results in Table 3.3 confirm a very high and statistically significant inverse relationship (-0,876) between US cif/fob ratios and manufactures as a proportion of merchandise imports. This economically and statistically significant relationship has a coefficient of determination of 0.767 that implies that over the period 1962 to 2001, about 77 per cent of the variation of the cif/fob ratio may be explained by the relationship between manufactures as a proportion of imports and the cif/fob ratios. Hummels (1999b: 29) explains that "the IMF data taken from IFS seems quite accurate for the US beginning in 1974 – the year that US national sources began reporting both cif and fob values of the flow." Accordingly,

correlation analysis post-1974 reveals a similar relationship with a correlation coefficient of -0.859. This economically and statistically significant relationship between the cif/fob ratios and a country's composition of imports suggests that a rise in the proportion of manufactured imports will contribute to the decline in the recorded cif/fob ratios[57]. These results show, yet again, the substantial and significant effects that changes in the composition of imports may have on the US cif/fob ratios.

FIGURE 3.8. UNITED STATES CIF/FOB RATIOS AND MANUFACTURED IMPORTS, 1962-2001
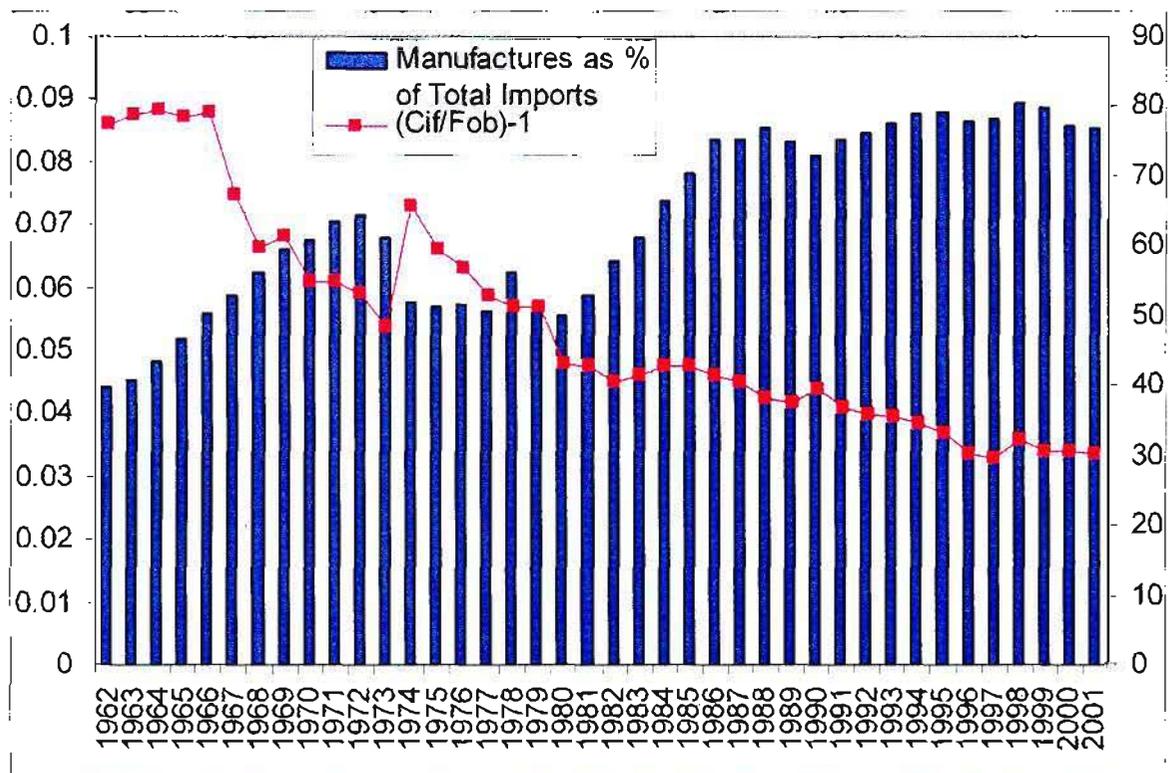
Source: Author calculations from *World Development Indicators*, 2003 and *International Financial Statistics*, 2003 in TIPS, 2004.

Note:

1. Hummels (1999b: 29) explains that "the IMF data taken from IFS seems quite accurate for the US beginning in 1974 – the year that US national sources began reporting both cif and fob values of the flow".

---

[57] The US correlation coefficient between manufactures as a proportion of total imports and the cif/fob ratios is even higher than that of South Africa's -0.688 (using WDI data, 2003) and -0.76 (SITC data from DTI, 2003) over the period 1988-2001.

3.1.2. MALAWI: A TRANSPORT COST TRAGEDY

"Five million face death as famine grips Malawi" was the news headline in early October 2005 (Corcoran, 2005). A country already plagued by AIDS and malaria is further contending with severe drought and famine. Compounding these hardships is the fact that Malawi faces extremely high international transportation costs.

So how high are Malawi's international transport costs? According to the African Development Report (2004: 192), between 1980 and 1994, most regions in Africa had experienced a slight decline in transport costs as measured by the regional cif/fob ratios. "The main exceptions are landlocked, Southern Africa and agriculture groups. The increases in all of these groups are largely due to Malawi, where the ratio in 1994 rose to 1.67 (because the war in Mozambique denied the shortest route to the sea)" (African Development Report, 2004: 192). This revelation that Malawi's international transport costs were measured at 67 per cent *ad valorem* is indeed tragic for the many reasons already explained in Section 3.1 and in Chapter Two, that included reduced trade competitiveness and potential to attract trade-oriented FDI. Both may be harmful to economic growth in the long run (Radelet and Sachs, 1998; Chowdhury, 2003).

So, can Malawi's international transport costs, proxied by the country's cif/fob ratio, plausibly be 67 per cent *ad valorem*? In other words, were Malawi's *ad valorem* shipping costs more than 17 times higher than the average for developed countries, measured at 3.9 per cent in 2003? (Author's calculations based on 2003 data from UNCTAD, 2005). Is it plausible that in 1994 the ratio rose to 67 per cent *ad valorem* "because the war in Mozambique denied the shortest route to the sea"? Is this disastrous scenario probable or even possible? The findings of Section 2.1 and Chapter Five clearly reveal that a country's cif/fob ratios are often error riddled and depend significantly upon the country's composition of imports. Consequently, as in South Africa's case, a country's cif/fob ratio does not necessarily reflect the level or variation in a country's direct international transport costs. Understandably, it would be prudent to examine Malawi's cif/fob ratio to evaluate these findings and statements made by the African Development Report (2004). Figure 3.9 illustrates Malawi's cif/fob ratio with the available data from the IMF's IFS, the same source used by the African Development Report (2004), for the period 1980-2000.

Figure 3.10 illustrates Malawi's SITC imports as a proportion of total imports for the period 1980-2002.

Evidently, Malawi's cif/fob ratios calculated from *International Financial Statistics* data (in TIPS, 2005) were 67 per cent for each of the nine years prior to 1994, and for each of the three years after 1994. The African Development Report (2004: 192) claims that Malawi's "ratio in 1994 rose to 1.67 (because the war in Mozambique denied the shortest route to the sea)." In contrast, Figure 3.9 illustrates that for 1994, Malawi's ratio apparently declined to 1.508, that is, 50.8 per cent *ad valorem* shipping costs. Besides, the civil war in Mozambique ended in 1992 (Sunday Times, 2006). Furthermore, notice that Malawi's cif/fob ratios do not reflect the substantial changes in Malawi's composition of imports that are particularly evident in SITC-7[58]. Likewise, consider that most developed and developing countries experienced a rise in cif/fob ratios for 2000, largely because of the significant rise in crude oil prices (see Table 3.1). In stark contrast, Malawi's cif/fob ratio plummeted from 60.9 per cent in 1999 to 13.6 per cent in 2000.

---

[58] Interestingly, notice how SITC-7 is substantially higher over the period 1986 to 1991, the same period during which Europe imposed economic sanctions on South Africa.

FIGURE 3.9. MALAWI'S CIF/FOB RATIOS, 1980-2000
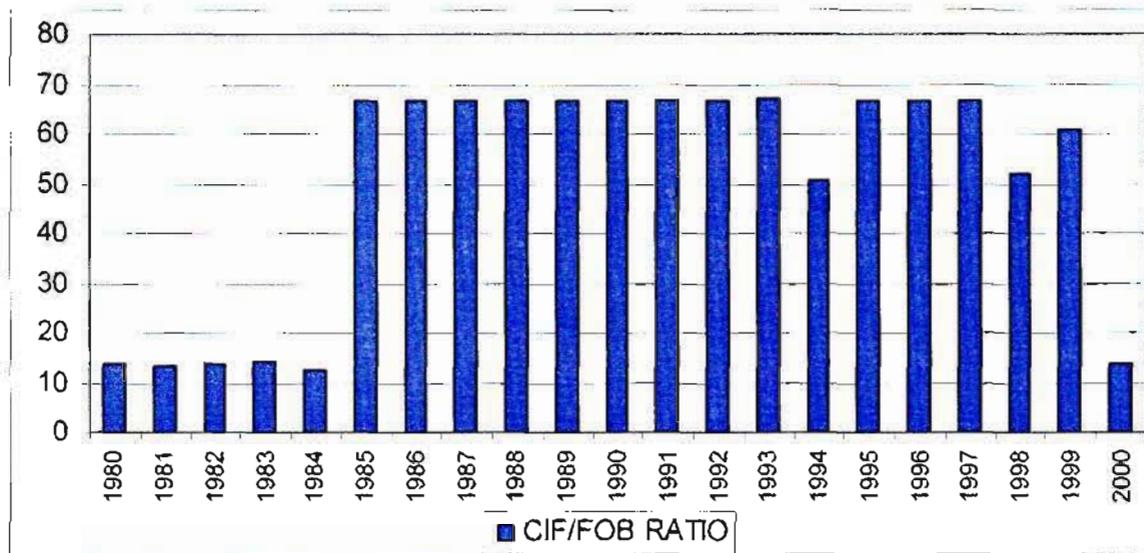
Source: own calculations using *International Financial Statistics* data in TIPS, 2005.

FIGURE 3.10. MALAWI SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002
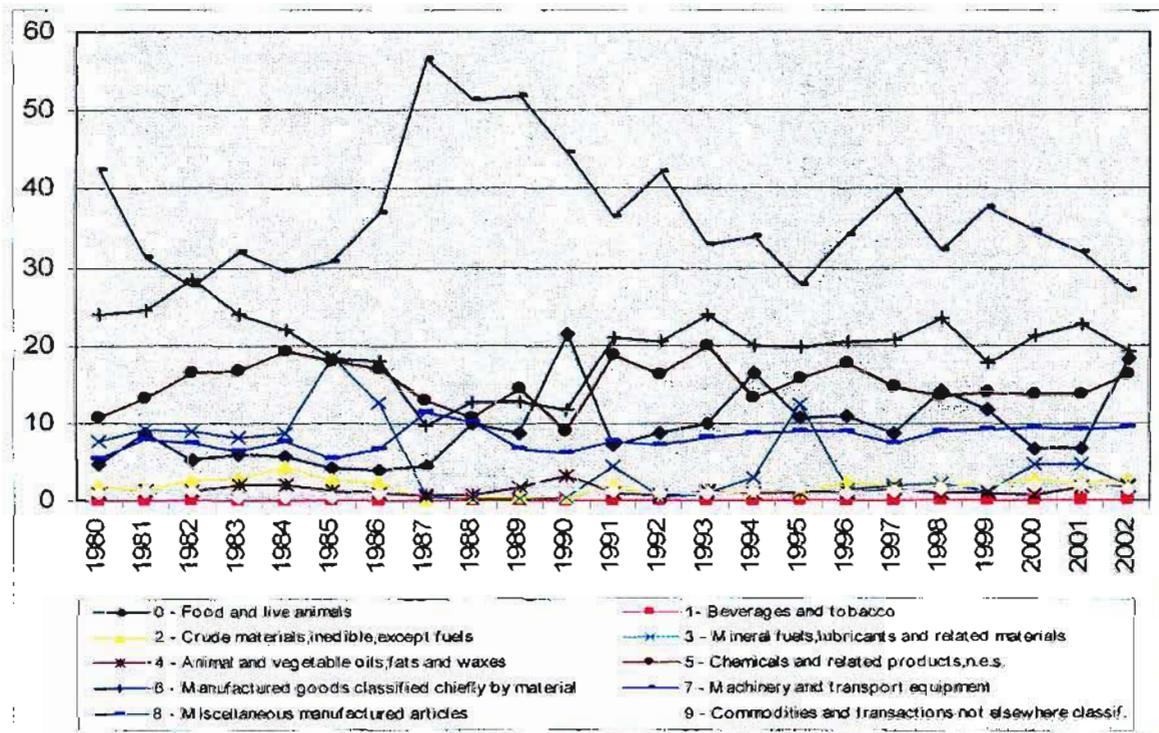
Source: own calculations using SITC (Revision 2) data in TIPS, 2005.

It appears that Malawi's consistently high ratio of 67 per cent *ad valorem* is largely the result of IMF staff imputations. As explained in Section 3.4, with IMF staff imputations either Malawi's imports cif or imports fob data are available, but not both. Using a constant conversion factor, in this case apparently 67 per cent, the IMF staff calculates the missing import time series values (also see Moneta, 1959: 42; Yeats, 1995)[59]. Evidently, imputations of the data, as in the case of Malawi, make the IMF cif/fob ratios "completely uninformative for many countries and suspect for many others" (Hummels, 1999b: 29). Accordingly, researchers need to examine carefully both trade data and country cif/fob ratios before embarking on econometric studies and other research.

In stark contrast to the case study of Malawi with extremely high and unreasonable cif/fob ratios, partly due to poor quality data, was the case study of the United States – a developed country with relatively good quality trade data as well as low and declining cif/fob ratios[60]. In general, whether a developed or developing country, where the quality of the data is reliable, the findings of Section 3.1 provide support for the fact that a country's composition of imports has a substantial and significant effect on that country's import cif/fob ratios, and thus should not be ignored or assumed constant. Yet many of the studies, explored in the literature reviewed in Chapter Two, view a country's cif/fob ratio as a measure of "shipping costs" and, to a large degree, discount the effects that changes in the composition of imports may have on country cif/fob ratios. Starting with the assumption that the ratio reflects changes in shipping costs rather than changes in the composition of imports, econometric use of the cif/fob ratios as a proxy for shipping costs have perhaps ventured too far – to assume a constant composition of imports. Section 3.2 investigates the econometric use of country cif/fob ratios to proxy for direct shipping costs in econometric procedures. The findings lead to a re-assessment and re-interpretation of some of the received literature on transportation costs.

---

[59] How, then, is UNCTAD (2000) able to report Malawi's cif/fob ratio at just below 40 per cent? The answer might be that the DOTS data set was used rather than the IFS data.

[60] Hummels and Lugovskyy (2003) use country cif/fob ratios for the imports of the US and New Zealand; the quality of these data appear sound. Furthermore, the correlation results in Table 7.2 suggest the good quality of these data.

3.2 ECONOMETRIC USE OF COUNTRY CIF/FOB RATIOS: A CRITIQUE[61]

In principle, the difference between c.i.f. and f.o.b. trade values represents the costs of freight and insurance. However, due to notorious measurement errors, these figures cannot be used in traditional econometric procedures.

(Geraci and Prewo, 1977: 67)

Geraci and Prewo (1977), Rose (1991), Radelet and Sachs (1998), Limão and Venables (1999; 2000; 2001), Naudé (1999a; 1999b) and Baier and Bergstrand (2001) along with other researchers use cif/fob ratios in econometric procedures[62]. Different dimensions of variation are used by the various econometric studies that use cif/fob ratios as measures of shipping costs. Geraci and Prewo (1977:67) use cif/fob ratios as their measure (proxy) for shipping costs, but explain: "due to notorious measurement errors, these figures cannot be used in traditional econometric procedures....Though these differences [cif/fob ratios] are indeed highly inaccurate measures of transport costs, they are included in our empirical analysis by applying an errors-in-variables approach. This allows the estimation of the elasticity of bilateral trade flows with respect to transport costs, which is the key product of this study" (Geraci and Prewo, 1977: 67). Similarly, Harrigan (1993 in Hummels and Lugovskyy, 2003: 4) is reported to have employed cross-sectional variation and directly addressed the quality problems with cif/fob ratios through an errors-in-variables approach. Rose (1991), and Baier and Bergstrand (2001) rely on panel variation in aggregate bilateral cif/fob ratios in order to relate trade growth to changes in transportation costs. Limão and Venables (2001) also relate trade volumes to cif/fob ratios, but exploit cross-sectional variation (see Chapter Two). Although sometimes using different dimensions of variation, authors that use the cif/fob ratios as their measure of shipping costs have typically made the underlying assumption, similar to Radelet and Sachs (1998: 3) that, despite shortcomings, "the cif/fob ratio may be used as a proxy for shipping costs". In other words, the

---

[61] Although I have a broad understanding of econometrics, I am not an econometrician. Thankfully, although there are some statistical methods that may help, ultimately determining causality, endogenous and exogenous variables, and examining other econometric issues are primarily matters of judgement.

[62] Other econometric studies like Badinger and Breuss (2003) and Botosaru (2003) attempt to use country cif/fob ratios to reflect international transport costs, but find the measure statistically insignificant. The empirical work to date has contributed to our understanding of the costs of transport. The following is not intended to be a scathing critique of the existing literature, but rather presents alternative ways of viewing (perceiving) the existing literature as a consequence of the findings of this thesis.

authors have assumed that changes in a country's cif/fob ratios reflect changes in that country's (direct) shipping costs that may affect international trade.

This section is not an exhaustive review of every possible study that has ever used the cif/fob ratio as a measure of shipping costs in econometric modelling. Neither is there the intention to discuss every possible econometric issue or limitation that may emerge from the ensuing analysis. Rather the purpose of this section is to facilitate a better understanding of country cif/fob ratios and their use (and in some cases perhaps misuse) as a measure of shipping costs in econometric modelling. The section therefore re-examines some of the econometric studies investigated in the literature reviewed in Chapter Two, with a particular focus on Radelet and Sachs (1998). Cognisant of the understanding and findings on country cif/fob ratios developed through this thesis, the ensuing analysis of the econometric studies is conducted within a paradigm that acknowledges, rather than assumes constant, the substantial and significant affect of changes in the composition of imports on these country cif/fob ratios.

Section 3.2.1 reassesses the received literature, particularly Radelet and Sachs (1998), on the determinants of shipping costs and Section 3.2.2 reassesses the impact of transport costs on trade and economic growth (also see Section 2.3 for the literature reviewed on the determinants of shipping costs).

3.2.1 RE-ASSESSING DETERMINANTS OF SHIPPING COSTS AS PROXIED BY COUNTRY CIF/FOB RATIOS

This section reassesses some determinants of shipping costs, particularly identified in Radelet and Sachs (1998), within a paradigm that considers the substantial and significant effects of changes in a country's composition of imports, rather than assuming these constant. This section critiques Radelet and Sachs (1998) as the study is used, despite apparently unpublished, as a justification for the use of the ratio in econometric modelling (for instance, Naudé, 1999a; 1999b), and the findings of which are frequently cited (for instance, Bloom et al., 1998; Naudé, 1999a; Chowdhury, 2003; Sanchez et al., 2004). Radelet and Sachs (1998) identified in their econometric study, economically and statistically significant determinants of the so-called "shipping costs". As already explained, Radelet and Sachs (1998: 3) assume that the ratio "reveals true differences in shipping costs rather than commodity mix effects" (Radelet and Sachs, 1998: 3) and further extend this assumption to an extreme by essentially assuming that the composition of imports are constant. Under such unrealistic assumptions, the cif/fob ratios becomes an assumed indicator of changes in direct shipping costs only, and is thus able to disregard the effect of changes in the composition of imports. Hence, assuming that the cif/fob ratio reflects "true differences in shipping costs", the researchers have sought, understandably, to identify determinants of actual shipping costs. Radelet and Sachs (1998) use econometrics (Ordinary Least Squares) to investigate statistically significant determinants of 43 developing country cif/fob ratios. The results presented in Table 2.2 and discussed in Section 2.3 were considered significant and informative. Figure 3.11 charts this econometric model. The dependent variable is the log of the cif/fob ratios and the independent variables are shipping distance (the sea distance to the nearest major world market); log of GDP per capita (PPP-adjusted in 1965, in 1985 dollars); port quality (1997 World Competitiveness Report); and a dummy variable for whether a country was landlocked or not. In other words, the authors use country cif/fob ratios as if they were direct shipping costs and thus only consider explanatory variables that may affect such shipping costs.

FIGURE 3.11. RE-ASSESSING DETERMINANTS OF SHIPPING COSTS
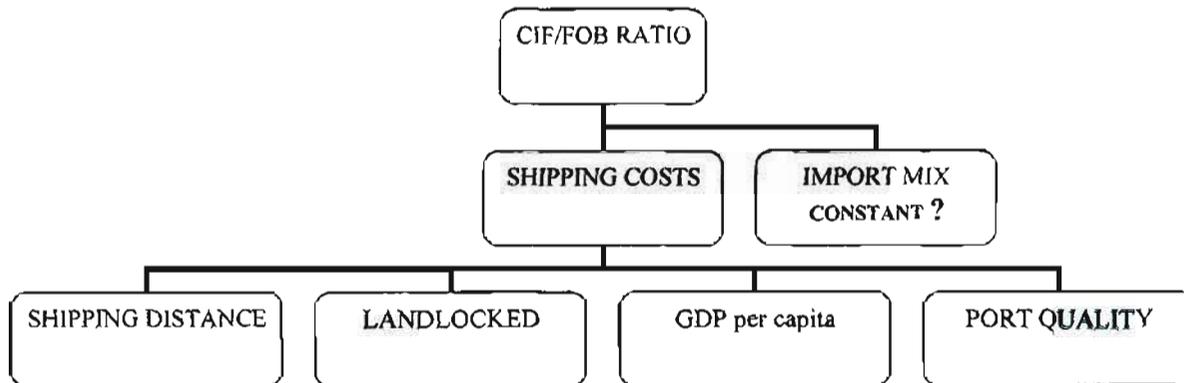
Source: Author decomposition and illustration of the econometric analysis by Radelet and Sachs (1998: 16). Also, see Table 2.2 for the econometric results and Section 2.3 for the interpretation of these results.

The findings of this thesis show that a country's composition of imports has a substantial and significant effect on the country cif/fob ratios, and should not be ignored or assumed constant. Consequently, it appears that the econometric model used by Radelet and Sachs (1998) may suffer from equation misspecification and omitted variable bias. With equation specification errors, when legitimate variables are omitted from a model, the consequences can be very serious: "The OLS estimators of the variables retained in the model not only are biased but are inconsistent as well. Additionally, the variances and standard errors of these coefficients are incorrectly estimated, thereby vitiating the usual hypothesis-testing procedures" (Gujarati, 1995: 472). In other words, the study by Radelet and Sachs (1998) may have generated incorrect results.

Similarly other studies, for instance the studies by Limão and Venables (1999; 2000;2001) may also suffer from the issues of omitting legitimate variables and perhaps equation misspecification problems, as they too have neglected (or assumed constant) the effects of an evolving composition of imports on the cif/fob ratio (see Table 2.3 in Section 2.3).

3.2.2 RE-ASSESSING THE IMPACT OF SHIPPING COSTS ON TRADE AND ECONOMIC GROWTH

This section reassesses the literature reviewed in Section 2.5, with a particular focus on the studies by Radelet and Sachs (1998) and Naudé (1999a; 199b). Radelet and Sachs (1998: 1) mention that there are very few empirical studies on the role of shipping costs and their effect on international trade and economic growth. The study by Radelet and Sachs (1998) uses country cif/fob ratios to examine differences in shipping costs across developing countries, and their impact on manufactured exports and economic growth. Radelet and Sachs (1998: 11) explain that four broad sets of variables appear to be most closely associated with economic growth across countries between 1965-90: initial conditions (income level, health, and education), government policies, demographic characteristics, and geographic and resource endowments (including shipping costs). The eleven specific variables accounted for 83 per cent of the variance in growth rates across countries[63]. Radelet and Sachs investigate two econometric models where they use the cif/fob ratio as the independent explanatory variable. In the first equation, average growth rate of non-primary manufactured exports as a share of previous year GDP is the dependent variable. Appendix B demonstrates, however, that there are significant differences in both levels and trends in export and import freight rates. In addition, on some trade routes export freight rates are lower than import freight rates, whilst on other routes export freight rates are higher than import rates. Hence, the practice of using import cif/fob ratios as a proxy for export freight trends and then using these import cif/fob ratios as the transportation cost determinant of growth in manufactured exports (Radelet and Sachs, 1998), or real value of South Africa's merchandise exports (Naudé 1999a; 1999b; 2001), are particularly questionable practices. The practice appears even less justifiable in the case of South Africa where there are distinct reasons, like economic sanctions, that promoted divergence between import and export transportation costs (see South Africa's historical port charges in Table 4.3 and liner freight rates in Figure B2). In the second equation, growth of real per capita GDP (1965-1990) is the dependent variable. In short, Radelet and Sachs (1998: 8, emphasis added) "find a strong

---

[63] Radelet and Sachs (1998) show the average cif/fob ratios for 61 countries over the period 1965-1990. Interestingly, some of the countries in their sample are the same countries for which this thesis has shown implausible and problematic cif/fob ratios or trade data. More specifically, these countries include: Malawi, Congo,

relationship between shipping costs and economic growth, after controlling for the ten other variables. The estimated coefficient is highly significant, and remained so across alternative specifications. The results imply that doubling shipping costs (e.g., from an 8% to 16% cif band) *is associated with* slower annual growth of slightly more than one-half of one percentage point. All else being equal, a landlocked country with shipping costs 50% higher than a similar coastal economy could expect slower growth of about 0.3 percentage points per year." In the light of the findings of this thesis, *other transportation cost studies, like Sanchez et al. (2003), that cite these* findings of Radelet and Sachs (1998) may be understandably mistaken in their interpretation of these results. For instance, Sanchez paraphrases Radelet and Sachs (1998: 8 in Sanchez et al., 2003: 201, emphasis added): "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. This impact may appear low, but it should be noted that lower growth over the long term results in sizable variation in per capita income." The small yet significant difference is that "is associated with" and "leads to" are not substitutable in the case where the proxy for shipping costs is country cif/fob ratios. A reason for this is that changes in country cif/fob ratios may be the *consequence* rather than the *cause* of changes in economic growth. To explain this debatable direction of causality, consider the following statement by Radelet and Sachs (1998: 8): "Shipping costs are also likely to affect a country's long-run rate of economic growth." From the results in Radelet and Sachs (1998: 20-21) it appears that in all four cross country growth regressions, the independent variable "shipping costs" is statistically significant and has a negative relationship with the dependent variable of real per capita GDP. Thus, Radelet and Sachs (1998) are suggesting that higher shipping costs (that is, higher cif/fob ratios) are likely to reduce a country's long-run rate of economic growth. However, within the paradigm suggested by this thesis, that acknowledges rather than assumes constant the substantial and significant affect of changes in the composition of imports, reconsider the statement by Radelet and Sachs (1998: 8) substituting the words "shipping costs" with the actual measure used, the cif/fob ratios: The country's cif/fob ratios "are also likely to affect a country's long-run rate of economic growth." Alternatively, can it be that a country's long-run rate of economic growth is likely to affect the country's cif/fob ratios? In

---

Zimbabwe and South Africa. Including these countries is likely to have affected the results of their econometric study.

other words, is it possible the a country's cif/fob ratio "causes" economic growth or that economic growth "causes" a country's cif/fob ratio, or is there feedback between the two?

Rather than consider the extreme assumption under which a country's cif/fob ratios are viewed as good proxies for direct shipping costs, consider the alternative extreme where cif/fob ratios only reflect changes in a country's composition of imports. The statement now reads: A country's composition of imports is also likely to affect a country's long-run rate of economic growth. Alternatively, it may be that a country's long-run rate of economic growth is likely to affect a country's composition of imports, or is there feedback between the two?[64]

Essentially, the econometric models used by Radelet and Sachs (1998) have assumed that the cif/fob ratios are exogenous variables that determine changes in economic growth, whereas the analysis above suggests that country cif/fob ratio may be endogenous explanatory variables. As a result, Gujarati (1995: 647) explains: "such an endogenous explanatory variable becomes stochastic and is usually correlated with the disturbance term of the equation in which it appears as an explanatory variable.... In this situation the classical OLS method [the method used by Radelet and Sachs, 1998] may not be applied because the estimators thus obtained are not consistent, that is, they do not converge to their true population values no matter how large the sample size."

Ultimately, Radelet and Sachs (1998: 1-2) conclude that:

> geographical considerations - specifically access to the sea and distance to major markets - have a strong impact on shipping costs, which in turn influence success in manufactured exports and long-run economic growth. Countries with lower shipping costs have had faster manufactured export growth and overall economic growth during the past thirty years than country's [sic] with higher shipping costs.

---

[64] Also, consider that the calculation of Gross Domestic Product and other measures used to calculate economic growth are dependant on a country's import values and thus composition of imports. Likewise, these import values, affected by the composition of imports, also cause changes in a country's cif/fob ratio.

At face value, these conclusions appear reasonable and perhaps what one might expect. Understandably, as mentioned in Section 3.2.1, the study by Radelet and Sachs (1998) is widely cited (for instance, Naudé, 1999a; Chowdhury, 2003; Sanchez et al., 2004) and has been a justification for the use of the ratio in econometric modelling (for instance, Naudé, 1999a; 1999b). However, when one considers that "shipping costs" are actually country cif/fob ratios, the actual meaning of these conclusions evolves and becomes more ambiguous than they initially appear. If one assumes that changes in a country's cif/fob ratios reflect changes in that country's (direct) shipping costs and then when actually using the ratio in econometrics, assumes constant the composition of imports, then any changes in the ratio are the result of changes in direct shipping costs, and the conclusions may be understood in their original form. This thesis, however, suggests an alternative paradigm, one in which the composition of imports is acknowledged to have a substantial and significant effect on the cif/fob ratio. Within this paradigm, reconsider the conclusions of Radelet and Sachs (1998). In order to ultimately facilitate a better understanding of country cif/fob ratios, consider for now, the extreme alternative scenario to the one suggested by Radelet and Sachs (1998), a scenario in which shipping costs are assumed constant, and that all changes in the ratio are the result of changes in the composition of imports. Once this exercise using the extreme alternative scenario is complete, the reader is welcome to relax the assumption, but as a consequence of this process should be in a better position to evaluate these and other claims regarding transportation costs when the actual measure used is a country's cif/fob ratio. Repeating the above finding by Radelet and Sachs (1998: 1-2, substituted words appear in italics), substituting the words "shipping costs" with the actual measure used, the cif/fob ratios, produces the following statement:

> geographical considerations - specifically access to the sea and distance to major markets - have a strong impact on *the cif/fob ratios*, which in turn influence success in manufactured exports and long-run economic growth. Countries with lower *cif/fob ratios* have had faster manufactured export growth and overall economic growth during the past thirty years than countries with higher *cif/fob ratios*.

This thesis provides evidence (in Chapter 2, Chapter 3.1 and Chapter 5) to support the hypothesis that changes in a country's composition of imports may significantly affect changes in that country's cif/fob ratios. More specifically, the case studies of the United States (Section 3.1.2)

and the other countries investigated in Table 3.2 (where the quality of the data is considered reliable) demonstrate a strong, negative and significant correlation that exists between a country's proportion of manufactured imports and that country's cif/fob ratios. In other words, both theory and the evidence in this thesis show that as a country's proportion of manufacturing imports rises, so there is a significant reduction in the level of that country's cif/fob ratios, *ceteris paribus*. Thus, re-consider the statement made by Radelet and Sachs (1998: 1-2) substituting the change in the level of the cif/fob ratio with a statistically significant cause of the change, that is, the change in a country's proportion of manufactured imports. Now consider these findings:

> geographical considerations - specifically access to the sea and distance to major markets - have a strong impact on *a country's proportion of manufactured imports*, which in turn influence success in manufactured exports and long-run economic growth. Countries with *a higher proportion of manufactured imports* have had faster manufactured export growth and overall economic growth during the past thirty years than countries with *a lower proportion of manufactured imports* (Radelet and Sachs, 1998: 1-2, substituted words appear in italics).

This alternative understanding may be useful. However, the debate surrounding causality re-emerges in that the statement suggests a higher proportion of manufactured imports may be a cause of the success in manufactured exports and long-run economic growth, whereas causality may run in the opposite direction. Furthermore, consider that a large proportion of international trade involves intra-industry trade. "Such intra-industry trade arises in order to take advantage of important economies of scale in production, which result when each firm or plant produces only one or a few styles or varieties of a product.... The more similar nations are in factor endowments, the greater is the importance of intra- relative to inter-industry trade" (Salvatore, 2001: 189). High income (developed) countries, in particular, have relatively higher proportions of intra-industry trade in manufactured products than lower income (developing) countries. Within this context, an alternative understanding of the original statement by Radelet and Sachs (1998: 1-2, substituted words appear in italics) emerges:

> geographical considerations - specifically access to the sea and distance to major markets - have a strong impact on *a country's level of income*, which in turn influence success in manufactured exports and long-run economic growth. *High income countries* have had faster manufactured export growth and overall economic growth during the past thirty years than *countries with lower incomes*.

Further analysis and research may be necessary; however, these new insights on existing studies may be the start of some rather interesting research.

In the absence of direct shipping costs, Naudé (1999a; 1999b) investigated the possible extent to which international transport costs, as proxied by the country's cif/fob ratio, may be adversely impacting on a developing country's exports, using South Africa as a case study (see Section 2.5 for a summary of his econometric model and findings). Naudé (1999a; 1999b) established that international transport costs, rather than domestic transport costs, are an obstacle to exports, and noted that South Africa's cif/fob ratio on imports has been on average seven per cent over the period 1988-91. This compared very unfavourably with the world average of three per cent, and even the average for developing countries of five per cent[65] (Naudé, 1999b: 12). In addition, "...international transport costs [import cif/fob ratios] to and from South Africa are almost 50% higher than the average for developing countries!" (Naudé, 1999b: 12). Firstly, it should be clear that this statement should read "to" rather than "to and from" South Africa. Secondly, this statement is not indicative of South Africa's real direct costs of shipping (see Chapter Five for actual developments in South Africa's direct costs of shipping). Additionally, Naudé (1999a: 57; 1999b: 20, and see Chapter 2.5) shows that "although international transport costs [cif/fob ratios] are statistically significant in reducing South African exports, the magnitude of the effect is relatively small (the elasticity of changes in exports with respect to changes in international transport costs was around 0.08%). Changes in exports react more substantially to changes in the real exchange rate (-0.76% elasticity) and the FOB value of imports (-0.34% elasticity)." Thus, these results would seem to indicate that although international transport costs (as proxied by the cif/fob ratio) do have a significantly negative effect on exports, the effect is relatively small and surpassed by the effect of the real exchange rate (Naudé, 1999a: 58). Similar to the econometric models of Radelet and Sachs (1998) and Limão and Venables (1999), Naudé (1999a; 1999b) assumes that the cif/fob ratios are indicators of (direct) shipping costs only, without acknowledging and accounting for the impact of an evolving composition of imports. As a result, the time series econometric model used by Naudé (1999a; 1999b), may suffer from

---

[65] My calculations (using the IFS data in appendix C) shows that South Africa's simple mean cif/fob ratio from 1988-91 is 7.95 per cent. Over the same period, the simple mean world cif/fob ratio is 5.25 per cent. Alternatively, the UNCTAD data (Table 3.1) shows the average annual cif/fob ratios for the world (5.22 per cent), developed countries (4.4 per cent) and developing countries (8.6 per cent).

omitted variable bias and equation misspecification (for which the consequences were explained in Section 3.2.1). Furthermore, Naudé assumes the cif/fob ratio to be an exogenous explanatory variable, that is, that changes in shipping costs (cif/fob ratio) cause changes in the value of South Africa's real merchandise exports. Thus, similar to the study of Radelet and Sachs (1998), the model proposed by Naudé (1999a; 1999b) may have the problem of an endogenous explanatory variable. In other words, Naudé (1999a; 1999b) employs an econometric model that may have used an endogenous explanatory variable, the cif/fob ratio, with all the consequent econometric problems.

In January of 2004 this study made contact with Professor Naudé (Director of Work Well, Research Unit for People, Policy & Performance, North-West University, personal communications, 2004) and enquired whether it would be possible to re-estimate his econometric model with the same data and dummy variables used in Naudé (1999a; 1999b). This study intended to update and contrast the results of the time series model used by Naudé (1999a; 1999b) with the use of the cif/fob ratio, and perhaps estimate a similar equation using the more direct data compiled by this thesis on Europe-South Africa liner freight rates. Unfortunately, for numerous reasons, he advised that it was not possible. He did explain, however, that he had experienced some challenges and odd results in working with the cif/fob ratio, and expressed interest and support for this thesis.

During the review of recent papers that have attempted to estimate econometric models utilising the cif/fob ratio as an explanatory variable, this study discovered two papers that appeared to have found "contradictory...[and]...statistically insignificant" results (Botosaru, 2003: 7). Badinger and Breuss (2003) used cif/fob ratios as their measure of "trade costs". The study sourced these data from the IMF's IFS Yearbook (1995 in Badinger and Breuss, 2003) for the period 1965-1994. "The data for 1950 to 1964 were set to the 1965-value, data for 1995-2000 to the 1994-value, which seems justified, given their little variation over the observed period" (Badinger and Breuss, 2003: 5). This practice is debatable, particularly if one considers the variation in post-1994 cif/fob ratios observed for various country and country groups analysed in this thesis (consider, for instance Figure 3.1). Most interestingly, for the analysis in this thesis, was that Badinger and Breuss (2003: 17) found: "The reduction in trade cost [cif/fob ratios]

played no role. These results turn out robust against various checks such as changes in the estimation period, a dynamic re-specification, or controlling for the potential endogeneity of the right hand side variables." Badinger and Breuss (2003: 17) also state:

> Our insignificant result for the reduction in trade costs [cif/fob ratios] contrasts with other studies whose samples contain more distant countries. The role of trade costs [cif/fob ratios] as a determinant of growth of world trade thus still deserves attention in future empirical studies, since their contribution to the growth of trade between distant countries like the EU Members and the US may have been substantial.

