Identifying export opportunities for South Africa in South America with special reference to measuring trade barriers

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SUMMARY

South African exports to South America have not increased in recent years, despite the high growth in import demand in South America. Reasons for the latter may include the high barriers to trade between South Africa and the different South American countries.

The main objectives of this study are firstly, to determine and measure the barriers to trade for South Africa in the different South American countries; secondly, to identify realistic export opportunities for South Africa in the South American countries and finally, to assist the various export promotion organisations, export councils and industry associations to focus their export promotion activities on the product-country combinations with a realistic potential for export success.

The literature study focused on defining and identifying the different barriers to trade and their influence on trade. Trade barriers are any parts of the trading process that increase trade costs. The trade barriers focused on in this study are tariffs, non-tariff barriers (NTBs), transport cost, time to import, infrastructure, logistics, distance, cultural distance and exchange rate. The effect of these costs on prices and the result on the price competitiveness of export prices are discussed.

The four largest trade barriers that South Africa faces when exporting to South American countries are tariffs, cost, time and language. Compared to the world, South America applies relatively high tariffs for goods imported from South Africa. The total transport cost and time are higher than the world averages. The language gap is also large, because Spanish is South America's overall most spoken language.

The Decision Support Model (DSM), developed by Cuyvers *et al.* (1995) and Cuyvers (1997), was chosen as the methodology to identify the most recent realistic export opportunities for South Africa in the South American countries (as described in the methodology). Filter 3.2 of the DSM was reconstructed and the data was updated.

The DSM results are presented according to product-country combinations. The South American countries in the top 50 product-country combinations, ranked according to each country's number of export opportunities, are Brazil (25), Peru (7), Argentina (5), Colombia (4), and Chile (4). These five countries are also the countries with the lowest trade barriers for

South Africa in South America. The products with the highest potential export values within the top 50 product-country combinations are: transportation products (e.g. 1500 cc-3000 cc automobiles and diesel trucks), mineral products (e.g. different variations of coal, anthracite and sulphurs), vegetable products (e.g. maize (except seed corn) and fresh pears and quinces), chemicals (e.g. polypropylene, ammonium, monoammonium, nitrogen-phosphorus-potassium), machinery (e.g. generators, engines, furnaces, boring machines etc.) and foodstuffs (wine, sugar and tobacco). It is recommended that the South African trade promotion organisations, namely the Department of Trade and Industry (DTI), the provincial trade promotion organisations, the various export councils and industry organisation use the results of this study to focus their investments in the production and export promotion strategies on the identified product-country combinations.

Keywords: Trade barriers, market accessibility, South Africa, South America, export opportunities, product-country combinations, export promotion.

OPSOMMING

Ten spyte van die groei in Suid-Amerikaanse invoer die afgelope paar jaar, het Suid-Afrika se uitvoer na die verskillende Suid-Amerikaanse lande nie toegeneem nie. Die lae vlakke van uitvoer sowel as stadige groei in uitvoer kan moontlik aan die handelsbeperkinge wat Suid-Afrika teëkom in hul uitvoer na Suid-Amerikaanse-lande toegeskryf word.

Die hoofdoelwitte van die studie is om eerstens die handelsbeperkinge tussen Suid-Afrika en die verskillende Suid-Amerikaanse lande te bepaal en te meet; tweedens, om realistiese uitvoergeleenthede vir Suid-Afrika in die Suid-Amerikaanse lande te identifiseer; en laastens om uitvoerbevorderingsorganisasies, uitvoer-rade en uitvoerassosiasies te ondersteun om hul uitvoerbevorderingsaktiwiteite op produk-land kombinasies, wat 'n realistiese potensiaal vir uitvoersukses aandui, te fokus.

Die literatuurstudie het daarop gefokus om die verskillende handelsbeperkinge te definieer en te identifiseer, sowel as om handelsbeperkinge se invloed op uitvoer te bepaal. Handelsbeperkinge staan bekend as enige element van die handelsproses wat die koste om handel te dryf, verhoog. In dié studie word daar op die volgende handelsbeperkinge gefokus: tariewe, nie-tarief-beperkinge, vervoerkoste, die tyd om in te voer, infrastruktuur, logistiek, kulturele afstand en die wisselkoers. Die effek wat die kostes op die pryse van produkte het, asook die invloed wat dit op prys-mededingendheid van uitvoerprodukte het, word bespreek.

Die vier grootste handelsbeperkinge wat Suid-Afrika gedurende die uitvoerproses na Suid-Amerika teëkom, is: tariewe, handelskoste, tydsduur om uit te voer, sowel as die taalverskille. In vergelyking met die wêreld, vra Suid-Amerika hoër tariefbeperkings vir invoer vanaf Suid-Afrika. Die totale vervoerkoste en -tyd om vanaf Suid-Afrika na Suid-Amerika uit te voer, is hoër as die totale vervoerkoste en -tyd om vanaf al die ander wêreldlande na Suid-Amerika toe uit te voer. Die taalverskil tussen Suid-Afrika en Suid-Amerika is groot, omdat die meeste Suid-Amerikaners net Spaans kan praat.

Die besluitnemingsondersteuningsmodel, wat deur Cuyvers *et al.* (1995) en Cuyvers (1997) ontwikkel is, is die gekose model om die realistiese uitvoergeleenthede vanaf Suid-Afrika na Suid-Amerika te identifiseer. Filter 3.2 van die besluitnemingsondersteuningsmodel is geherstruktureer en die data is opgedateer.