Botosaru (2003), for instance, attempts to analyse the effects of some geographical and demographical aspects on trade and economic growth through pool time, cross section regression on data from 1960 to 2000 for 36 developing African, European, Asian, and Latin American countries. Similar to Badinger and Breuss (2003: 17) the study by Botosaru (2003: 7) finds:

> The CIF-FOB ratio should negatively affect trade and thus GDP growth; however, the results I obtained were contradictory (albeit the CIF-FOB ratio came out to be statistically insignificant). I obtained a positive relationship of 0.002% with a standard error of 0.04 between the CIF-FOB ratio and GDP growth, although when regressing log GDP on only log CIF-FOB, the marginal effect of the latter on GDP growth is a negative -0.011% with a standard error of 0.04.

There may be other studies that have attempted to use country cif/fob ratios as their indicator of a country's transportation costs. Likewise, these studies may also have encountered "contradictory...[and]...statistically insignificant" results (Botosaru, 2003: 7). However, statistical significance is not a substitute for economic (substantive) significance. "The standard argument is that if certain variables enter the model significantly, the information should not be spurned. But such an argument merges statistical significance and substantive significance" (McCloskey, 1998: 128)[66].

---

[66] Furthermore, it appears that "...statistical measures of 'importance' are a diversion from the proper target of research – estimation of the relevant parameters – to the task of 'explaining variation' in the dependent variable" (Goldberger, 1991: 241 in McCloskey, 1998: 126).

Promoting a better understanding of the economic significance, that is the composition and behaviour of country cif/fob ratios, should help to promote better use of these ratios in research. For instance, a better understanding of the economic significance of these ratios would help researchers to realise that country cif/fob ratios are not good measures (proxies) for developments in international transport costs – not only because of the commonly cited errors in measurement, but also because these ratios are substantially and significantly affected by the changing composition of imports. Perceived in this light, findings like those from Badinger and Breuss (2003: 17) and Botosaru (2003: 7) could now be expected, understandably, to be "statistically insignificant" and should no longer be considered "contradictory", but rather of economic significance.

3.3 CONCLUSIONS

"The numbers are necessary material. *But they are not sufficient to bring the matter to a scientific conclusion.* Only the scientists can do that, because 'conclusion' is a human idea, not Nature's. It is a property of human minds, not of the statistics."

(McCloskey, 1998: 112).

The purpose of this chapter is to contribute towards a better understanding of country cif/fob ratios and to assess their global use as a measure (proxy) for international transport costs. The case studies comparing a shipping cost perspective with that of a trade composition perspective on the cif/fob ratios of developing countries in Africa, like Malawi, and developed countries, like the United States, each add insights into the usefulness of country cif/fob ratios as measures of transportation costs. This Chapter found numerous instances in which use of these ratios have resulted in misunderstandings, misleading and misinterpreted findings, and spurious econometric results on both the determinants of transport costs and the impact of transport costs on trade and economic growth. Many of these investigated issues may be avoided when the true nature (composition and behaviour) of country cif/fob ratios are understood and acknowledged in practice; in particular, that the ratios are *ad valorem* shipping costs where the evolution in a country's imports substantially and significantly affect that country's cif/fob ratios.

Despite these new insights and findings on country cif/fob ratios, the absence of direct measures of shipping costs limits this chapter's ability to answer the research question on whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can substitute them for direct measures with confidence. Insights on developments in South Africa's seaborne commerce and *direct* shipping costs are provided in Chapter Four and Chapter Five. Chapter Four investigates South Africa's port performance through the evolution in port policy, pricing and cargo growth. Chapter Five will then evaluate South Africa's shipping costs as revealed through the broad trends in the country's import cif/fob ratios and Europe-South Africa liner shipping freight rates.

CHAPTER FOUR

SOUTH AFRICA'S PORT PERFORMANCE:
POLICY, PRICING AND GROWTH[67]

With about 95 per cent of South Africa's trade volume seaborne or about 80 per cent in value terms (Siko, 1996: 4; Jones, 2004), the country is strategically dependent upon the efficiency and effectiveness of her seven commercial ports. South Africa's commercial ports serve not only a strategic role through trade facilitation, but also help to shape the economic growth and development of the entire Southern African region[68]. In 2002, total port cargo handled stood at some 190 million tons, representing roughly 3.5 per cent of world sea trade volumes (ISL, 2002). Due to South Africa's geographic location, substantial hauls are required to link this country to its major international markets and suppliers. Consequently, South Africa accounts for approximately 6 per cent of global tonne-miles (Jones 2002b)[69]. This performance places South Africa within the top 12 international maritime trading nations (Jones, 2002b).

South Africa reduced its mean tariff for all products from 11.7 per cent in 1994 to 4.9 per cent by 2002 (Cassim, 2002: 11). By July 2000, nearly 60 per cent of South Africa's imports faced a zero tariff (Economic Report on Africa, 2002). South Africa's trade liberalisation and the associated reduction in tariff and non-tariff barriers means that transport costs have become an increasingly important determinant of trade performance (Chasomeris, 2004). Micco and Perez (2001) confirm that distance is still the main factor behind transport costs; however, among the many other variables that affect transport costs, the efficiency of ports is the most important, and the

---

[67] An earlier version of this chapter was presented as a paper at the Economic Society of South Africa, biennial conference, Durban, 7-9th September, 2005 (Chasomeris, 2005a).

[68] In southern Africa, Botswana, Lesotho, Malawi, Swaziland, Zambia and Zimbabwe are all profoundly dependent on South Africa's transport network. This dependency, however, was reinforced by South Africa's deliberate strategy of economic and military destabilisation during economic sanctions. According to Hans Abrahamsson (1989 in Iheduru, 1996: 5): "The objective of this destabilisation process is two-fold. On the one hand, it aims to disrupt any sustained development in the majority-ruled neighbouring countries. On the other hand, by increasing dependency on South African ports, it aims at making the neighbouring countries victims of any future sanction policy, which in turn reduces international pressure for sanctions."

[69] Jones (2002b) attempted to estimate this real sea transport activity in 2002 by associating each regional tonnage flow with the steaming distance to a median port in each broad geographic region.

one that can be most directly affected by government. Within competitive port environments, Haralambides and Veenstra (2002: 782) explain that "the right prices can lead a port to prosperity and growth; the wrong ones can guide it to extinction or to the proliferation of subsidies and inefficiency." South Africa has acknowledged the strategic role of ports and the necessity to promote effective and efficient transport throughout the logistics chain (Department of Transport, 2004). Furthermore, the post-sanction drive towards an export-oriented economy has resulted in significant trade liberalisation and increasing advocacy of competitive markets and liberalisation of services in order to promote investment, economic growth and employment in South Africa through increased integration into the global economy.

The purpose of this chapter is to investigate and reveal South African port performance with a particular focus on the evolution of port policy and pricing. Through measuring the evolution in port costs, in particular from *ad valorem* wharfage to the current cargo dues, the chapter aims to contribute towards a better understanding of South African port cost efficiency and tariff reforms with their impact on cargo owners. Section 4.1 investigates aggregated sea-trade trends and the impressive cargo growth through South Africa's ports. Beneath the veil of the aggregated trade statistics, however, is the fascinating historical role and evolution in South Africa's port governance, policy and pricing, as concisely reviewed in Section 4.2. Contemporary developments in South Africa's port policy, pricing and governance are revealed, in Section 4.3, with a particular focus on a contrast between port tariffs engineered in the past to support an import-substitution economy and the present tariff structure that edges South Africa closer toward a globally competitive port pricing system. Section 4.4 concludes.

4.1. SOUTH AFRICA'S SEA-TRADE GROWTH AND PORT LOCATION

South Africa has become a major sea-trading nation. With more than 90 per cent, by volume, of world trade seaborne, and approximately 98 per cent of South Africa's exports conveyed by sea (Naude, 1999b: 5), South Africa's commercial ports clearly play a vital role in both the economic performance and the development of the entire Southern African region.

With port performance generally measured in terms of cargo volumes, an analysis on this basis shows that South African port traffic has doubled from 40 million tons in 1969/70 to 80 million tons by 1977/78, and roughly doubled again to reach 160 million tons by the mid 1990s (Jones, 2002b: 144). By 2002, total cargo handled stood at some 190 million tons (Ports of Southern Africa and Mauritius, 2003). Figure 4.1 presents the location and total annual import and export volumes passing through South Africa's seven commercial ports from April 2001 to March 2002. Briefly, South Africa's multipurpose ports include: Port Elizabeth; East London, the only river port; and Mossel Bay, a relatively small but specialised port serving the south coast fishing industry and the offshore gas fields (Department of Transport, 1998). The hub ports include: Cape Town, a terminal port oriented towards the western sea routes; and Durban which is ideally positioned to serve the eastern sea routes. The deepwater ports are Saldanha and Richards Bay that opened for business in 1976. Saldanha features a massive iron ore terminal that exports more than 20 million tons a year from Sishen. Richards Bay features a multipurpose terminal and a bulk metal terminal. It is also renowned for its multi-product dry bulk handling facilities and boasts the world's largest bulk coal terminal. Trade densities shown in Ffigure 4.1 are largely generated by the industrial heartland in Gauteng. From the statistics in Figure 4.1, which exclude petroleum, it is clear that Richards Bay handled the most cargo with volumes in excess of 90 million tons. Durban comes in second with total cargo handled at about 29.5 million tons or 56.8 million tons when including petroleum. However, if one looks at the value and cargo mix handled at the two ports, Durban handles much higher valued cargo than Richards Bay. As the busiest port in Africa, Durban cargo alone accounts for a little more than two-thirds of national imports and exports carried by sea (Pearson, 1995 and Jones, 1997 in Jones 2002b).

In terms of "real" sea transport activity, traffic passing through local ports generates some 12,200 million ton-miles of maritime freight activity, or about 6 per cent of global activity – a performance that places South Africa within the top twelve nations on the international maritime-trading league table (Jones, 2002b). This country's share of global maritime activity consequently exceeds its share of global GDP by more than twenty to one (Jones, 2002b).

FIGURE 4.1. SOUTH AFRICAN PORTS
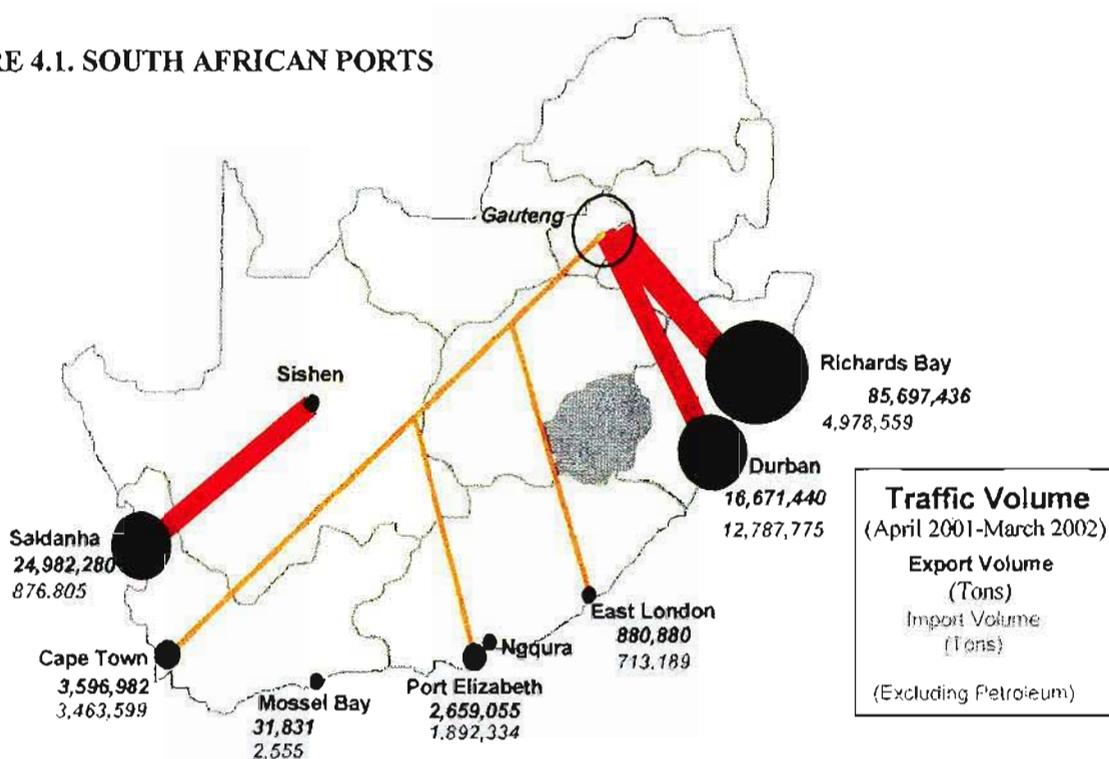
Source: adapted from Department of Transport, 1998 and National Port Authority, 2002.
Note: 1. The port of Ngqura (Coega), currently under construction, is 20km northeast of Port Elizabeth. The port

is of deepwater construction capable of serving Panamax dry and liquid bulkers and the new generation of

cellular container ships.

Not only has there been impressive traffic growth through the ports, but also, as Jones (2002b: 144) correctly identifies, "the centre of gravity of Southern African seaborne commerce has shifted firmly eastward over time, and is now entrenched in KwaZulu-Natal." In 1970, before the construction of Richards Bay, some 59 per cent of total port traffic was handled in Durban. By 1983/84, the combined traffic share of Durban and Richards Bay had risen to 73 per cent, and by 2000 to 76 per cent (see Table 4.1). "The losers in this process have been the Cape ports, whose hinterlands, with few exceptions, have shrunk to their immediate geographic regions, and Maputo, which once commanded a guaranteed share of Witwatersrand traffic and rivalled Durban in terms of facilities and port activity" (Jones, 2002b: 144).

The country's aggregated trade volume statistics partially mask the significant impact of economic sanctions (1985-1993). During 1960 to 2001, South Africa's average import-to-GDP ratio was 23.8 per cent, whereas the average export-to-GDP ratio was 27 per cent (Du Toit, 2004: 54). During economic sanctions, the import-to-GDP ratio declined 5.3 percentage points from 22.6 per cent in 1985 to a low of 17.3 per cent in 1992. The export-to-GDP ratio declined 10.2 percentage points from 31.5 per cent in 1985 to as low as 21.3 per cent in 1992 (Du Toit, 2004: 54). "Since 1992, however, imports and exports as a percentage of GDP have increased to 27.1 per cent and 31 per cent respectively in 2001" (Du Toit, 2004: 54). On the one hand, Du Toit (2004: 54) states: "these import and export ratios indicate the impact of isolation on the country's foreign trade and the extent of inward focus in the economy." On the other hand, the re-enumeration and re-classification of South Africa's post-sanctions trade (particularly evident in South Africa's petroleum imports) have likely contributed to these trends in the trade ratios (see Chapter 3.1).

TABLE 4.1. CARGO HANDLED AT SOUTH AFRICAN PORTS: 1969/70 TO 2000, SELECTED YEARS

(all cargoes, including petroleum products, in million metric tons)

Year[1]	Richards Bay	Durban	East London	Port Elizabeth	Cape Town	Saldanha	Total Traffic[2]
1969/70	-	24.0	1.7	6.7	7.8	-	40.2
1974/75	-	34.7	3.5	10.4	10.4	-	59.0
1976/77	6.7	34.5	3.1	9.3	9.4	5.5	68.7
1977/78	13.1	35.4	3.5	7.3	9.4	11.7	80.4
1978/79	15.7	34.0	4.0	7.3	9.7	14.1	85.0
1983/84[3]	37.9	32.8	2.6	5.9	7.9	9.7	96.8
1987	47.1	44.3	2.5	4.3	5.9	12.3	116.4
1990	52.6	38.4	2.5	5.3	7.1	25.0	130.9
1994	69.0	41.4	3.2	4.9	9.8	23.3	151.6
2000[3]	91.8	49.7	1.1	7.1	11.8	24.5	186.2

Source: Jones 2002b: 145, using data from South African Railways and Harbours, Annual Reports, various years;
Charlier, 1996; and Port of Durban Statistics, 2000.

Notes: 1.   Traffic volumes are shown for financial years (1 March to 28/29 February) up to
1983/84, and thereafter for calendar years.

2.   Total traffic excludes the activities of the small port of Mossel Bay, where volumes
were tiny before the Mossgas project came on stream from 1992.

3.   Traffic magnitudes for 1983/84 and 2000 include estimates for unpublished
oil and petroleum traffic. All other years include more accurate measures of these
previously classified commodities.

Clearly, foreign trade makes an important and growing contribution to the South African economy. As impressive as the growth trends in South Africa's port traffic may appear, Section 4.2 investigates beyond the statistics to gain a better understanding of the trade environment, governance and policy context within which this growth occurred.

100

4.2. SOUTH AFRICA'S PORT POLICY, PRICING AND GOVERNANCE: AN HISTORICAL PERSPECTIVE

Commercial ports play a crucial role in South Africa's transport system and should be treated as strategic entities operated on sound economic principles with an understanding that the country's ports do not only facilitate trade, but also may stimulate and shape the economic growth and development of the entire Southern African region. A brief reflection on the evolution of South Africa's port policy, pricing and governance shows that, historically, commercial ports have reflected the political system along with its related and often undesirable market and industrial policies.

During the pre-Union period (1833-1908) the commercial ports were operated under varying degrees of state control. The harbours were financially autonomous and all revenue and expenditure accrued to the harbour administration. As such, each port authority administered its own tariffs and the revenue generated as a result accrued to harbour administrations and was easily identifiable (Jones, 1988a: 132). Since all of the harbours operated independently, inter-port competition was rife and promoted competitive tariffs, as each port authority tried to secure as large a traffic base for itself as possible (Jones, 1988a: 132).

The South African Railways and Harbours (SAR&H, 1909-1981) was established by the unification of both the harbour and railway authorities as a result of increasing conflicts amongst the various colonies and considerable inter-port competition. The subsequent introduction of a uniform tariff structure brought to an end the prior inter-port competition. Under SAR&H control, the ports were supposed to be run according to sound business principles, generating enough revenue to remain self-sufficient, with the exception of providing preferentially cheap transport specifically for the agricultural and industrial sectors (Jones, 1984 in Giladi, 2003: 68). Furthermore, there was a large degree of cross-subsidisation from the surplus profits generated by harbour activities to cover the losses incurred by the railways (Jones, 1988b).

The South African Transport Services Act of 1981 transformed SATS into a business enterprise belonging to the state and brought about a shift in the emphasis of port governance and pricing policy. In April 1982 these changes came into effect whereby the ports' physical capital, from an expenditure and revenue perspective, was controlled by the new harbour administration called the South African Transport Services (SATS, 1982 to 1989). The Act also required that the "economic interest and the transport needs of the whole country" be taken into consideration (Giladi, 2003: 62), rather than just those of the agricultural and industrial sectors. SATS was thus to operate the ports according to business principles, with no exceptions. This, however, could not be achieved with the uniform tariff structure in place, which was unrelated to cost and took no account of the commercial differences between the South African ports, resulting in substantial inter-port cross subsidisation. SATS managed to avoid demarcation problems of the previous era between harbour and railways by ensuring that all cargo functions fell under the port administration (Jones, 1988a: 132). Although the new system reduced inter-modal cross-subsidisation that placed harbour profits in better perspective, there was still some surviving inter-modal and considerable intra-port cross subsidisation (see Table 4.2).

In 1989 there was a decision to commercialise the activities of SATS. The legal structure of SATS, however, was inadequate to operate as a commercial entity. Hence a public company called Transnet was subsequently formed on the 1st of November 1989, with government as the sole shareholder. Transnet was the umbrella company, which maintained five divisions: Spoornet (rail); Portnet (ports); Petronet (pipelines); Autonet (roads); and South African Airways, all of which operated as separate companies. Portnet was the new port authority, which under the new arrangement posed a dilemma. Portnet had two conflicting objectives: firstly, it had to act as a port authority to safeguard public interest, and secondly to exploit its comparative advantage in the pursuit of its commercial and financial objectives. In essence it was thought by port users that Transnet, as a transport company had the potential to misuse its monopoly of South Africa's ports. Thus having a national ports authority function as part of a transport company has resulted historically in the formation of several undesirable conditions that have detracted from the primary purpose of ports, skewing prices, misallocating port revenues and creating suspicion in the maritime and transport industries about the impartiality of the port entity within a transport company (White Paper, 2002: 13). This dismal port environment was

not only inconsistent with the ideals of "international best practice" but also evidently incompatible with the goals of economic growth and development through export orientation and re-integration of South Africa into the global economy.

Further insights into the historical evolution and impact of South Africa's port policy and governance are revealed in Section 4.2.1 that focuses on the controversial and highly contested arena of port pricing.

4.2.1. SOUTH AFRICAN PORTS PRICING POLICY

"The South African ports, and indeed the transport sector as a whole, have a long history of getting prices wrong. Consequently it is little surprise that they also have a history of misallocating resources across and within modes."

(Jones, 2002a)

The legacy of South Africa's freight system and port pricing strategy reflected a system designed to support an import substitution economy. Consequently, the current port administrators inherited a port tariff structure that was literally awash with distortions. The essence of these old tariff distortions is captured in Table 4.2 that shows the broad cost-price skewness that existed in South Africa's ports. Generally, the South African ports set prices well below full cost recovery for a number of port functions, including marine infrastructure and services. Port dues – payment by vessels for the use of marine infra-structural assets such as dredged approach channels, fairways and turning basins; berth dues; tug charges and pilotage charges generated revenues below associated costs. Cargo handling charges were closer to related costs, but fell short of full cost coverage. Cargo functions were thus being used to subsidise marine functions. This practice made the South African ports cheap for ships but very expensive for the cargo they carried. Prices that are structured in this way prejudice the carriage of marginal cargoes and deter vessels from working additional cargo at any port call (Jones, 1988b; Jones 2002a).

.

TABLE 4.2. INTRA-HARBOUR CROSS SUBSIDISATION, LATE-1980s

FUNCTION	TARIFF	PRICE / COST SKEWNESS	% OF TOTAL REVENUE
Marine Infrastructure	Port, berth dues	Price well below Average Cost	≈ 3
Marine Services	User Charges	Price below Average Cost	≈ 6
Cargo-working Infrastructure	*Ad Valorem* Wharfage	Price substantially exceeds Average Cost	≈ 55
Cargo Services	User Charges	Price $\approx$ Average Cost	≈ 30
Miscellaneous (Lights etc.)	–	–	≈ 6

Source: Adapted from Jones, 1988b: 5.

In stark contrast, if there was to be any cross subsidisation in South African ports, authorities should want to price in exactly the opposite fashion, making the ports cheap for cargo and more expensive for ships. This is logical since ports earn most of their income from cargo functions rather than marine functions. Port authorities, therefore, should not structure tariffs in a way that unnecessarily penalises cargo, especially in the context of aspirant hub and transhipment ports (Jones, 1988b).

Within this context, how was it possible for the ports as a whole, and Durban in particular, to manage to record sustained levels of significant profits for decades? The answer: *ad valorem* wharfage.

4.2.2. *AD VALOREM* WHARFAGE

Ad valorem Wharfage has long been the most controversial and the most bitterly resented item in the old tariff book (see Jones, 1988; Jones, 2002b; Naudé, 1999). This section concentrates on two dimensions of contention. Firstly, the value-based rather than cost-based tariff structures, and secondly, the high levels of *ad valorem* wharfage that grossly skewed revenues in excess of costs. Historically, some port users have maintained that wharfage was a duty, tax or toll, based on the value principle, *ad valorem*, and as such resembled the ruling excise duties. On the contrary, the port authority maintained that "as is the case with any other charge prescribed in the Official Harbour Tariff Book, wharfage, which was applied to all cargo passing over the wharves in the harbours, was raised to cover specific and defined costs and should thus not be likened to a duty, tax or toll" (Skinner, 1983: 2). The "specific and defined costs" were those connected with the cargo handling infrastructure in the harbours such as the provision and maintenance of roads, rail tracks, storage sites, hardened surfaces, and the like. Wharfage charges, however, had no bearing on the operational activities prior to placing shipment cargo in the appliances provided by the ship or subsequent to the placement of landed cargo on the wharfside, in respect of which landing and shipping charges were maintained. This meant that *ad valorem* wharfage expressly excluded such tangible items of superstructure as terminals, gantries, wharf-cranes or cargo handling equipment for which explicit charges were raised. Wharfage was then presumably to finance the costs of the provision of general rail and road access to berths, cargo handling aprons and other general cargo infrastructure (Jones, 1988a).

The principle of applying wharfage on an *ad valorem* basis had also been criticised for many years (for instance see Jones, 1988a). For example, before the implementation of Value Added Tax in 1991, *ad valorem* wharfage charges were 1.8 per cent on import containers and 0.9 per cent on identical export containers. Hence, much of the criticism centred around the fact that wharfage on an *ad valorem* basis favours low-valued commodities in that it is proportionately lower than high-valued commodities while utilising the same infrastructure and port services. Furthermore, the legacy of the import substitution regime was also clearly reflected by the differential in the level of import versus export charges; that is, port wharfage charges were twice the rate for imports than for identical exports (see Table 4.4). These discriminatory situations are

essentially the antithesis of both cost and equity-based pricing principles. While it would be unreasonable to expect prices to be exactly equated to costs, they should be reasonably related. Proposals that wharfage be changed to a more cost-based tariff, for instance a cost orientated charge per ton, were rejected on the grounds that this would hugely increase the amount paid on low-value cargo and undermine the competitiveness of South Africa's exports (Skinner, 1983). Additionally, it was considered that changing the basis of wharfage would be unwise as wharfage on lower valued cargo would be drastically increased while competitiveness on especially the export market would be seriously affected with far reaching implications for the national economy. Hence, in order to prevent such a situation developing, the levying of wharfage on tonnage only (mass or volume, as the case may be) would necessitate the compilation of a comprehensive classification of the different commodities to provide for the appropriate rating of the various commodities. It was also considered "inevitable that such a system, would also require to be based, as in the case of *ad valorem* wharfage on the value principle and, furthermore, the classification will have to be continuously adapted in accordance with changing economic conditions and values" (Skinner, 1983: 4).

On the other hand, the levying of wharfage on an *ad valorem* basis not only eliminated the necessity for such a classification, but primarily kept pace with price changes and fluctuations in exchange rates, thus avoiding the need to increase the relevant tariffs unless absolutely necessary. Moreover, the *ad valorem* basis ensured that wharfage was actually applied to a specific type of traffic in relation to the extent that such traffic can bear the charge. The port authority thus saw the raising of wharfage on an *ad valorem* basis as a fair and most acceptable method of recovering the relevant infrastructural costs (Skinner, 1983). Although the ability-to-pay principle argues for some sensitivity of tariffs to the value of cargoes, the principle should not be used to defend *ad valorem* wharfage applied on a wholesale basis in all South African ports.

The controversial levels and value-based nature of wharfage put sea transport at a disadvantage compared to other transport modes, where the prices were cost-based. *Ad valorem* tariffs also raised the cost of moving cargo through South African ports, reduced the country's comparative cost advantage in foreign markets, reinforced the effect of high tariff barriers and discouraged

imports in general, especially those of high value. Such a pricing structure is not conducive to efficient port operations and the proper utilisation of resources. It is in the public interest to adopt efficient economic pricing principles that would promote economic growth through lowering trade costs. In addition, it should have been more of a concern to port authorities that wharfage as an *ad valorem* charge had been eliminated in most ports elsewhere in the world (Jones, 2003a). South African ports were able to charge high wharfage rates due to the lack of inter-port competition. Most other top class world ports are unable to levy such a charge as they operate in highly competitive environments and are likely to lose customers to competing ports if they did so. For these reasons, *ad valorem* wharfage has been one of the most controversial and bitterly resented tariff items for the past fifty years (Jones, 2002a).

Some consequences of this *ad valorem* pricing strategy were that wharfage was the main source of harbour revenue, where skewed prices substantially exceeded average costs, generating revenues that dwarfed associated costs by a factor of 300 to 400 per cent (Jones, 2002b). Losses associated with other mainly marine related functions were expunged, and the South African ports emerged as profitable entities with aggregate waterfront charges that were high by world standards, particularly when viewed against productivity levels that were low by those same standards. Hence the new administration inherited ports that were artificially cheap for vessels and artificially expensive for their cargoes, on the basis of tariffs that made sense for neither (Jones, 2002a).

Although *ad valorem* wharfage formed the principal source of revenue for Portnet and a major profit source for Transnet, these funds were not ploughed back into the ports in the form of infrastructure investment. Rather, the profits appropriated by Transnet were divided between its various divisions, used to subsidise less profitable transport modes of road and rail and to reduce the actuarial deficit in the company's pension fund (Jones, 1988b). The profits made on the wharfage tariff item also allowed port authorities to keep the prices of other services and facilities artificially low (see Table 4.2). Thus by international benchmarks, South African ports have been expensive for their users. A comparison of the unusually large Port Authority charges can be seen most clearly in Figure 4.2 below, and resulted predominantly from *ad valorem* wharfage. Wharfage charges were levied in South African ports as early as 1925. The Moving

South Africa study, in Figure 4.2, showed that port charges in South Africa were high in comparison to both developed and developing countries.

FIGURE 4.2. TOTAL WATERFRONT CHARGES
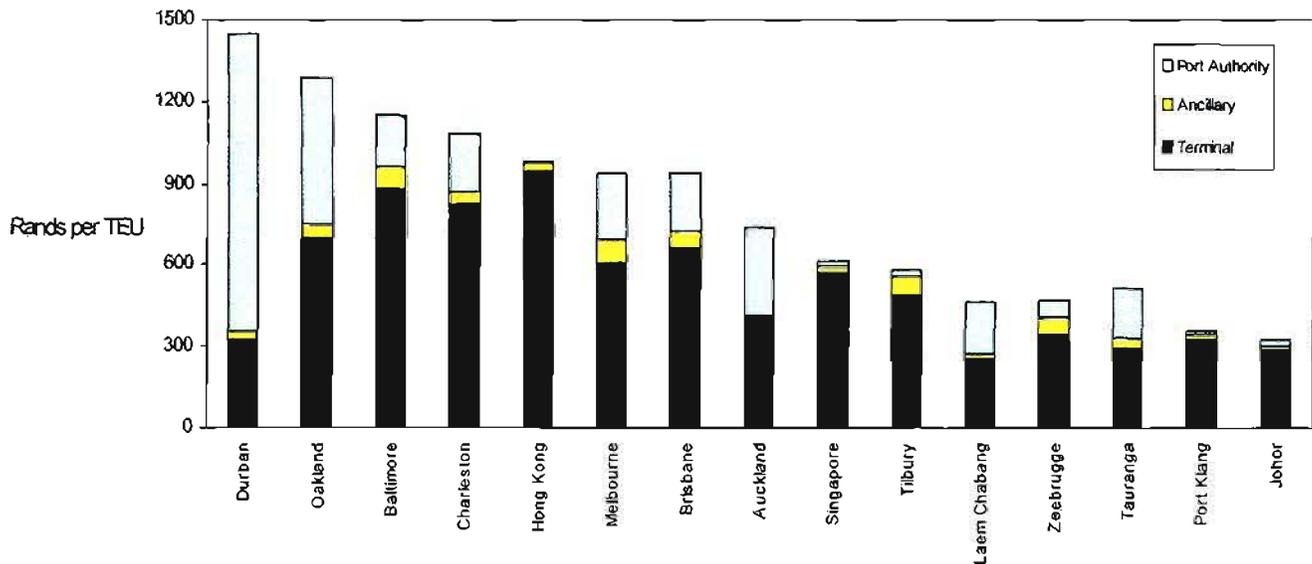
Note: Breakdown of waterfront charges may vary due to different financial structures which affect pricing

Source: Department of Transport, 1998, TEUs are twenty foot containers.

Terminal charges, in Figure 4.2, are the cargo-handling costs, while the Port Authority charges represent port infrastructural charges. These charges would include port and berth dues but would be primarily composed of wharfage. The port tariff comparison in Figure 4.2, showed that port authority charges in South Africa, exemplified here by the port of Durban, were relatively more expensive than the other selected ports.

South Africa's trade liberalisation and acceptance into the international trading community has resulted in a fundamental shift in the country's macroeconomic policy. *Ad valorem* wharfage helped to promote the government's macroeconomic policy of an import substitution economy. Naudé (1999b: 21-22) established that "claims that domestic transport costs are negatively impacting on exports are difficult to substantiate. Indeed, South Africa's inland transport costs compare favourably to those of selected overseas countries. The major problem as far as domestic transport costs are concerned may be the taxation of international trade through *ad*

valorem wharfage fees ... Because these *ad valorem* wharfage charges are a significant source of revenue for Portnet (the state owned enterprise responsibly [sic] for all ports in South Africa), their abolition seems unlikely."

Due to the implementation of Value Added Tax in 1991, wharfage reduced from 1.8 per cent on imports and 0.9 per cent on exports to 1.78 per cent and 0.89 per cent respectively. In Rand terms, however, due to the depreciation of the Rand:US$ exchange rate, wharfage receipts rose disproportionately relative to the cost basis of the charge[70]. In 2001, the *ad valorem* wharfage charge reduced from 1.78 per cent on imports to 1.7 per cent, and for exports, wharfage decreased from 0.89 per cent to 0.85 per cent. Although still a value-based tariff, with anti-import bias, the changes brought the Port Authority marginally closer to ensuring globally competitive port rates. Despite the apparent decline in *ad valorem* wharfage rates, from a Rand perspective, cargo owners were experiencing rising costs determined by the uncertain and increasingly volatile international value of the Rand.

Skinner (2003 in Chasomeris, 2003d: 12) calculated wharfage revenues collected for both import and export cargo in the Port of Durban over the five year period from 1997 to 2001. The largest contribution towards export wharfage was from general cargo (39.6 per cent). The largest contributors to import wharfage revenues were: general cargo (47.5 per cent), vehicles and components (13 per cent), and machinery (14 per cent). Together these imports contributed 74.5 per cent or R2.72 billion over the five year period. With South Africa's trade liberalisation, and the expanding opportunities through preferential access to international markets, the government's strategy shifted to that of export promotion. A large part of the new export promotion strategy was focused on the manufacturing sector whose contribution to total exports had doubled from 14 per cent to 28 per cent between 1994 and 2001 (Inggs, 2003). Manufactured goods, however, are generally considered higher-value commodities, and by 2001, Rand denominated wharfage costs to both importers and exporters were at their highest (Chasomeris, 2003d: 12). Therefore, in order to contribute to the country's new trade policy of reducing transport costs, improving export competitiveness and the move toward port privatisation, a new tariff structure was required.

---

[70] The country's real effective exchange rate depreciated by 3.9% per annum during 1994-2001 (du Toit, 2004: 54).

4.3. SOUTH AFRICA'S CONTEMPORARY PORT POLICY, GOVERNANCE AND PRICING

Early 2002 witnessed the dismemberment of the old Portnet into a landlord port authority (National Ports Authority - NPA) responsible for port infrastructure and marine services, and a port operator (SA Port Operations - SAPO), responsible for public sector terminal operations[71]. The NPA performs landowner and regulatory functions and is responsible for the development and management of port property and infrastructure, the supply of marine services to vessels and marine safety (Vessel Tracking System, lighthouses and dredging services). The NPA considers its business to be of critical importance to the surrounding socio-economic environment. "The business plan of the NPA demands the company achieves productivity gains efficiently and effectively, while showing continued growth and economic viability" (Enslin, 2003). The NPA in turn leases out cargo-working infrastructure to SAPO, who have taken over all cargo-handling operations, effectively running all those public sector terminals that fall under the ownership and control of Transnet. The mission of SAPO is to "be a world class, globally competitive cargo handling and logistics management business within the next three years" (Morwe, 2003).

The new port policy, revealed through the White Paper on National Commercial Ports Policy was approved by Cabinet in March of 2002. The purpose of this policy is "to ensure affordable, internationally competitive, efficient and safe port services based on the application of commercial rules in a transparent and competitive environment applied consistently across the transport system" (White Paper, 2002: Ministerial foreword). The new vision for a South African port system is:

> A system of ports, seamlessly integrated in the transport network, that is jointly and individually self-sustainable through the delivery of high levels of service and increasing efficiency for a growing customer base, enhancing South Africa's global competitiveness and facilitating the expansion of the South African economy through socially and environmentally sustainable port development (White Paper, 2002: 9).

---

[71] There are also a large number of privately operated terminals in various South African Ports, principally engaged in the handling of bulk and neo-bulk cargoes.

The vision is relatively comprehensive and seeks to rectify the many ills of the past port governance, policy and consequent pricing. The "system of ports" to which the vision refers includes all the existing commercial ports, that is, Richards Bay, Durban, East London, Ngqura, Port Elizabeth, Mossel Bay, Cape Town, Saldanha Bay, Port Nolloth, and offshore cargo handling facilities as well as all future ports and offshore cargo handling facilities to be constructed. These ports will be financially self-sufficient, and will be managed and administered by the National Ports Authority that will instil commercial discipline in the ports, and pave the way for efficiency gains necessary for ports and users to become competitive in the global economy (White Paper, 2002: 9).

In order to deliver on this National Commercial Ports Policy vision, it is acknowledged that a number of broad goals need to be pursued. These are (White Paper, 2002: 10):

- "To invest in port infrastructure, superstructure, equipment and systems in ways which satisfy social, financial, economic or strategic investment criteria;
- To improve the safety, security, reliability, quality and speed of port operations and services;
- To enable port users to access the port system in the most efficient way possible;
- To promote good employment practices and standards;
- To achieve the above goals in a manner which is economically and environmentally sustainable, and minimises negative externality impacts on non-users; and
- To promote intermodalism."

These goals are expanded on through the specific objectives and guiding principles identified in the White Paper (2002: 10-12). There is also an acknowledgement of the ills of the past port environment (a necessary step towards sustainable transformation) and a willingness to lay down a new foundation with a spirit of goodwill toward all port stakeholders.

The White Paper on National Commercial Ports Policy has laid down a broad and generally acceptable policy environment from which a more formal instrument like the National Ports Authority Bill has been created. There is still debate, however, over whether the NPA will

initially remain a division of Transnet, become a subsidiary of Transnet in the short or medium term or a separate State-Owned-Enterprise in the medium to long term. Irrespective of the outcome, the NPA Act will lay down the framework within which the NPA will be obliged to operate in the future. Commenting on the Ports Bill, in October 2004, Public Enterprise minister, Alec Erwin, said that the NPA will remain within Transnet as a strengthened regulator, with the intention of moving it to a public company (NPA, 2004).

4.3.1. CONTEMPORARY PORT PRICING IN PRACTICE

An important part of the transformation process is acknowledging that South African ports have inherited many performance and pricing problems. The NPA now acknowledge that there are pricing issues; more importantly, the NPA are willing and able to address many of these pricing anomalies. The new South African port tariff arrangement that came into effect from May 1, 2002, was the first full tariff structure to emerge after the dismemberment of the old Portnet into a landlord port authority, the NPA, and a port operator, SAPO. This functional split required that the old tariff set up be unbundled and repackaged to fit the new bipolar port structures. "The objectives of NPA tariff reform were clearly stated as being to create a transparent tariff structure based on user pay and cost coverage in relation to the provision and maintenance of basic port infrastructure" (Giladi, 2003: 102). These changes marked the first substantial reform of South African port tariffs over the past fifty years (Jones, 2002a).

To achieve a more fair, efficient and competitive system, it was essential that *ad valorem* wharfage be eliminated. In 2002, wharfage charges were replaced with a set of cargo dues. Cargo dues are levied on a unit basis (set box rate) for containers and a tonnage (volume) basis for other forms of cargo. The new tariff also embodies a degree of rate flexibility, with preferential rates for break-bulk and neo-bulk cargoes on a commodity and volume-driven basis (Port Tariffs, 2002 and Jones, 2002a). Rather than the value-based *ad valorem* wharfage, cargo dues are cost related and remove the previous discrimination against high value cargo, bringing South Africa more in line with international practices (Jones, 2002b; Jones, 2003a). This means, however, that there were clearly gainers and losers from the new dispensation. According to the NPA's

then CEO, Siyabonga Gama, cargo importers and exporters were to be the main beneficiaries of the reduced wharfage rates (Rodrigues, 2002b). The introduction of cargo dues has stabilised the port cost environment for cargo owners through removing *ad valorem* wharfage and the associated burden of exchange rate fluctuations. Hence cargo dues are expected to make a positive contribution to trade growth through the ports. Gama (in Rodrigues, 2002b) did concede, however, that some of the high-volume, low-value cargoes would have been affected detrimentally by the introduction of cargo dues, but indicated that this was necessary to ensure that they paid for their fair share of port infrastructure. As a result of the introduction of cargo dues, Table 4.4 shows that some high value cargo owners have gained, experiencing decreases in costs of 67 per cent. The move has, however, attracted widespread criticism from exporters of low-value cargos who benefited from subsidised rates in the past and now claim to be bearing the brunt of tariff reform. Some traders may have seen costs soar by 150 per cent on a 12m container (Chasomeris, 2003d: 25; and Table 4.4). While using a value-based approach in the past may have been less than perfect, some form of differentiation should be retained between different commodities, based on their ability to absorb costs within the import or export market (Rodrigues, 2002b). This is more commonly referred to as "charging what the traffic can bear." For instance, charcoal exporters from the Natal Midlands, who feared that the new dues would kill off their export business, raised concerns. Such special interests can, hopefully, be resolved by negotiation, but the nub remains the level of cargo dues, on an aggregated basis. If the revenue reductions from the replacement of wharfage with cargo dues substantially out weigh the additional expenditure on marine infra-structural and specific service charges, then the generalised cost of transport through the South African ports will fall and trade should be stimulated. If increased expenditure commitments by users exceed real wharfage gains then seatrade will be stifled (Jones, 2002a). Despite the very high volume of commodities traded, most cargoes will pay less because of their value. The creation of cargo dues, along with the split of the NPA and SAPO, has also increased transparency within the ports. While Transnet historically appropriated wharfage revenue for other uses, cargo dues are now retained by the port itself and reinvested in harbour infrastructure.

The transformation of wharfage into cargo dues attempts to close the extent of cross subsidisation and cost-price irregularities across marine and cargo functions (see Table 4.2). Figure 4.3 shows the percentage changes in the country's marine services, port dues and cargo dues from 1999 to 2005. Marine tariffs are charged for the rendering of marine infrastructure like pilotage, tug assistance and berthing. Port dues are raised to cover the "wet" infrastructure of the port, that is, breakwaters, turning basins, aids to navigation inside the port and maintenance dredging of the port. Cargo dues are raised to cover the "dry" infrastructure of the port, that is the provision and maintenance of quaywalls, roads, railways, buildings, fencing, security, lighting – outside terminal boundaries (Nico Walters, NPA, personal communications, 2005). When the NPA changed from *ad valorem* wharfage to unit cargo dues in 2002, there was a significant reduction in the costs for cargo owners (see Figure 4.3). Marine services, however were historically charged below cost recovery. This was subsequently adjusted in the tariff reform process with the result that marine tariffs became time or distance and cost based which led to marine tariffs being adjusted by 25 per cent and then 11 per cent to address below cost adjustments. Port dues were adjusted once-off by 30 per cent in 2002. The increase in marine charges helps to lessen the effects of intra-port cross subsidisation. It appears that rather exorbitant profits continue to be made on cargo dues (the highest tariff revenue generator) that are used to subsidise far less profitable marine tariff items, such as port dues, pilotage and tug assistance (McPherson, 2003). These tariff changes have created a shift away from wharfage and cargo dues towards a more cost-based tariff. Additionally, South Africa's attempts to improve trade competitiveness partially lie in targeting below inflation adjustments. The NPA have expressed intent to keep adjustments in port costs aligned with the country's inflation targets (Nico Walters, NPA, personal communications, 2005). Cargo dues will remain a major revenue source, as the future investment in port infrastructure remains high, especially as the provision of appropriate capacity and infrastructure timeously is vital to facilitating growth in South Africa's trade (Nico Walters, NPA, personal communications, 2005). The 2005/6 adjustments of 1 per cent in Cargo Dues and 3.1 per cent for Marine and Port Dues are clearly well within the country's core consumer inflation targets of between 3 and 6 per cent, thus not only facilitating but also promoting growth in South Africa's trade. Table 4.3 shows a summary of the changing port tariff environment and the resulting impact on South African ports and port users.

FIGURE 4.3. PERCENTAGE CHANGE IN SOUTH AFRICA'S PORT CHARGES, 1999-2005
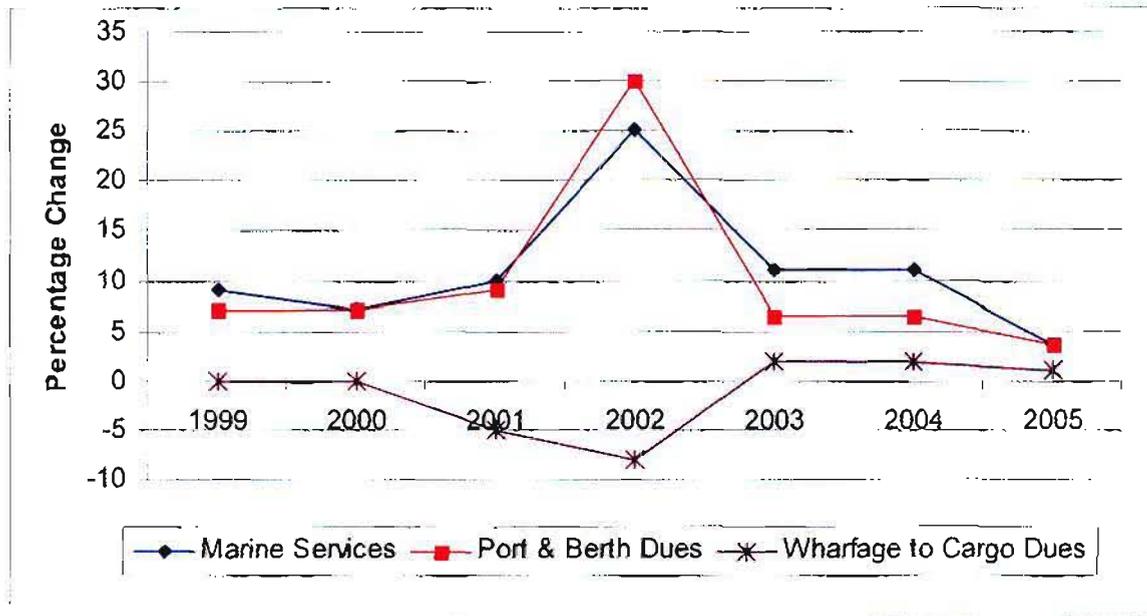
Source: Adapted from Kamlesh Kanjee, Senior researcher, NPA, personal communications, 2005.

TABLE 4.3. PORT TARIFFS AND THE IMPACT ON PORTS AND CARGO OWNERS

	Import	Export	Impact
Wharfage (Before 1991) **Wharfage (Value Added Tax) (Since 1991)**	1,8% 1,78%	0,9% 0,89%	**Ports:** Inflated port profits, cross subsidisation from ports to other government ventures. Revenues highly vulnerable to exchange rate fluctuations. Promoted government's goal of an import substitution economy. **Cargo owners:** exploited and burdened. Uncertainty, as port costs were highly vulnerable to exchange rate fluctuations. Note: Wharfage calculation capped: R9000
Wharfage (2001/2002)	1,70%	0,85%	**Ports:** Projected reduction of NPA revenue as a result of the tariff change: R250 million. **Cargo owners:** Decreased costs, still value based tariff. Port authority edges closer to ensuring globally competitive port rates. Note: Wharfage calculation capped: R9423
Cargo Dues (2002/2003) **Per Container:** **6m / 20 foot** **12m / 40 foot**	 R 1 480,00 R 2 960,00	 R 735,00 R 1 470,00	**Ports:** Anticipated reduction in NPA's cargo dues revenue in the order of R400 million. NPA's CEO Siyabonga Gama said the organisation expected to see about R896m coming off the top line, or revenue, during 2002. Port reduced the effect of this reduction on net profit by focusing on cost reduction. **Cargo owners:** High value cargo benefits through lower costs. Low value cargo owners may experience a rise in costs(table 4.4)
Cargo Dues (2003/2004) **Per Container:** **6m / 20 foot** **12m / 40 foot**	 R 1 510,00 R 3 020,00	 R 750,00 R 1 500,00	**Ports:** Anticipated real as opposed to nominal reduction in NPA's cargo dues revenue in the order of R388 million (Skinner, 2003 in Chasomeris, 2003d). **Cargo owners:** the 2 per cent increase in cargo dues is well below the inflation rate thus reducing real costs to cargo owners, facilitating/stimulating trade.
Cargo Dues (2004/2005) **Per Container:** **6m / 20 foot** **12m / 40 foot**	 R 1 600,00 R 3 200,00	 R 795,00 R 1 590,00	**Ports:** Anticipated real as opposed to nominal reductions in NPA's cargo dues revenue. **Cargo owners:** Although annual inflation has been reduced, the 2 per cent increase in cargo dues is still well below the inflation rate thus reducing real costs to cargo owners.

Sourced from: Port Tariffs, various years; Skinner, 2003; Jones, 2002b; Rodrigues, 2002b; Chasomeris, 2003d.

TABLE 4.4.   TARIFF STRUCTURE, NOMINAL IMPORT COSTS AND THE IMPACT ON CARGO OWNERS:

HIGH VERSUS LOW VALUE CARGO IMPORTS, AN EXAMPLE

Commodity	*Ad Valorem* Wharfage (Pre-2001)	Wharfage 2001/2002	Box Rate 2002/2003	Box Rate 2003/2004
High value cargo One 6m container Cargo value: R700 000	R4 485	R4 485	R1 480 (Costs decrease 67%)	R1 510 (Nominal costs +2%)
Low value cargo One 6m container Cargo value: R70 000	R1 246	R1 190	R1 480 (Costs increase 24%)	R1 510 (Nominal costs +2%)
6m calculation:	28M3 * 9000 * 1,78%	28M3 * 9423 * 1,7%	Set Box Rate	Set Box Rate
High value cargo One 12m container Cargo value: R700 000	R8 971	R8 970	R2 960 (Costs decrease 67%)	R3 020 (Nominal costs +2%)
Low value cargo One 12m container Cargo value: R70 000	R1 246	R1 190	R2 960 (Costs increase 149%)	R3 020 (Nominal costs +2%)
12m calculation:	56M3 * 9000 * 1,78%	56M3 * 9423 * 1,7%	Set Box Rate	Set Box Rate

Source: Own calculations from data in Table 4.3.

4.4. CONCLUSIONS

South Africa's seven commercial ports have served not only a strategic role through trade facilitation, but have also helped to shape the economic growth and development of the entire Southern African region. Port traffic volumes continue to show significant growth with total cargo of some 190 million tons handled in 2002 (Ports of Southern Africa and Mauritius, 2003). The chapter investigated South Africa's port performance with a particular focus on the evolution of port policy and pricing. Historically, port users have expressed a justified discontent with port governance, policy and pricing that promoted: import substitution; intra- and inter-port cross subsidisation; inter-modal cross subsidisation; insufficient investment in port infrastructure and superstructures; bureaucracy; skewed prices; and created suspicion in the maritime and transport industries about the impartiality of the port entity (Jones 1988b; White Paper, 2002: 13). This dismal background provided an opportunity to appreciate the current port policy and governance with the functional separation of Portnet into SAPO, as the port operator, and the NPA as port landlord. The functional split was also, arguably, necessary to facilitate the plans to concession port terminals. Contemporary developments reveal, however, that even though private sector opportunities will materialise, the government has abandoned wholesale concession of port terminals, following strong objections by labour, and opted to invest in infrastructure itself (Enslin, 2006: 1). The government's and the NPA's willingness to acknowledge and address many of the ills of the past has resulted in: increased government and Transnet funds allocated for the upgrade and maintenance of port infrastructure and superstructure; improved pricing principles that include a transformation from value-based (*ad valorem* wharfage) pricing towards a more cost-based (and user pays) pricing approach while concurrently attempting to reduce the historical imbalances between port dues and cargo dues and the consequent intra-port cross subsidisation.

There are still many challenges to address if South Africa is to continue to improve overall port performance. Port pricing areas that still need to be addressed include the lack of port competition; the inefficient pricing across all seven ports; the residual skewness of port revenues compared with costs; and the charging of cargo dues on import containers at twice the rate of identical export containers. Additionally, there are some costs and performance issues – congestion problems; low container moves per hour; aged equipment; high staff turnover and inexperienced staff (45 per cent new); and facilities that have not kept pace with demand (CSIR in Department of Transport, 2004) – that may not be directly reflected through port pricing and may contribute towards a rise in overall costs. Nonetheless, the government's recent commitments to increase capital expenditure and improve the efficiency and effectiveness of not only South Africa's ports, but the entire logistics chain is welcomed and necessary if the country is to reduce the costs of doing business in and from South Africa.

CHAPTER FIVE

ASSESSING SOUTH AFRICA'S
SHIPPING COSTS[72]

International trade is widely viewed as an engine of economic growth and social development[73]. Transport costs are significantly able to impede international trade[74]. As international trade is conducted mainly by sea, with volumes above 70 per cent for most countries and more than 90 per cent for most of Africa's economies (UNCTAD, 2003b: 10), it is important to understand the nature and magnitude of international maritime transport costs. High international transport costs serve, on the one hand, to protect domestic producers from foreign competition, and yet on the other hand, they provide a significant anti-export bias that reduces international competitiveness. Globally, trade liberalisation has reduced both tariff and non-tariff barriers which means that the effective rate of protection provided by transport costs is, for many countries, considerably higher than that provided by tariffs[75]. This implies that transport costs have become an increasingly important determinant of trade performance.

With more than 95 per cent of South Africa's trade volume seaborne or about 80 per cent in value terms, the country is strategically dependent upon the maritime transport industry (Siko, 1996: 4; Jones, 2004). South Africa's commercial ports and established international shipping network have served not only a strategic role of trade facilitation, but have also helped to shape the economic growth and development of the entire Southern African region. Due to South Africa's geographic location, substantial hauls are required to link this country to its major international markets and suppliers.

---

[72] An earlier version of this chapter was published in the *Journal of Development Perspectives* (Chasomeris, 2005b).

[73] Stiglitz (2002: 4) states: "Opening up to international trade has helped many countries grow far more quickly than they would otherwise have done." Frank and Romer (1999 in Micco and Perez, 2001: 1) claim "...trade has a quantitatively large, significant, and robust positive effect on income."

[74] This fact is well documented (Limão and Venables, 2001; Micco and Perez, 2001). This chapter uses the terms transport costs and shipping costs interchangeably.

[75] Micco and Perez (2001) show that in the cases of Chile and Ecuador, *ad valorem* transport costs are more than twenty times greater than *ad valorem* tariffs.

Consequently, South Africa accounts for approximately 6 per cent of global tonne-miles[76]. This performance places South Africa within the top 12 international maritime trading nations (Jones, 2002b). Despite the rising importance in South Africa's international sea-trade, the controversial socio-economic and political context that has surrounded much of the country's history meant that the South African trade and maritime policy environment was geared toward an import-substitution economy.

Since 1994, South Africa's trade and industrial policy has moved away from import substitution towards export orientation and the promotion of internationally competitive exports. Trade liberalisation lowers import protection provided by tariffs and non-tariff barriers and hence reduces the anti-export bias and enables resources to flow towards sectors with a comparative advantage (Cassim and Oyango, 2002:1). Consequently, South Africa has adopted trade liberalisation as official policy with the aim of raising economic growth and sustainable job creation through improving the country's international competitiveness. South Africa reduced its mean tariff for all products from 11.7 per cent in 1994 to 4.9 per cent by 2002 (Cassim and Oyango, 2002: 11). By July 2000, nearly 60 per cent of South Africa's imports faced a zero tariff (Economic Report on Africa, 2002). This reduction in South Africa's trade barriers suggests that transport costs may have become, by default, an increasingly important determinant of trade performance. Thus, crucial to the success of the new trade policy objectives is the restructuring of the transport sector, with particular emphasis on reducing international transaction costs of which transport costs are the largest component[77].

Despite the importance of transport costs and their ability significantly to impede international trade, direct measures of transport costs are difficult to obtain, and there are relatively few studies on international transport costs (as confirmed by Micco and Perez,

---

[76] Jones (2002b) attempted to estimate this real sea transport activity in 2002 by associating each regional tonnage flow with the steaming distance to a median port in each broad geographic region.

[77] "The notion of transport costs (shipping costs) may be broadened to include all costs of transfer, mainly freight, but also insurance, handling, freight-forwarders' commissions, etc., and even tariffs" (Kindleberger, 1968: 90). Transport costs are typically the most significant with South Africa's ocean and port costs estimated to account for about eighty per cent of the total international transport logistics chain for general cargo (Department of Transport, 1998). This thesis focuses on international transport costs rather than the broader term of transfer costs.

2001). This chapter presents an overview of South Africa's shipping costs as revealed through the broad trends in the country's import cif/fob ratios (Section 5.1) and Europe-South Africa liner shipping freight rates (Section 5.2). Section 5.3 concludes with an answer to the research question of whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures.

5.1 TRENDS IN SOUTH AFRICA'S SHIPPING COSTS: AN IMPORT CIF/FOB RATIO PERSPECTIVE

Very few countries report detailed information on transport (shipping) costs as part of their trade statistics and direct measures of international transportation costs are difficult to obtain (Micco and Perez, 2001; OECD, 2002; Hummels and Lugovskyy, 2003). In the absence of direct measures, researchers have used an indirect measure of international transportation costs − a country's import cif/fob ratio[78]. In principle, the measure compares the "cost, insurance and freight" (cif) value with the "free on board" (fob) value of imports. The country import ratio (cif/fob)-1 provides a measure of *ad valorem* shipping costs (see Section 2.1). Chapter Two, however, exposes several shortcomings of these ratios that are often characterised by measurement errors in the values of imports cif and imports fob; by IMF staff imputations, that is, constructed ratios; by concerns of bias "if high transport cost countries systematically import lower transport cost goods"; by aggregation over the different sources of supply, so for each country there is a single cif/fob ratio; and by misunderstanding, misinterpretation and misuse of these country cif/fob ratios (see Chapter 2.1 and Limão and Venables, 2001: 7). Indeed, this thesis has exposed many limitations to the use of country cif/fob ratios as a measure of international transport costs. Nonetheless, Radelet and Sachs (1998: 3) maintain that although subject to shortcomings, "these data are relatively consistent and complete, and provide a good

---

[78] A country's import cif/fob ratio has received various names in the literature, for instance: freight factor, shipping costs (Radelet and Sachs, 1998), *ad valorem* transport costs, *ad valorem* shipping costs and *ad valorem* freight rate (Yeats, 1977), a country's average freight rate (UNCTAD, 2003b), CIF-FOB band and

starting point for examining the general costs of international shipping for almost all countries in the world." Likewise, because of their availability and coverage, Rose (1991), Radelet and Sachs (1998), Naudé (1999a; 1999b; 2001), Limão and Venables (2001) and Baier and Bergstrand (2001) among others have used IMF import cif/fob ratios to assess the effect of transportation costs on trade (see Chapter Three, which critiqued some of these seminal studies). Additionally, UNCTAD's *Review of Maritime Transport*, as the principal annual publication on international transportation and trade issues, uses IMF cif/fob ratios to monitor and report *ad valorem* shipping costs globally (UNCTAD, 2005).

In South Africa, Naudé (1999a; 1999b; 2001) investigated the country's international transport costs, as proxied by the cif/fob ratio. Naudé (1999a; 1999b; 2001) established that international transport costs, rather than domestic transport costs, are an obstacle to exports and estimated South Africa's cif/fob imports ratio to have been on average seven per cent over the period 1988-91. This compared very unfavourably with the world average of three per cent, and even the average for developing countries of five per cent. He also notes that "international transport costs to and from South Africa are almost 50% higher than the average for developing countries!" (Naudé 1999b: 12). Naudé (1999b: 20; 2001) found, however, that although shipping costs (proxied by the cif/fob ratio) were statistically significant in reducing South African exports, the magnitude of the effect is relatively small (the elasticity of changes in export values with respect to changes in shipping costs was around 0.08).

Chasomeris (2003c:147) calculated a simple mean cif/fob ratio on imports for the last four decades. Table 5.1 shows, contrary to the declining world transport cost trends, that South Africa's freight costs as a percentage of import values (cif/fob ratio) has been on the increase from a decade average of 4.54 per cent in the 1960s; 7.9 per cent in the 1970s; 8.8 per cent in the 1980s; to 10.84 per cent in the 1990s. Theory suggests that the higher the international transport costs, the more firms may pay for imported intermediate

transport cost *rate* (Naudé, 1999a;1999b), c.i.f.-f.o.b. transport-cost factor and average c.i.f.-f.o.b. factor (Baier and Bergstrand, 2001).

goods; they may also receive less for their exports. In addition to this, the higher transport costs may increase the price of imported capital goods, which could reduce investment and the rate of technological transfer and thus reduce South Africa's economic growth. In South Africa's case, however, a simple mean calculation of the cif/fob ratio shows that during economic sanctions, these "shipping costs" were lower than in the post economic sanctions period. More specifically, during South Africa's time of economic sanctions, the resultant average transport cost rate was 8.87 per cent over the years 1985 to 1993 inclusive. The post economic sanctions period from 1994 to 2000 had an average transport cost rate of 12.3 per cent. Alternatively, if we use 1994 as the dividing line, justified as the divide by both the democratic elections and the end of South Africa's current account surplus, then South Africa's cif/fob ratio on imports increased from an average of 8.89 per cent (1985-1994) to an average of just over 12.8 per cent (1995-2000).

TABLE 5.1. SOUTH AFRICA'S FREIGHT COSTS AS A PERCENTAGE OF IMPORT VALUES (CIF/FOB RATIO)

cif/fob ratio:	4.54	7.9	8.8	10.84
Years:	1960-69	1970-79	1980-89	1990-99

Source: Chasomeris, 2003c: 147.

These trends identified in South Africa's cif/fob ratios raise a number of questions that the author is currently researching. One particularly important research question is whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures. Chasomeris (2004 and Chapter Three) explains that the composition of South Africa's imports has a substantial influence on the level of the cif/fob ratio, and that it is therefore incorrect to assert that the country's cif/fob ratio is a good indicator of direct international transport costs. Rather, a country's cif/fob ratios are composite indicators that are determined by changes in both the level of transportation costs and changes in the composition of a country's

124

imports. For instance, high-value imports per unit weight (e.g. manufactured imports) will have very low cif/fob ratios, whereas low-value agricultural imports may have high cif/fob ratios. In other words, a decrease in the proportion of a country's manufacturing imports may contribute to a rise in the level of the cif/fob ratio. Similarly, an increase in the proportion of mining imports may contribute to a rise in the ratio. South Africa's trade liberalisation and re-integration into the global economy, along with the establishment of preferential trade agreements, has substantially changed the country's composition of imports resulting in a higher proportions of mining imports (by value) and this has contributed to the rise in the country's cif/fob ratio (as explained in Chapter 3.1). If South Africa's recorded trade data were reliable, then South Africa's evolving composition of imports should have a substantial and significant effect on the country's cif/fob ratios (as in the case of the United States of America, see Section 3.1.1). Accordingly, South Africa's cif/fob ratios might then rather be indicative of changes in the country's composition of imports than changes in the country's direct shipping costs. These trade data, however, are not reliable.

Yeats (1995: summary findings) investigated the broader question: "Why are partner-country data so unreliable for approximating 'missing' trade data?" The evidence showed:

- "Problems in reporting or processing COMTRADE data.
- Valuation differences (f.o.b. versus c.i.f.) for imports and exports.
- Problems relating to entrepot trade, or exports originating in export processing zones.
- Problems associated with exchange-rate changes.
- Intentional or unintentional misclassification of products.
- Efforts to "conceal" trade data for proprietary reasons.
- Financial incentives to purposely falsify trade data" (Yeats, 1995: summary findings).

Understandably, Yeats (1995: summary findings) concludes that:

> Efforts to improve the *general* quality, or availability, of trade statistics using partner country's country data holds little or no promise, although this information may be useful in specific cases where the trade statistics of a certain country are known to incorporate major errors. Significant progress in upgrading the accuracy, and coverage, of trade statistics can be achieved only by improving each country's procedures for data collection.

Additionally, Yeats mentions numerous cases of deviations from established United Nations standards for reporting trade statistics. In particular, reference is made to South Africa as there were "numerous cases where African countries were reporting trade with Republic of South Africa which failed (for political reasons) to report matched statistics – similar discrepancies were observed in many countries' trade with Israel" (Yeats, 1995: 33).

Mindful of the above data quality shortcomings in the IMF matched partner statistics and the resultant limitations of country import cif/fob ratios (also see Chapter 2.1), this thesis investigated further shortcomings in South Africa's trade data and empirical evidence of errors in South Africa's monthly cif/fob ratios. South Africa's monthly cif/fob ratios are calculated using data sourced from the IFS database.

There are several ways to check the quality of a country's cif/fob ratios. The first may be to examine the trends in the ratios over time (Hummels, 1999b: 28). Hummels and Lugovskyy (2003: 8) restrict their study to analysing only the IMF cif/fob ratios that lie in the *ad valorem* transport costs range of 0 to 100 per cent. In other words, negative cif/fob ratios that imply negative *ad valorem* transportation costs, and transportation costs exceeding the value of the goods being shipped are excluded as errors[79]. In South

---

[79] Hummels (1999b: 29) notes that both the United States and New Zealand require shippers to report measures of trade valued with and without freight and insurance costs on their import documentation. Likewise, South Africa's Customs Department requires the declaration of imports cif and imports fob on the customs and excise documentation (Jack Heyns, 2004, South African Revenue Services, Customs and Excise, personal communications). Interestingly, *ad valorem* wharfage, that is, port charges are apparently not included in the cif calculation (Heyns, 2004, South African Revenue Services, Customs and Excise, personal communications). If this is the case, then South Africa's cif/fob ratios do not account for port charges directly. Consequently, the degree to which these port charges (port pricing) are able to deter or promote trade would be difficult to measure using the cif/fob ratio. Additionally, port efficiency and

Africa's case, 11 out of 550 monthly IFS cif/fob observations during the period that included January 1957 to October 2002, have a negative ratio, which Hummels and Lugovskyy (2003: 8) have referred to as errors (see Figure 5.1). In addition there is an all time high monthly ratio of 72.7 per cent in February 1997 and the second highest of 52.3 per cent in April of 1997. These anomalies have caused the annual cif/fob ratio for 1997 to reach an all time high of 17 per cent. Although none of South Africa's annual cif/fob ratios are categorised as errors, one should be aware that these monthly errors are aggregated into the annual data.

Hummels and Lugovskyy (2003: 10) reveal that the number of observations lying in a reasonable range of implied transportation costs (0-100 per cent *ad valorem*) increased markedly in the last 10 years of their sample. They interpret this as a rough indicator that the IMF data quality could be improving (Hummels and Lugovskyy, 2003: 10). Likewise, in South Africa's data, the last recorded negative cif/fob ratio was in July 1997. This may be an indication that the quality of South Africa's trade statistics and thus the recorded IFS cif/fob ratios has improved. Hummels and Lugovskyy (2003: 28) rank 119 countries according to their mean and standard deviation of the error. Interestingly, South Africa ranks 115 with a mean of 0.292 and a standard deviation of the error of 0.184 (Hummels and Lugovskyy, 2003: 28). Hummels and Lugovskyy (2003: 9) explain that: "Richer exporters, presumably those with better national statistical agencies, have lower errors throughout the sample". Applying this interpretation to the results for South Africa, however, produce illogical conclusions. Specifically, war-torn countries like Rwanda (97th position), Sudan (83rd position) and the Democratic Republic of Congo (71st position) have "presumably... better national statistical agencies" (Hummels and Lugovskyy, 2003: 9) than South Africa (115th position) - this is most unlikely! Nonetheless, South Africa's very high mean and standard deviation of the error, and resultant low ranking by Hummels and Lugovskyy's (2003: 28) are further evidence to

---

infrastructure, to the degree that it is reflected through port pricing, is not (directly) measurable. This insight might have some implications for the study by Limão and Venables (2001). Limão and Venables (2001: 451) use country cif/fob ratios as a measure of transport costs and one of the main findings include that a country's infrastructure "is a statistically and quantitatively important determinant of transport costs and of bilateral trade flows" (also see Chapter 3.2 for a critique of the econometric use of country cif/fob ratios).

doubt the overall quality and reliability of South Africa's trade statistics and import cif/fob ratios.

A simple decomposition and observation of South Africa's recorded SITC imports as a proportion of total imports (1980-2002) shows that for many years a large portion of the country's SITC data (revision 2, from TIPS, 2005) was unclassified (SITC-9 in Figure 5.2). Chapter Three analysed South Africa's disaggregated SITC data from TIPS (2005, in Table 3.2 and Appendix C) and revealed serious data quality problems that included non-disclosure of imports and incorrect classification of goods, particularly the strategically sensitive petroleum imports. For instance, due to the economic sanctions on South Africa, the vast majority of goods, by value, were lumped together under SITC-9, that is, commodities and transactions not elsewhere classified. Thus, the low quality ranking of South Africa's trade data by Hummels and Lugovskyy (2003: 28) may be the result of deliberate measures like non-disclosure and misclassification of trade under economic sanctions, rather than indicative of the quality of South Africa's national statistical agencies. Hence, South Africa's trade data are neither likely to accurately indicate the country's actual *ad valorem* shipping costs nor direct costs of transportation. With these insights into the nature of the cif/fob ratio, it clearly becomes necessary to compile better direct indicators of South Africa's international transport costs.

FIGURE 5.1. SOUTH AFRICA'S MONTHLY CIF/FOB RATIO, JANUARY 1957 TO OCTOBER 2002
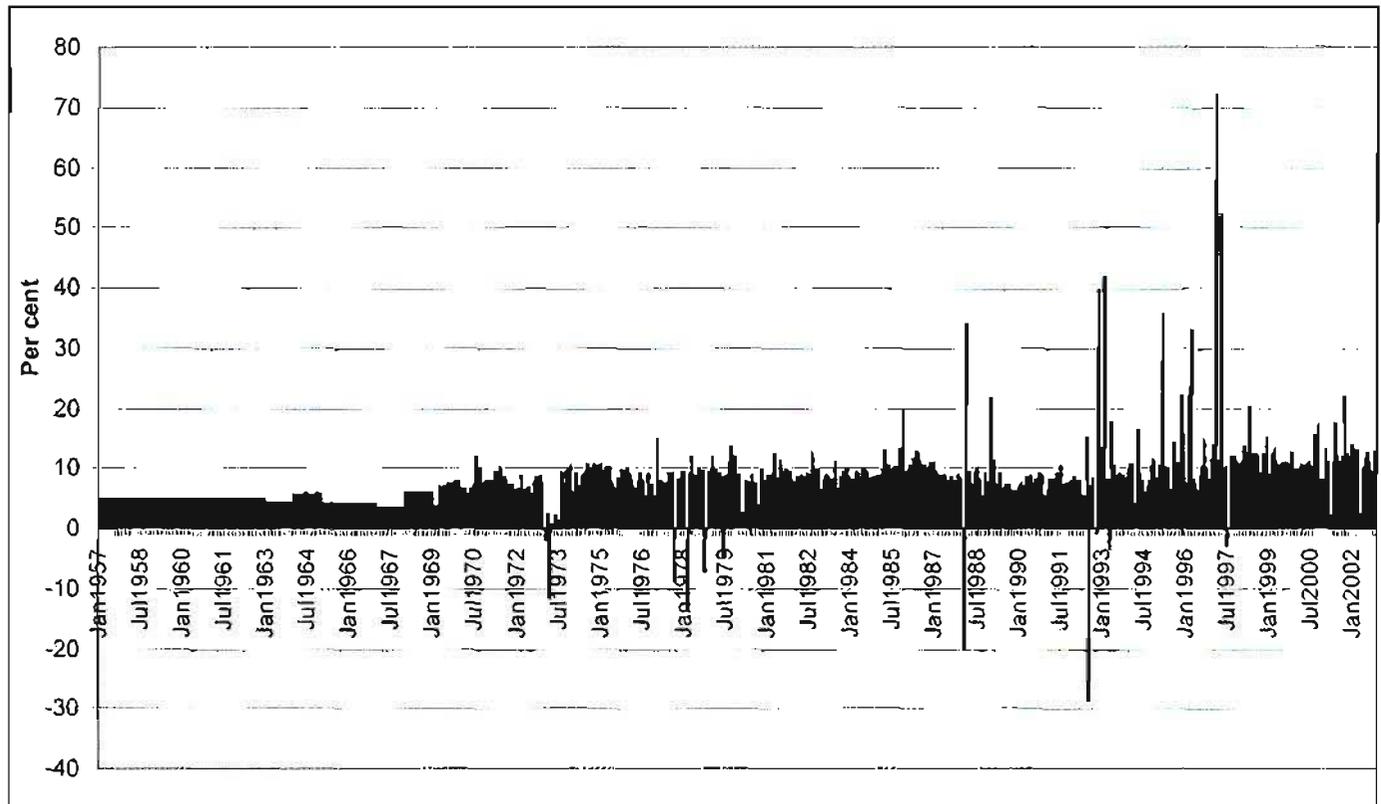
Source: Author calculated from *International Financial Statistics* in TIPS, 2004.

Note:

1. *Ad valorem* transport costs should, in theory, be between 0 and 100 per cent of the fob value of imports. Errors are recorded where monthly cif/fob ratio are below zero (see Hummels and Lugovskyy, 2003). Errors are recorded on eleven occasions. These months are Jan 73, Mar 73, Sep 77, Feb 78, Oct 78, Jun 79, Jan 88, Jul 92, Oct 92, Apr 93 and July 97.

2. After consideration, this thesis uses the annual imports cif and imports fob data from International Financial Statistics (in TIPS, 2004) to calculate annual cif/fob ratios. That is, this thesis does not meddle with the aggregated annual data.

3. There is monthly variation in cif/fob ratios before January 1969, but as Figure 5.1 shows, it is limited.

FIGURE 5.2. SOUTH AFRICA'S SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002
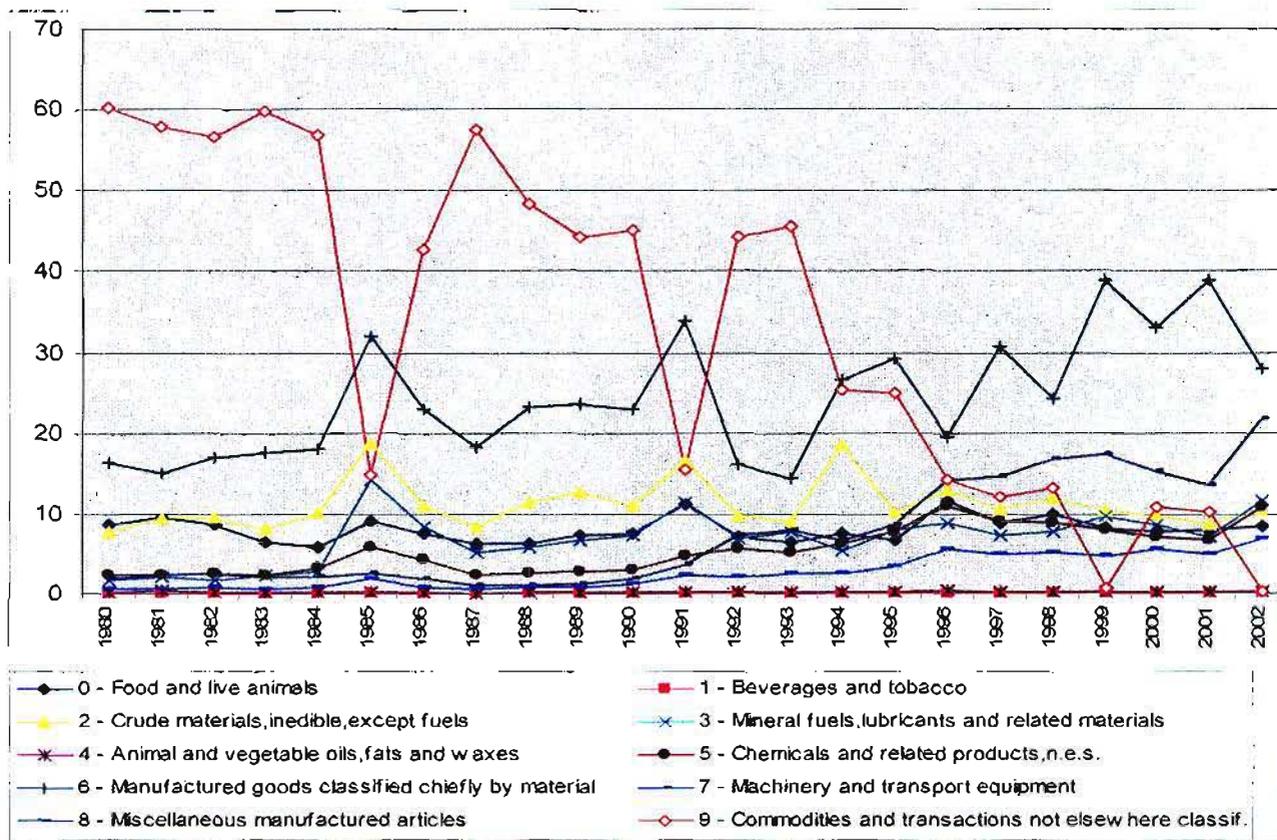
Source: own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

Despite the importance of transportation costs, direct measures of international transport costs are difficult to obtain (see Micco and Perez, 2001; OECD, 2002; and Hummels and Lugovskyy, 2003). The research question on whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures would benefit greatly if there were more direct measures of international transport costs available with which one could compare the direct with the indirect cost measures. Unfortunately, there are very few sources of direct data. Furthermore, where data on direct transportation costs are apparently available, the opportunities to use the data are often limited as the data are often considered commercially sensitive (e.g.

privately negotiated prices). Additionally, where companies are willing to divulge the prices charged, the data are often the officially set tariff rates that may deviate from the actual negotiated tariffs (With reference to both the air-freight industry and the liner shipping industry tariffs for South Africa's international trade routes). The lack of useable cost data and difficulties in gathering direct transport cost data for research is clear from many other studies. For instance, Radelet and Sachs (1998: 3) report that "surprisingly, more direct shipping cost data − e.g. from transport companies − is generally proprietary information and therefore hard to assemble for a large number of countries on a systematic basis." The Organisation for Economic Co-operation and Development (OECD, 2002) through investigating the potential for removal of anti-trust exemptions for the liner shipping industry should have been most able to acquire the necessary direct data. Unfortunately, for some, "the quality of the data provided by both carrier and shipper representatives, while variable, tended to be rather poorly suited to the detailed analysis necessary for the study" (OECD, 2002: 13). Though there is a clear lack of usable cost data, my research has yielded two maritime transport related perspectives on South Africa's international transport costs.