Die besluitnemingsondersteuningsmodel se resultate is volgens produk-landkombinasies aangebied. Die Suid-Amerikaanse lande wat in die top 50 produk-landkombinasies is, is die volgende (gelys volgens die aantal uitvoergeleenthede): Brasilië (25), Peru (7), Argentinië (5), Colombia (4) en Chili (4). Hierdie vyf lande is ook die lande met die laagste handelsbeperkinge vir Suid-Afrika in Suid-Amerika. Die produkte met die grootste uitvoerpotensiaal in die top 50 produk-land kombinasies is: vervoerprodukte (bv. 1500 cc-3000 cc motors en dieseltrokke), mineraalprodukte (bv. verskillende variasies van steenkool, antrasiet en sulfate), groente (bv. mielies (behalwe saadkoring) en vars pere en kwepers), chemikalieë (bv. polipropileen, ammonium, monoammonium, stikstof-fosfor-kalium), masjinerie (bv. kragopwekkers, enjins, oonde, boormasjiene) en voedselprodukte (bv. wyn, suiker en tabak). Daar word aanbeveel dat die Suid-Afrikaanse uitvoerbevorderingsinstansies, naamlik die Departement van Handel en Nywerheid, provinsiale uitvoerbevorderingsorganisasies, uitvoer-rade en industrie-assosiasies, die resultate van hierdie studie gebruik om hul investering in produksie- en uitvoerbevorderingstrategieë op die produk-landkombinasies met die grootste uitvoerpotensiaal in Suid-Amerika te fokus

Sleutelwoorde: Handelsbeperkinge, mark-toeganklikheid, Suid-Afrika, Suid-Amerika, uitvoergeleenthede, produk-landkombinasies, uitvoerbevordering

ABBREVIATIONS

AIEC	Automotive Industry Export Council
AVE	*Ad valorem* equivalent
DAFF	Department of Agriculture, Forestry and Fisheries
DSM	Decision Support Model
DTI	Department of Trade and Industry
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HHI	Herfindahl-Hirshmann Index
HS	Harmonised System
ITC	International Trade Centre
ITRISA	International Trade Institute of Southern Africa
LPI	Logistics Performance Index
Mercosur	Common Southern Market or *Mercado Común del Sur*
NM	Nautical Miles
NTB	Non-tariff Barrier
ONDD	*Office National du Ducroire*
RCA	Revealed Comparative Advantage
SACU	Southern African Customs Union
SAEEC	SA Electrotechnical Export Council
SPS	Sanitary and Phytosanitary Measures
TBT	Technical Barriers to Trade
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
US$	United States Dollar
WTO	World Trade Organisation

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CHAPTER 1: INTRODUCTION

1.1 Background

The global financial crisis resulted in a decrease in global trade in 2009 (International Trade Forum, 2010; Onguglo, 2010). All trade was negatively affected, but the trade of countries of the South, also known as developing/emerging economies, recovered more rapidly than developed countries did. This is evident from the fact that developing countries' imports were 2% higher in April 2010 than their pre-crisis peak in April 2008 (Zoellick, 2010; Rosales, 2010), whereas developed countries' imports were 19% lower in April 2010 than its pre-crisis peak in April 2008 (Zoellick, 2010; Rosales, 2010).

This decrease in the imports of the developed countries can be explained by the fact that in 2009, the developed countries were the main importers of products and services from the South, but in 2010, they experienced very low economic growth, which weakened their demand for imports from the South (International Trade Forum, 2010; Onguglo, 2010). Although developing countries' share in world imports is roughly half of the developed countries' imports, it is growing faster (Pangestu, 2010). Accordingly, developing countries are responsible for more than half of the growth in world imports from 2000 to 2010 (Zoellick, 2010). Therefore, South-South trade is increasing at a relatively fast pace (Onguglo, 2010; Rosales, 2010).

Currently, South-South trade is growing at a rate of 11% per year. This is almost double the growth rate of total world exports (DTI, 2010a:39). According to the Department of Trade and Industry (2010a:40), South-South trade is also the new key reason for growth in developing countries.

South-South trade contains a large number of benefits for the countries involved. When new trade relations between countries from the South are formed, they allow the countries to share experience, obtain a better understanding of each other's economies, discover opportunities in the other countries, and build on their respective strengths (DTI, 2010a:40). Co-operative arrangements in the vital areas of transportation, communication and technology sharing for industrial upgrading resulting from South-South trade can also contribute to the competitiveness of developing country firms. These agreements can also possibly offer new inflows of foreign direct investment (FDI) to acquire infrastructural, technological, institutional, as well as human resources (DTI, 2010a:40). Onguglo (2010) states that the widening and deepening of

cooperation between developing countries reduce trade barriers, increase trade and make trade more equitable between these countries (Onguglo, 2010).

Another benefit of South-South trade is differentiation in developing countries' production and exports (Onguglo, 2010). Due to the difference in demand between the traditional Northern markets and new Southern markets, developing countries need to produce a wider range of products. South-South trade has also caused developing countries to produce and export more value-added (higher technology) products, which lowers dependence on trade in commodity products (Onguglo, 2010; Pangestu, 2010).

South Africa and the countries in South America[1] can take advantage of all of the above-mentioned benefits of South-South trade. South Africa specifically, can benefit from a diversified and more value-added export basket, which will allow the country to be more competitive. During one of the World Trade Organisation's (WTO) conferences, UNCTAD XII, a key recommendation for Africa was to get out of its "commodity dependence syndrome" and make sure that the natural resource sector fulfils a wider range of development objectives through links with the rest of the economy (ITRISA, 2010:134). It is therefore essential, also for South Africa, to export more value-added products as the country currently mainly exports low value added products (DTI, 2010a:40).

Over 70% of South-South trade is between Asian countries, while 6% is between Latin American and Caribbean countries and 2% is trade within Africa (Onguglo, 2010). The largest South-South traders are Brazil, China, India, the Republic of Korea, Singapore and Saudi Arabia. This indicates a large potential for African, Latin American and the Caribbean countries to increase trade with other Southern hemisphere countries (Onguglo, 2010).

The national export promotion organisation in South Africa, the Department of Trade and Industry (DTI), also identified this opportunity for South Africa to increase trade with other Southern hemisphere countries. Due to the *market* and *trade reforms* that were adopted by South American countries over the past decade, the DTI is specifically interested in increasing trade with these countries (DTI, 2010b:7).

[1] South America includes the following countries: Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela.

The *market reforms* adopted by South American countries over the past decade were aimed at increasing macroeconomic stability and economic efficiency. These reforms brought about major changes in the countries' economies. This is evident in the high growth in GDP over the past decade, especially in Brazil, Chile and Argentina (DTI, 2010b:7). This growth in GDP was mostly caused by high consumer demand and larger revenues from elevated commodity prices. These improvements caused international business confidence in South America to increase and the continent is nowadays seen as a lucrative export destination (DTI, 2010b:7).

When also considering the *trade reforms* in South America, the evidence of trade liberalisation is clear. Brazil, Argentina, Paraguay and Uruguay established the Common Southern Market or *Mercado Común del Sur* (Mercosur) trading bloc in 1994 (DTI, 2010b:7; Bratt, 2005), and Chile signed free trade agreements with Mercosur, as well as other South American countries in 1996 (Bratt, 2005). Chile has also simplified and lowered its tariffs. The trade liberalisation in South America has led to a 58.2% increase in world exports to South America between 2001 and 2009 (DTI, 2010b:7; ITC, 2010).

1.2 Problem statement and motivation

To shed more light on South America's total import growth and specifically South Africa's trade with the South American continent, see Table 1.1 below.

Table 1.1: Growth in exports from South Africa and the world to South America (2001-2009)[2]

Exporter	Importer	Growth in exports (%, p.a.)			Market share 2009 (%)
		(2007-2009)	(2005-2009)	(2001-2009)	
World	South America	12.6%	37.7%	58.2%	0.2%
South Africa	South America	-74.1%	9.3%	18.6%	0.1%
South Africa	World	-18.8%	12.7%	51.7%	0.4%

Source: ITC (2010)

From Table 1.1 it is clear that:

(i) Regardless of the strong growth in South America's imports from the world, as well as the forming of the Mercosur trading block and the signing of a SACU-Mercosur Free Trade

[2] International trade data are only available from 2001 to 2009.

Agreement in 2004, South Africa has not sufficiently utilised the large increase in import demand in South America over the past decade (DTI, 2010b:7; Bratt, 2005).

(ii) South America's total import demand has grown by 58.2% from 2001 to 2009, but South Africa's exports to South America have only grown by 18.6% over the same period.

(iii) South America imports 0.2% of the world exports. Of South American imports, only 0.1% of total imports are from South Africa. This suggests that the there exists a significant export opportunity to South America in terms of size as well as growth.

The question is therefore, why is South Africa not adequately utilising this export opportunity? A possible explanation for South Africa's relatively small market share in and low export growth to South America could have been low overall exports from South Africa. However, this is not the case when analysing Table1.1. South Africa's exports to the world have grown by 51.7% from 2001 to 2009. Therefore, the question remains, why is South Africa's exports to South America relatively low, although demand in South America is large and growing?

The DTI (2010b) attempted to find a solution to this question by investigating how South Africa can increase trade with Latin America[3]. A firm-level survey was conducted and identified that South African exporters faced significant trade barriers in Latin American markets. Therefore, it seems that barriers to trade may explain the low growth in exports from South Africa to South America (DTI, 2010b).

Apart from the DTI's (2010b) specific investigation into increasing trade with Latin America, the DTI also commissioned a study by Viviers, Steenkamp, Rossouw and Cuyvers (2010) to, among other things, specifically identify realistic export opportunities for South Africa in South America. This project started in 2006 when the DTI recognised the need for a scientifically-based study to identify export opportunities for South Africa, because, at the time, the DTI only used historical export performance to identify potential export markets for South Africa (DTI, 2005:47). The DTI commissioned Viviers and Pearson (2007) to apply the Decision Support

[3] Latin America consists of South America and Central America. South America includes the following countries: Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela. Central America consists of: Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua and Panama (World Atlas, 2011).

Model (DSM) of Cuyvers, de Pelsmacker, Rayp and Roozen (1995), and Cuyvers (1997; 2004) in order to identify realistic export opportunities for South Africa.

The DSM methodology consists of four filters. It starts by taking into consideration all possible world-wide product-country combinations and sequentially eliminates uninteresting markets to leave only the markets that show the highest export potential. Filter 1.1 takes into consideration the countries' political and commercial risk ratings, while filter 1.2 eliminates countries based on macro-economic data (i.e. GDP, GDP per capita, GDP growth and GDP per capita growth). Following filter 1, filter 2 examines market size and growth of the remaining product-country combinations. Market concentration (filter 3.1) and market accessibility (filter 3.2) are considered in filter 3. The last filter (filter 4), firstly determines whether South Africa specialises in producing and exporting the product-country combinations from filter 3, then filter 4 categorises all the product-country combinations in 20 cells according to market size and growth and the size of South Africa's actual exports (Cuyvers *et al.,* 1995; Cuyvers, 1997; Cuyvers, 2004).

Two updates of the DSM, as well as refinements on the 2007 South African study were done and published in four publications (Viviers, Rossouw & Steenkamp, 2009; Steenkamp, Rossouw, Viviers & Cuyvers, 2009; Viviers *et al.*, 2010; Steenkamp, 2011).