Consider Table 5.2. South Africa's average distance of over 11,000 km from her international markets in Asia and Europe, results in an ocean freight portion of the containerised transport chain that accounts for 60 to 68 per cent of total shipping costs and 83 per cent of total travel time. In comparison, inland transport accounts 19 to 27 per cent of total freight costs and requires 11 per cent of total travel time (Department of Transport, 1998: 100).

TABLE 5.2. DISTRIBUTION OF TRANSPORT COSTS ALONG THE VALUE CHAIN

	Cross haulage and cartage	Inland terminal & trunk leg	Port	Ocean transport
Average Distance	20km	720km	500m	11,200km
Exports Portion of Transport Cost	10%	17%	13%	60%
Imports Portion of Transport Cost	7%	12%	13%	68%

Source: Department of Transport, 1998: 101.

Chapter Four investigated the evolution in South Africa's international transport costs from a port policy and pricing perspective. The next section investigates South Africa's direct shipping costs from a Europe-South Africa liner freight rates perspective.

5.2. LINER SHIPPING FREIGHT RATES: A EUROPE-SOUTH AFRICA PERSPECTIVE

The European Union is South Africa's most important trade partner, accounting for over 40 per cent of aggregate imports and exports, as well as 70 per cent of foreign direct investment (South Africa.info, 2004). Germany, the United Kingdom, France, Italy, the Netherlands, Belgium and Spain are seven of South Africa's top ten trading partners. The signing of the Trade, Development and Co-operation Agreement (TDCA) between South Africa and the European Union, in 2000, provides for the establishment of a bilateral free trade area between the EU and South Africa, in conformity with World Trade Organisation (WTO) rules. The agreement's combination of free trade, development, co-operation, finance, technical assistance and political dialogue will in all likelihood serve as a model for the EU's future relationships with the rest of Africa (South Africa.info, 2004). The TDCA requires elimination of customs duties on more than 90 per cent of all goods traded between South Africa and the EU after a 12 year period. To achieve this, South Africa will have to eliminate tariffs on 86 per cent of EU imports after a period of 12 years, whereas the EU will allow 96 per cent of South African exports to enter its markets free of import duty after ten years (South Africa.info, 2004). This reduction in tariff barriers implies that transport costs may have become, by default, an increasingly important determinant of trade competitiveness for both regions.

Table 5.1 revealed that the majority of transport costs and transit times occur in the ocean portion of international container trade. Figure 5.3 combines South Africa's cif/fob ratio, the constant Rand-based Europe-South Africa Conference liner freight rate index and the balance of payments current account situation for the period 1971 to 2002[80]. Space does not allow for a full exposé of Figure 5.3. The two periods of current account surplus are reflected by the darkened bars and occurred for very different reasons. The first period of surplus was recorded from 1977 to 1980 and the second from 1985 to 1994. The Rubicon

---

[80] The constant Rand-based Europe-South Africa freight rate index was constructed as follows. I researched and compiled data for the nominal US$ freight rate index that was then converted into US$'s and subsequently into rands. The nominal rands time series was divided by South Africa's GDP deflator and then converted back into a constant Rand index with a base year of 1980 (Figure 5.3 and Appendix B).

speech by State President P. W. Botha in 1985, subsequently led to the US Congress imposition of economic sanctions in 1986. Hence between 1986 and 1993, South Africa was subject to international financial sanctions and had to repay its foreign debt and therefore could not afford to run current account deficits. Economic policy thus had to be aimed at ensuring a current account surplus with deliberate tariff and non-tariff measures that not only kept imports low but distorted the country's composition of imports. Figure 5.3 suggests that the cif/fob ratio was lower for the two periods of current account surplus. In particular, if we look over the period 1985 to 1993, the simple mean cif/fob ratio was 8.87 per cent, significantly lower than the post-sanctions (1995-2002) mean of 12.9 per cent. If the cif/fob ratio is used as a proxy for direct transport costs, then the ratio indicates that post-sanction South Africa, despite the advent of democracy in 1994 accompanied by further trade liberalisation and increased competition in services, experienced average costs that were 45 per cent higher than the average "transport costs" during economic sanctions!

The Europe-South Africa liner freight rate index reveals an alternative perspective, one that lies is stark contrast to that of the cif/fob ratio. Over the period 1985 to 1991, the year in which the European Community dropped sanctions against South Africa, nominal US$ freight rates had increased by 96.7 per cent to reach an all-time high in 1991. These high import freight rates were another deterrent to imports. The southbound index also suggests that economic sanctions and the lack of shipping competition had a significant impact on import freight rates.

The end of economic sanctions brought about a new era of trade liberalisation with immense untapped potential for both South Africa and the consequent demand for Europe-South Africa liner services. South Africa's post-apartheid political and economic liberalisation has resulted in increased trade interest and domestic investment that has raised cargo volumes and attracted new shipping lines into the trade (Chasomeris, 2004). Since there are large economies of scale in the provision of liner shipping services, greater cargo volumes allow shipping lines and conferences to operate larger ships and to spread fixed route costs over a larger number of shipments. With sufficiently large traffic

volumes, transport operators can also reap economies of scope by offering services on connected routes. By 2000, there had been a 52.5 per cent decline in nominal US$ southbound freight rates as compared to 1991.

FIGURE 5.3.

SOUTH AFRICA'S CIF/FOB RATIO AND

EUROPE-SOUTH AFRICA LINER FREIGHT RATES

(1971-2002)
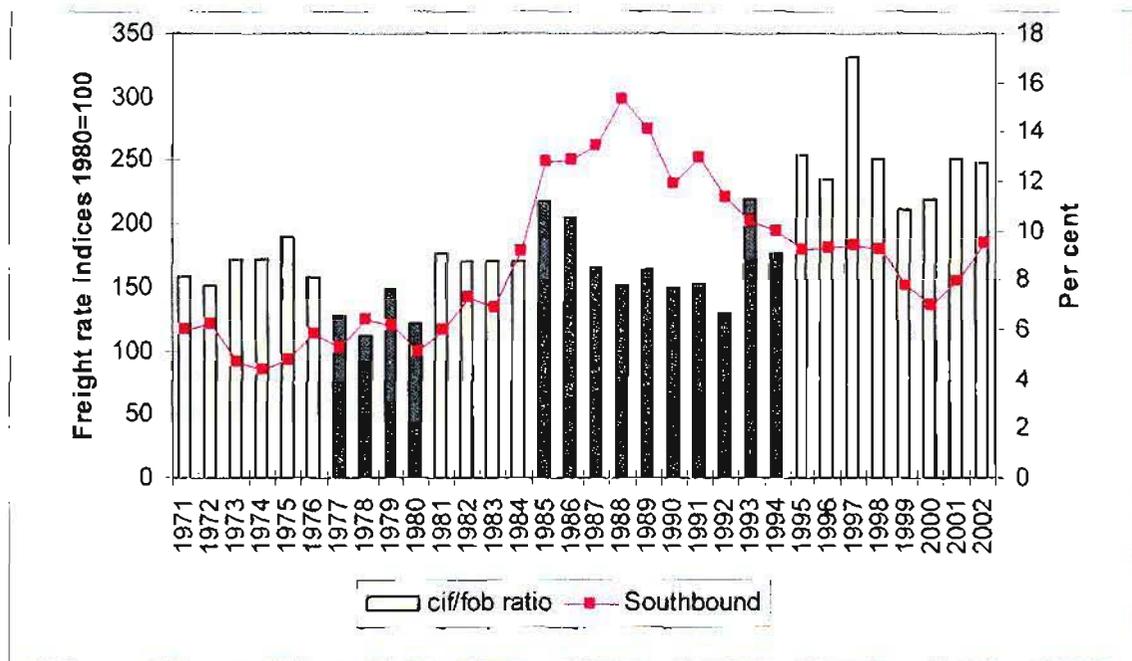
Source: Author compiled and calculated[81].

[81] To create the Southbound freight rate index, I spliced together data from 1950 to 1985 inclusive in Berridge (1987) and the freight rate index kindly provided by Pollington (2003, SAECS Conference secretary, personal communications). Pollington notes that the sources are yearly-average rates for the trade between Southern Africa and the United Kingdom and North-west Continent. Furthermore, he stressed that the data was taken from a handful of sources available to him at the time and represented a statistical sample which was skewed in favour of containerised (FCL/FCL) transport over other forms. In order to present a constant Rand freight rate perspective - as opposed to the nominal US$ freight rates presented in Chasomeris (2004) - it was necessary to convert the nominal dollar index into rands and then deflate these values using South Africa's GDP deflator (data from TIPS, 2005).

In constant Rand terms, Figure 5.3 shows that the real all-time peak in liner freight rates was during the heart of sanctions in 1988. As compared with 1983, freight rates had risen by 121 per cent by 1988. Since 1988, real southbound freight rates were on a downward trend and by 2000 had declined by 55 per cent (the peak in 1991 was partly due to the Iraqi oil crisis). The rising trend in container freight rates for 2001 and 2002 are a global phenomenon essentially driven by the growth in world sea trade. Thus in stark contrast to the rising transportation cost perspective created by the cif/fob ratio, the mean post European imposed sanctions freight rates (1992-2002) were 32 per cent lower than the average during sanctions (1986-1991).

Figure 5.4 illustrates further the contrasting perspectives on South Africa's international transport costs. The global context is one of declining average tariffs for both developed and developing countries. Furthermore, *ad valorem* transportation costs (the cif/fob ratios) have declined for many countries and regions (see Chasomeris, 2003c). Mindful of the global context, Figure 5.4 presents South Africa's *ad valorem* import (custom) duties and *ad valorem* transport costs (both as proportions of imports fob) for the period from 1990 to 2002. South Africa's trade liberalisation is revealed through the decline in the country's trade-weighted mean import duty from 11.3 per cent in 1990 to 3.5 per cent in 2002. It also appears that South Africa may have embarked on a process of trade liberalisation long before the removal of economic sanctions in late-1993. Of potential concern, however, is the rise in South Africa's international transport costs, as proxied by the cif/fob ratio. Transport costs as a proportion of imports (fob), which are the cif/fob ratios, have increased significantly from 7.7 per cent in 1990 to 12.7 per cent in 2002! In other words, in 1990 *ad valorem* transport costs were 32 per cent below *ad valorem* tariffs, whereas in 2002 *ad valorem* transport costs are almost 365 per cent higher than *ad valorem* tariffs! In stark contrast, over the same period, real Europe-South Africa liner freight rates had declined by 20 per cent.

FIGURE 5.4. SOUTH AFRICA'S AD VALOREM TARIFFS, AD VALOREM TRANSPORT
COSTS AND REAL EUROPE-SOUTH AFRICA LINER FREIGHT RATES, 1990-2002
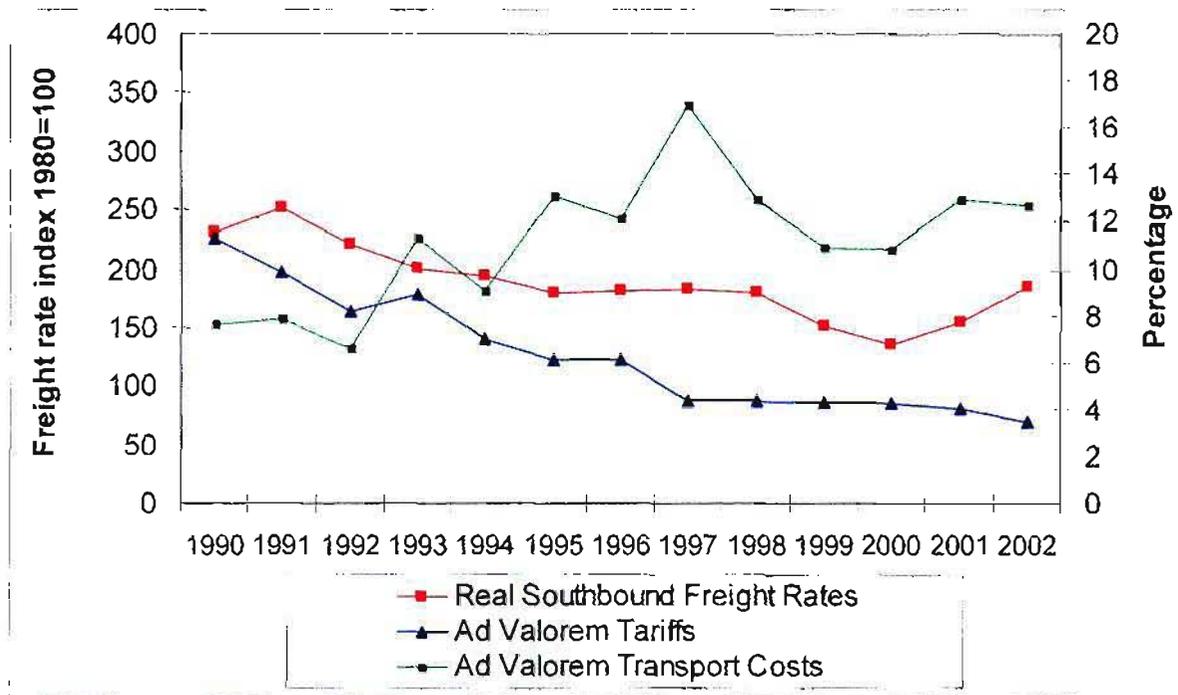
Notes:

1. The calculation of South Africa's *ad valorem* Tariffs: Import (customs) duties divided by imports fob, multiply by 100.

2. The calculation of South Africa's *ad valorem* transport costs: Imports cif divided by Imports fob, minus 1, multiply by 100.

Author compiled and calculated from SARB and IMF data available from TIPS, 2005 and Pollington, 2003, SAECS, Conference Secretary, personal communications.

5.3. CONCLUSION

South Africa's *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. The findings on South Africa's cif/fob ratios imply that researchers cannot and should not use the ratio as a reliable indicator (proxy) for South Africa's direct shipping costs. Furthermore, South Africa's (historical) trade data are not reliable as there are serious data quality problems that include efforts to conceal trade data for political (sanctions) reasons, re-enumeration and re-classification of trade data, particularly the strategically sensitive petroleum imports. Consequently, South Africa's inaccurate trade data generate inaccurate and unreliable country cif/fob ratios that are neither able to show South Africa's actual *ad valorem* shipping costs nor direct costs of transportation. South Africa's experience also suggests that other countries, like transition economies, undergoing trade liberalisation with re-enumeration and reclassification of imports due to improvements in the quality of trade statistics, may experience an increase in mining (petroleum) as a proportion of total imports that contributes to a rise in that country's cif/fob ratio. This increase in the country's cif/fob ratio, however, should not necessarily be interpreted as an increase in direct shipping costs, but rather may be a consequence of changes in the nature and recorded values of a country's imports. Consequently, studies that have used the cif/fob ratios to analyse a country's or region's transport costs may have estimated the true levels and trends in international transport costs incorrectly and thus may also misinterpret their impact on trade. Hence, researchers worldwide should carefully reconsider the use of the cif/fob ratio as a proxy for direct shipping costs. When the cif/fob ratio is used, however, it should be analysed within the evolving context of a country's import composition, within its historical context, and where possible, compared to other more direct indicators of international transport costs like ocean freight rates.

CHAPTER SIX

SOUTH AFRICA'S MARITIME POLICY AND TRANSFORMATION OF THE SHIPPING INDUSTRY[82]

South Africa is a significant sea-trading nation. South Africa's seaborne commerce accounts for 95 per cent of the country's trade volume or about 80 per cent in value terms (Siko, 1996: 4; Jones, 2004). With the country's commercial ports handling in excess of 190 million tons of cargo, representing roughly 3.5 per cent of world sea-trade volumes and 6 per cent of global tonne-miles, South Africa is strategically dependent upon the maritime transport industry (ISL, 2002; Jones, 2002b; Ports of Southern Africa and Mauritius, 2003).

Even though South Africa is clearly an important sea-trading nation, it is not a significant shipowning or ship operating nation. In February 2000, only six ships – owned by Safmarine – with a combined net registered tonnage of 87 140, could be considered South Africa's deepsea merchant marine, on the basis of flag or formal registration (Chasomeris 2003b: 2). Numerous factors have led to this phenomenon, not least of which was apartheid and the restrictions placed upon South African vessels through economic sanctions. Yet despite a decade of democracy, and an improved legal environment brought about by the Ship Registration Act of 1998, tonnage on the South African register has continued to decline. Furthermore, the decade has witnessed slow progress on the quest to empower, educate and integrate the vast majority of black South Africans who have historically been excluded from participating in South Africa's maritime economy.

---

[82] An earlier version of this chapter is due for publication as an article in the *Journal of Interdisciplinary Economics*, 2006, Vol.17, A B Academic Publishers: Great Britain.

On the 10th December 2003, representatives of the maritime industry met in Durban to formally sign South Africa's Black Economic Empowerment (BEE) Charter for the maritime transport industry. The overarching long-term vision of the maritime charter is "to develop South Africa to become one of the world's top 35 maritime nations by the year 2014." (BEE MTI, 2003: clause 2.1.1). In particular, the stated vision of the charter is to "substantially increase the number of SA flagged vessels and develop new South African shipping companies that are globally competitive..." (BEE MTI, 2003).

A means suggested to achieve this vision is captured in the following statement: "What we are calling for is a clear strategy/plan for the majority of South African cargo, going through South African ports to be carried on South African ships" (BEE MTI, 2003). More specifically, the measurable shorter term objective is "to persuade local cargo owners to increase the cargo carried on South African ships to 25,1% of the total within the next 5 years subject to review on an annual basis. Within 5 years, SA companies with particular focus on BEE companies should broker 25,1% of all cargo handled by brokers within the next 5 years, subject to review on an annual basis."

This chapter initiates an investigation into South Africa's maritime policy and the transformation of the national shipping industry. It provides a constructive critique of the long-term vision of the Maritime Charter on Black Economic Empowerment. Section 6.1 reflects upon the economic principles underlying maritime transport policy. With this understanding, section 6.2 outlines South Africa's liberal shipping policy. Section 6.3 investigates the legislative context of the BEE maritime charter before section 6.4 applies maritime theory and "international best practice" to present a constructive critique of the maritime charter's long-term vision. Conclusions are drawn in section 6.5 which provide a way forward to ensure the successful and sustainable transformation of South Africa's shipping industry.

These principles underpinned all of the economic issues addressed by the Maritime Transport Working Group (Department of Transport, 1995), and likewise should be considered when assessing the current policies and issues surrounding the black economic empowerment Charter and vision for South Africa's maritime transport industry.

6.2. SOUTH AFRICA'S CURRENT SHIPPING POLICY

The importance of South Africa's sea trade and associated maritime policy has long been recognised, and has evolved through the centuries. Historical, socio-economic and political factors unique to South Africa, as well as the international shipping environment, have helped to mould South Africa's present shipping policy. In this chapter, shipping policy is used broadly, referring to a range of policy tools and regulations applied to the maritime sector. "National shipping policies are normally intended to promote national flag fleets through various forms of preferential treatment such as fiscal advantages, direct subsidy of operations and construction, and through overtly protectionist measures such as reserving part of or even all cargo for national flag vessels" (Sletmo, 2002: 471). In a similar vein, Sturmey (1975, in Sletmo, 2002: 472) notes that: "A nation may be said to have a shipping policy when it encourages, permits, or formulates measures to interfere with or control the free play of market forces in regard to the employment of shipping. The inference or control may extend from ad hoc measures to a carefully planned and continuous policy."

Accordingly, the commercial shipping policy of a state is reflected in the legislative, administrative and economic measures which the state adopts towards shipowning and operation in the national economy and international markets for sea transport. While these measures may concern its own merchant fleet or be directed at foreign shipping, the effect will invariably have both domestic and international repercussions. For that reason, national shipping policies are not only domestic matters, but also matters of international concern (Floor, 1993: 5.1.1). The potential benefits of any shipping

industry include a "contribution to its national economy in terms of its effects on the balance of payments, the employment opportunities it offers to seafarers and subsequently to shore based management activities, its value to shipping centres…and its backflow to the national government via taxes and value-added" (Marlow, 2002: 527).

In a study entitled "The international shipping industry and South Africa's seaborne trade", Jones (1987) analysed South Africa's maritime policy in the mid-1980s. Briefly, the potential regulatory measures which appeared to be impracticable or unnecessary at the time included: multi-lateral cargo sharing; direct cargo reservation; direct flag preference; direct subsidisation and the pursuit of discriminatory port tariffs (Jones, 1987: ix-xii). The study recognised the benefits of the freest possible trade environment, but also recognised that "second best" interventions might at times be appropriate in an imperfect trading world where many trading nations practice unilateral maritime protectionism. These included the pursuit of bilateral agreements with those trading partners who might otherwise practise unilateral cargo reservation; the placing on the statute books of potentially retaliatory measures aimed at those states that discriminate against South African carriers; greater support for local carriers in respect of government cargoes; the pursuit of 'package' deals between landside transport operators and sea carriers; attempts to secure the shipment of a higher proportion of exports on a cif basis; and a change in the attitude of government towards the domestic shipping industry as a strategic asset whose reinforcement would be in the national interest (Jones, 1987: xii-xvi). Since that time, much of the shipping protectionism has evaporated.

The 1993 Report of the Committee of Enquiry into a National Maritime Policy for South Africa (the Floor Report, para 5.1.19) states: "the shipping policy of South Africa is currently more liberal than protectionistic". This is based on the notion that the maritime transport industry is a self-regulating transport mode that has historically produced services of sufficient quantity and quality to service the seaborne commerce needs of southern Africa (Jones, 2002c).

On the regulatory front, South Africa maintains one of the most liberal maritime policy regimes in the world (Jones, 2002c). In brief, it has:

- no Cabotage rules. The coastal trades are open to all flags and carriers, without this "open ports" policy in any way threatening domestic carriers.
- no multilateral, bilateral or unilateral cargo reservation. South Africa never acceded to the UNCTAD cargo-sharing formula that sought to establish a "quota" system for Conference liner cargoes. No cargoes are reserved for national ships.
- no flag preference or flag discrimination. In this regard, an "open ports" policy is practised; all vessels receive equal treatment in our ports, subject only to a "first planned, first served or first come, first served" approach.
- made no attempt to influence the terms of shipment of exports and imports.

The only area of formal state involvement with deepsea shipping was found in the area of Conference Liner shipping in the form of the so-called Ocean Freight Agreement (OFA), a long-standing tripartite agreement between the SAECS (South Africa Europe Container Service) carriers, the Government and the PPECB (Perishable Products Exports Control Board). In terms of this agreement:

- the Conference carriers agreed to provide a certain quality of service (vessels and vessel space, including specialised space, such as reefer slots for perishable cargoes);
- the PPECB agreed to support the conference via citrus and deciduous fruit exports;
- the government agreed to ship public sector cargoes on conference vessels and use moral suasion to generate support for the conference from private shippers (observed in the breach);
- floor and ceiling freight rates were re-negotiated annually.

The OFA was unique to the South Africa/Europe conference trade, and was not an example of flag preference: preference for certain cargoes was given to conference carriers of several nationalities (including South Africa), but there was no provision specifying shipment by any particular line, flag or vessel. At worst, it represented cargo

preference for conference as opposed to non-conference carriers. The OFA had, however, been weakened by the partial withdrawal of the fruit export lobby (PPECB) which was securing its own independent transport arrangements to an increasing degree (Jones, 2002c). In 1996, the Perishable Products Export Control Board was dismantled, leaving the northbound refrigerated cargo trade more open to market forces, and many shippers having to handle freight negotiations for the first time, with varied results (Pollington, SAECS Conference secretary, personal communications, March, 2003). There are no other maritime regulatory interventions in South Africa, other than the maintenance of safety standards.

6.3. THE BEE MARITIME CHARTER IN LEGISLATIVE CONTEXT

In South Africa, "black people" is a generic term which means Africans, Coloureds and Indians. In order to integrate the vast majority of black South Africans and effectively achieve the goals of black economic empowerment, government intervention is needed. Consequently, there is official legislation and government procurement policy that aims to promote the interests of the previously disadvantaged segments in society. There is also tremendous economic and socio-political pressure in South Africa today to conform to the National government desires, policies and laws surrounding affirmative action and black economic empowerment. Table 6.1 summarises a number of Acts introduced to help promote black economic empowerment.

TABLE 6.1. ACTS PROMOTING BLACK ECONOMIC EMPOWERMENT.

ACT	AIM
Preferential Procurement Policy Framework Act (2000)	To award various government contracts and tenders not only on price, capacity or track record but also on race, disability and gender.
National Empowerment Fund Act (1996)	To allow state funding so that black people may acquire some income-generating assets
The Employment Equity Act (1998)	To enforce race considerations in the hiring and promotion policies of anyone employing 50 people or more (or producing turnover above differing sectoral thresholds) To address unfair discrimination on the basis of sexual orientation, culture, religion or belief, HIV status, disability, etc.
Skills Development Act (1998)	To redress skills shortages among, in particular, black people
Basic Conditions of Employment Act (1997)	To oblige companies to report on their internal wage differentials and require them to narrow an undefined "disproportionate" wage gap between management and employees.
Labour Relations Act (1995)	To allow bargaining councils to be established and registered with the aim of facilitating worker participation and decision-making in the workplace To entrench the right to strike, encourage sectoral and enterprise bargaining and clarify unfair dismissals and information disclosure
Broad-Based Black Economic Empowerment Act (2003)	To establish a legislative framework for the promotion of black economic empowerment; to empower the Minister to issue codes of good practice and to publish transformation charters; to establish the Black Economic Advisory Council; and to provide for matters connected therewith.

Source: Haydam (2002: 32-33) and Broad-Based Black Economic Empowerment Act, 2003.

The policy of BEE is intended "to promote the achievement of the constitutional right to equality, increase broad-based and effective participation of black people in the economy and promote a higher growth rate, increased employment and more equitable income distribution" (Broad-Based BEE Bill, 2003). In addition to the numerous pieces of

legislation presented in Table 6.1, the Broad-Based Black Economic Empowerment Act No. 53 of 2003 empowers the Minister to issue codes of good practice and to publish transformation charters. "Charters are negotiated agreements between business, labour and the government aimed at guiding transformation. They also guide private and public sector leverage – they can be powerful tools, but need to be constantly watched. And debate on the charters is essential" (Bungane and Brown, 2004: 23). Bungane and Brown (2004: 23) explain that through their involvement in designing the charters, all stakeholders (in the mining, liquid fuels, financial and maritime sectors) are duty-bound to implement the BEE framework, which each charter outlines.

On the 10th December 2003 representatives of the maritime industry met in Durban to formally sign South Africa's Black Economic Empowerment (BEE) Charter for the maritime transport industry. Subsequently, both Morwe (2003), the CEO of South African Port Operations, and Radebe (2003) the then Minister of Public Enterprises, called for public contributions and debate on the maritime charter. Unfortunately, there has been very little public discussion or debate. Radebe (2003), at the launch of the Maritime Charter, stated that "we are more than keen to hear the views of all and sundry on how we can make the system work better for the benefit of the whole country...". In response to this calling, section 6.4 initiates a constructive critique of the maritime charter's long-term vision.

6.4. THE BEE MARITIME CHARTER: A CRITIQUE

The maritime charter's long-term vision should provide direction for all stakeholders to channel their efforts towards the same sustainable transformation goals. The charter's long-term vision should be in the best interests of not only the shipping (maritime) industry but ultimately South Africa as a whole. Furthermore, the transformation, development and growth intended by the empowerment charters are envisioned to be broad-based and sustainable. Mindful of these broad goals, the sound principles of economic freedom and maritime policy, and the currently rather liberal South African maritime policy, this section initiates a constructive critique of the maritime charter's long-term vision.

In general, Charters have obvious constraints, as recent criticism reveal (Bungane and Brown, 2004: 23):

- "Charters are relatively 'short' processes encapsulated in written form – but no matter what the targets, institutions and the people don't change that easily.
- Charters are instruments of negotiation, where give and take means that everybody wins something but may lose something as well.
- More often than not, charter discussions encompass diverse and large sectors, so that common thresholds or an industry mean against which to set targets seldom capture the interests of all stakeholders."

In addition to these general constraints faced by Charters, one particular recommendation of the Charter – that a significant part of South Africa's trade be carried in South African ships – deserves closer scrutiny.

Even though South Africa has a large trade volume, this large volume does not necessarily mean that it has a competitive advantage in the transportation of those goods! Why South Africa may not have a competitive advantage in shipping is discussed shortly,

but first consider the suggested means and shorter-term goals suggested to achieve this vision. The specific recommendations are as follows:

> 2.3.1 To promote a collaborative relationship with organisations such as Proudly South Africa (PSA) and stakeholders in the mining and liquid fuels industries (The Ship South African Campaign) to persuade local cargo owners to increase the cargo carried on South African ships to 25,1% of the total within the next 5 years subject to review on an annual basis. Within 5 years, SA companies with particular focus on BEE companies should broker 25,1% of all cargo handled by brokers within the next 5 years, subject to review on an annual basis.
>
> 2.3.2 The new mining and liquid fuels industry leadership should place shipping on the agenda as part of their strategic level discussions on export and import programmes. These industries are well positioned to facilitate the utilisation of black shipping service providers in joint ventures with established companies. *What we are calling for is a clear strategy/plan for the majority of South African cargo, going through South African ports to be carried on South African ships.*
>
> <div align="right">(BEE Charter MTI, 2003, emphasis added).</div>

The nationalist sentiments expressed in the long-term vision and short-term goals of the BEE Maritime Charter are similar to policies that have been tried and tested globally in both developed and developing countries. In many instances, however, these national shipping policies were found wanting (see Sletmo, 2002).

6.4.1 WORLDWIDE EVIDENCE ON NATIONAL FLAG REGISTRATION, CARGO RESERVATION AND COMPETITIVE ADVANTAGE

Issues like cargo reservation and national flag registration, up to the late 1960s were investigated by Horn (1969: 246) who conclusively disproved the old "trade follows the flag" doctrine and suggests there may be a stronger case for the opposite doctrine, that "the flag follows trade". Horn (1969: 246) concluded that "the widespread preoccupation with the share of national shipping in the carriage of a country's foreign trade is irrelevant.... To try by artificial means to stimulate the share of national shipping will be an interference with market forces, leading away from efficiency and towards bilateralism.... Theoretically, it would be feasible to bilaterate world shipping, but only at

an extremely heavy over-all cost in terms of inefficiency, excess capacity and higher freight rates. My feeling is that such a "balkanisation" of world shipping would certainly be a retrograde step."

One might argue that things may have changed since Horn (1969) came to these conclusions. Turing to the literature of the 21st century with distinguished authors like Hoffman (2004) and Sletmo (2001, 2002 in Hoffman, 2004), it is clear that developments in the global maritime industry have led these authors to believe that there are no longer "maritime nations", that is, "nations with a nationally flagged, built, operated and manned fleet, but, instead, countries are maintaining a participation only in certain parts of the industry, depending on their comparative advantages" (Hoffman, 2004: 2). A country is said to have a comparative advantage in producing a good (or service) if the opportunity cost – that is, the value of the best alternative foregone – for producing the good is lower domestically than in a foreign country. Hoffman (2004) also explains that "it is not the Nations that trade most that also provide the transport services. National trade is not being transported by nationally owned, or operated, or flagged ships. In fact, the vessel owner, its operator, and its flag are likely to come from three different countries. Even if a country is a strong trader and a strong supplier of maritime transport services, it is most likely that the national trade is not being transported by the national shipping company" (Hoffman, 2004: 2). Clearly, the vision and goals of the maritime charter lie in contrast with these contemporary global maritime practices.

It is true that countries ranging from Benin to India have cargo reservation policies that at least nominally restrict the scope for trade (World Bank, 2001: 112). There was a time when even UNCTAD promoted a form of multilateral cargo reservation under the UNCTAD Liner Code of Conduct – conceived to encourage the development of the shipping industry in developing countries by guaranteeing domestic lines a 40 per cent share of conference-based liner traffic (World Bank, 2001: 112). West Africa, for instance, attempted to implement this formula and promote their shipping industry. The results from West Africa, however, were dismal and detrimental to the development and growth of these economies (Palsson, 1998 and Sletmo, 2002). Consequently, UNCTAD

is currently undergoing a re-evaluation of the usefulness of the cargo sharing formula and, presumably, will conclude that "shipping and transportation are services to international trade and not a basic industry of national importance in and by itself. This way, shipping will be viewed as a means to an end – i.e. trade rather than a status developing nations need to achieve. Thus, who physically renders transportation service becomes less important than the efficiency, costs and service the market will decide are rational" (Palsson, 1998: 2).

The World Bank (2001: 112) believes that "Cargo reservation schemes have probably declined in significance, as more and more countries have phased them out. In addition, the increased transfer of ships to open registries to enable the ship owners to benefit from more efficient cost conditions has further diluted the importance of cargo sharing." Similarly, Sletmo (2002: 477) states: "Logically, shipping policy in its traditional form based on perceived national needs and aimed at maximising the size of national fleets through promotional and protectionistic means, should be dead." In stark contrast to such thinking, the Maritime Charter calls for "a clear strategy/plan for the majority of South African cargo, going through South African ports to be carried on South African ships" (BEE MTI, 2003: clause 2.3.2).

Sletmo (2002: 485-492) investigated the context and national shipping policy of Canada, China and West Africa. Of the three examples, the experience of Canada may guide South Africa on a way forward towards the successful transformation of the shipping industry. In Canada it was evident that exporters were determined to prevent any form of national support for a Canadian flag fleet (Sletmo, 2002: 485-487). Their opposition was based on the fear that directly or indirectly, they would be made to bear the cost of any such "promotional" or protectionist policies. In essence the Canadian exporters' argument was: "you may create a few jobs in shipping, but for each job so created, we will lose many more jobs in our exporting industries" (Sletmo, 2002: 286)[83]. It would be understandable if South African exporters harboured fears that either directly, or indirectly, they may be made to bear the cost of any such "promotional" or future

---

[83] While no empirical evidence for this position was offered, it carried a lot of weight (Sletmo, 2002: 486).

protectionist policies. Furthermore, the lobbies of exporters and resource industries in South Africa far outweigh the potential pressures from the maritime sector. Interestingly, after the investigation of a maritime task team, it was decided that Canada – like most OECD Countries – has no competitive advantage in shipping and has come to accept its need to rely on open markets to supply its shipping services. Being part of a large trade system with massive amounts of cargoes, Canada benefits from aggressive competition among ports, shipping lines and other suppliers of logistics services (Sletmo, 2002: 491). One important legislative spin-off from the Canadian Task Force Report was the creation of a fiscal environment conducive to the establishment and maintenance of international ship management activities in Canada. Although at first strongly resisted by the Canadian Minister of Finance, amendments to their income tax were ultimately made and there are at least 25 shipping groups in Canada that have taken advantage of the changes in the tax law (Sletmo, 2002: 487). Could the experience of Canada perhaps be a guide for the successful transformation of South Africa's shipping industry rather than the current vision and goals suggested in the Maritime Charter?

6.4.2 ARE SOUTH AFRICAN FLAGGED SHIPS AT A COMPETITIVE DISADVANTAGE?

In 1987, South Africa's maritime fiscal policy was found to be a supportive one, "broadly comparable with the tax and incentives parameters facing western shipowners" (Jones, 1987: viii). Consequently, no major policy changes were recommended. The sole suggested addition was to make tax allowances available where attempts to camouflage *de facto* South African vessel ownership (due to sanctions resulting from apartheid) imposed higher costs on the shipowner (Jones, 1987: viii). Since that time, the fiscal environment facing the international shipping industry has changed dramatically and that facing South African shipowners is no longer as supportive as it once was (Chasomeris, 2000: 65-76). At present more than 70 per cent of the international shipping industry operates without paying normal income tax, and in addition, the shipping industry is considered more sensitive to the level of taxation than others owing to the enormous cost

152

of ship replacement. There was a time in the 1980s when the South African fiscal policy environment was considered supportive and broadly comparable with the tax and incentives facing western shipowners; but the international shipping arena has moved on, leaving South African shipowners and operators to compete internationally on an inequitable fiscal basis.