With regard to South America, the Viviers and Pearson (2007) study found that only 0.5% of all the export opportunities identified for South Africa in the rest of the world were situated in South America. Brazil was the only South American country in which export opportunities for South Africa were selected (Viviers & Pearson, 2007). In the 2009 study, the number of export opportunities identified for South Africa in South America increased to 2.8% of the world total export opportunities (Viviers *et al*., 2009). Brazil, Ecuador and Peru were the three South American countries that were selected. In both the 2007 and 2009 re-runs of the DSM, the South American countries that were not selected fell out in filter 1, in which political and commercial risk, as well as macro-economic size and/or growth of countries are taken into consideration. In order to identify more realistic export opportunities for South Africa in South America, the DTI requested a special refinement to the DSM in 2010. The DTI requested to exclude filter 1 for the South American countries, and consequently no elimination of these countries on the basis of political and commercial risks or the macro-economic- size and growth

was done. Therefore, all South American countries were considered in filter 2 of the 2010 re-run of the DSM (Viviers *et al*., 2010)[4].

Despite the re-run of the DSM without filter 1 for South America (Viviers *et al.,* 2010),[5] a large number of South American countries were still eliminated later in the filtering process and analysis. Of the twelve South American countries, seven countries were eliminated in filter 3.2. Filter 3.2 assesses the market accessibility of countries and elimination in this filter indicated these countries' high barriers to trade (low market accessibility). Therefore, the DSM also seems to indicate that a possible reason for the low trade between South Africa and South American countries, as well as the small number of export opportunities identified for South Africa in South America, is due to some of the South American countries' high barriers to trade.

Therefore, both the available studies on South Africa's exports to South America, namely the study of the DTI (2010b) as well as the DSM study in 2010 (Viviers *et al.,* 2010) found that despite the high growth in demand in South America, the high barriers to trade between South Africa and South American countries might be reasons for South Africa's relatively low exports and low growth in exports to South America.

The research questions for this study are therefore:

- How to determine and measure the barriers to trade for South Africa in the different South American countries?
- What is the realistic export opportunities for South Africa in the South American countries?
- Given the identified trade barriers, on which product-country combinations should export promotion organisations focus their export promotion activities on, to have the highest possible export success?

[4] The 2010 application of the DSM contained a specific section in which potential export opportunities to South America were identified (therefore running the DSM without filter 1).
[5] The 2010 study by Viviers *et al*. used data from 2007.

1.3 Objectives

The main objectives of this study are to:

- discuss the different barriers to trade identified in the international trade literature and provide an overview of the empirical evidence of each barrier's impact on international trade;
- investigate, measure and compare the barriers to export from South Africa to the South American countries versus South Africa's exports to the world.
- identify realistic export opportunities, by reconstructing and updating[6] the DSM for South Africa to the different South American countries (using the latest data and reconstructed filter 3.2 on trade barriers); and
- provide recommendations for the South African export promotion organisations and industry associations, firstly in terms of the number and potential export value of the realistic export opportunities in the different South American countries, and secondly, on the status of South American trade barriers that could be addressed in bilateral and multilateral trade negotiations and discussions.

1.4 Research method

The research methods include a literature and an empirical study.

1.1.1 Literature study

In the literature study, an overview of the different barriers to trade identified in the international trade literature will be discussed. The typical barriers to trade that appear in the literature are logistical barriers, transport time and costs, non-tariff barriers, tariff barriers and exchange rates. From the literature, an overview of the empirical evidence of each barrier's impact on international trade will also be discussed.

[6] 2007 trade data were used in Viviers *et al.* (2010). This was before the world-wide economic crisis in 2009. This study aims to update these results with 2010 data.

1.1.2 Empirical study

The empirical study will firstly investigate and measure the different barriers to trade for South Africa in the South American countries. Secondly, it will identify realistic export opportunities, by updating and running the reconstructed DSM for South Africa in the different South American countries, specifically analysing the results from filter 3.2 (that address the various trade barriers).

The list of identified export opportunities will be categorised in different cells according to South Africa's relative market share and the import size and growth in demand for the identified export opportunity. The cells will be used to make recommendations to the South African trade promotion organisations as to which product-country combinations to focus their export promotion activities on. Recommendations to the various South African export promotion organisations and industry associations in terms of the existing South American trade barriers that could be taken into account in bilateral/multilateral trade negotiations will also be provided.

1.5 Outline of chapters

In Chapter 1, an introduction to this study is provided, by stating the background, problem statement, motivation, objectives, method as well as the outline of the chapters. The literature study, in Chapter 2, will provide an overview of the current literature on the barriers to trade, and the impact of these barriers on international trade. Chapter 3 will investigate, measure and compare the trade barriers (identified in Chapter 2) that South Africa faces when exporting to the South American countries, as well as the trade barriers that South Africa faces when exporting to the world. In Chapter 4, the methodology of the DSM, applied to identify realistic export opportunities for South Africa in the South American countries, will be described. Filter 3.2 of the DSM methodology, which focuses on trade barriers, will be reconstructed to make it more applicable for South Africa's exports to the South American countries. The results of this updated and reconstructed DSM, applied to identify export opportunities for South Africa in the South American countries, will be provided in Chapter 5. Chapter 6 concludes by providing a summary of the study, as well as recommendations for South Africa's export promotion organisations and industry associations.

CHAPTER 2: LITERATURE OVERVIEW OF TRADE BARRIERS

2.1 Introduction

"The longer it takes to trade and the more expensive it becomes to import and export, the less competitive traders are and they cannot reach international markets. Economies with cumbersome trade procedures, timely delays and expensive trade costs are minimising their trade potential" (The World Bank, 2009:49).

In international trade there are numerous factors that hinder or impede the trading process. These factors are known as trade barriers or export barriers. Leonidou (1995:31) defined trade barriers as "any attitudinal, structural, operative or other obstacle that hinders or inhibits companies from taking the decision to start, develop or maintain international trade activity."