Chasomeris (2000, 65-90) gave a critical review of the South African tax environment, and argued that the present tax structure in the context of the international shipping arena is unsatisfactory. South African companies currently pay a proportional tax rate of 29 per cent and a secondary tax on companies (STC, a dividend tax) of 12.5 per cent, resulting in an effective corporate tax rate of 36.89 per cent. There are accelerated depreciation provisions, but such provisions embody an element of subsidy, yield comparatively little tax, and in traditional policy frameworks offers little to attract companies or investors[84]. South Africa's re-entry into the international mainstream trading community has the potential to create opportunities for a strengthening and expansion of the country's maritime community. One way of helping to achieve this could be through the introduction of a tonnage tax. A tonnage-based corporate tax (commonly referred to as tonnage tax) contrasts with the generic corporation tax system under which a company's tax liability is based on the commercial profits that the company has made in the year. It ignores actual profit and instead computes a notional profit on the basis of the number and size of ships operated and taxes this profit, rather than the commercial profit, at the normal corporation tax rate. The tonnage tax rate is generally set so that notional profits, and hence actual corporation tax paid, are minimal. The mechanism seems to be an ingenious device for obtaining virtual tax exemption compatible with international tax treaty obligations. It departs from normal corporation tax principles of taxing actual profits to introduce a notional basis which bears no relationship to actual profits earned. It is widely recognised as a sensible and pragmatic way of achieving a low-tax regime, and is being implemented by some leading maritime nations (see Chasomeris, 2000).

---

[84] For ships acquired before 1 April 1995 the accelerated depreciation allowed was 40 per cent in the first year, and 10 per cent thereafter. Ships acquired on or after 1 April 1995 face a new set of depreciation laws that allow for 20 per cent straight line depreciation - the same as other land based industries (Meyerowitz, 1999: 24.4).

The Ship Registration Act of 1998 enhanced the eligibility of shipowners to register their ships in South Africa without the loss of the "genuine link" required under the 1982 Law of the Sea Convention. The Ship Registration Act, however, is only the first step in making the South African register attractive enough to bring its own prodigal owners back onto the flag, and possibly even lure foreign owners. Whilst these legislative measures are most certainly a step in the right direction, it is fiscal measures, including the creation of a competitive tax environment, which will have a greater impact on the success of South Africa's maritime policy initiatives. It is this context which led Hare, the chairman of the Maritime Transport Policy Working Group to state that "...negotiating a competitive tax regime for ship operation will be one of the greatest challenges yet to come before the distinctive South African flag is seen fluttering from too many more taffrails" (Lloyd's List Africa Weekly, 1998: 4). Likewise, Chasomeris (2000: 98) concluded that "the evidence suggests that without seriously addressing the South African fiscal shipping environment, there is little prospect of creating a level playing field which is necessary for South African shipowners and operators to compete internationally.... A comprehensive package of policy measures needs to be put in place with a tonnage tax as a key policy.... With an improved fiscal environment, a more cohesive set of partnerships between traders, carriers, the financial sector and the state should result, and these in turn are likely to confer significant benefits on the wider South African economy."

Despite a decade of democracy and an improved legal environment brought about by the Ship Registration Act of 1998, tonnage on the South African register has continued to decline. Of the six deepsea container ships flying the South African flag in February of 2000, only one remains (Safmarine Oranje) as of March 2004, but this vessel is no longer beneficially owned by a South African company (SAMSA, 2004). On the other hand, South African companies presently control (either through direct ownership or long-term charter) an estimated seventy mainly bulk-oriented vessels with an aggregate carrying capacity of roughly 2.45 million deadweight tons (dwt), or approximately 0.3 per cent of global carrying capacity that the ISL estimated at 816 million dwt in 2003 (Jones, 2004).

These vessels are not flagged in South Africa and are hence able to take advantage of the many benefits associated with open registers (Marlow, 2002: 524).

In summary, the long-term vision of the maritime charter and short-term means identified to achieve the vision should be further clarified and debated. To promote the South African shipping industry, create more South African shipping companies and attract vessels to the South African flag, it is clearly necessary to reconsider South Africa's maritime fiscal policy.

Although an equitable fiscal policy environment may be considered necessary to attract ships onto the South African register, it will not be sufficient. Rather, South Africa, that is, South African companies would need to have (or be able to create) a comparative advantage in ship owning, operation and registration[85]. Bergantino and Marlow (1998 in Marlow, 2002: 524) explain that flagging out is primarily caused by the desire to minimise costs by placing the vessel under a relatively low cost regime and estimated that crew cost differences between selected EU flags and lower-cost open registry vessels range from 22 per cent to 333 per cent. Even though the primary reason for flagging out is generally accepted as being the need to reduce overall costs (Marlow, 2002: 524), Bergantino and Marlow (1998 in Marlow, 2002: 524) mention that other reasons for choosing a foreign flag may include: "the desire for less bureaucratic control, the need to ensure the availability of skilled labour, the high costs of compliance with national flag standards, fiscal considerations, trading routes and historical reasons." For each of these additional considerations, South African flagged vessels may well be at a competitive disadvantage compared to lower-cost open registry vessels. Further empirical investigation is required.

So how, then, in the context of a less competitive South African ship register, could it be possible to achieve the Charter's vision "to substantially increase the number of SA flagged vessels and develop new South African shipping companies that are globally

---

[85] Mayer (2004) cites labour-related issues, fiscal measures, and the ranking of creditors' claims against the proceeds of a sale of vessel under the Admiralty Jurisdiction Regulation Act, as some of the reasons for the paucity of South African flagged vessels.

competitive"? One means suggested to promote this vision, although extremely controversial, is the introduction of cabotage on South Africa's coastal trades. The reservation of the coasting trade of a country for ships operating under the flag of that country, cabotage, does not currently apply in South Africa. There are some in the shipping industry, however, who have recently motivated for cabotage legislation (see Mayer, 2004). If the country's policy makers begin to take seriously the proposals to introduce cabotage, they should first investigate the pros and cons of cabotage. Understanding and adapting the following list of pros and cons from Cavana's (2004: 193, parentheses added) New Zealand study may contribute towards a more holistic cabotage debate:

"Pros
- It is sustainable;
- Is used by major trading partners;
- Breaks no international treaties;
- Is easy to implement and remove;
- It removes the inequitable competition of foreign flag shipping;
- All three domestic transport modes will benefit from the availability of greater volumes of cargo;
- Gives support to domestic shipping, road and rail services;
- Lessens the dependence on overseas shipping;
- Provides the potential to maximise participation in coastal shipping services;
- Makes shipping services from the South Island more sustainable (Specific to the New Zealand context);
- Is less cost to the government than tax concessions to shipping in isolation;
- It gives more certainty in planning for domestic operations;
- Has the potential to preserve and provide employment for seafarers;
- Assists employment in the maritime infrastructure by providing expertise for the maritime services;
- Regulates the importation of foreign labour; and
- It could be a springboard for trans-Tasman and international operations. (Specific to the New Zealand context).

Cons
- It is not clear how and when any additional employment opportunities will eventuate;
- There is a potential for a downstream negative impact on employment in general;
- There is no indication that increased investment in the shipping industry will result;

- The ability will be lost to take advantage of present marginal cost services to reduce supply chain costs to New Zealand traders;
- Evidence suggests there will be increased freight charges in the domestic trade; and
- There will be reduced competition and service levels on those legs covered at present by foreign operators."

Cavana's (2004: 193) study concluded that the introduction of cabotage would have an overall net negative impact on New Zealand.

In South Africa's case, the recommendations of Jones (1987) and views of Jones and Kennedy (1991: 21) "rejected directly interventionist shipping measures such as cargo reservation, cargo scheduling, flag discrimination and discriminatory port practices as inappropriate in the South African sea transport market. Rather, moral suasion and possible fiscal incentives were identified as more useful routes towards a more supportive environment for the local sea transport industry." Furthermore, the current South African government has made a commitment to improve the effectiveness and efficiency of the entire transport chain in an attempt to reduce the overall costs of doing business in and from South Africa. Huge capital expenditures and upgrades are anticipated for the ports, rail and pipelines over the next five years. Additionally, the port costs for 2005 are strategically designed to increase by 3.1 per cent, that is, below core inflation, representing a real reduction in the costs of maritime transport (NPA, 2004). Nonetheless, South Africa's geographical location is positioned far from her most important trading partners. Furthermore, about 98 per cent of exports, by volume, are seaborne (Naudé, 1999). Wefa (in Preece, 2004: 53) estimates that commodities and commodity derived products together are still responsible for 60 to 65 per cent of all South Africa's physical exports, excluding services. More importantly, the generally poor performance of commodity prices has led to a decline in South Africa's world export market share (Moola in Preece, 2004: 53). Hence, similar to the case of New Zealand: "price competitiveness of shipping is a key determinant in determining the success in an export market or whether the exporter is in the export market at all!" (Cavana, 2004: 182).

Job creation is an important argument used both for and against measures like cabotage, preferential shipping tax benefits, and other measures to support the local shipping industry. In South Africa - where jobless growth has resulted in broadly-defined unemployment rates of around forty per cent, and half the population still lives below the poverty line - the need to create jobs is vital. From an international trade economist's perspective, however, Krugman (1993b) explains that the level of employment is a macroeconomic issue, depending in the short run on aggregate demand and in the long run on the natural rate of unemployment. He concludes: "Trade policy should be debated in terms of its impact on efficiency, not in terms of phoney numbers about jobs created or lost" (Krugman, 1993b: 25). These views should be considered as South Africa continues the debate on measures to transform the shipping industry.

Despite nine drafts, some of the concepts, definitions and time frames used in the Maritime Charter require additional thought and clarification. These include the following.

- Many of the black empowerment objectives have been set time frames of approximately five to ten years. Yet the proposed targets, timeframes and weightings on the BEE scorecard will be reviewed every 2.5 years and subject to change by an independent Peer Review Mechanism (BEE MTI, 2003: 20).

- What is really meant by "25.1% of the total within the next five years?" Is this 25.1 per cent measured by value or by volume? What is meant by "the total?"

- Furthermore, the vision (BEE MTI, 2003: clause 1.5) to "develop South Africa to become one of the world's top 35 maritime nations by the year 2014" is not only unclear in terms of what it means to be a "maritime nation" but, unfortunately, I have not seen convincing evidence to suggest that the vision is in the best interests of South Africa.

South Africa's isolation brought about during apartheid and economic sanctions has left many South African companies without a desire and/or ability to become involved in the maritime transportation of their goods. The general aversion by many South African exporters to become involved in the transportation of their cargo and lack of "sea-

mindedness" (Jones and Kennedy, 1991) presents a significant challenge to the proposed "Ship South Africa Campaign". Jones and Kennedy (1991: 5) provide an impressionistic overview of the terms of shipment in respect of the major commodity groups that shows:

> Some 85 per cent of coal exports, some 70 per cent of manganese ore tonnages, all maize exports, all molasses, all vermiculite and most of sugar exports were transported under terms of fob, loading ports. By contrast, virtually all paper products, a large proportion of rock phosphate exports and the majority of ferro-alloys move on a cif or c&f [cost and freight] basis.

Interestingly, Jones and Kennedy (1991:21) found that every shipper interviewed would vehemently oppose any coercive state attempt to skew the terms of shipment towards a higher percentage of cif exports. Such state intervention could also prove detrimental to continued export sales in some overseas markets. Understandably, Jones and Kennedy (1991:21) conclude: "Direct intervention to secure a higher incidence of cif sales is consequently not recommended".

Lushnikov (2003a) investigated the terms of shipment of dry-bulk exports from the Port of Richards Bay and found that about 82 per cent of the volume of surveyed cargo was shipped on free on board (fob) terms of shipment. Hence, of the total dry-bulk cargo shipped, less than 18 per cent was shipped on cost insurance and freight (cif) arrangements where the bulk exporters have the right to designate the ship. The fact that the vast majority of bulk cargo is shipped from South African ports on fob terms of shipment means that the majority of exporters do not have the legal right to elect the vessel. Consequently, the majority of South African exporters do not have the legal right to appoint a "South African ship" to carry the exported cargo[86]. Circumstances like these have led Jones (2004) to conclude that South Africa "remains a nation of miners, manufacturers and farmers, not a nation of shippers, ship operators or ship owners."

---

[86] This phenomenon is largely due to the nature of the exported cargo, the lack of sea-mindedness (see Jones and Kennedy, 1991) and historical disadvantages created under economic sanctions on South African traders and vessel owners/operators (see Lushnikov, 2003a for an in-depth investigation into South Africa's terms of shipment in dry bulk exports).

6.5. CONCLUSIONS AND WAY FORWARD

This chapter investigated South Africa's maritime policy and provided a critique of the long-term vision of the BEE Maritime Charter to transform the national shipping industry. Currently, South Africa's liberal shipping policy has no Cabotage rules; no multilateral, bilateral or unilateral cargo reservation; no flag preference or flag discrimination; and no attempt is made to influence the terms of shipment of exports and imports. Despite a decade of democracy, sustained sea-trade growth, and an improved legal environment brought about by the Ship Registration Act of 1998, tonnage on the South African register has continued to decline. An important reason for the decline is that ships registered under the South African flag are currently at a competitive disadvantage, largely because of South Africa's less favourable shipping tax system as compared with vessels under most other registers worldwide. With currently little prospect of changing South Africa's shipping tax environment, alternative promotional and perhaps protectionist measures may need to be pursued to achieve the Charter's long-term visions and goals. Cargo reservation and/or cabotage may be effective in attracting vessels to the less competitive South African ship register. These promotional and protectionist shipping policies, however, are not consistent with both the international and, more importantly, national policy drive towards the promotion of competitive markets and economic freedom; lower transportation and transaction costs; reducing inequality though promoting broad-based empowerment; and increasing liberalisation of both trade and services. Despite nine drafts, South Africa's maritime charter clearly requires further clarity, thought and more open debate.

A Task Force should be appointed with members who represent a cross-section of shipowners, labour, users of shipping services (importers and exporters), and academics, similar to the Canadian Task Force (Sletmo, 2002). The purpose of the Task Force would be to evaluate changing conditions in the international shipping market and the possible need for measures to encourage the expansion of the South African shipping fleet[87]. Additionally, all stakeholders who can affect or are affected by South Africa's shipping policy should be encouraged to make formal contributions. The findings of this Task Force should provide the necessary insight and foresight to ensure an appropriate vision, which looks beyond the short-term desires of a minority and considers the needs of the wider South African economy.

---

[87] There should also be further consideration of whether a South African ship should be defined in terms of registered flag, beneficial ownership, and/or control of cargo.

CHAPTER SEVEN

CONCLUSIONS

This thesis has investigated developments in South Africa's seaborne commerce and global use of country cif/fob ratios as measures of shipping costs. The research has addressed five important aims. First, Chapters Two and Three contributed towards a better understanding of country cif/fob ratios and some consequences of their use worldwide as a measure (proxy) for direct international transport costs. Second, Chapter Four investigated South Africa's port performance through the evolution in port policy, pricing and cargo growth. Third, Chapter Five presented an overview and assessment of South Africa's shipping costs as revealed through the broad trends in the country's import cif/fob ratios and Europe-South Africa liner shipping freight rates. Fourth, Chapter Five also examined the question of whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures. Finally, Chapter Six initiated an investigation into South Africa's maritime policy and provided a critique of the long-term vision of the Maritime Charter on Black Economic Empowerment to transform the national shipping industry.

It is not the purpose of this section to repeat all of the interesting findings and conclusions presented in this research. Rather, this section aims to draw together the many findings from the various chapters and present a concise conclusion that proceeds from the specific context of South Africa's seaborne commerce and shipping costs to the global context and broader implications as well as recommendations on the use of country cif/fob ratios as measures of shipping costs.

South Africa's seaborne commerce and shipping costs are strategically dependent upon the country's seven commercial ports and international shipping networks, handling an estimated 95 per cent of trade volume or 80 per cent in value terms (Siko, 1996: 4; Jones, 2004). Although South Africa is clearly an important sea-trading nation, it is not a significant shipowning or ship operating nation. South Africa's new Maritime Charter of December 2003 has the long-term vision "to develop South Africa to become one of the

world's top 35 maritime nations by the year 2014". Currently, South Africa's liberal (market-driven) shipping policy has no cabotage rules; no multilateral, bilateral or unilateral cargo reservation; no flag preference or flag discrimination; and no attempt is made to influence the terms of shipment of exports and imports. In stark contrast, the Charter calls for "a clear strategy/plan for the majority of South African cargo, going through South African ports to be carried on South African ships". Chapter Six argued, however, that even though South Africa has a large volume of trade, it does not necessarily have a competitive advantage in the shipment of these goods. Ships registered under the South African flag are currently at a competitive disadvantage, largely because of South Africa's less favourable shipping tax system as compared with vessels under most other registers worldwide. An equitable fiscal policy environment, however, may not be sufficient to attract ships onto the South African register. Rather, South Africa, that is, South African companies would need to have (or be able to create) a comparative advantage in ship owning, operation and registration. With currently little prospect of changing South Africa's shipping tax environment, alternative promotional and perhaps protectionist measures may need to be pursued to achieve the current Charter's long-term visions and goals. In particular, proposals for cargo reservation and/or cabotage may be marginally effective in attracting vessels to the less competitive South African ship register. These promotional and protectionist shipping policies, however, are not consistent with both the international and, more importantly, national policy drive towards the promotion of competitive markets and economic freedom; lower transportation and transaction costs; reducing inequality though promoting broad-based empowerment; and increasing liberalisation of both trade and services. Thus, such policies to promote or protect the national shipping industry might not be in the broader economic interests of South Africa. Furthermore, South Africa's isolation brought about during apartheid and economic sanctions has left many South African companies without a desire and/or ability to become involved in the maritime transportation of their goods. For instance, the vast majority of dry-bulk cargo is shipped from South African ports on fob terms of shipment (Lushnikov, 2003a); this means that the majority of South African exporters do not have the legal right to appoint a "South African ship" to carry this exported cargo. Despite nine drafts, South Africa's maritime charter clearly requires

further clarity, thought and more open debate. A Task Force should be appointed to research and ensure an appropriate vision, which looks beyond the short-term desires of a minority and considers the needs of the wider South African economy.

Globalisation and the associated trade liberalisation, evident in the marked reductions in both tariff and non-tariff barriers, implies that transport costs have become, by default, an increasingly important determinant of trade performance. Despite the importance of transport costs and their ability to impede international trade, direct measures of transportation costs remain difficult to obtain. Hence, researchers have used a country's import cif/fob ratios as an aggregated measure of a country's international shipping costs. Analyses of the broad trends in South Africa's cif/fob ratios produced (initially) disturbing perspectives. Chasomeris (2003c: 147) showed that contrary to the world transport cost trends, South Africa's cif/fob ratio (*ad valorem* international transport costs) had been on the increase from a decade average of 4.5% in the 1960s; 7.9% in the 1970s; 8.8% in the 1980s; to 10.8% in the 1990s. Additionally, this thesis has shown that over the period 1985 to 1993 that included economic sanctions, the simple mean cif/fob ratio was 8.87 per cent, significantly lower than the post-sanctions (1995-2002) mean of 12.9 per cent. If the cif/fob ratio is used as a proxy for direct transport costs, then the ratio indicates that South Africa's post-sanctions shipping costs are 45 per cent higher than the average for the period that included economic sanctions. Such counterintuitive perspectives on South Africa's shipping costs spurred further research on the measurement and use of country cif/fob ratios and the search for alternative indicators of developments in South Africa's direct shipping costs. In particular, a pivotal research question addressed in this work is whether South Africa's cif/fob ratios approximate actual shipping costs so that researchers can confidently substitute them for direct measures. Thus contributing towards the aims of this thesis, Chapter Four compiled data and researched the evolution in South Africa's port charges, while Chapter Five compiled and investigated the broad trends in Europe-South Africa liner freight rates.

The research on the evolution in South Africa's port pricing and policy creates an understanding and presents an alternative, direct cost perspective that cannot be achieved using a country's import cif/fob ratios. Historically, South Africa's freight system reflected a system designed to support an import substitution economy. The import substitution regime was particularly evident in the ports' *ad valorem* wharfage charges that were twice as high for imports as for identical exports. These charges, because they were levied *ad valorem* rather than on a cost basis, reinforced the effect of high tariff barriers to discourage imports in general, and higher value imports in particular, in order to reduce the country's requirement for foreign currency, generate port revenues and promote import substitution. Furthermore, port users had expressed a justified discontent with intra- and inter-port cross subsidisation; inter-modal cross subsidisation; insufficient investment in port infrastructure and superstructures; bureaucracy; skewed prices; and the impartiality of the port entity (Jones 1988b; White Paper, 2002: 13). This dismal background provided an opportunity to appreciate the current port policy and governance with the functional separation of Portnet into SAPO, as the port operator, and the NPA as port landlord. In order to contribute to the country's new trade policy of export promotion, the government and the NPA have had to acknowledge and address many of the ills of the past. Accordingly, the government and Transnet have increased the allocation of funds for the upgrade and maintenance of port infrastructure and superstructure. The NPA has improved port pricing principles that have included a transformation from value-based (*ad valorem* wharfage) pricing towards a more cost-based (and user pays) pricing approach while concurrently attempting to reduce the historical imbalances between port dues and cargo dues and the consequent intra-port cross subsidisation[88]. Furthermore, the NPA has expressed intent to promote the country's attempt to become more competitive through targeting below inflation adjustments (Nico Walters, NPA, personal communications, 2005). Evidently, the 2005/6 adjustments of 1 per cent in Cargo Dues and 3.1 per cent for Marine and Port Dues are clearly well within the country's core consumer inflation targets of between 3

---

[88] Chapter Four also found, however, that the current pricing policy attracted widespread criticism from exporters of low-value cargoes who benefited from subsidised rates in the past. Although high-value cargo owners had gained from the transformation in pricing policy, some low-value traders may have seen costs soar by 150 per cent on a 12-meter container (see Table 4.4).

and 6 per cent, thus not only facilitating but also promoting growth in South Africa's trade.

The analyses of Europe-South Africa liner freight rates found that the simple mean post-European sanctions freight rates (1992-2002) were 32 per cent lower than the average during sanctions (1986-1991). In stark contrast, if the cif/fob ratio is used as a proxy for direct transport costs, then the ratio indicates that South Africa's post-sanctions shipping costs are 45 per cent higher than the average for the period that included economic sanctions. Furthermore, the country's cif/fob ratios (*ad valorem* transport costs) had increased from 7.7 per cent in 1990 to 12.7 per cent in 2002, a rise of 65 per cent. In contrast, over the same period, real (GDP deflated) Europe-South Africa liner freight rates had declined by 20 per cent[89]. The evidence investigated 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. Such findings on South Africa's cif/fob ratios imply that researchers cannot and should not use the ratio as a reliable indicator (proxy) for South Africa's direct shipping costs. Furthermore, South Africa's (historical) trade data are not reliable as there are serious data quality problems that include efforts to conceal trade data for political (sanctions) reasons, re-enumeration and re-classification of trade data, particularly the strategically sensitive petroleum imports. Consequently, South Africa's inaccurate trade data generate inaccurate and unreliable country cif/fob ratios that are neither able to show South Africa's actual *ad valorem* shipping costs nor direct costs of transportation[90].

---

[89] Additionally, Chapter Five illustrated South Africa's trade liberalisation through the decline in the country's *ad valorem* import tariffs from 11.3 per cent in 1990 to 3.5 per cent in 2002. Overall, South Africa's post-sanctions reduction in direct shipping costs may have directly stimulated exports and imports, whilst the general depreciation of the Rand may have made the country's exports more competitive, and the reduction in customs tariffs has lowered the costs of imports.

[90] The quality of South Africa's post-sanctions trade data appears to be improving (see Chapter 5.1). As the quality of a country's trade data and the derived cif/fob ratios improves, so the ratio will become more indicative of actual *ad valorem* shipping costs. Nonetheless, these improved cif/fob ratios may remain an unreliable and/or unusable indicator of direct transportation costs, largely because of the evolving composition of imports (see Chapter 3.1.1 for the case study on the United States cif/fob ratio).

South Africa's experience also suggests that other countries, like transition economies, undergoing trade liberalisation with improvements in the quality of trade statistics, may experience an increase in mining (petroleum) as a proportion of total imports that contributes to a rise in that country's cif/fob ratio. This increase in the country's cif/fob ratio, however, should not necessarily be interpreted as an increase in direct shipping costs, but rather may be a consequence of changes in the nature and recorded values of a country's imports. Consequently, studies that have used the cif/fob ratios to analyse a country's or region's transport costs may have estimated the true levels and trends in international transport costs incorrectly and thus may also misinterpret their impact on trade. Indeed, this study has found numerous instances in which use of these ratios have resulted in misunderstandings, misleading and misinterpreted findings, and spurious econometric results on both the determinants of transport costs and the impact of transport costs on trade and economic growth.

The analyses of the definition, source, composition and nature of country cif/fob ratios raised legitimate concerns and showed severe limitations to using these data. In brief, the evidence investigated in this thesis shows:

- **Problems with inconsistent definitions and use of terminology**

A country's import cif/fob ratio has received various names in the literature, 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, 2003b:13), CIF-FOB band on imports and transport cost *rate* (Naudé, 1999a;1999b), c.i.f.-f.o.b. transport-cost factor and average c.i.f.-f.o.b. factor (Baier and Bergstrand, 2001). Furthermore, inconsistencies in standard textbook definitions of imports cif and imports fob are exacerbating the potential for misuse and misunderstandings of country cif/fob ratios. The Incoterms (International Chamber of Commerce, 1999) definition specifically states that both cif and fob terms of shipment are to be used only for sea and inland waterway transport. In contrast, the definition of cif and fob in the international trade statistics (for instance the International Financial

Statistics), is much broader, and includes costs for maritime and other modes of transport. Consequently, it appears that textbooks on international trade (see Salvatore, 2001) define and briefly discuss the concepts of imports cif, imports fob and a country's cif/fob ratio, using the international trade definitions from the IMF. In contrast, maritime transport textbooks (see Stopford, 1997; Alderton, 1995; McConville, 1999) define and discuss these same concepts using the official Incoterms (International Chamber of Commerce, 1999).

Textbooks and research should be more consistent and explicit in their definitions, reporting, and use of such measures as imports cif, imports fob, and the import cif/fob ratios. Researchers should be careful not to "change the subject" by using potentially misleading terms like "shipping costs" or "freight rates" that may be misunderstood and create an impression, to the uninformed reader, of using direct transportation costs, whereas the actual measure used is a country's cif/fob ratios, that is, import *ad valorem* transportation costs.

- **Trade data issues**

The quality (accuracy) of a country's derived cif/fob ratios depends upon the quality of that country's imports cif and imports fob time series data. Unfortunately, for many countries, these trade data are not reliable (see Yeats, 1995, and Hummels and Lugovskyy, 2003 for a fuller discussion).

Be acutely aware of IMF staff imputations. For instance, contrary to the findings of the African Development Report (2004: 192), this thesis finds that Malawi's consistently high cif/fob ratio of 67 per cent *ad valorem* appears largely the result of IMF staff imputations. Using a constant conversion factor, in this case apparently 67 per cent, the IMF staff calculates the missing import time series values (also see Moneta, 1959: 42; Yeats, 1995). Evidently, imputations of the data, as in the case of Malawi, are not only counterproductive for research, but also may be harmful to the economy insofar as such a distorted perspective is able to discourage investment and trade. In addition, regional

measures of shipping costs, like that of Africa's cif/fob ratio (reported and used by UNCTAD's *Review of Maritime Transport*), may be biased by the inclusion of such "imputed" data – distorting the recorded levels and variation in a regions or group of country's aggregated cif/fob ratios.

Unfortunately, it is sometimes unclear which countries have unreliable data and whether there has been consistent quality over time. This study used and recommends the following simple, yet effective, diagnostic procedures that will assist in assessing the quality of the import time series data. First, conduct visual analyses of the cif/fob ratio trends over time using descriptive statistics, preferably with an understanding of the historical trade context. Never use one or even a few years without first looking at those particular years within its historical time series context. Second, check the data for errors in the disaggregated (monthly) cif/fob ratios. For example, are any of the ratios negative or above one, that is, are *ad valorem* shipping costs negative or above 100 per cent? Third, correlation analyses between various country and country group annual cif/fob ratios and their respective SITC imports as a proportion of total imports, may alert the researcher to potential problems with the quality of these data (see Chapter 3.1). Finally, this study recommends that if the cif/fob ratio is used, it should be analysed within the evolving context of a country's import composition, within its historical context and, where possible, compared to other more direct indicators of international transport costs like ocean freight rates.

- **A country's cif/fob ratio is frequently misunderstood and misused as a descriptive statistic**

A typical assumption made in the literature that uses country cif/fob ratios as a measure (proxy) for direct transport costs is that a rise in a country's cif/fob ratios is supposed to measure (indicate) a rise in that country's (direct) international transport costs that can be expected to lead to a reduction in international trade (see Rose, 1991: 421; Radelet and Sachs, 1998: 3). In addition, a higher country cif/fob ratio is typically considered less desirable than a lower country cif/fob ratio (see for instance Bloom et al., 1998).

169

This study has shown that a country's cif/fob ratio statistic alone does not give enough information to make such judgements. Rather, there needs to be an understanding of the reasons for the exhibited level and variation in these country cif/fob ratios. In the search for better understanding and use of country cif/fob ratios, be mindful that the measure is an aggregated and import trade weighted average ratio where the weightings are, in large part, determined by the composition of imports that are not the same across countries and groups of countries. Furthermore, these trade weightings of the ratios change over time, adding a further element of non-comparability – not only between countries, but also, comparing changes in a particular country's ratios over time (also see Hummels 1999b). Consequently for some countries, a rising ratio may be positively correlated with a rise in direct shipping costs, whereas in other countries, a rising ratio may be negatively correlated with direct shipping costs. Thus it is possible, as this thesis has shown in the case study of South Africa (Chapter Five), that a country's *ad valorem* shipping costs may rise despite a decline in direct shipping costs.

The study by Bloom (et al., 1998), for instance, labels their Table 2 as "Indicators of Accessibility for Trade, by Region". These indicators were actually cif/fob ratios, labelled as shipping costs, and shows that the situation looks dismal for Sub-Saharan Africa with 20 per cent "shipping costs", as compared with only 5 per cent for Western Europe – there is no mention of the shortcomings and most importantly no explanation of how the composition of imports is likely to affect these "Indicators of Accessibility for Trade". Such biased cif/fob ratio comparisons between countries and groups of countries may be misunderstood and undermine the competitiveness of some (developing) countries in foreign markets, and reduce trade opportunities together with the potential to attract trade-oriented foreign direct investment. Interestingly, if South Africa were included in these indicators of accessibility for trade, potential investors may be confused as South Africa's mean cif/fob ratio was 8.87 per cent for the period that included economic sanctions (1985-1993), significantly lower than the post-sanctions (1995-2002) mean of 12.9 per cent. Clearly, the level and variation in a country's cif/fob ratios do not necessarily indicate the level and variation in that country's direct shipping costs.

- Erroneous assumptions and econometric (mis)use of country import cif/fob ratios

In addition to the abovementioned concerns and limitations, Chapter Three showed that whether a developed or developing country, where the quality of the data is reliable, a country's composition of imports has a substantial and significant effect on that country's import cif/fob ratios, and thus should not be ignored or assumed constant. Understood in this context, changes in country cif/fob ratios may be perceived to be a *consequence* rather than a *cause* of changes in international trade. Yet many of the studies, explored in the literature reviewed in Chapter Two, view a country's cif/fob ratio as a measure of "shipping costs" and, to a large degree, discount the effects that changes in the composition of imports may have on country cif/fob ratios. Starting with the assumption that the ratio reflects changes in shipping costs rather than changes in the composition of imports, econometric use of the cif/fob ratios as a proxy for shipping costs have perhaps ventured too far - to assume a constant composition of imports. Hence, whether implicitly (Naudé, 1999a; 1999b) or explicitly (Radelet and Sachs, 1998; Rose, 1991), transportation cost studies that use country cif/fob ratios as "shipping costs" typically make the above-mentioned limiting assumption. In other words, these studies assume and use a country's cif/fob ratios as exogenous explanatory variables whereas, in reality, a country's cif/fob ratio may indeed be an endogenous variable, which has consequently generated spurious empirical results. Additionally, the findings of studies that use country cif/fob ratios may suffer severe bias, not only from the potential misuse of these ratios in econometric modelling, but also because of shortcomings in the trade data used to calculate these import cif/fob ratios[91]. Clearly, researchers should carefully reconsider the use of a country's cif/fob ratio as a proxy for direct shipping costs.

---

[91] Recall, Yeats (1978: 355) conducts tests that indicate cif/fob ratios "do not approximate nominal transportation costs in spite of the assumption often made in gravity flow and trade related models". Thus, Yeats (1978: 358) concludes, "the magnitudes of the discrepancies revealed in the official trade statistics are certainly sufficient to bias findings of the theoretical and empirical studies." In addition, Hummels and Lugovskyy (2003: abstract) conclude that "IMF c.i.f./f.o.b. ratios are badly error-ridden in levels, and contain no useful information for time-series or cross-commodity variation."

Despite the rising importance of international transport costs, a lack of reliable and comparable data continues to hinder research. This thesis confirms that direct measures of transportation costs are difficult to obtain – but not impossible. Researchers in the public and private sectors, including perhaps the Department of Transport, South African Revenue Services and the Department of Trade and Industry, should collaborate in devoting more effort and resources towards compiling and maintaining a good quality time series database on direct measures of transport costs for all modes of transport. Assembling such data sets on direct measures of transportation costs, which are comprehensive, continuous and contains time series of sufficient length, can be the basis for substantial contributions to trade and transportation research. The author's quest to compile data and understand developments in South Africa's direct shipping costs continues, and should prove a rewarding focus for future research.

In the end, Paul Krugman (1993c: 366) reminds us: "There are plenty of people out there trying to change the world in various ways; the point of economic research is to understand it"[92]. Overall, the findings in this thesis enhance our understanding of developments in South Africa's seaborne commerce and the global use of country cif/fob ratios as measures of international transport costs.

---

[92] "Even if the ultimate aim of economic theory is better policy, one does not best serve that aim by trying to make every journal article into a policy proposal. The immediate policy implications of a new idea are in the end less important than its intellectual contribution. There are plenty of people out there trying to change the world in various ways; the point of economic research is to understand it" (Krugman, 1993: 366).

BIBLIOGRAPHY

Abrahamsson, B.J. (1968). "A Model of Liner Price Setting". *Journal of Transport Economics and Policy*, pp. 321-331.

African Development Report (2004). "Africa in the World Economy, Africa in the Global Trading System", Economic and Social Statistics on Africa. Oxford University Press: New York.

Alderton, P.M. (1995). "The Costs and Revenues". Chapter 8, in Sea Transport. Operation and Economics. Fourth Edition. Thomas Reed Publications: London.

Amjadi, A. and Yeats, A. (1995). "Nontariff Barriers Africa Faces: What did the Uruguay Round Accomplish, and What Remains to Be Done?". The World Bank International Economics Department International Trade Division, March 1995.

Anderson, F.J. (1982). "Transport Costs and Real Income in a Small Region". *The Canadian Journal of Economics*, vol. 15, no. 3, August, pp. 525-534.

Anderson, J. E. and van Wincoop, E. (2003). "Trade Costs." *Journal of Economic Literature*, Vol. XLII, No. 3, September, pp. 691-751.

Asia Times (2000). "Southeast Asia, a new era in Asian shipping". Online, (Asia) atimes.com, September, 2.

Ayogu, M.D. (2002). "Debating 'Privatisation' of Network Utilities". *S.A. New Agenda – South African Journal of Social and Economic Policy*, Issue 8, Fourth Quarter.

Badinger, H. and Breuss, F. (2003). "What Has Determined the Rapid Post-War Growth of Intra-EU Trade?" IEF Working Paper Nr. 48, February.

Baier, S. L. and Bergstrand, J. H. (2001). "The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity", *Journal of International Economics*, V. 53 No.1, pp. 1-27.

Baird, A. (1999). "Privatisation Defined; Is it the Universal Panacea?" Napier University, June, 27th.

Baumol, W.J. and Willig, R.D. (1986). "Contestability: Developments since the Book". *Oxford Economic Papers, New Series*, vol. 38, Supplement: Strategic Behaviour and Industrial Competition, pp. 9 – 36.

Baumol, W.J. Panzar, J.C. Willig, R.D. (1982). Contestable Markets And the Theory of Industrial Structure. Harcourt Brace Jovanovich, Inc.: New York

BEE MTI (2003). "Broad-Based Black Economic Empowerment Charter for the Maritime Transport Industry", at www.sacob.co.za/Transport&Maritime/bee_charter_july.pdf.

Bennathan, E. and Walters A. (1969). "Revenue Pooling and Cartels". *The Journal of Industrial Economics*, vol. 21, No. 2, July, pp. 161-176.

Bennathan, E. and Walters, A. (1979). "Port Pricing and Investment Policy for Developing Countries", Oxford University Press: London.

Bennathan, E. and Wishart, J. (1983). "Private and Public Enterprise in the Ports of Developing Countries". A Paper Presented to the Transportation Research Forum: Presentation Draft.

Berridge G., R., (1987). The Politics of the South Africa Run. European Shipping and Pretoria. Clarendon Press, Oxford.

Bloom D. E. and Sachs J. D. (1998). "Geography, Demography, and Economic Growth in Africa" Revised Edition, October. Harvard Institute for International Development: Harvard University.

Botosaru, I. (2003). "Geography, Demography, Trade, and Economic Growth. Landlocked Countries". Irene, iboto@u.washington.edu.

Branch, A.E. (1982). Economics of Shipping Practice and Management. Chapman and Hall: London.

_____ (1998). Maritime Economics Management and Marketing. Third Edition. Stanley Thornes Ltd.: United Kingdom.

Brooks, M.R. (2000). "Restructuring in the Liner Shipping Industry: A Case Study in Evolution" (August), background material based on Brooks (2000), Sea Change in Liner Shipping: Regulation and Managerial Decision-Making in a Global Industry. Pergamon Press, Oxford, United Kingdom.

_____ (2002). "International Trade in Manufactured Goods." The Handbook of Maritime Economics and Business, by Grammenos, C. TH. (Ed.) MPG, pp. 90-104.

Brueckner, J. K. and Pels, E. (2004). "European Airline Mergers. Alliance Consolidation, and Consumer Welfare". Paper presented at the Regional Science Association International, World Congress, 2004.

Budget Review (2004). Republic of South Africa. 10 Years of Freedom, South Africa 1994-2004. National Treasury or www.Treasury.gov.za.

Bungane, K. and Brown, A. (2004). "Flawed – but a step forward" in Economy and Business, Mail & Guardian, April 8 to 15.

Burkett, L. (1994). The Word on Finances. Topical scriptures and commentary. Moody Press: Chicago.

Busse, M. (2003). "Tariffs, Transport costs and the WTO Doha Round: The Case of Developing Countries". Hamburg Institute of International Economics, Department World Economy, Germany. e-mail: busse@hwwa.de.

Button, K. J. (1993). Transport Economics. Second Edition, Edward Elgar: England.

Byington, R. and Olin. G. (1983). "An economic analysis of freight rate disparities in US liner trades". Applied Economics, vol. 15, pp. 403-407.

Casas, F.R. (1981). "Transport Costs in the Pure Theory of International Trade: Some Comments". The Economic Journal, vol. 91, No. 363, September, pp. 741-744.

Casas, F.R. (1983). "International Trade with Produced Transport Services". The Journal of Industrial Economics, Vol. 35, No.1, March, pp. 89-109.

Cassel, G. (1928). "The Rate of Interest, the Bank Rate, and the Stabilization of Prices". The Quarterly Journal of Economics, Vol. 42, No. 4, 511-529.

Cassel, G. (1928). "The Treatment of Price Problems". The Economic Journal, Vol. 38, No. 152, 589-592.

Cassim, R. and Onyango, D. (2002). "The State of Trade Policy in South Africa". Johannesburg: Trade and Industrial Policy Secretariat (TIPS). Draft.

Cavana, R. Y. (2004). "A qualitative analysis of reintroducing cabotage onto New Zealand's coasts". Maritime Policy and Management. Vol. 31, No. 3. pp. 179-198.

Chalmers, R. (2002). "Tariff reform to lose ports R900m a year". Business Day, August 5th.

Chasomeris, M. G. (2000). "The Potential Benefits of a Tonnage-Based Corporate Tax to South Africa and the South African Shipping Industry." Unpublished master's thesis. University of Natal, Durban.

_____ (2003a). "The Potential Benefits of a Tonnage-Based Corporate Tax to South Africa and the South African Shipping Industry", Economic Research Unit: University of Natal, Durban.

_____ (2003b). "South Africa's Seaborne Commerce: Trade Flows, Transport Costs and the Maritime Transport Policy Environment", School of Maritime Studies: University of Natal, Durban.

_____ (2003c). "South Africa's Sea Transport Costs and Port Policy in a Global Context". *Africana bulletin,* Volume 51, pp. 133-163.

_____ (2003d). "South Africa's Ports: Policy, Investment and Growth". Discussion Paper No. 35. School of Economics and Management, University of Natal, Durban.

_____ (2004). "Trade Liberalisation and South Africa's Maritime Transport Costs", paper presented at the Regional Science Association International World Congress, Port Elisabeth, 14-17th April.

_____ (2005a). "South Africa's Port Performance: Policy, Pricing and Growth", paper presented at the Economic Society of South Africa, biennial conference, Elangeni, Durban, 7-9th September.

_____ (2005b). "Assessing South Africa's Shipping Costs" *Journal of Development Perspectives,* September, Volume 1:1, pp. 129-145. Published by the Economic Society of South Africa.

_____ (2006). "South Africa's Maritime Policy and Transformation of the Shipping Industry". *Journal of Interdisciplinary Economics,* 2006, Vol.17, pp. 269-288. A B Academic Publishers: Great Britain.

Chowdhury A. K. (2003). "Statement at the opening session of the Latin American Regional Meeting of Landlocked and Transit Developing Countries on Transit Transportation Cooperation", March 12th, www.un.org/special-rep/ohrlls/ohrlls/hr%20statement%20Transit%20transport%20cooperation.htm.

Christian Action Network (2004). Biblical Issues. Voter's Guide Pamphlet. www.christianaction.org.za.

Church J. and Ware, R. (2000). Industrial Organisation A Strategic Approach. McGraw-Hill International Edition. Management & Organisation Series, Boston.

Clark, X. Dollar, D. and Micco, A. (2004). "Port efficiency, maritime transport costs, and bilateral trade". *Journal of Development Economics* 75, pp. 417-450.

Clegg, P. (2000). "Improving efficiency in South Africa's ports". *Ports International,* April.

Coega Development Corporation (2002). The Coega Project, Port Elizabeth, also www.coega.com.

Commission of the European Communities, (2001). "Commission Staff Working Document on Public Financing and Charging Practices in the Community Sea Port Sector", February, SEC (2001) 234, Brussels.

Conlon, R.M. (1981). "Transport Cost and Tariff Protection of Australian and Canadian Manufacturing: A Comparative Study". *The Canadian Journal of Economics*, vol. 14, no.4, November, pp. 700-707.

Corcoran, B. (2005). "Five million face death as famine grips Malawi" in The Observer, October 2nd, www.obsever.guardian.co.uk/international/story/0,,1583021,00.html.

Davies, J. E. (1983). "Pricing in the liner shipping industry: a survey of conceptual models". *Canadian Transport Commission*, Report No. 1983/04E.

_____ (1983). "An Analysis of Cost and Supply conditions in the Liner Shipping Industry". *The Journal of Industrial Economics*, Vol. 31, No. 4 June, pp. 417-435.

_____ (1989). "Impediments to contestability in liner markets". *Logistics and Transportation Review*, 25, pp. 325-342.

Davis, D.R. (1998). "The Home Market, Trade and Industrial Structure". *The American Economic Review*, Vol. 88, No. 5 December, pp. 1264 – 1276.

Davis, D. R. and Weinstein, D. E. (2001). "An Account of Global Factor Trade", *American Economic Review*, V.91 no 5, pp. 1423-53.

De Klerk, V. (2003). "Hedging. Importers rocked by strong Rand. Two year of expensive forward cover will affect profits". *Finance Week*, September 3rd.

Department of Transport (1995). Maritime Transport Policy Working Group. Report to Plenary No. 1, July, Government Printer: Pretoria.

_____ (1998). "Moving South Africa: A Transport Strategy for 2020." Government Printer: Pretoria.

_____ (2002). "The National Department of Transport White Paper on National Commercial Ports Policy", Government Printer: Pretoria.

_____ (2004). "Streamlining the National Freight Logistics System" Executive Overview of the New Freight Logistics Strategy, 30th September, presentation.

Doi, M. Ohta, H. Itoh, H. (2000). "A Theoretical Analysis of Liner Shipping Conferences and Strategic Alliances", *Rurds*, Vol. 12, No. 3, November. Blackwell Publishers: Oxford.

Drewry Shipping Consultants (2004). "Relevance of Africa is declining", *Fairplay Publications*, February 8th.

Du Toit, J. (2002). "The Structure of the South African Economy." The SA Financial Sector Forum: Rivonia.

Economic Report on Africa (2002). "Tracking Performance and Progress". Economic Commission for Africa, 2002. Ethiopia: Addis Ababa.

Elgin (2004). "Engineering BEE Deal struck". The Mercury, Thursday September 30 pp. 16.

Enslin, S. (2003). "NPA plans funding talks with Transnet". The Mercury, Business Report, Sunday Tribune, 7 September.

_____ (2004). "Grindrod sets sail for LSE listing". The Mercury, Business Report, December 7th pp. 1.

_____ (2006). "SA's $25bn ports investment under fire" The Mercury, Business Report, June 29th, pp. 1.

Exley, H., (Ed.). (1993). The Best of Business Quotations. Exley Publications in Great Britain.

Finger, J.M. and Yeats, A.J. (1976). "Effective Protection by Transportation Costs and Tariffs: A Comparison of Magnitudes". *The Quarterly Journal of Economics*, Vol. 90, No. 1 February, MIT Press, pp. 169-176.

Fink, C. Mattoo A. and Neagu, I. C. (2002). "Trade in International Maritime Services: How Much does Policy Matter?" *The World Bank Economic Review*, Vol. 16, No. 1, pp. 81-108.

Floor, B. C. (1993). "Report of the Committee of Enquiry into a National Maritime Policy for the Republic of South Africa (Floor Report)", Annexure C: Clause 2.7, Republic of South Africa.

Frankel, J. A. Stein, E. and Wei, S. (1997). Regional Trading Blocs in the World Economic System. Washington, D.C. Institute for International Economics.

Gardner, B. M. (1977). "Port pricing – an alternative approach". Transport of steel exports, an investigation into the scope for rationalisation, Department of Maritime Studies, University of Wales, pp 347 – 365.

Gardner, B. Marlow, P. and Nair R. (2002). "The Economic Regulation of Liner Shipping: The Impact of US and EU Regulation in US Trades". *The Handbook of Maritime Economics and Management*, Ch. 15, pp. 327-345.

Geraci, V.J. and Prewo, W. (1977). "Bilateral Trade Flows and Transport Costs", *Review of Economics and Statistics*, Vol. 59, No. 1, February, pp. 67-74.

Giladi, K. (2003). "The South African Oil Industry and its Relationship with the Ports". Unpublished masters thesis. University of Natal, Durban.

Goss, R. O. (1970). Studies in Maritime Economics. Cambridge at the University Press.

_____ (1986). "Seaports should not be subsidised", *Maritime Policy and Management 13(2)*.

_____ (1990a). "Economic policies and seaports: 1. The functions of seaports", *Maritime Policy and Management 17(3), pp 207-219*.

_____ (1990b). "Economic policies and seaports: 3. Are port authorities necessary?", *Maritime Policy and Management 17(4)*.

Graillot, A. (1990). "The subsidisation of seaports", *Maritime Policy and Management 17(4)*.

Gujarati, D. N. (1995). Basic Econometrics. Third Edition. New York: McGraw-Hill.

Hallwood, C.P. and MacDonald, R. (2000). International Money and Finance. 3rd Edition. Blackwell Publishers: UK.

Haralambides H.E. and Veenstra, A.W. (2002). "Port Pricing", in The Handbook of Maritime Economics and Business, by Grammenos, C. TH. (Ed.) MPG, pp. 782-802.

Harris, S. (2002). "Anchors aweigh! Grindrod has good earnings prospects but the N shares are preventing a re-rating". *Finance Week*, October, 30.

_____ (2003). "Stranded. Navigating foreign exchange straits". *Finance Week*, July, 16.

Haydam, N. (1997). The Principles of Macroeconomics. First edition. J. L. van Schaik Academic: Pretoria

_____ (2002). The Principles of Macroeconomics. Second Edition, Van Schaik Publishers: Pretoria.

_____ (2004). The Principles of Microeconomics. Third Edition. Van Schaik Publishers: Pretoria.

Heaver T.D. and Studer K.R. (1972). "Ship Size and Turnround Time: Some Empirical Evidence." *Journal of Transport Economics and Policy*, 6, pp. 32-50.

Heaver, T.D. (1973). "The Structure of Liner Conference Rates". *The Journal of Industrial Economics*, Vol. 21, No. 3, July, pp. 257-265.

Hoffmann, J. (1988). "Concentration in Liner Shipping: Causes and Impacts". *World Sea Trade Service Review*, Vol. 1, Third Quarter pp. 68 – 74.

_____ (2004). "The Process of Concentration in Shipping: Why and How Countries are Specializing in Different Maritime Businesses." Presented to KTRA, 3rd International Gwangyang Port Forum, Korea, April.

Holden, M. (2005). "Trade liberalisation in South Africa once again". *South African Journal of Economics*, Volume 73:4, pp. 776-784.

Horn, J. (1969). "Nationalism Versus Internationalism in shipping", in *Journal of Transport Economics and Policy*, September.

Hummels, D. (1999a). "Have International Transportation Costs Declined?" Working Paper: University of Chicago, July. (www.purdue.edu/departments/economics).

_____ (1999b). "Towards a Geography of Trade Costs", mimeo, *University of Chicago*.

_____ (2001). "Time as a Trade Barrier", *mimeo*, Purdue University.

Hummels, D. and Lugovskyy, V. (2003). "Usable Data? Matched Partner Trade Statistics as a Measure of International Transportation Costs". Submitted to *Review of International Economics*.

Hutson, T. (2003). "Innovation has steered MSC through three decades". *Freight and Trading Weekly*, 30th Anniversary Special Feature, April.

_____ (2004). "First black empowered ship enters service today" in Ports and Shipping, March 8th at www. ports.co.za.

Iheduru, O. C. (1996). "Post-Apartheid South Africa and Its Neighbours: A Maritime Transport Perspective", The Journal of Modern African Studies, Vol. 34, No. 1, pp.1-26.

Inggs, M. (2003). "Investment in ports vital, says Erwin", Business Report, The Mercury, February 12th.

Institute of Shipping Economics and Logistics (ISL), (2001). *Shipping Statistics Yearbook*. Published by ISL, Bremen.

_____ (2002). *Shipping Statistics Yearbook*. Published by ISL, Bremen.

International Chamber of Commerce, (1999). Incotrems 2000. ICC official rules for the interpretation of trade terms. Entry into force 1st January. The world business organisation.

Jansson, J.O. and Shneerson, D. (1978). "The Effective Protection Implicit in Liner Shipping Freight Rates". *The Review of Economics and Statistics*, Vol. 60, No. 4, November, pp. 569 – 573.

Jennifer Crwys-Williams (Ed.) (2004). In the words of Nelson Mandela. Penguin Books (South Africa) (Pty) Ltd., Johannesburg.

Jones, T. (1987). "The international shipping industry and South Africa's seaborne trade." Technical Report RT/78. National Institute for Transport and Road Research, CSIR, Pretoria.

_____ (1988a). "The Economic Role of Coastal Shipping as a Domestic Transport Mode in South Africa". Unpublished Masters Dissertation. University of Natal.

_____ (1988b). "A General Overview of Harbour Tariff Principles". Presentation at S.A. Harbours Conference, Sun City, 14 April.

_____ (1997). The Port of Durban and the Durban Metropolitan Economy, Research Monograph No.10, Economic Research Unit: University of Natal, Durban.

_____ (1999). Economic of Ports and Harbours. Notes, mimeo University of Natal Durban.

_____ (2002a). "Invisible Hand Effective When Prices in Line With True Costs" in The Mercury, Highroad for KZN, June 5th.

_____ (2002b). "The South African Freight Transport Sector", in The Decline of the South African Economy, Ed. Jones, S., UNISA: Pretoria.

_____ (2002c). Economics of Ports and Harbours: Notes, mimeo, University of Natal: Durban.

_____ (2003a). "The Port of Durban – Characteristics, User Perceptions and Growth Constraints", Durban Metropolitan Local Development Study, June, Durban.

_____ (2003b). School of Economics and Management, The economics of ports and `harbours: lecture notes, University of Natal, Durban.

_____ (2004). "The South African Maritime Industry: An Overview", *mimeo*, University of KwaZulu-Natal: Durban.

Jones, T and Kennedy, (1991). "The Terms of Shipment of South African Seaborne Trade", Council for Scientific and Industrial Research, Pretoria.

Juhel, M. H. (1998). "Globalisation, Privatisation and Restructuring of Ports", 10th Annual Australasian Summit, Ports, Shipping and Waterfront Reform, December.

Keller, G. and Warrack, B. (1999). Statistics for Management and Economics. Fifth Edition. Johannesburg: Duxbury Thomas Learning. Printed in the United States of America.

Kindleberger, C. P. (1968). "Transport Costs and Location Theory" in International Economics, Fourth Edition, Irwin Inc. Illinois.

Krugman, P. (1991). "Increasing returns and economic geography". *Journal of Political Economy*, 99: 183-199.

_____ (1993a). "On the relationship between trade theory and location theory". *Review of International Economics*, 1: 110-122.

_____ (1993b). "What do Undergrads Need to Know about Trade", *American Economic Review*, May, Vol. 83, No. 2, pp. 23-26.

_____ (1993c). "The Narrow and Broad Arguments for Free Trade", *American Economic Review*, May, Vol. 83, No. 2, pp. 362-366.

_____ (1995). "Development, Geography and Economic Theory". MIT Press: Cambridge MA.

_____ (1996). "Urban concentration: the role of increasing returns and transport costs". *International Regional Science Review*, 19 (1/2): 5-30.

_____ (1998). "What's new about the New Economic Geography?" *Oxford Review of Economic Policy*, 14(2): 7-17.

Lloyds List Africa Weekly, (1998). "South African ship registration casts off its historic shackles", No. 178, November, pp. 4.

Loxton, L. and Fabricius, P. (2004). "Minnow Botswana surprised by tax attack from Goliath South Africa", in Business Report. Sunday Tribune, October 31st.

Laing, E. T. (1977). "Shipping Freight Rates for Developing Countries. Who Ultimately Pays?" September, Journal of Transport Economics and Policy.

Larson, R. and Farber, B. (2000). Elementary Statistics, Picturing the World. Annotated Instructor's Edition. Prentice-Hall Inc. Printed in the United States of America.

La Saponara, F. (1986). "Seaports and Public Intervention". *Maritime Policy and Management 13(2),* pp 139-154.

Lawrance, D. H. (2000). "Ports and Transport Logistics in Southern Africa: Performance and Prospects". Maritime Africa 2000 Conference Proceedings, Durban: Butterworths.

Leandro, G.M. Inmaculada, M.Z. and Celestino, S.B. (2000). "Intra-European Foreign Trade of Spanish Regions". Application of Gravity Equation with Transport Costs Data. European Trade Study Group – Second Annual Conference, Glasgow, 15 – 17.

Limão, N. and Venables, A. J. (1999). "Infrastructure, Geographical Disadvantage and Transport Costs". London, United Kingdom: London School of Economics. Mimeographed document.

_____ (2000). "Infrastructure, Geographical Disadvantage Transport Costs and Trade". London, United Kingdom: London School of Economics. Mimeographed document.

_____ (2001). "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade". *The World Bank Economic Review,* Vol. 15, No. 3, 451-479.

Linert, P.H. (1986). International Economics, Eighth Edition, Irwin: Illinois.

Lushnikov, A. (2003a). "A Critical Analysis of the International Terms of Shipment in Dry-Bulk Exports from the Port of Richards Bay". Unpublished masters thesis, University of Natal, Durban.

_____ (2003b). "South Africa's Maritime Transport Industry: The Government and National Maritime Policy". Unpublished paper, University of Natal, Durban.

Luswazi, F. (2003). "The Port of Coega: What Role will the Port of Coega Play within South Africa's Containerised Seatrade". Unpublished honours dissertation, University of Natal, Durban.

Martin, R. (1999). "The new 'geographical turn' in economics: some critical reflections". *Cambridge Journal of Economics,* 23: 65-91.

Martinez-Zarzoso, I. and Suarez-Burguet, C. (2004). "Transport Costs and Trade. Empirical Evidence for Latin American Imports from the European Union". Research Papers in International Business, Centre for International Business Studies.

Marks, S. (2004). "Ronald Reagan: a South African remembrance" in Thisday, Friday June, 11th pp. 11.

Marlow, P. (2002). "Ships, Flags and Taxes", in The Handbook of Maritime Economics and Business, by Grammenos, C. TH. (Ed.) MPG, pp. 512-529.

Marx Jnr., D. (1967). "Regulation of International Liner Shipping and Freedom of the Seas". *The Journal of Industrial Economics*, Vol. 16, No. 1, November, pp. 46-62.

McCloskey, D. N. (1998). The Rhetoric of Economics. Second Edition, The University of Wisconsin Press: Wisconsin.

McConville, J. (1999). "International Trade and Transport Costs" in Economics of Maritime Transport: Theory and Practice. First Edition. The institute of Chartered Shipbrokers: London.

McPherson, B (2003). "Port Pricing Policy", Unpublished Bachelor of Commerce (Honours) dissertation, University of Natal, Durban.

Meyer, C. (2004). "Cabotage – An incentive for local ship registration?" in *Maritime Southern Africa*, November/December, pp. 22.

Meyerowitz, D. (1999). Meyerowitz on Income Tax. The Rustica Press: Ndabeni.

Meyrick, S. (1991). "How far does economic theory really take us?" Proceedings from New Thinking in Port Pricing, University of Wollongong.

Micco, A. and Perez, N. (2001). "Maritime Transport Costs and Port Efficiency". Prepared for the seminar "Towards Competitiveness: The Institutional Path." Inter-American Development Bank. Chile: Santiago.

Micco, A. and Perez, N. (2002). "Determinants of Maritime Transport Costs" Inter-American Development Bank: New York. http://www.iadb.org/res.

Midoro, R. and Pitto, A. (2000). "A critical evaluation of strategic alliances in liner shipping". *Maritime Policy and Management*, Vol. 27, No. 1, pp. 31 – 40.

Milner, C. Morrissey, O. and Rudaheranwa, N. (1998). "Protection, Trade Policy and Transport Costs: Effective Taxation of Ugandan Exporters". Centre for Research in Economic Development and International Trade (CREDIT) research paper, University of Nottingham. www. Nottingham.ac.uk/economics/research/credit.

Milner, C. (2002). "Protection by Tariff Barriers and International Transport Costs", Research Paper Series 2002/01, University of Nottingham, mimeo.

Mohr, P. (1998). Economic Indicators, First Edition, University of South Africa Press: Pretoria

Moneta, C. (1959). "The Estimation of Transportation Costs in International Trade", *Journal of Political Economy* Vol. 67, No. 1, pp. 41-58.

Morwe, T. (2002). "Durban Container Terminal ends backlogs". Martin Creamer's Engineering News. http://www.creamermedia.co.za.

Morwe, T. (2003). "The Business of Modern Ports". Presentation by Morwe, the CEO of South African Port Operations, at The Royal Hotel, Durban, August 21st.

Mouton J. (2003). How to succeed in your Masters & Doctoral Studies. A South African Guide and Resource Book. Van Schaik: Pretoria.

Mpahlwa (2004). "BEE approaching normality" in Business Report, August 31st.

Mthetwa, S.N. (2003). "The Maritime Industry in South Africa. An Opportunity for Logistics Advancement in the Bulk Exports." Unpublished paper. University of Natal, Durban.

Mthetwa, S.N. (2004). "The South African Maritime Industry in the Face of Black Economic Empowerment". Unpublished paper, University of KwaZulu-Natal, Durban.

NPA (2002). National Ports Authority, Port Statistics. http://www.npa.co.za.

_____ (2004). Electronic Newsletter of the National Ports Authority of South Africa. www.npa.co.za.

_____ (2005). "Port Tariff Increases Geared at Lowering Costs of Doing Business in South Africa. 26th January, www.npa.co.za.

Naudé W. (1999a). "Trade in Transport Services: South Africa and the General Agreement on Trade in Services." *Draft report submitted to the Trade and Industrial Policy Secretarial (TIPS)*, August.

_____ (1999b). "The Impact of International Transport Costs on the Exports of a Developing Country: The Case Study of South Africa." Presented at the TIPS Annual Forum at Glenburn Lodge, Muldersdrift, 19-22 September.

_____ (2001). "Shipping Costs and South Africa's Export Potential: An Econometric Analysis", *South African Journal of Economics,* 69(1), March, pp.123-146.

Nolte, F. (2003). "National Ports Authority Bill 2003". The Port of Durban, Middle Managers Conference, 30th April.

OECD (2002). "Competition policy in Liner Shipping," Final report, Organisation for Economic Co- operation and Development, Division of Transport, USTI/DOT(2002)2.

Obstfield, M. and Rogoff, R. (1998). Foundations of International Macroeconomics. MIT Press: Cambridge, MA.

Packard, W.V. (1995). Shipping Pools. Second Edition, Lloyd's of London Press Ltd., London.

Panagariya, A. (2000). "Preferential Trade Liberalization: The Traditional Theory and New Developments". *Journal of Economic Literature,* Vol. 38, No. 2 June, pp. 287 – 331.

Palsson, G. (1998). "Multiple Ports of Call versus Hub-and-Spoke. Containerised Maritime Trade between West Africa and Europe." Sub-Saharan Africa Transport Policy Program. The World Bank and Economic Commission for Africa. SSATP Working Paper No. 31, January. The World Bank, Africa Region.

Peat, A. (2002). "Caustic reaction greets new port dues". Freight Trading Weekly, 22 March.

Porter, M. (1994). "The role of location in competition". *Journal of the Economics of Business,* 1(1): 35-39.

Portnet, (1998). "Port of Durban: The Undecided Expansion", Case prepared by Ronnie Holtshausen and Pat Raw, Unpublished discussion document, August.

_____ (1999). The Port of Durban, Handbook and Directory. Portnet: Durban.

Port Tariffs, (2001). National Ports Authority of South Africa, Port tariffs, 1 April, First Edition.

_____ (2002). National Ports Authority of South Africa, Port Tariffs, 1 May, Second Edition, or www.npa.co.za.

_____ (2003). National Ports Authority of South Africa, Port tariffs, 1 April, Third Edition. www.npa.co.za.

_____ (2004). National Ports Authority of South Africa, Port tariffs, 1 April, Fourth Edition. www.npa.co.za.

_____ (2005). National Ports Authority of South Africa, Port tariffs, 1 April, Fifth Edition. www.npa.co.za.

Ports of Southern Africa and Mauritius, (2003). Harbour Reference Guide, CD Duplications, 54th Edition.

Preece, H. (2004). "Twist of fortune. SA hit by downturn in commodity prices", in Finance Week, 7th July.

Pugel, T. A. and Lindert, P. H (2000). International Economics. Eleventh Edition. Irwin McGraw-Hill: New York.

Radebe (2003). "Address by Jeff Radebe at the Maritime Transport Industry BEE Indaba" in Durban, 26th September. http://www.transport.gov.za/comm-centre/sp/2003/sp0926.html.

Radebe, J. (2002). "Concessioning won't halt value-addition plan". Martin Creamer's Engineering News. http://www.creamermedia.co.za.

Radebe, J. (2003a). "Durban port concessioning architecture soon." Martin Creamer's Engineering News. http://www.creamermedia.co.za.

Radebe, J (2003b). "Address by Jeff Radebe at the Maritime Transport Industry BEE Indaba" in Durban, 26th September. http://www.transport.gov.za/comm-centre/sp/2003/sp0926.html.

Radelet, S. and Sachs, J. (1998). "Shipping Costs, Manufacturing Exports, and Economic Growth", *mimeo*, Harvard Institute for International Development. Also presented at the American Economics Association annual meeting.

Richards, P.J. (1967). "Shipping Problems of Underdeveloped Countries", *Bulletin of the Oxford University Institute of Economics and Statistics*, August, Vol. 29, Issue 3, pp 265-281

Rodrigues, M. (2002a). "Plans to fast-track concession for South Africa's 'haemorrhaging' harbour", Martin Creamer's Engineering News. http://www.creamermedia.co.za.

_____ (2002b). "Reduced port costs to increase competitiveness", Martin Creamer's Engineering News. http://www.creamermedia.co.za.

Roe, M. (2002). "Shipping policy in the globalisation era: The inter-relationship between international, supra-national and national shipping policies", in *The Handbook of Maritime Economics and Business*, by Grammenos, C. TH. (Ed.) MPG, Chapter 22.

Rose, A. (1991). "Why Has Trade Grown Faster Than Income?" *Canadian Journal of Economics*, V24 n2, pp. 417-27.

Sachs, J.D. and Warner, A.M. (1995). "Economic reform and the process of global integration". Brooking Papers on Economic Activity,1: 1-118.

Salvatore, D. (2001). International Economics. Eighth Edition. Wiley International Edition. John Wiley & Sons, Inc. Fordham University.

SAMSA (2004). South African Maritime Safety Authority Annual Report, Cape Town.

Siko, M. (1996). "South Africa's Maritime Interest and Responsibilities". *African Security Review*, Vol. 5 No. 2.

Skinner, R. H. (1983). "Wharfage on cargo moving through the South African ports", South African Transport Services and Unicorn Lines (Pty) Ltd, Seminars on Coastwise Cargo Valuation, Durban.

Sjostrom W. (1989). "Collusion in Ocean Shipping: A Test of Monopoly and Empty Core Models". *Journal of Political Economy*, vol. 97, no. 5. pp. 1160-1179.

_____ (2002). "Liner Shipping: Modelling Competition and Collusion". The Handbook of Maritime Economics and Business, by Grammenos, C. TH. (Ed.) MPG, pp. 307-326.

Slack, B. Comtois, C. and Sletmo, G. (1996). "Shipping lines as agents of change in the port industry". *Maritime Policy and Management 23(3)*.

Sletmo, G. K. (2000). "Port Life Cycles: Policy and Strategy in the Global Economy". *International Journal of Maritime Economics 2(2)*.

Sletmo, G. K. (2002). "The Rise and Fall of National Shipping Policies". The Handbook of Maritime Economics and Business, by Grammenos, C. TH. (Ed.) MPG, pp. 471 – 493.

Smith, A. (1776). An inquiry into the nature and causes of the wealth of nations. George Routledge and Sons: London.

Song, D. and Panayides, P.M. (2002). "A conceptual application of co-operative game theory to liner shipping strategic alliance". *Maritime Policy and Management*, Vol. 29, No. 3, pp. 285-301.

South Africa.info (2004). The Official Gateway. Published for the Marketing Council of South Africa. www.safrica.info.

Staniland, H. (2000). "The Current and Future Legislative and Regulatory Maritime Framework in South Africa". Presented at the Maritime Africa Conferences (2000) April, Durban Exhibition Centre, Butterworths.

Stiglitz, J. E. (2002). Globalisation and Its Discontents. Penguin Books: Great Britain.

Stopford, M. (1988). Maritime Economics. First Edition. Routledge: London.

_____ (1997). Maritime Economics. Second Edition. Routledge: London.

Sturmey, S. G. (1965). "National Shipping Policies". *Journal of Industrial Economics*, Vol. 14, No. 1, November, pp. 14-29.

Sturmey, S. G. (1967). "Economics and International Liner Services". Journal of Transport Economics and Policy, Vol. 1-2, May, pp. 190-203.

Sunday Times, (2006). "Reforms Spur Rapid Growth Since War's End". News, 18 June, at http://allafrica.com/stories/printable/200606191197.html.

The Economist (2005). "A man of two faces", Johannesburg, January 22nd, pp.27-29. www.economist.com.

The Holy Bible (2001). English Standard Version. Containing the Old and New Testament, Crossway Bibles, a division of Good News Publishers. Printed in China for the Bible Societies.

TIPS (2003). Trade and Industrial Policies Strategies, Statistical Database, www.tips.co.za.

_____ (2004). Trade and Industrial Policies Strategies, Statistical Database, www.tips.co.za.

_____ (2005). Trade and Industrial Policies Strategies, Statistical Database, www.tips.co.za.

Todaro, M. L. (1994). Economic Development. Fifth Edition. Longman: New York.

Trefler, Daniel (1995). "The Case of the Missing Trade and Other Mysteries", *American Economic Review*, v85 n5, pp. 1029-46.

Trujillo, L. and Nombela, G. (2000). "Privatising Port Services", The World Bank Group, Private Sector and Infrastructure Network, October, Note Number 222.

UNCTAD (1975). "Port Pricing." Report by the UNCTAD secretariat, *TD/B/C.4/110/Rev.1.* United Nations Conference on Trade and Development, New York.

_____ (1992). "Strategic Issues in Port Pricing". Ch1 – 5, United Nations Conference on Trade and Development, Geneva.

____ (1999). "Review of Maritime Transport 1999." United Nations Publications: New York and Geneva.

____ (2000). "Review of Maritime Transport 2000." United Nations Publications: New York and Geneva.

____ (2001). "Review of Maritime Transport 2001." United Nations Publications: New York and Geneva.

____ (2002). "Review of Maritime Transport 2002." United Nations Publications: New York and Geneva.

____ (2003a). "Review of Maritime Transport 2003." United Nations Publications: New York and Geneva.

____ (2003b). "African ports: reform and the role of the private sector." Report by the secretariat of UNCTAD, (UNCTAD/SDTE/TLB/5).

____ (2004). "Review of Maritime Transport 2004." United Nations Publications: New York and Geneva.

____ (2005). "Review of Maritime Transport 2005." United Nations Publications: New York and Geneva.

UNCTAD Media Summary (2000). "Review of Maritime Transport 2000." United Nations Publications: New York and Geneva.

____ (2001). "Review of Maritime Transport 2001." United Nations Publications: New York and Geneva.

Van Niekerk, H. C. (1994). "Restructuring of Port Charges in South Africa". Rand Afrikaans University, September (Masters Thesis).

____ (1997). "Proposed New Tax Regime for the SA Shipping Industry." Research report commissioned by the Department of Transport, Pretoria.

Van Niekerk, H. C. and Floor, B.C. (1992). "Report on visit to the Ports of Fremantle, Sydney, Melbourne, Yokohama, Kobe, Hong Kong and Singapore during July 1992". Transport Research Association, August 7th.

Van Niekerk, H.C. (2002). "Port Restructuring, Policy and Regulation: The South African case". IAME Panama Conference Proceedings, 13 – 15 November.

Veenstra, A. W. (1999). Quantitative Analysis of Shipping Markets. Thesis Series. Delft University Press: The Netherlands.

Walgreen, J.A. (1969). "Liner Nationality and Steamship Conference Rate-Making". *Journal of Industrial Economics,* vol. 17, No. 3, July, pp. 205-209.

Wall, H. J. (2001). "Have Regional Trade Blocs Diverted U.S. Exports?". *International Economic Trends.* The Federal Reserve Bank of St. Louis. February.

Walters II W. G. (1970). "Transport Costs, Tariffs, and the Pattern of Industrial Protection". *The American Review,* Vol. 60, No. 5, pp. 1013-1020.

_____ (1971). "A Note on Transport Costs and the Choice of a Tariff Valuation Base". *The Journal of Political Economy,* Vol. 79, No. 4 Jul.-Aug., pp. 926-928.

White Paper (2002). "The National Department of Transport White Paper on National Commercial Ports Policy", 6th March. Government Printers: Pretoria.

Willingale, M. (1998). Ship Management. 3rd Edition. Business of Shipping Series: London.

Wolfe, J.N. (1959). "Transport Costs and Comparative Advantage". *The Journal of Political Economy,* vol. 67, no. 4, August, pp. 392-397.

World Bank, (2001). "Transport Services: Reducing Barriers to Trade". Chapter 4 of the World Global Economic Prospects, pp. 97-127, http://www.aercafrica.org/publications/GEPchapter4/.

World Bank (2002). "International Trade and Development: Data on Import Tariffs and NTBs". Internet Posting: http://www1.worldbank.org/wbiep/trade/TR_Data.html.

World Development Indicators (2002). The World Bank: Washington.

Yeats A. J. (1977). "Do International Transport Costs Increase with Fabrication? Some Empirical Evidence". *Oxford Economic Papers,* New Series, Vol. 29, No. 3, pp. 458-471.

_____ (1978). "On the Accuracy of Partner Country Trade Statistics", *Oxford Bulletin of Economics and Statistics,* v40, n4, pp. 341-61.

_____ (1995). "Are Partner-Country Statistics Useful for Estimating 'Missing' Trade Data?" International Economics Department, International Trade Division: The World Bank.

Yeats, A. J. Amjadi, A. Reincke, U. and Francis N.G. (1996). "What Caused Sub-Saharan Africa's Marginalisation in World Trade?". The World Bank: Washington.

Zerby, J.A. and Conlon, R.M. (1983). "Joint Costs and Intra-Tariff Cross-Subsidies: The Case of Liner Shipping". *The Journal of Industrial Economics*, Vol. 31, no. 4, June, pp. 383-396.

APPENDIX A

INTRODUCTION

The data used for this thesis come from various sources. Data sourced from the International Monetary Fund's *International Financial Statistics,* World Development Indicators, the South African Reserve Bank and Standard International Trade Classification (SITC) data from the World Trade Analyser, are primarily from the TIPS (2005) database. In addition, this thesis uses data from the Institute of Shipping Economics and Logistics (ISL), SITC data from South Africa's Department of Trade and Industry, and various editions of UNCTAD's *Review of Maritime Transport.* Due to the dearth of direct measures of transport costs, the compilation of the Europe-South Africa-Europe liner freight rates for the period 1950-2003 is a significant contribution of this thesis. Berridge (1987) provides an index of both Northbound and Southbound freight rates for the period 1950-1985. Personal communications both nationally and abroad were required to compile these data for the overlapping period 1985-2003 (see Appendix B for the explicit compilation of the freight rate indices and the limitations of these data). This thesis also compiles and examines historical data on South Africa's port charges from various literary sources and combines these with contemporary data and developments (1999-2005) sourced via personal communications with port pricing decision makers at the National Port Authority. Appendix C contains the data used, in Chapter Three, for the correlation analyses between various countries annual cif/fob ratios and annual compositions of imports.

FIGURE A1. DECLINE IN TRADE BARRIERS, 1920-1990
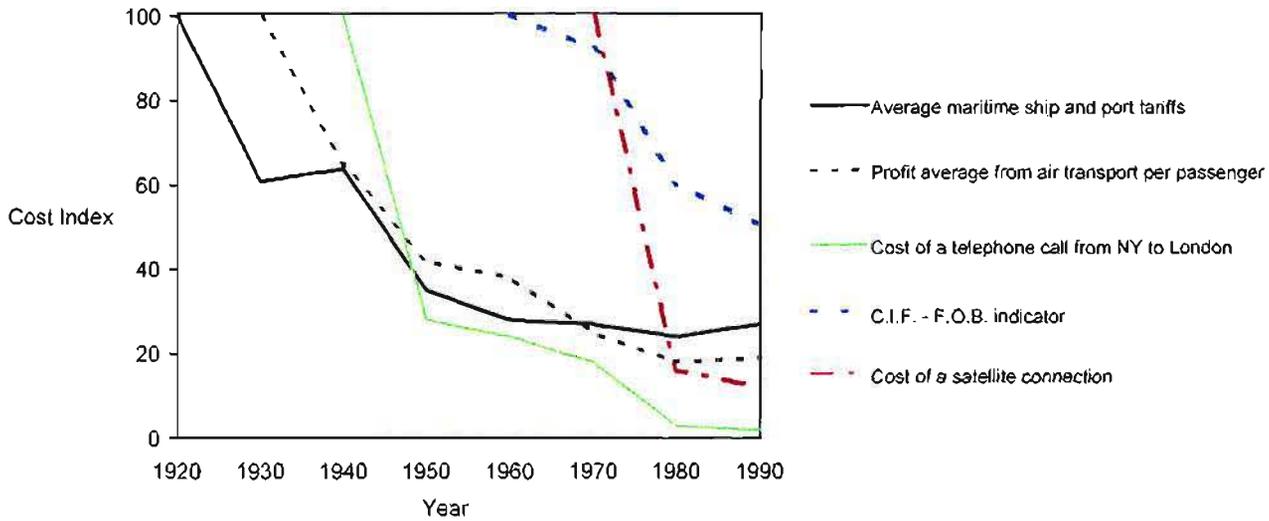
Note: C.I.G. index is based in the proportion of F.O.B. costs plus insurance and freight for disposable goods.
Source: Intelstat satellite tariffs; C.I.F., F.O.B. proportion from World Bank data; other data from Hufbauer 1991

Source: Department of Transport, 1998.