Barriers to trade are a key topic in research on exports. This is evident from the fact that many studies have underlined the importance of trade barriers (Arteage-Ortiz & Fernándex-Ortiz, 2010:396). Research on export barriers or trade barriers has started from as early as 1987 (Bilkey, 1987). Since then, the number of studies has exponentially grown, due to the increasing process of internationalisation and globalisation (Kotabe & Helsen, 1998) and the fact that export decision-makers consider export barriers to be very important (Sharkey, Lim & Kim, 1989).

Arteage-Ortiz and Fernándex-Ortiz (2010:395) and Kee, Nicita and Olarreaga (2008:31) identified important gaps in export research over the last thirty years. According to them, the problem with most of the studies is that they measure trade restrictiveness, without clearly defining or classifying trade barriers. The studies also use barriers that are not well grounded in theory. When using these ungrounded or undefined barriers in analyses, the outcomes and recommendations are inaccurate (Kee *et al.*, 2008:31). Furthermore, there has been no consistency in the types or number of trade barriers used. There is also no indication of the different export barriers' relative importance to one another and there is no homogeneous approach in methods to identify the most important barriers, nor the different types of barriers, or a relative scale in which they could be included. All these shortcomings in the research create confusion about the actual hindering effect that export barriers have on trade (Arteage-Ortiz & Fernándex-Ortiz, 2010:397-406).

In addition to the above-mentioned limitations of past research on trade barriers, the majority of research on export highlights the fact that it is very important to understand the hindrances of exporting, as well as the influence thereof on export activity on a macro- as well as micro-economic level (Arteage-Ortiz & Fernándex-Ortiz, 2010:396).

Anderson and Van Wincoop (2003:2) view trade barriers as any part of the trading process that increases trade costs. Additional trade costs inflate prices and therefore could make exporting products uncompetitive. It could also inhibit companies from taking the decision to start, develop or maintain international activity (Leonidou, 1995:31). Martìnez-Zarzoso and Márquez-Ramos' (2008) found that, on average, in 167 countries, each $1 cut in trade costs can increase exports by more than $1 000. Egger (2005:599) states that a 1% decline in the costs to trade increases the bilateral export to importer GDP ratios by 0.6%. The costs of trade are negatively correlated with the volume of trade. The more expensive it is to trade, the less trade will occur (Hoekman & Nicita, 2008:14). Hoekman and Nicita (2008:17-18) found that a 10% decrease in costs of trade will increase trade by 4.8%. The study also stated that if the high trade costs of low income countries lowered to the middle income average, imports will increase by 7.4%.

These studies prove that trade costs do inhibit trade. Anderson and Van Wincoop (2003:2) specified that the different facets of trade costs include policy barriers (tariffs and non-tariff barriers), transportation costs (both freight costs and time costs), information costs, contract enforcement costs, costs associated with the use of different currencies, legal and regulatory costs, and local distribution costs (wholesale and retail). According to Hoekman and Nicita (2008:17-18), distance, having a common border, and the same language are all important determinants of trade costs.

For purposes of this study, tariffs, non-tariff barriers, transportation costs, transport time, infrastructure, logistics, distance, cultural distance and the exchange rate all contribute to trade costs and can therefore be defined as trade barriers. Each of these barriers and their influence on trade will subsequently be discussed in sections 2.2.1 to 2.2.8.

2.2 Types of trade barriers

2.2.1 Tariffs and non-tariff barriers

Over the years, multiple studies found tariffs, as well as non-tariff barriers (also known as non-tariff measures) to have a negative effect on trade volumes (Hoekman & Nicita, 2008:15-16). According to Hoekman and Nicita (2008:1), tariffs as well as non-tariff barriers (NTBs) are still the main sources of trade restrictiveness, in spite of preferential access programmes. They found that if tariffs and NTBs are reduced to 10% for low income countries, imports in these countries will increase by 8.4% (Hoekman & Nicita, 2008:17-18).

This section will discuss different studies' results on the impact and the importance of tariff and NTBs on trade.

2.2.1.1 Tariffs

There are different studies investigating the impact of tariffs on trade. Each study uses different countries and different data. The main conclusion of most of these studies is that increasing tariffs has a notably negative effect on trade (Wilson, Mann & Otsuki, 2004:851).

In Hummels' (1999:27) investigation of the United States, New Zealand and five Latin American countries, he found that if tariffs are increased by 10%, it will cause a 56% decrease in trade. Haveman, Nair-Reichert and Thursby (2003:485) found that tariffs decrease trade flows by an average of 5.5% in the 15 most developed importing countries.

Wilson *et al.* (2004:851) established that if the world average *ad valorem* tariff decreases from 8.5 to 7.5%, it will lead to a 1.1% increase in trade. Hoekman and Nicita (2008:17-18) stated that if an exporter can obtain 1% less tariffs than its competitors, he will increase his exports by 3.5%. Moreover, if the average tariff trade restrictiveness index for low income countries goes down by 5%, imports of these countries will rise by 5.7% (Hoekman & Nicita, 2008:17-18).

Papadopoulos, Chen and Thomas (2002:172) state that since tariffs increase an exporter's prices, they have a negative effect on trade. Furthermore, Baier and Berstrand (2001:1,23) found that 25% of the average post-World War II world trade growth rate can be attributed to tariff rate reductions.

In section 2.2.1.2, non-tariff barriers and their effect on trade will be discussed in more detail.

2.2.1.2 Non-tariff barriers (NTBs)[7]

Non-tariff barriers have become increasingly important for numerous reasons. The first reason is the growing unease of consumers (particularly in developed countries) about environmental and sanitary risks. Secondly, some countries use the argument of environmental risks as a reason to protect their markets. Thirdly, there is an increasing, relative importance of remaining obstacles, like NTBs, when tariffs are very low (Freudenberg & Paulmier, 2005:44).