FIGURE A2. WORLD TRADE LIBERALISATION, 1940-2000
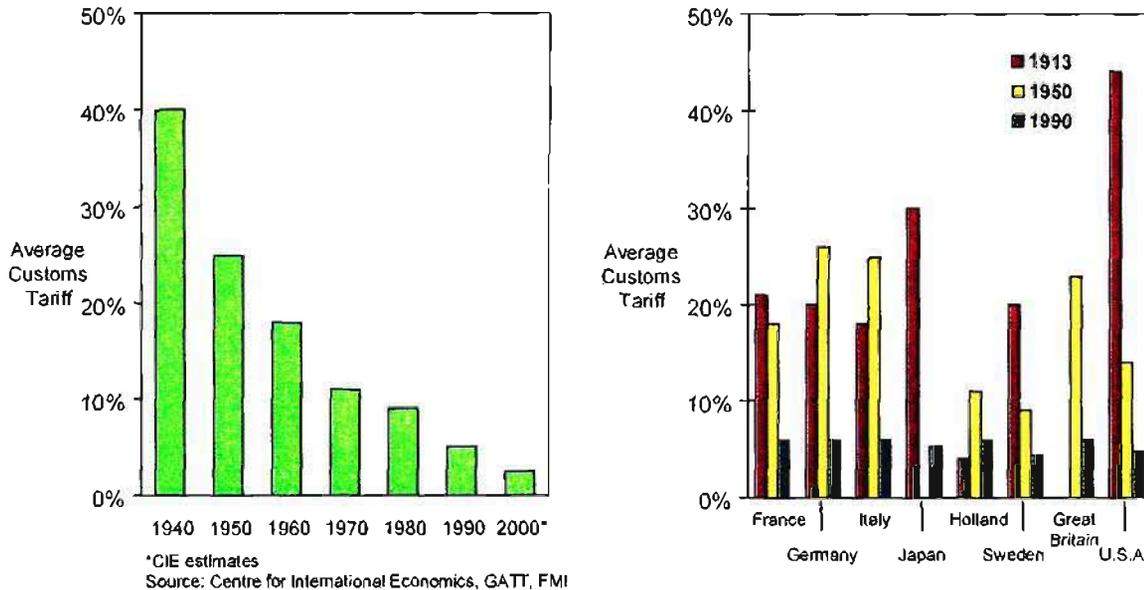
*CIE estimates
Source: Centre for International Economics, GATT, FMI

Source: Department of Transport, 1998.

194

FIGURE A3. TRANSPORT AND COMMUNICATIONS COSTS, 1930-2000 (IN 1990 $US)
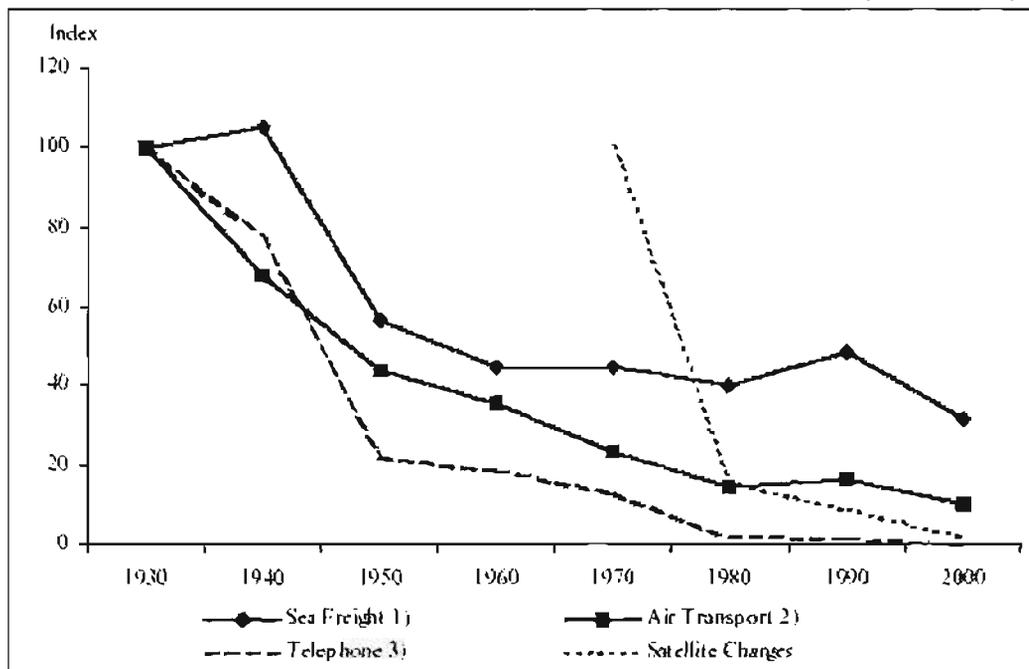
Notes: 1. Average ocean freight and port charges per short ton of import and export cargo;
2. average air transport revenue per passenger mile;
3. cost of three-minute telephone call from New York to London.

Sources: Hufbauer (1991), US Department of Commerce (2001), World Bank (2002) in Busse, 2002: 12.

FIGURE A4. TRENDS IN AVERAGE TARIFF RATES FOR DEVELOPING AND INDUSTRIAL COUNTRIES, 1988-1999 (UNWEIGHTED)
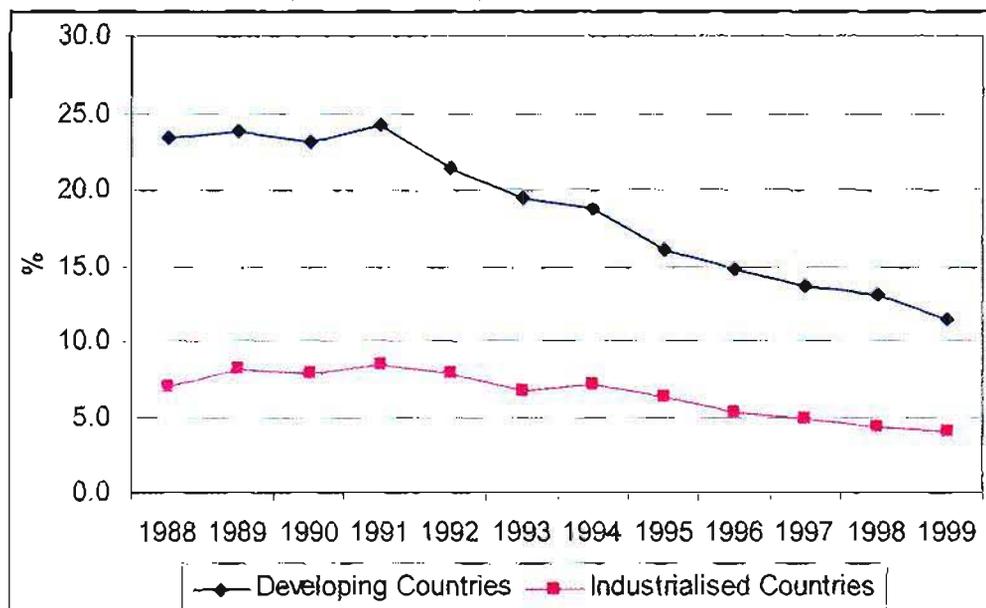
Source: own diagram using data from World Bank (2002).

Note: All tariff rates are based on unweighted averages for all goods in *ad valorem* rates, or applied rates, or MFN rates, whichever data are available in a longer period.

APPENDIX B

COMPILING THE EUROPE-SOUTH AFRICA-EUROPE LINER FREIGHT RATE INDICES, 1950-2003

The purpose of this section is to compile a measure of South Africa's direct shipping costs as recorded though Europe-South Africa-Europe liner freight rates over the period 1950-2003[1]. These Europe-South Africa Conference (ESAC or SAECS) liner freight rates contribute to a more holistic understanding of the evolution in South Africa's shipping costs. The additional insights provided by the evolution in South Africa's liner freight rates can neither be achieved through an analysis of the port charges (Chapter Four) nor the country's cif/fob ratios (Chapter Five).

Professor Berridge (1987) wrote a book entitled: "The Politics of the South Africa Run: European Shipping and Pretoria." The book, now out of print, was based on work in archives throughout South Africa, at the Public Record Office in London, in the archives of the British & Commonwealth Shipping Company, and at the offices of the "Conference" which controlled the trade. It was access to these hitherto closed private files (until the late 1970s), which gave the book its authority. Understandably, this study is not in the same privileged position with access to such confidential documents. It was in Appendix IX that I found the changes in northbound and southbound freight rates for the Europe-South Africa trade since 1951. The freight rate indices from Berridge (1987: Appendix IX), for the period 1950-1985, with a base year of 1950 is shown in table B1, and presented in figure B1[2].

---

[1] The actual indices used are FAK (freight all kind) Northbound and Southbound freight rates between the North West Continent (Europe) and South Africa. "A conference line is a group of two or more shipping lines which enter into an agreement to adopt the use of a common freight rate structure and a regular scheduled service on specific routes. The advantages of the conference lines are: regular schedules services even when volumes of freight are low; stable rates normally established for a period of a year and timeous notification is usually given if rates or services are adjusted" (Mbendi, 1998). In 1998, the participating members of the SAECS Conference Line included: CMB Transport Line, CGM SUD, Consortium Hispania Lines, Deutche Afrika Linen G.m.b.H, Ellerman Harrison Container Line Ltd, Lloyd Triestino, Maritime Carrier Shipping G.m.b.H., Namibia Shipping Lines (Pty) Ltd, Navinter Line, Nedlloyd Lunen B.V., P&O Containers, Royal Swazi National Shipping Corp Ltd, Safmarine / Saflink and Transatlantic Southern Africa Services Ltd. (Mbendi, 1998). It would be interesting to see how many of these members are still in operation and more importantly – who owns who?

[2] An index is a method of easily comparing a set of numbers. All numbers are shown in relation to a base number which is usually 100 and in this case allows for a comparison of freight rates over time.

TABLE B1. EUROPE-SOUTH AFRICA FREIGHT RATE INDEX, 1950-1985

	Northbound	Southbound
1950	100	100
1.7.51	110	110
1.9.55	121	121
15.2.57	127	127
1.2.58	130	130
1.11.60	130	140
1.1.61/13.2.61	136	140
1.1.62	136	150
1.4.64	146	165
1.4.65	146	181
1.7.66	153	190
1.8.67	162	204
1.9.68	178	235
2.5.69	169	235
1.10.70	182	264
15.3.71	193	290
23.8.71	217	326
30.10.72	233	350
26.8.74	256	385
1.8.75	282	423
27.12.76	324	486
1.1.78	417	626
1.7.78	442	664
1.1.79	508	764
1.1.80	569	856
1.1.81	649	976
1.1.82	727	1093
1.1.83	782	1175
1.1.84	876	1316
1.1.85	946	1421

Source: Berridge, 1987: Appendix IX.

FIGURE B1. EUROPE-SOUTH AFRICA FREIGHT RATE INDEX, 1950-1985
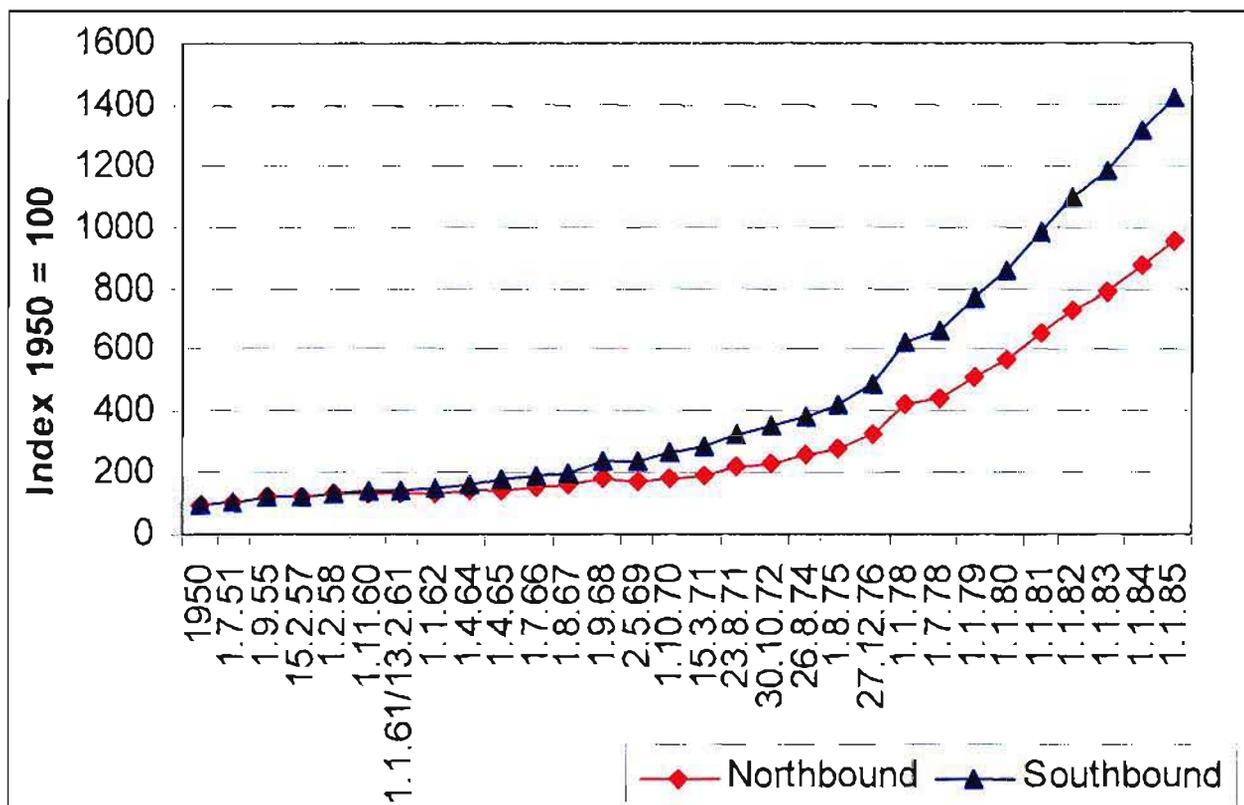
The analyses of these data in Berridge (1987), is the most interesting and insightful literature I have read on the Europe-South Africa trade. Although Berridge (1987) makes a most valuable contribution to our understanding of the trade, only a small portion of the history covered in the book occurred during my lifetime. Subsequent to Berridge (1987), South Africa has experienced the international pressure of economic sanctions (1986-1993) and the post-apartheid freedom with democracy and re-integration into the global trading community. My curiosity and concern (because of the initially counter-intuitive cif/fob ratio findings, see Chapter 5.1) encouraged me to research further: What had happened to the South Africa-Europe liner freight rates during economic sanctions, and what has been the impact of South Africa's post-sanctions re-integration and trade liberalisation on the level of these freight rates?

My research to compile the contemporary freight rates led me into numerous discussions with individuals based in Durban, Cape Town and Johannesburg. More specifically, I interviewed informed individuals at freight forwarders like Safcor Panalpina and Union Transport International (UTI) as well as shipping lines including Safmarine and Mediterranean Shipping Company (MSC). Through this process I gained invaluable practical insights into the structures, daily operations and annual strategic freight rate negotiations that are conducted between freight forwarders and shipping lines. These interviews, however, yielded little in terms of my quest to compile actual freight rate indices. On the one hand, my experience generally confirms the experience of other researchers, for instance Radelet and Sachs (1998: 2) who state that: "surprisingly, more direct shipping data – e.g. from transport companies – is generally proprietary information and therefore hard to assemble...". On the other hand, many of those companies I interviewed only proclaim to have access to data for the past two or three years. Finally, my research led me to Mr. Pollington, the Secretary of the Europe South Africa Conference. He most graciously provided me with a freight revenue index based on freight rates for 1985 which dovetailed with the information in Professor Berridge's book. Pollington stressed, however, that the data were taken from a handful of sources available to him at the time and represented a statistical sample which was skewed in favour of containerised (FCL/FCL) transport over other forms (Pollington, Secretary of the Europe South Africa Conference, personal communications, March, 2003). With a base year of 1950, table B2 show these average freight rate indices for the period 1985 to 2000.

TABLE B2. EUROPE-SOUTH AFRICA LINER FREIGHT RATES, 1985-2000

Year	Southbound	Northbound
1985	100	100
1986	95	107
1987	62	91
1988	57	89
1989	61	91
1990	65	97
1991	68	102
1992	67	107
1993	66	106
1994	68	102
1995	68	102
1996	64	95
1997	55	96
1998	49	84
1999	45	68
2000	41	57

Source: Pollington, 2003 (Secretary of the Europe South Africa Conference, personal communications, March).

Note: these data are yearly-average rates for the trade between Southern Africa and the United Kingdom and North-west Continent.

Pollington (Secretary of the Europe South Africa Conference, personal communications, March, 2003) explained these data as follows.

> ...the 'tumble' in 1987 was more apparent than real. The Conference had been operating on historic base data for their Currency Adjustment Factor (CAF) calculation. This had resulted in a negative factor approaching 40 per cent, due to the comparative strength of the tariff currency (US$) against the other currencies in the basket. It was decided in 1987 that the disparity between the 'paper' freight rate and the true Dollar-denominated value of the freight earnings was no longer tolerable (especially as many shippers found the calculation too complex). The CAF, and the related Bunker Adjustment Factor, which compensates for fuel price movements, were accordingly absorbed into the freight rate, and new tariff base rates were issued.

Table B3 shows results of factoring the effect of the prevailing level of CAF into the formula.

TABLE B3. CURRENCY ADJUSTMENT OF THE EUROPE-SOUTH AFRICA LINER FREIGHT RATES, 1985-2000

| Year | Freight only | | CAF | Adjusted for CAF | |
	Sbd	Nbd		Sbd	Nbd
1985	100	100	-38.92	61	61
1986	95	107	-36.69	58	70
1987	62	91	2.93	64	94
1988	57	89	21.29	79	110
1989	61	91	11.95	73	103
1990	65	97	4.98	70	102
1991	68	102	17.98	86	120
1992	67	107	10.02	77	117
1993	66	106	-0.25	66	105
1994	68	102	-0.25	68	102
1995	68	102	-0.25	68	102
1996	64	95	-0.25	64	94
1997	55	96	-0.25	55	96
1998	49	84	-0.25	49	84
1999	45	68	0	45	68
2000	41	57	0	41	57

Source: Pollington, 2003 (Secretary of the Europe South Africa Conference, personal communications, March).

Pollington took the level of CAF on the first trading day of each year for illustrative purposes. Having remained at a negligible –0.25 per cent for several years, the Conference decided to set the level to zero in 1998 (Pollington, Secretary of the Europe South Africa Conference, personal communications, March, 2003). "There was, as you can see, an upward drift in freight rates to the mid-1990s. This represents the peak of the sanctions era, when the few shipping companies in the Europe-SA-Europe trade were relatively insulated against the effects of global competition" (Pollington, Secretary of the Europe South Africa Conference, personal communications, March, 2003). To compile and create the freight rate indices, I spliced together data from 1950 to 1985 inclusive in Berridge (1987) and the freight rate index kindly provided by Pollington (SAECS Conference secretary, personal communications, March, 2003). Pollington notes that the sources are yearly-average rates for the trade between Southern Africa and the United Kingdom and North-west Continent. Furthermore, he stressed that the data was taken from a handful of sources available to him at the time and represented a statistical sample which was skewed in favour of containerised (FCL/FCL) transport over other forms.

The maritime economy is enormously complex and freight rates are the final product of many factors. On the one hand, factors affecting demand for shipping services include the development of the world economy, seaborne commodity trades, average hauls, political events and the costs of transport. On the other hand, factors affecting the supply of shipping services include: developments in the world fleet, shipbuilding production, fleet productivity, scrapping and losses, and variation in freight rates (see Stopford, 1998: 114-149 for a fuller discussion of these factors). Furthermore, one needs to be mindful that there were many developments between 1950 and 2003 on the Europe-South Africa-Europe trade, including trade compositional changes, which limit the usefulness of comparison over such a lengthy period. More specifically, containers were not in operation over the entire period and were only fully endorsed on the 1 July 1977 (Berridge, 1987). This is one of the reasons why I do not attempt to use econometric analyses of these data. Rather, these data are used by Chasomeris (2004) to focus on the broad freight rate trends observed during economic sanctions and then contrast these with the evolution of freight rates in post-sanctions South Africa. The source of these data between 1985 and 2003 as well as the more consistent composition of the trade (essentially containerised transport) allows for a more justifiable comparison over time. Indeed, containers have transformed liner shipping into a neo-bulk industry because the vessel operator is unconcerned with their contents unless they contain dangerous or refrigerated goods. Therefore, the traditional price differentiation for different types of cargo is increasingly giving way to FAK (freight all kind) freight rates and the tendency toward treating "a box as a box as a box"; this practice may also be indicative of the declining monopoly power of liner companies and their conferences (Haffmann, 2000 in Song and Panayides, 2002: 292).

The time series freight rate data compiled by this study and analysed above ends in 2000. Although grateful for the privilege of access to the freight rate data from 1985 to 2000, my curiosity to know the latest freight rates and developments on the trade led to further research. Telephonic and ultimately personal interviews with local (Durban-based) freight forwarders (Botha, personal communications, Union Transport International, 2003, April) resulted in access to the US$ freight rates over the period 2000-2003 (see Table B4). I convert the actual US$-denominated freight rates, in table B4, into indices and splice these data to the existing time

202

series in order to provide an overall impression of the level and variation of freight rates for the period 1950 to 2003.

TABLE B4. EUROPE-SOUTH AFRICA FREIGHT RATES, 2000-2003

	Northbound US$	Southbound US$
2000	900	1350
2001	900	1350
2002	950	1450
2003	1050	1550

Source: Published FAK ESAC Tariffs, Botha, personal communications, Union Transport International, 2003, April.

In order to present a constant rand-based freight rate perspective - as opposed to the nominal US$-based freight rates presented in Chasomeris (2004) - it was necessary to convert the nominal dollar index into rands and then deflate these values using South Africa's GDP deflator (data from TIPS, 2005). The constant rand-based Europe-South Africa freight rate index was constructed as follows. I researched and compiled data for the nominal US$ freight rate index that was then converted into US$'s and subsequently into rands. The nominal rands time series was divided by South Africa's GDP deflator and then converted back into a constant rand index with a base year of 1980 (see Table B5).

TABLE B5. EUROPE-SOUTH AFRICA-EUROPE FREIGHT RATE INDICES, 1950-2003

Year	Northbound Nominal 1950=100	Southbound Nominal 1950=100	Real Southbound 1980=100	Real Northbound 1980=100
1950	100	100		
1951	110	110		
1952	110	110		
1953	110	110		
1954	110	110		
1955	121	121		
1956	121	121		
1957	127	127		
1958	130	130		
1959	130	130		
1960	130	140		
1961	136	140		
1962	136	150		
1963	136	150		
1964	146	165		
1965	146	181		
1966	153	190		
1967	162	204		
1968	178	235		
1969	169	235		
1970	182	264		
1971	217	326	116.179	116.3406
1972	233	350	120.76	120.9406
1973	233	350	92.12922	92.26706
1974	256	385	85.61361	85.64133
1975	282	423	92.50363	92.77456
1976	324	486	113.182	113.5135
1977	324	486	101.8113	102.1095
1978	442	664	124.5529	124.7295
1979	508	764	120.5339	120.5705
1980	569	856	100	100
1981	649	976	116.8723	116.9144
1982	727	1093	142.1311	142.2213
1983	782	1175	134.4905	134.6548
1984	876	1316	178.8583	179.1095
1985	946	1421	249.7888	250.1678
1986	899.475	1630.656	251.0572	208.3343
1987	992.5246	2189.738	262.3606	178.8995
1988	1225.148	2562.459	297.632	214.0783
1989	1132.098	2399.393	274.1794	194.6161
1990	1085.574	2376.098	231.8673	159.3661

1991	1333.705	2795.41	251.5658	180.5624
1992	1194.131	2725.525	221.1142	145.7404
1993	1023.541	2445.984	201.0488	126.5652
1994	1054.557	2376.098	193.6439	129.2918
1995	1054.557	2376.098	179.4134	119.7904
1996	992.5246	2189.738	181.3188	123.6384
1997	852.9508	2236.328	183.5868	105.3395
1998	759.9016	1956.787	180.1983	105.2752
1999	697.8689	1584.066	151.7861	100.5991
2000	635.8361	1327.82	134.8367	97.13494
2001	635.83607	1327.8197	155.0595	111.7033
2002	671.16029	1426.1767	184.9828	130.9621
2003	741.80874	1524.5337	NA	NA

Source: Author compiled from Berridge (1987: Appendix IX), Pollington, 2003 (Secretary of the Europe South Africa Conference, personal communications, March, 2003) and published FAK ESAC tariffs, Botha, personal communications, Union Transport International, 2003, April.

Experimentation with numerous base years produced interesting perspectives, however, using a base year of 1950 results in the most widely understandable illustration of the trends in the nominal US$-based indices over the period 1950-2003. Figure B2 shows the spliced and base year adjusted northbound and southbound liner freight rate indices for the period 1950 to 2003.

FIGURE B2. EUROPE-SOUTH AFRICA-EUROPE LINER FREIGHT RATES, 1950-2003
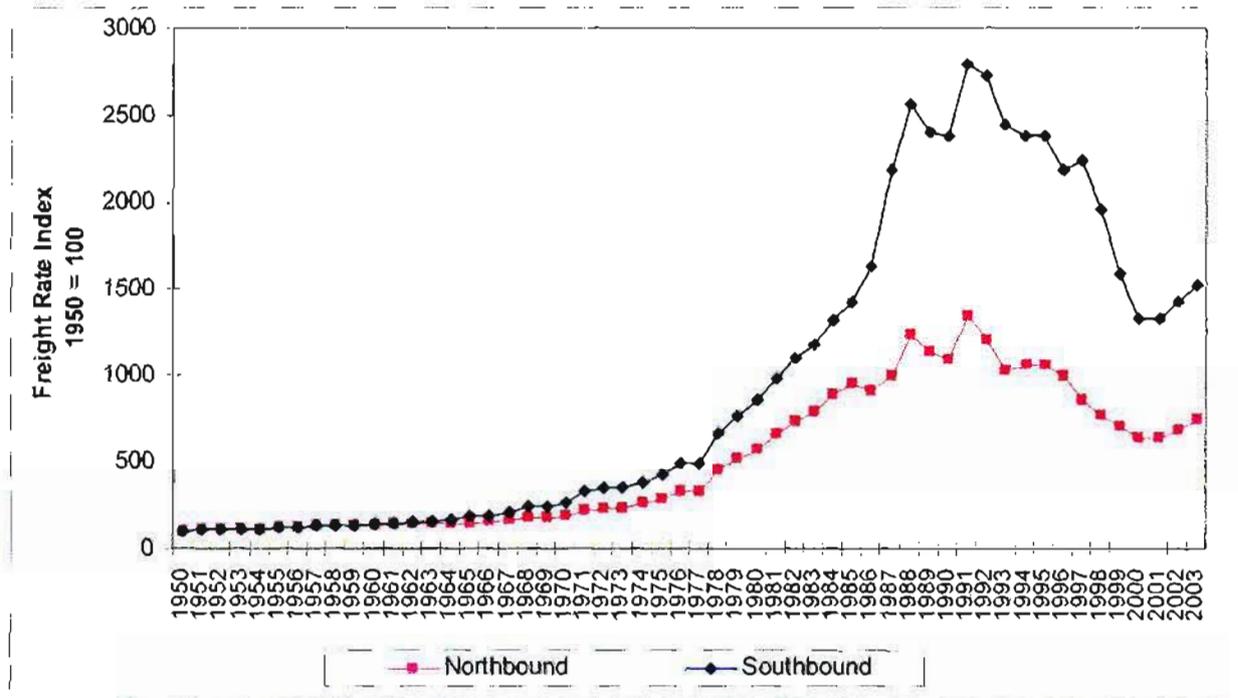
Source: Author compiled from Berridge (1987: Appendix IX), Pollington, 2003 (Secretary of the Europe South Africa Conference, personal communications, March) and published FAK ESAC tariffs from Botha, 2003 (personal communications, Union Transport International, April).

This research process has been exceptionally interesting and rewarding. These compiled freight rate data have been used by Chasomeris (2004; 2005). Additionally, the use of these freight rates in Chapter Five and the consequent findings should prove both appealing and fruitful for continued research.

APPENDIX C

TABLE C1. SOUTH AFRICA'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Percentage of Total Imports

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	6.27	8.544831	0.002129	7.651561	1.819554	0.18452	2.275807	16.28819	2.024381	0.733123	60.26513
1981	9.11	9.527566	0.001845	9.370762	2.05391	0.354449	2.347996	15.07048	2.453513	0.73144	57.90542
1982	8.78	8.561749	0.001699	9.510174	1.737446	0.220265	2.647402	16.94552	2.690009	0.778144	56.73938
1983	8.72	6.395873	0.001869	8.233058	2.297337	0.16575	2.468285	17.58889	2.048703	0.633075	59.98209
1984	8.79	5.777201	0.001307	10.13805	2.839256	0.158556	3.188449	18.10353	2.082352	0.759031	56.82286
1985	11.18	9.141276	0.003847	18.70115	14.19624	0.205771	5.873182	32.06281	2.516362	2.044632	14.87388
1986	10.51	7.50214	0.00223	10.9269	8.436718	0.1492	4.278831	23.07158	1.84277	0.85888	42.71003
1987	8.48	6.244847	0.001812	8.462882	5.177708	0.100654	2.282016	18.29835	1.040677	0.648126	57.5635
1988	7.81	6.320763	0.002146	11.35521	5.774179	0.112956	2.666781	23.19979	1.169041	0.877872	48.30885
1989	8.44	7.285757	0.002344	12.77136	6.623753	0.135855	2.861732	23.79469	1.297465	0.902171	44.09281
1990	7.67	7.538593	0.001875	11.08845	7.240296	0.110587	2.942422	22.94992	1.845855	1.187785	44.90861
1991	7.88	11.18782	0.004383	16.56361	11.3621	0.200867	4.653931	33.98125	3.658753	2.340183	15.61319
1992	6.62	7.04357	0.007321	9.599883	6.903832	0.198849	5.612322	16.24646	7.273223	2.228216	44.16159
1993	11.28	6.562363	0.006455	9.050726	7.856687	0.193961	5.100864	14.40796	7.986351	2.684167	45.51139
1994	9.04	7.507268	0.007426	18.4962	5.486915	0.144182	6.175442	26.72745	6.71555	2.665433	25.33896
1995	13.04	6.727401	0.007691	10.15528	8.063978	0.177874	7.660114	29.29774	8.717098	3.350688	25.08071
1996	12.12	11.58246	0.018677	12.8677	8.862896	0.325119	10.93268	19.61453	14.19749	5.610211	14.13922
1997	16.99	8.853704	0.015035	10.61056	7.41748	0.215265	9.047216	30.87424	14.56483	4.846713	12.06644
1998	12.89	9.948769	0.017192	11.76451	7.782921	0.217127	8.899733	24.40335	16.83862	5.188335	13.23742
1999	10.88	8.206667	0.016328	10.28296	9.799448	0.178769	7.969491	39.0806	17.37	4.730121	0.749106
2000	10.86	7.763912	0.016279	9.791774	8.551889	0.16678	7.155057	33.18185	15.32944	5.693475	10.73789
2001	12.89	7.990054	0.017299	8.539132	7.054536	0.114976	6.673008	39.03284	13.61339	5.042406	10.2098
2002	12.70	8.299379	0.020641	10.28624	11.62061	0.139929	10.68758	28.0154	21.76014	6.93951	0.187117

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

FIGURE C1. SOUTH AFRICA SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Source: own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C2. AFRICA'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Percentage of Total Imports

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	13.42	11.97468	0.008979	3.072071	8.807693	1.388127	8.605866	18.07237	39.73295	6.220332	1.228012
1981	0	13.3031	0.008791	2.832892	8.170659	1.302253	7.57063	17.44179	40.61278	6.942289	0.944544
1982	10.82	12.73005	0.010185	3.021476	8.447019	1.350298	7.565875	17.71078	40.75307	6.465208	0.937717
1983	10.65	14.01934	0.010414	3.320157	8.109979	1.601127	8.372216	17.7856	38.3548	6.389074	1.006297
1984	10.82	14.77628	0.010458	3.726525	5.578791	1.929875	8.848824	17.42294	39.0198	6.488707	1.162452
1985	11.03	14.44078	0.010521	3.791538	7.160338	2.075821	9.854928	17.74427	36.73347	5.986987	1.159776
1986	11.09	13.49436	0.011277	3.734371	4.660095	1.686311	10.6983	17.29058	38.97353	7.137144	1.197617
1987	11.3	12.49163	0.0105	3.894404	5.05175	1.321225	11.38838	17.24483	38.24452	7.908436	1.40487
1988	11.3	12.67638	0.010161	3.768717	3.360601	1.622597	11.60398	17.04791	39.52567	8.038232	1.339813
1989	11.29	13.79327	0.010507	4.153524	3.960808	1.462181	11.04507	17.94066	38.17816	7.045029	1.370587
1990	11	12.26234	0.010258	3.989828	4.987028	1.341613	10.16612	18.10181	39.43163	7.104548	1.589313
1991	11.1	11.59403	0.011831	3.582946	4.975687	1.404373	10.40689	18.14906	39.16316	7.756255	1.784483
1992	11.15	12.1454	0.014008	3.298223	3.693746	1.503323	10.17839	18.34943	39.47541	7.917641	2.0376
1993	11.06	11.86169	0.012266	3.108371	3.487249	1.414953	10.6491	18.39259	39.16486	8.590886	2.103723
1994	11.05	12.01397	0.011853	3.237659	3.216095	1.576602	10.49967	18.20093	39.66353	8.496244	1.910024
1995	11.44	12.23449	0.010928	3.744692	5.08907	1.772075	10.4383	18.34617	36.88999	8.523235	1.869255
1996	11.41	12.39509	0.01119	3.455654	4.754933	1.670084	10.33834	18.36287	37.53691	8.683074	1.684034
1997	11.53	12.18279	0.012226	3.940833	5.00944	1.546277	10.53893	18.10623	36.39064	8.618737	2.443548
1998	11.36	11.76261	0.011161	3.376411	4.096762	1.6978	10.35557	17.92853	38.41355	8.546131	2.70658
1999	12	10.97855	0.012662	3.044982	7.776835	1.580042	10.14288	17.76685	35.93683	8.742681	2.764151
2000	12.97	11.19215	0.01264	3.090155	10.30269	1.147539	9.886845	16.90337	35.84984	8.478008	1.885462
2001	12.65	11.49086	0.01277	2.653959	8.101815	1.046619	10.1078	17.22262	36.51939	8.42462	3.15534
2002	11.8	11.57784	0.012636	2.699647	9.268492	1.303586	10.39696	17.3629	35.38743	8.374318	2.365235

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.
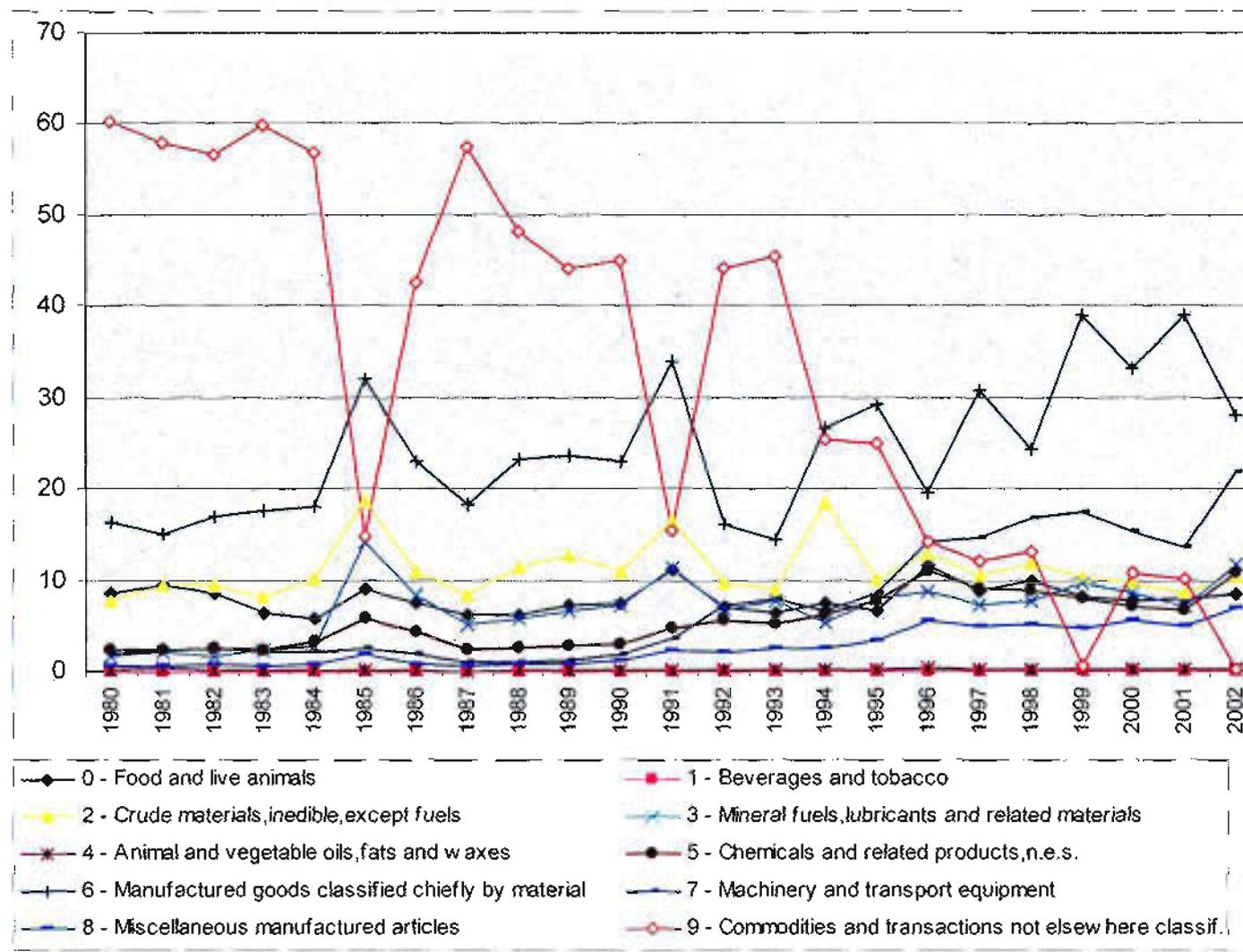
TABLE C3. MALAWI'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Percentage of Total Imports