NTBs play a large part in the trade restrictiveness of a country. NTBs are said to add, on average, 87% more restrictiveness than already imposed by tariffs. In 34 countries (out of 78), NTBs' contribution to trade restrictiveness is higher than that of tariffs (Kee *et al.*, 2008:28). If tariffs decrease by 10%, trade volume will increase by 2%, while if NTBs are reduced by 10%, trade volume will increase by 3.8%. Therefore, according to Hoekman and Nicita (2008:7), NTBs limit trade more than tariffs do.

Interestingly, Haveman *et al.* (2003:485) found that NTBs can either have a positive or a negative effect on trade, but the net effect was found to be negative – a trade reduction of 0.4%.

More and more countries have been utilising NTBs and the number of products covered by NTBs is also increasing (Hoekman & Nicita, 2008:3). Developed countries' restrictiveness of NTBs is proved to be stronger than those of developing countries (Kee *et al.*, 2008:31). This is because NTBs are imposed more by countries (usually high- and middle-income countries) that tend to charge lesser *ad valorem* average tariffs. There is also a tendency by developed countries to use anti-dumping rules as NTBs against developing countries.

Another reason why developed countries are using NTBs is that they pay high tariffs to import products, especially commodities from developing countries, which form part of their production inputs. In contrast, developing countries' imports are highly skewed towards manufactured

[7] Non-tariff barriers (NTBs) are a limitation that acts as an obstacle to trade; NTBs are a subset of non-tariff measures (NTMs). NTMs describe a wider range of trade measures that can have a positive or negative effect on trade (Jensen, 2010:9).

goods from developed countries, which face relatively low barriers (Hoekman & Nicita, 2008:3; Kee *et al.*, 2008:31).

In a study done by Freudenberg and Paulmier (2005:44) to determine the relative attractiveness of different markets, it was noted that it would be more comprehensive to include not only tariff barriers, but also non-tariff barriers (like technical barriers to trade (TBT) and sanitary and phytosanitary measures (SPS)) in the analysis. Many other studies also found NTBs to be an important export restraint and determinant of market attractiveness. However, most of the earlier studies found that non-tariff barriers are a bigger obstacle to export than tariff barriers are, and did not include it in their market selection models (Papadopoulos *et al.*, 2002:169-172). Papadopoulos *et al.* (2002:172) state that most NTBs are qualitative (e.g. labelling rules, price surveillance) and measuring them necessitates a quantification scheme, which can pose difficulties and is not attempted in most research. Hoekman and Nicita (2008:12) also stated that many studies found NTBs to be a significant restraint to trade, but the difficulty in measuring (quantifying) NTBs inhibits researchers to investigate the precise effect of NTBs on trade (Hoekman & Nicita, 2008:12). Some studies assumed that NTBs will be dealt with in the market analysis stage of the market selection process (Papadopoulos *et al.*, 2002:169-170).

In section 2.2.2, the effect of transport costs on trade (section 2.2.2.1), as well as the factors that influence transport costs (section 2.2.2.2) will be discussed.

2.2.2 Transport costs

2.2.2.1 Effect of transport costs on trade

Transport costs influence trade performance as well as trade competitiveness (UNCTAD, 1999:2). International transport costs can have the same effect on trade as custom tariffs or the exchange rate (Hoffman, 2002). Therefore, a decrease in transport costs will stimulate exports as well as imports (Hoffman, 2002).

On the other hand, if transport costs increase, it has a noteworthy negative result on trade volumes (Martìnez-Zarzoso & Nowak-Lehmann, 2007:242, 3145). High transport costs have the ability to price a country out of export markets. This is specifically in cases where transport costs represent a large part of the final price of the product (as with labour-intensive or high value-added sectors/industries, as well as natural-resource-based activities) (Martìnez-Zarzoso

& Nowak-Lehmann, 2007:242, 3145; UNCTAD, 1999:2). High transport costs not only affect exports, but also imports. They increase the costs of domestic production, because high transport costs on imports inflate the prices of imported goods, for example capital goods, fuel, food, and intermediate inputs. This increase in costs of domestic production results in the un-competitiveness of manufactured exports that have a large import content (UNCTAD, 1999:2).

According to Baier and Berstrand (2001:1, 23), 8% of world trade growth after World War II is due to a decrease in transport costs. The quantitative effect of transport costs on trade openness as well as economic growth will consequently be discussed.

Limão and Venables (2001:451) found that if transport costs increase by 10%, trade will decrease by 20%. Martìnez-Zarzoso and Nowak-Lehmann (2007:412) also found that a 10% decrease in transport costs increases trade by over 20%. There seems to be a 1 to 2 ratio (negative) between transport costs and trade, but Limão and Venables (2001:453,471) also predicted that if transport costs are doubled, trade volumes (imports as well as exports) will go down by 45%, indicating a 1 to 2.25 ratio (Limão & Venables, 2001:453,471). This illustrates that economies of scale exist. Therefore, the more the transport costs go down, the higher the ratio of increase in trade will be.

Another study, by Clark, Dollar and Micco (2004:417) on the efficiencies related to transport costs, found that when a country reduces the inefficiencies related to transport costs[8] by 50 percentiles, it is associated with a 25% increase in trade. Furthermore, an increase in transport costs of 50 percentiles will reduce trade by 22% (Clark *et al.*, 2004:421).

In Egger's (2005:593) investigation of the impact that transport costs have on trade openness or ease of trading, he found that for every 1% reduction in transportation costs, there is a 0.6% increase in trade openness. The effect that a decline in transport costs has on trade openness has notably grown in the three decades from 1970 to 2000. The reduction of transport costs is therefore becoming more effective as time goes by (Egger, 2005:599).

When considering economic growth rate, estimations show that a doubling of transport costs is associated with a reduction in economic growth of more than a half of a percentage point

[8] These are transport cost inefficiencies within ports, thus port inefficiency, for example hold-ups at ports because of extra custom requirements or cargo inspections.

(Radelet & Sachs, 1998). However, Chasomeris (2006) argued that Radelet & Sachs' (1998) simple OLS model used an endogenous explanatory variable and hence have spurious results.

From the above, it is clear that transport cost has a negative effect on trade. The question arises: What factors determine the increase or decrease of transport costs? Section 2.2.2.2 considers the factors that influence transport costs.

2.2.2.2 Factors that influence transport costs

There are numerous factors that influence transport costs; starting from the value of the merchandise, road transport costs, distance between the place of production and the harbour (see section 2.2.6), port charges, number of liner services, distance to the trading partner (see section 2.2.6), total annual volume of bilateral trade, frequency and size of shipments, private sector participation in port investments, as well as countries promoting competition and establishing incentives with regard to transport costs (UNCTAD, 1999:6; Martìnez-Zarzoso & Nowak-Lehmann, 2008:3153; Hoffman, 2002).

Hoffman (2002) found that the larger the value of the merchandise, the higher the costs of transporting the merchandise. With high value merchandise, there arises a need for better insurance cover and the shippers are willing to pay higher prices for safer packaging, as well as faster delivery. Therefore, a 1% increase in the value of the merchandise has a 0.358% increase in transport costs (Hoffman, 2002). In the case of distance, Hoffman (2002) showed that a doubling of the distance between the trading countries increases transport costs by 16.5%. If there are more liner services between two countries, economies of scale exist. Having more liner services gives the exporter more options to choose from. Hoffman (2002) stated that increasing the number of liner services from 5 to 20 will result in a decrease of 12% in freight and insurance costs. In the case of the annual volume of trade increasing, Hoffman (2002) found that an increase from 1 million tonnes to 10 million tonnes will have a 6% saving on transport costs per ton.

When comparing transport costs with tariffs, it is clear that transport costs are an important trade barrier. According to Hoffman (2002), transport costs have almost the same impact on trade as tariffs, as transport costs can also influence the competitiveness of an exporter (as mentioned in section 2.2.1.1). However, the difference between transport costs and tariffs is that transport costs have become more and more important for export competitiveness,

whereas tariffs have not (Hoffmann, 2002). Therefore, transport costs contribute relatively more to the effective rate of protection (Limão & Venables, 2001:45). This protection is in several situations significantly higher than that provided by tariffs (Limão & Venables, 2001:45; WTO, 2004). Given that the "effective rate of protection" of transportation costs is in most cases higher than tariffs, obtaining minimal transportation costs is an important determinant when an importer has to choose a trading company or country (Hummels, 1999:27).

The question arises: What is the situation of transport costs in landlocked countries? According to Limão and Venables (2001:471), landlocked countries' transport costs are 50% higher than those of coastal countries and this consequently results in landlocked countries having 60% less trade. This can be accredited to landlocked countries not having their own seaports and need to transport consignments further than coastal countries. According to Limão and Venables (2001:471), if landlocked countries improve their infrastructure, the transport costs will be less. The study described that if a landlocked country improves its infrastructure by 50%, they will overcome more than half of the drawbacks coupled with being landlocked (Limão & Venables, 2001:452). Therefore, infrastructure deterioration leads to an increase in transport costs, which influences trade negatively.

On the other hand, the World Bank (2009:53) stated that even though landlocked countries are faced with long distances and bad infrastructure that decrease trade, the main reasons for higher trade costs are rent-seeking and inefficient markets like trucking and inadequate transit procedures. These inefficient transit services lead to consignments taking up more time in the trade process. As mentioned in section 2.1, transportation costs are not only freight cost, but also time cost.

Section 2.2.3 will focus on transport time as a trade barrier.

2.2.3 Time to import

The time that it takes to trade is a very important part of the trading process. According to Djankov, Freund and Pham (2006:1), it is more important for a country to reduce time to trade, than to reduce tariff barriers in order to stimulate exports. Hummels (2001:44) states that trade reformers focus excessively on reducing tariffs, but not enough on minimising delays for exporters as well as importers. The focus must shift from cutting tariffs to cutting delays. It is found that the costs of tariffs are lower than the costs of import delays. The same is true for the

costs of exporting delays (except for East Asia and Western Europe) (The World Bank, 2007:44). For example, in Africa, the costs of delays are four times more than the tariff payments that exporters in Africa face (The World Bank, 2007:44).

Djankov *et al.* (2006:1) found that each day that an export consignment is delayed is equal to a country distancing itself 85 kilometres further away from the export destination. This is equivalent to trade being reduced by 1%. In the case of time-sensitive products, a 10% reduction in delays will increase exports by 30% (Djankov *et al.,* 2006:21).

According to Hummels (2001:21), for every additional day in ocean transit, the probability of trade goes down by 1% for all goods and 1.5% for manufactured goods. Some manufacturing exporters show the willingness to pay for time saving that is equal to 0.8% *ad valorem* tariffs per day (Hummels, 2001:21).

Martìnez-Zarzoso and Nowak-Lehmann (2007:242) also found that transportation times in general, but mainly road transport time, have a considerable negative effect on trade flows.

One of the factors that can assist to decrease the time of transport is infrastructure, which will be discussed in section 2.2.4.

2.2.4 Infrastructure

The DTI (2004) stated that better infrastructure leads to larger volumes of trade and hence more exports. In other words, poor infrastructure increases transport costs (see section 2.2.2) that decrease trade volumes (Martìnez-Zarzoso, Pérez-García & Suárez-Burguet, 2008:3145). Bougheas, Demetriades and Morgenroth (1999:169) also agree with this as they found that there is a positive relationship between the level of infrastructure and the volume of trade. They stated that the variation in the volume and quality of infrastructure in different countries can possibly be the reason for differences in transport costs, which sequentially, may be responsible for differences in competitiveness (Bougheas *et al*., 1999:170; Jansen van Rensburg, 2000:3).