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	13.81	4.766925	0.008661	1.888628	7.824541	1.03279	10.81642	23.95295	42.34387	5.394803	1.112984
1981	13.51	8.789715	0.010471	1.49849	9.214281	1.331346	13.25509	24.45406	31.23878	7.947834	1.223301
1982	13.81	5.146752	0.008979	2.716676	8.93918	1.322212	16.3711	28.28747	27.40519	7.570807	1.342683
1983	14.17	6.079281	0.010667	2.942427	8.26961	1.945995	16.7458	23.97037	31.84201	6.525419	0.612355
1984	12.38	5.656804	0.007733	4.473147	8.75367	2.006728	19.12277	21.80368	29.39417	7.598394	0.417351
1985	66.66	4.30232	0.007081	2.684214	18.30007	1.176299	17.87738	18.25349	30.64356	5.54084	0.513762
1986	66.67	3.86751	0.0093	2.40975	12.59822	0.943484	16.96492	17.86819	36.76107	6.715362	0.94155
1987	66.67	4.423699	0.001103	0.282006	0.391441	0.860327	12.86029	9.773385	56.55347	11.41828	3.326823
1988	66.67	10.03088	0.002483	0.511258	0.274119	0.695569	10.73349	12.74506	51.21387	10.18173	3.365735
1989	66.67	8.633784	0.002717	0.385203	0.311	1.867089	14.33217	12.7548	51.8469	6.822894	2.774443
1990	66.67	21.40985	0.014938	0.509347	0.558114	3.152601	8.912896	11.81048	44.56109	6.12842	1.463357
1991	66.67	7.329425	0.003574	1.882265	4.481052	0.933201	18.56766	20.96412	36.4134	7.801932	1.269525
1992	66.67	8.591126	0.024145	0.776399	0.424922	0.814862	16.22526	20.35452	42.14333	7.339436	0.915598
1993	67.01	10.01836	0.009904	1.140917	0.903767	1.17938	19.95106	23.90238	32.75528	8.214601	0.943882
1994	50.86	16.33697	0.015711	1.13883	2.895074	1.083673	13.16057	20.0029	33.78108	8.835424	1.194368
1995	66.67	10.73008	0.009198	0.988261	12.57171	0.93262	15.76285	19.60187	27.75476	9.05052	1.687567
1996	66.67	10.95929	0.021353	2.411558	1.378584	1.103638	17.77641	20.41623	34.00014	8.861009	0.957814
1997	66.67	8.724361	0.018585	2.077681	1.942372	1.488128	14.71142	20.76181	39.60533	7.516212	1.314139
1998	52.16	14.20966	0.014317	1.896139	2.235809	0.873306	13.53214	23.40023	32.03621	8.855632	1.529151
1999	60.91	11.80091	0.033512	2.161706	1.166689	0.889417	13.82125	17.79718	37.59777	9.288711	2.125188
2000	13.61	6.636119	0.039105	2.796157	4.618644	0.838889	13.79932	21.11525	34.7086	9.492695	2.083809
2001	NA	6.727506	0.051472	2.243947	4.78365	1.618435	13.79048	22.5465	31.96364	9.227501	1.951159
2002	NA	18.2043	0.021878	2.650527	2.104874	1.781562	16.24536	19.1092	26.82841	9.505954	1.382019

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C4. UNITED STATES CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Percentage of Total Imports

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	4.78	6.440903	0.010858	4.308576	34.02005	0.222975	3.343665	13.31505	26.37631	9.389512	1.49714
1981	4.74	5.678284	0.011561	4.27589	31.65904	0.176059	3.389349	14.47516	27.51014	10.19174	1.488235
1982	4.48	6.055142	0.013351	3.662664	27.28396	0.166468	3.688292	13.41114	31.04845	11.89552	1.453301
1983	4.58	6.110788	0.011693	3.669461	22.46484	0.205979	3.973554	13.64903	34.74134	12.65436	1.361332
1984	4.74	5.560468	0.010129	3.490972	18.79789	0.228208	3.981496	14.04962	38.03061	13.32535	1.522493
1985	4.74	5.465183	0.010409	3.054605	15.53317	0.199463	4.098844	13.76726	41.0201	14.46763	1.352831
1986	4.61	5.755365	0.010167	2.941661	10.28348	0.141778	4.101399	13.40531	44.76856	15.92704	1.658748
1987	4.48	5.143971	0.010045	3.190011	11.1077	0.157214	4.064037	13.41514	44.30162	16.58411	1.031663
1988	4.22	4.660528	0.009329	3.277339	8.881673	0.207136	4.616912	14.2641	45.25317	16.31779	1.588467
1989	4.17	4.458063	0.009027	3.07795	10.5207	0.161607	4.464546	13.60702	44.26801	16.93236	1.606991
1990	4.38	4.492033	0.009401	2.793884	12.88153	0.157536	4.508335	12.74185	42.70616	16.27862	2.499963
1991	4.08	4.615082	0.00984	2.580145	11.81331	0.168747	4.863074	12.37498	43.03164	16.70734	2.861663
1992	3.99	4.342017	0.00987	2.576022	9.280513	0.211716	5.230218	12.03148	44.81117	17.70014	2.829698
1993	3.95	3.994976	0.009538	2.555596	9.529536	0.189485	5.150259	11.85017	45.27338	17.92639	2.576409
1994	3.82	3.898051	0.007909	2.68261	7.639254	0.183825	5.132522	12.4255	47.24303	17.40225	2.602106
1995	3.67	3.719806	0.007241	2.754429	8.191405	0.190819	5.249999	12.41581	47.39679	16.69363	2.663172
1996	3.36	3.69562	0.008215	2.627758	10.00598	0.212286	5.410474	11.99641	46.40817	16.53309	2.288704
1997	3.27	3.787131	0.008532	2.58415	8.875324	0.190212	5.595789	12.05224	46.42795	16.9883	2.645745
1998	3.56	3.782796	0.008235	2.376763	5.665638	0.170763	5.831954	12.73848	47.82707	17.77713	3.005869
1999	3.40	3.474721	0.00806	2.17945	7.586845	0.143546	5.824718	11.87557	48.12796	17.1202	2.861039
2000	3.39	3.143359	0.007093	1.856178	11.63452	0.119663	5.614505	11.31231	46.69446	16.28639	2.629392
2001	3.35	3.413654	0.008203	1.841048	11.0238	0.106528	6.344937	11.18497	45.60896	16.76771	2.88803
2002	3.34	3.452513	0.009103	1.797465	9.979891	0.129234	7.115648	11.3489	45.1174	16.98804	3.160542

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C5. WORLD CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Percentage of Total Imports

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	6.64	8.894876	0.008961	6.37782	23.46569	0.560803	7.136526	16.06744	25.18898	8.220785	3.190951
1981	0	9.130258	0.00932	5.874304	23.52711	0.525248	7.043807	15.08142	26.55286	8.49824	2.834793
1982	6.65	8.934852	0.010116	5.553582	22.37577	0.505233	7.282069	14.87235	27.64025	8.909845	2.9144
1983	6.67	8.994866	0.009663	5.654414	20.59568	0.549678	7.56957	14.96768	28.47984	9.164064	3.057872
1984	6.15	8.653592	0.009181	5.847828	19.42038	0.716162	7.802072	14.92298	29.49454	9.486037	2.738365
1985	5.72	8.185019	0.009691	5.515672	16.56786	0.670423	8.097083	15.23249	31.37895	10.03001	3.353395
1986	5.33	8.554224	0.010085	5.352901	11.20637	0.439137	8.570962	15.84453	34.01264	11.49371	3.517039
1987	5.33	7.937976	0.010193	5.394272	10.44948	0.404934	8.822108	15.95988	34.05314	11.96635	3.99252
1988	5.27	7.934601	0.01005	5.580133	7.381259	0.433374	9.080014	16.6555	34.63412	11.98247	5.313534
1989	5.27	7.808832	0.010367	5.480945	8.409051	0.420281	8.780086	17.03302	35.21143	12.32409	3.495603
1990	5.22	7.392184	0.011429	4.702852	10.13607	0.38238	8.571751	16.33286	35.43562	12.60769	3.29562
1991	5.24	7.550752	0.011975	4.281925	9.10488	0.38684	8.767015	16.14633	36.37558	13.05826	3.130888
1992	5.33	7.600614	0.012397	4.05147	7.867313	0.390766	8.814291	15.89979	37.17328	13.72719	3.235529
1993	5.44	7.438899	0.012056	3.811015	7.438636	0.389529	8.955767	15.79758	37.7198	13.80302	3.440111
1994	5.4	7.232804	0.011917	4.053487	6.392232	0.474427	9.143056	16.03895	38.46053	13.44709	3.565774
1995	5.27	7.018138	0.010952	4.098374	6.806208	0.501525	9.206245	16.29165	38.1036	12.74795	4.131082
1996	5.25	6.990949	0.011367	3.729823	8.16932	0.448732	8.997458	15.33742	38.70021	12.83383	3.655539
1997	5.24	6.59952	0.010969	3.652236	7.885246	0.466264	9.014517	15.21194	39.30548	13.13327	3.634675
1998	5.06	6.469158	0.010859	3.358079	5.528249	0.505718	9.319748	15.2705	41.38492	13.48306	3.594701
1999	5.52	6.040484	0.010381	3.067479	7.128887	0.423242	9.251112	14.52374	41.81121	13.42611	3.289685
2000	6.22	5.310599	0.008819	3.008425	10.36698	0.296021	8.841609	13.94285	41.45196	12.75538	3.144314
2001	6.11	5.695128	0.009235	2.982634	9.621778	0.303314	9.490002	13.91553	40.5923	13.02768	3.448122
2002	5.5	5.640851	0.009461	2.965117	9.058086	0.386152	10.04768	13.86844	40.47766	12.92315	3.68675

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C6. MAURITIUS' CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	20.99329	21.74843	0.005893	4.179534	12.85231	2.390103	6.504099	25.6382	18.0315	7.146889	0.91962
1981	16.82355	24.74636	0.005113	3.996537	17.88579	2.972631	6.487538	22.15384	15.4295	5.691104	0.125399
1982	16.89166	26.01883	0.003856	4.700066	17.37568	3.095324	7.481388	23.71476	10.62071	6.409476	0.198219
1983	15.69675	20.73452	0.0051	4.539624	19.73339	3.165488	7.256247	25.04874	11.97078	6.769695	0.271542
1984	14.70256	18.72122	0.002518	4.414038	22.24349	3.414205	5.198903	29.41447	9.953213	6.022279	0.366424
1985	16.18489	14.84013	0.003293	5.305469	19.58049	3.075598	5.02897	32.2001	11.07672	7.521033	1.042165
1986	10.9115	10.24734	0.00428	3.849713	0.291924	1.69018	5.915924	43.09949	22.76067	10.07658	1.640186
1987	11.41783	8.221052	0.002964	3.163707	5.655548	1.015759	4.740569	42.28076	23.94205	8.428278	2.255878
1988	10.32762	7.630583	0.003659	1.990796	0.462673	1.219852	5.72227	32.89855	37.50212	9.985243	2.222025
1989	10.5056	10.9828	0.004606	3.232668	0.577163	1.217501	6.015528	36.75579	28.55462	10.65155	1.551765
1990	9.570731	10.13922	0.005054	2.538559	8.853547	0.752347	6.185428	35.57183	25.53396	8.79902	1.120717
1991	9.773996	9.604385	0.005566	2.424675	10.42628	0.685343	5.954188	33.13759	26.98671	9.238059	0.986169
1992	10.24377	11.26133	0.00724	2.3137	3.58411	1.062977	7.149511	36.30017	25.92841	10.22762	1.448181
1993	10.22285	11.77623	0.006105	2.507817	1.544774	0.983811	7.471592	38.70562	23.7642	11.30016	1.335269
1994	9.325654	10.97578	0.006651	2.214451	2.673683	1.105969	6.406695	33.77995	30.82407	10.17446	1.179882
1995	9.061191	12.77107	0.006655	2.575249	4.565027	0.855466	6.872986	35.16518	24.4422	10.74363	1.343728
1996	7.903239	12.96583	0.005776	2.839757	1.502524	0.826634	7.390965	35.46507	27.5309	9.712007	1.188723
1997	8.275781	12.20702	0.00614	2.404764	3.758266	0.998771	6.697762	34.49425	27.76616	9.651856	1.407119
1998	8.249484	12.98047	0.007403	2.709573	2.684931	1.223922	7.189762	36.08047	23.79	10.40209	2.19846
1999	NA	11.43279	0.008624	1.788328	3.814152	0.888853	6.100102	32.41608	31.39396	9.857936	1.445394
2000	NA	12.19798	0.006906	1.649335	6.437685	0.706743	7.038165	35.38026	23.91482	11.05123	0.93314
2001	NA	13.42683	0.006833	1.969338	5.28576	0.752022	7.382349	32.94044	24.33357	11.59078	1.635576
2002	NA	14.27283	0.009781	2.22703	8.262109	0.842066	7.154837	31.35366	21.95633	10.62153	2.331466

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C7. NEW ZEALAND'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	NA	4.513048	0.00797	3.55249	23.70467	0.34071	10.19914	17.99104	29.87014	7.314698	1.717036
1981	18.7604	4.096767	0.007982	3.696231	20.23548	0.377009	10.60676	17.50353	33.70251	7.640882	1.342681
1982	9.286282	5.087	0.008346	3.668172	17.70851	0.364812	10.05483	18.53212	34.7896	7.27894	1.681391
1983	15.35319	4.853529	0.008019	3.330282	17.65715	0.500506	10.70115	18.2762	33.72598	8.341525	1.811816
1984	33.43661	4.304965	0.009009	2.726993	14.37728	0.617334	11.33662	19.39922	34.5287	8.208677	3.599314
1985	10.1096	4.107077	0.007391	2.694441	11.81492	0.552168	11.0044	18.32501	38.99742	8.827899	2.937526
1986	9.163575	4.667021	0.009908	3.290359	7.850962	0.334853	10.82351	17.74983	41.49176	10.31971	2.481215
1987	9.095689	4.662179	0.009011	3.437715	6.79037	0.315637	11.6981	18.50227	40.82846	10.61776	2.246376
1988	9.186037	5.691296	0.012324	3.990249	3.647284	0.429619	12.21461	18.85819	38.82667	13.15754	1.952173
1989	9.459108	5.002871	0.009731	1.741944	3.637	0.326278	11.42118	16.64537	42.99808	12.66422	4.589998
1990	9.125922	4.029333	0.009513	1.698087	7.757885	0.261237	10.30021	14.63753	42.84114	11.97721	5.546084
1991	9.38253	4.919719	0.009732	1.636661	6.558212	0.302274	11.87283	16.23694	37.37493	13.98242	6.142841
1992	8.38975	4.519014	0.008876	1.629633	5.322398	0.420592	11.82279	15.62183	41.02436	13.33954	5.412213
1993	8.599524	4.657879	0.009812	1.765071	2.755884	0.436907	12.88877	15.42686	40.46259	13.88335	6.741443
1994	8.057974	4.313415	0.009402	1.607456	5.456573	0.426798	11.53724	14.5108	43.30939	12.88685	5.011252
1995	7.791022	5.149487	0.009068	1.928308	5.461521	0.383648	11.84833	15.07412	44.01929	12.83238	2.396044
1996	7.819822	5.384678	0.009889	1.755215	6.426355	0.346339	11.58052	14.46024	43.02998	13.69641	2.331356
1997	7.455969	5.615042	0.010655	2.397942	6.40534	0.294358	11.09586	13.86903	41.72812	14.44853	3.080304
1998	7.683793	6.196325	0.012182	2.565676	4.630576	0.486565	10.54454	12.19571	43.75396	14.2047	4.20377
1999	6.596949	5.525161	0.011954	2.222797	5.113252	0.359804	10.94101	13.58135	43.63702	14.06892	3.355275
2000	6.533569	5.684136	0.011669	1.566496	8.703104	0.346654	11.0716	13.70361	40.14693	14.16888	3.44166
2001	6.990409	5.931104	0.011815	1.921324	8.008561	0.304584	11.44862	12.7622	41.37999	13.51663	3.545501
2002	6.623805	6.144556	0.012589	1.752355	8.546365	0.429312	10.80243	13.05363	40.89965	13.31985	3.792967

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C8. CONGO'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	22.17891	14.76694	0.018768	1.16027	9.289084	0.846246	9.948763	24.92097	28.37477	8.291829	0.524373
1981	22.62608	9.25146	0.00891	0.822063	13.89995	0.431258	6.348956	22.89077	37.89176	7.043881	0.528923
1982	22.42727	8.211714	0.0116	0.610185	7.570431	0.438803	5.048288	19.60012	50.64546	6.360122	0.354884
1983	22.89372	10.98196	0.013788	0.617438	3.664711	0.539873	6.303874	20.80629	47.07475	8.054769	0.57752
1984	22.93201	16.05303	0.018064	0.645044	3.684414	1.252431	8.038601	22.67565	35.89577	9.205039	0.74359
1985	22.89977	14.7095	0.016331	0.740415	2.329078	0.729302	7.704035	24.15188	37.8895	9.573133	0.540031
1986	22.90029	10.07007	0.01691	0.561013	0.880717	1.866778	10.24768	17.10692	42.04323	15.08734	0.445258
1987	22.9001	11.14645	0.016307	1.317784	1.491714	2.968101	11.1209	16.82569	38.87143	13.60681	1.020378
1988	22.90003	14.69518	0.014507	0.987599	0.899341	1.44756	12.18025	17.66753	35.27246	14.47899	0.920345
1989	22.90769	13.29607	0.013883	0.961446	1.252763	0.975862	11.44565	15.76976	40.40596	13.94918	0.555004
1990	22.89454	12.01778	0.009478	0.796551	0.452873	0.808267	10.42764	17.42976	40.0164	15.90165	1.201309
1991	22.89854	14.21448	0.013408	0.916266	1.496593	1.223019	9.505816	15.56515	38.15183	16.68556	0.900444
1992	22.90006	15.73203	0.009877	0.87287	0.604866	1.47253	10.84	16.79348	31.51655	20.40929	0.770695
1993	22.89982	15.45609	0.008161	1.023009	0.688962	0.516982	12.0897	13.24904	35.54762	19.66167	0.950844
1994	3	17.33619	0.012083	1.34863	2.138877	2.129299	11.79222	14.72402	33.83604	13.55624	1.930179
1995	2.983975	9.977844	0.012396	1.168919	1.418871	1.317576	8.95101	33.87175	31.5504	8.882943	1.621088
1996	3	7.045952	0.007007	0.658657	1.548039	0.530128	5.334513	10.31639	67.22581	5.78778	0.852019
1997	3	14.28022	0.012427	2.221953	2.20646	1.167587	10.12834	25.44653	28.65184	11.49668	3.157675
1998	21.82392	14.99111	0.008251	2.646562	1.76004	1.27598	11.20218	14.70124	31.57582	19.18771	1.834269
1999	17.54653	18.77911	0.017411	2.763914	4.023221	1.670203	11.45525	17.07996	27.94913	12.75929	1.778847
2000	3	20.57634	0.020629	3.18154	2.050084	1.837257	12.87741	15.86592	29.31742	10.94156	1.289549
2001	NA	18.04208	0.015333	3.504909	1.741053	1.320975	11.15313	15.24398	37.58112	8.873889	1.00561
2002	NA	15.60034	0.016867	2.99226	2.850378	2.037505	14.33457	16.98648	31.6944	10.66443	1.152909

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C9. AUSTRALIA'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	10.13436	3.597446	0.008401	3.777547	14.82445	0.397987	8.395	17.22731	37.15935	12.27907	1.501694
1981	10.83755	3.152885	0.007714	3.242109	14.38813	0.327797	7.840434	16.52021	39.8679	12.41875	1.4704
1982	13.00336	3.298267	0.008117	2.686815	14.65683	0.345237	7.328337	16.63769	40.46366	12.61102	1.160452
1983	12.34213	4.185243	0.00835	2.993293	11.04798	0.438901	8.34759	15.87031	40.91865	14.05572	1.30727
1984	14.23272	4.280342	0.007515	2.983763	9.433565	0.462249	8.375719	17.08885	41.03358	14.14454	1.445938
1985	11.84425	4.04047	0.007907	2.717172	5.241057	0.317384	8.087013	15.78812	47.04335	14.27886	1.695847
1986	9.287154	4.153894	0.008656	2.624386	4.419499	0.233116	8.030724	15.7156	46.26002	15.85503	1.84212
1987	8.700512	4.672368	0.009413	3.078882	1.427211	0.12701	2.745154	16.89725	49.38461	17.19219	3.534005
1988	8.272822	3.829686	0.00845	3.579441	2.366422	0.276653	10.37884	16.95205	45.71163	13.95077	2.109578
1989	9.811313	3.602128	0.00742	2.939852	4.426214	0.2514	8.53865	16.35765	46.58555	14.37365	2.18285
1990	7.98703	3.632302	0.007866	2.53824	5.812578	0.259014	8.516588	14.84791	45.61988	14.50388	3.483043
1991	7.5466	4.00139	0.0078	2.3451	4.947138	0.303621	8.99689	15.42215	43.77913	14.90361	4.520929
1992	7.600022	3.777827	0.007524	2.334089	4.240133	0.351322	9.484026	15.22524	43.11106	16.03771	4.686191
1993	7.440891	3.770308	0.007317	2.314884	4.245678	0.352403	9.852189	14.62545	44.22351	16.1546	3.729311
1994	7.04246	3.827853	0.00704	2.197373	3.802119	0.312178	9.296956	14.23586	46.61594	15.6834	3.324358
1995	6.720281	3.606825	0.00641	2.019841	5.000618	0.315524	9.767116	14.23435	46.47298	14.49097	3.450758
1996	6.557231	3.421265	0.00652	1.757398	6.191314	0.364366	10.07783	13.29843	46.73791	14.43571	3.063806
1997	6.621563	3.533293	0.00704	1.666243	5.884826	0.337039	10.03782	13.32819	45.55159	15.35478	3.60221
1998	6.391448	3.427284	0.006208	1.553282	4.05355	0.345483	10.55887	12.81407	44.82855	15.85027	5.947828
1999	5.626639	3.630308	0.006966	1.498671	5.885538	0.304801	10.69393	12.49652	45.57358	15.18634	4.033746
2000	5.666724	3.503168	0.007192	1.619713	9.35622	0.262004	9.78286	11.76043	45.36477	14.57254	3.059058
2001	5.267687	3.685442	0.007788	1.334095	8.220106	0.241082	11.32146	11.67301	43.2736	14.99193	4.480532
2002	5.509383	3.499758	0.007562	1.341518	6.616947	0.27853	10.13303	11.67759	46.37338	14.51267	4.810366

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C10. GERMANY'S CIF/FOB RATIO AND SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

	CIF/FOB	0	1	2	3	4	5	6	7	8	9
1980	3.008358	10.08286	0.01032	7.659285	22.14686	0.42318	7.192052	18.69936	19.28373	12.24465	1.235999
1981	3.316272	10.21989	0.011156	7.177354	23.25607	0.440298	7.536509	16.91134	20.51765	11.92618	0.899083
1982	3.091677	10.36901	0.011511	7.065312	23.15392	0.441759	8.052748	16.49334	20.42918	11.77992	1.063659
1983	3.085767	10.34504	0.010993	6.936055	20.65516	0.474386	8.313193	16.97546	22.12986	12.07646	0.995099
1984	3.046878	10.07919	0.01005	7.106333	19.91738	0.675718	8.728968	16.84943	22.29333	12.25521	1.089458
1985	2.806162	9.691775	0.010863	6.837653	18.40515	0.56136	9.211737	16.99854	23.86514	12.30912	1.033169
1986	2.680273	10.67051	0.011232	6.399544	11.16531	0.323183	9.418016	18.30592	27.23422	14.19731	1.162814
1987	2.540727	9.882531	0.011365	6.024781	9.172952	0.280031	9.534294	18.26389	28.92202	15.64911	1.133907
1988	2.611929	9.623316	0.010522	6.416729	7.289507	0.329893	9.671663	19.43477	29.80566	15.30439	1.071847
1989	2.648988	8.81967	0.009999	6.417167	7.474322	0.325475	9.348494	19.71321	30.76065	14.80569	1.335464
1990	2.425421	8.345467	0.010383	4.968465	8.439074	0.253724	8.745986	18.70406	32.90244	15.03243	1.569991
1991	2.585748	8.322667	0.010846	4.211148	8.473358	0.236881	8.261543	17.43208	34.58539	16.09269	1.299595
1992	2.551574	8.548112	0.010947	4.198852	7.46143	0.261177	8.33218	17.63463	34.60685	16.69871	1.163357
1993	2.786999	9.293652	0.011017	3.869034	6.832409	0.254654	8.486564	17.20129	33.56801	18.16123	1.23151
1994	2.800038	8.988053	0.01088	4.116049	6.3262	0.303468	8.881633	17.89165	34.0945	17.19735	1.113117
1995	2.800008	8.479271	0.010472	4.073599	5.479078	0.277611	8.64101	18.76086	35.0866	16.35706	1.797754
1996	2.800063	8.312509	0.01077	3.624999	7.277466	0.262267	8.664997	17.03627	35.81345	16.84479	1.086249
1997	2.799984	7.72388	0.01049	3.758633	7.026928	0.28227	8.642773	16.57514	36.81432	16.31782	1.809296
1998	2.799963	7.295281	0.010577	3.527605	5.259764	0.261602	9.31233	16.70457	38.65045	15.96459	1.966144
1999	NA	6.8499	0.011603	3.017023	5.47947	0.246456	9.227134	15.99976	40.26794	15.99622	1.755795
2000	NA	5.774801	0.009755	3.024354	8.968155	0.196496	8.986343	15.29281	40.09119	14.99032	1.700037
2001	NA	6.160509	0.009919	2.882061	7.891953	0.213562	9.748423	14.73729	40.26936	14.75431	2.35066
2002	NA	6.245567	0.01083	2.950516	7.212404	0.253296	10.92251	14.30079	40.43645	14.30541	2.290038

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

TABLE C11. RAW CORRELATION RESULTS BETWEEN VARIOUS COUNTRY AND COUNTRY GROUP CIF/FOB RATIOS AND THEIR RESPECTIVE SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS

(see Chapter 3.1 and table 3.2 for a summary, analysis and interpretation of these raw results)

World 1982-2002	Correlation Analysis SITC Category	n	r	t	Africa 1982-2002	SITC Category	n	r	t
	0	21	0.231915	1.039229		0	21	-0.62411	-3.48178
	1	21	-0.60276	-3.29279		1	21	0.549964	2.870293
	2	21	0.223081	0.997525		2	21	-0.45831	-2.24771
	3	21	0.824342	6.347421		3	21	0.511092	2.59189
	4	21	0.227572	1.018692		4	21	-0.5475	-2.85193
	5	21	-0.62862	-3.52329		5	21	0.231402	1.036797
	6	21	-0.58384	-3.13463		6	21	-0.44689	-2.17747
	7	21	-0.50942	-2.58043		7	21	-0.72154	-4.54258
	8	21	-0.70795	-4.36934		8	21	0.584483	3.139865
	9	21	-0.50831	-2.57284		9	21	0.645993	3.688797

USA 1980-2002	Correlation Analysis SITC Category	n	r	t	Mauritius 1980-1998	SITC Category	n	r	t
	0	23	0.933083	11.88877		0	19	0.805753	5.609456
	1	23	0.77911	5.695329		1	19	-0.39998	-1.79936
	2	23	0.84483	7.235959		2	19	0.821567	5.941647
	3	23	0.666151	4.093074		3	19	0.776666	5.083687
	4	23	0.416681	2.100509		4	19	0.847831	6.59235
	5	23	-0.92469	-11.13		5	19	-0.12775	-0.53109
	6	23	0.853012	7.490063		6	19	-0.73237	-4.43475
	7	23	-0.71617	-4.70238		7	19	-0.75647	-4.76886
	8	23	-0.68634	-4.32456		8	19	-0.82484	-6.01542
	9	23	-0.82929	-6.80052		9	19	-0.62608	-3.31047

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.

TABLE C11. RAW CORRELATION RESULTS BETWEEN VARIOUS COUNTRY AND COUNTRY GROUP CIF/FOB RATIOS AND THEIR RESPECTIVE SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS (CONTINUED)

South Africa 1980-2002	Correlation Analysis SITC Category	n	r	t	South Africa 1995-2002	SITC Category	n	r	t
	0	23	0.250711	1.186809		0	8	0.052773	0.129448
	1	23	0.706099	4.569543		1	8	-0.18226	-0.45404
	2	23	0.014572	0.066782		2	8	0.030057	0.073657
	3	23	0.428646	2.174169		3	8	-0.40296	-1.07849
	4	23	0.180068	0.838887		4	8	0.091672	0.2255
	5	23	0.766285	5.465455		5	8	0.177579	0.442003
	6	23	0.478246	2.495483		6	8	-0.13933	-0.34466
	7	23	0.705916	4.567181		7	8	-0.17357	-0.43172
	8	23	0.726741	4.848283		8	8	-0.18061	-0.44979
	9	23	-0.6751	-4.19351		9	8	0.257009	0.651422

New Zealand 1981-2002	Correlation Analysis SITC Category	n	r	t	Germany 1980-1998	SITC Category	n	r	t
	0	22	-0.45731	-2.29972		0	19	0.469569	2.192879
	1	22	-0.41164	-2.01997		1	19	0.14208	0.591815
	2	22	0.340893	1.621656		2	19	0.469945	2.195131
	3	22	0.578455	3.171365		3	19	0.772766	5.020075
	4	22	0.584051	3.217818		4	19	0.647323	3.501612
	5	22	-0.09012	-0.40468		5	19	-0.60074	-3.0983
	6	22	0.57116	3.111825		6	19	-0.52229	-2.52527
	7	22	-0.66283	-3.95884		7	19	-0.65162	-3.5419
	8	22	-0.63404	-3.66678		8	19	-0.64054	-3.43916
	9	22	-0.16939	-0.76864		9	19	-0.32491	-1.41649

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.

TABLE C11. RAW CORRELATION RESULTS BETWEEN VARIOUS COUNTRY AND COUNTRY GROUP CIF/FOB RATIOS AND THEIR RESPECTIVE SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS (CONTINUED)

AUSTRALIA 1980-2002	Correlation Analysis SITC Category	n	r	t	Malawi 1980-2000	SITC Category	n	r	t
	0	23	0.300109	1.441727		0	21	0.326118	1.503723
	1	23	0.457561	2.358142		1	21	-0.12168	-0.53435
	2	23	0.738875	5.024846		2	21	-0.57785	-3.08617
	3	23	0.474984	2.473479		3	21	-0.32121	-1.47847
	4	23	0.432914	2.20078		4	21	-0.1402	-0.6172
	5	23	-0.52976	-2.86234		5	21	0.038396	0.167489
	6	23	0.81155	6.365044		6	21	-0.61726	-3.41979
	7	23	-0.49633	-2.61998		7	21	0.406454	1.939091
	8	23	-0.48707	-2.55566		8	21	0.1857	0.823777
	9	23	-0.81207	-6.37691		9	21	0.281586	1.279166

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005. Own correlation analysis between SITC imports as a proportion of total imports and country cif/fob ratios.

TABLE C12. LATIN AMERICA'S SITC IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002
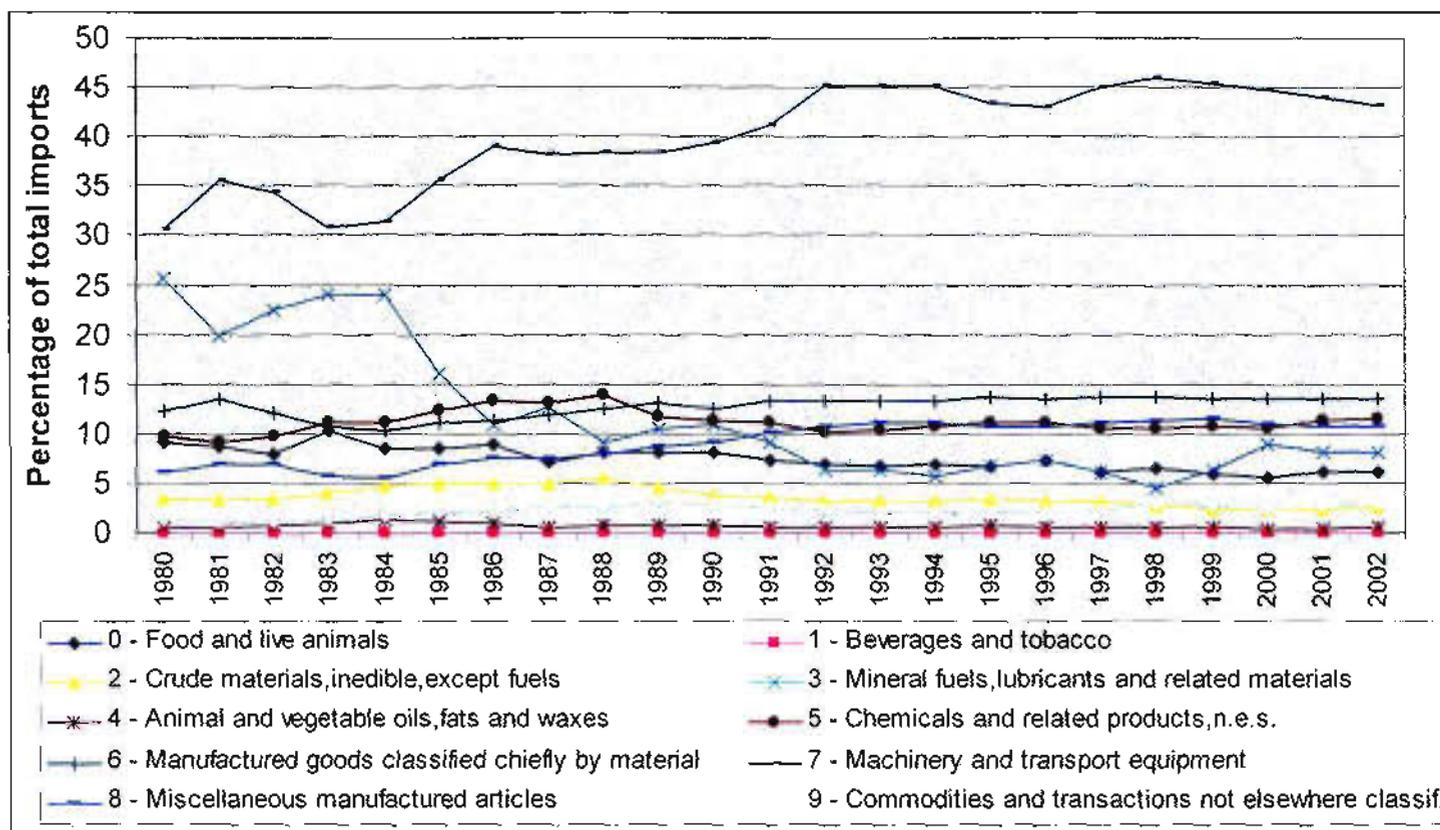
	0	1	2	3	4	5	6	7	8	9
1980	9.199051	0.007225	3.385878	25.71866	0.668667	9.727388	12.39177	30.61819	6.221113	1.346806
1981	8.825822	0.006743	3.348408	19.96836	0.640656	9.224631	13.45308	35.69785	6.97034	1.196538
1982	7.983042	0.007404	3.439358	22.44932	0.704869	9.729332	12.13386	34.51853	7.063304	1.237937
1983	10.39854	0.006308	3.909111	24.13964	1.023945	11.07554	10.80047	30.8868	5.822219	1.312929
1984	8.590528	0.005239	4.872358	24.0704	1.3797	11.22696	10.44835	31.55398	5.636146	1.697641
1985	8.49775	0.006202	4.956425	16.09888	1.203762	12.4398	11.23831	35.75556	6.941141	2.248184
1986	8.890303	0.007267	4.944688	10.99879	0.943957	13.3438	11.42593	38.98766	7.53383	2.204308
1987	7.126027	0.007392	4.999297	12.80371	0.659619	13.22844	11.92145	38.26955	7.537382	2.715305
1988	8.147676	0.008801	5.552223	9.148234	0.887244	13.84748	12.58209	38.46171	7.909512	2.583688
1989	8.257487	0.007254	4.658601	10.61325	0.81811	11.67163	13.05401	38.36074	8.720106	3.120677
1990	8.149084	0.008628	3.863832	10.91029	0.736393	11.33503	12.58323	39.36402	9.233659	2.961648
1991	7.335845	0.009506	3.497176	9.232221	0.67866	11.09177	13.27936	41.15834	10.09552	2.680496
1992	6.961446	0.009694	3.185601	6.41143	0.605875	10.13862	13.31527	45.27903	10.73093	2.402423
1993	6.787417	0.010134	3.173001	6.289172	0.62425	10.35639	13.33256	45.17174	11.07438	2.177672
1994	6.972303	0.009413	3.26181	5.684102	0.682755	10.67323	13.25958	45.13989	11.20843	2.17655
1995	6.831726	0.009776	3.376676	6.759341	0.751593	11.2253	13.78716	43.42928	10.71983	2.141442
1996	7.306679	0.008384	3.251313	7.340359	0.641227	11.06986	13.60154	43.0638	10.79395	2.092917
1997	6.229195	0.008217	3.133706	6.190131	0.596539	10.63447	13.75131	45.08809	11.12409	2.430741
1998	6.552615	0.007844	2.746519	4.586599	0.67712	10.55617	13.83509	46.01456	11.33684	2.910094
1999	6.034391	0.006522	2.429717	6.36585	0.52598	10.67494	13.49164	45.48917	11.4543	2.881842
2000	5.519393	0.004959	2.45998	8.954883	0.396176	10.47194	13.54903	44.82204	10.88515	2.44549
2001	6.104432	0.005564	2.389899	8.080728	0.394109	11.27457	13.56774	44.10622	10.753	2.772871
2002	6.112439	0.005146	2.6124	8.124161	0.536848	11.50057	13.62279	43.25178	10.69232	3.032142

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 calculations of country import cif/fob ratios using data from *International Financial Statistics*. Own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.

FIGURE C2. LATIN AMERICA'S IMPORTS AS A PROPORTION OF TOTAL IMPORTS, 1980-2002

Source: own calculations of import proportions using Standard International Trade Classification Revision 2 data from World Trade Database in TIPS, 2005.