Limão and Venables (2001:456)[9] examined the relationship between infrastructure and transport costs. They found that an increase in the level of infrastructure by 25 percentiles

[9] The sample of countries in this study consists of more than a hundred. For a list see Limão and Venables (2001:475).

decreases costs by an amount equal to a distance reduction of 3 466 km of sea travel or 419 km of overland travel (according to their shipping data). In percentage terms, poor infrastructure is responsible for 40% of predicted transport costs for coastal countries and 60% for landlocked countries. For landlocked countries, a 50% improvement in their infrastructure will resolve more than half of their disadvantages of being landlocked (see section 2.2.2) (Limão & Venables, 2001:452).

It is particularly important for developing countries to enhance their level of infrastructure as developing countries usually export low value-added products and it has been found that infrastructure has the largest impact on low value-added sectors (Martìnez-Zarzoso *et al.,* 2008:3153).

Martìnez-Zarzoso *et al.* (2008:3145) stated that infrastructure has a more significant impact on trade costs than distance does. Infrastructure also forms part of a country's logistics. The importance of logistics in trade will be investigated in section 2.2.5.

2.2.5 Logistics

According to Arvis, Mustra, Ojala, Shepherd and Saslavsky (2010:46), who constructed the Logistics Performance Index (LPI)[10] for the World Bank, logistics are not only important, but vital to facilitating trade. Logistics include a range of important activities starting from transportation, warehousing, cargo consolidation, border clearance, country distribution and payment systems. All these activities involve public as well as private agents. A viable system of global logistics is referred to as the "backbone of international trade" (Arvis *et al.*, 2010: iii).

The LPI index is the first international benchmarking instrument that distinctively measures the vital factors of trade logistics performance. It is particularly focused on measuring the trade and transport facilitation friendliness of countries. Arvis *et al.* (2010) constructed this report for 155 world countries by surveying nearly 1 000 logistic professionals (Arvis *et al.*, 2010:1; 46).

The LPI focuses on the six most important areas of trade logistics, namely the efficiency of the customs clearance process; the quality of trade and transport-related infrastructure; the ease of arranging competitively priced shipments; the competence and quality of logistics services; the

[10] The World Bank issued a report named "The Logistics Performance Index (LPI)" that was constructed by Arvis *et al*. (2010).

ability to track and trace consignments; and the frequency with which shipments reach the consignee within the scheduled or expected time (Arvis *et al.*, 2010:4).

From the analysis done in the 2007 LPI report, Arvis *et al.* (2010) could identify the advantages for a country that has efficient logistics. They stated that better logistics result in growth of trade, diversification of exports, gaining new foreign direct investment, as well as establishing economic growth (Arvis *et al.*, 2010:1). For example, it was found in 2007 and 2010, that a country with the same income per capita level, but a higher logistics performance level than another country, has a 2% higher growth in trade (Arvis *et al.*, 2010:iii). Countries with inefficient logistics tend to have higher average times to import or export; therefore, better logistics make trading faster (Arvis *et al.*, 2010:46).

Hoekman and Nicita (2008:17) found that a higher LPI[11] has a direct positive influence on bilateral trade. Also, if low income countries' LPIs increase to the average level of middle income countries, imports will increase by 15.2%. Coefficient estimates for the LPI also suggest that a 1% increase in the LPI score (which indicates a score getting better) would raise trade volumes by approximately 50%, in terms of exports as well as imports.

Portugal-Perez and Wilson (2008) found similar results to Hoekman and Nicita (2008). If Ethiopia improved the quality of its logistics to 50% of the quality of South Africa's logistics, the country will benefit the amount equal to a 7.5% tariff cut and therefore expand trade.

As mentioned in section 2.2.5, logistics include a whole range of activities. For instance, when considering customs clearance, setting up new electronic data interchange systems for submitting and processing documents would help to improve the time to clear goods at customs. In the case of Benin, Guyana, Haiti, Mali and Uganda, the time to clear goods was cut by three days when they implemented new systems (The World Bank, 2009:52). India also installed an electronic system for traders to submit their cargo documentation, which makes it possible for the clearance process to start before the ship arrives. These modifications enable exporters to cut the number of delayed days by seven days (The World Bank, 2007:45). Columbia also did some reforming in terms of improving roads that led to the port. They introduced selective inspections of the cargo at customs, and expanded operating hours at the

[11] The LPI score indicates the performance on the six most important areas of trade using a five-point scale (1 = the lowest score, 5 = the highest score).

ports. These changes led to document preparation being cut by five days and terminal handling was cut by two days (The World Bank, 2007:46).

The next trade barrier's influence on trade that will be discussed is distance.

2.2.6 Distance

Distance is also an important variable to consider when two countries are trading. When two countries are further away from each other, the transport costs (see section 2.2.2.1) for moving a consignment between the two are more (Coughlin, 2004:1; DTI, 2004). Higher transport costs have a negative effect on the trade volume (see section 2.2.2.1). When a country is further away in distance, it also increases the time to travel, which also influences trade negatively (DTI, 2004) (see section 2.2.3).

Martìnez-Zarzoso and Nowak-Lehmann (2007:3145) found this negative effect that distance has on trade costs to be bigger for high value-added sectors than for low value-added sectors, while Papadopoulos *et al.* (2002:183) stated that distance has a larger effect on the transport costs of bulky goods.

When quantifying the relationship between distance and transport costs, as well as trade in general, Clark *et al.* (2004:420) found that if the distance between the United States and a trading partner is increased by 100%, maritime transport costs will increase by around 20%. For Latin America's internal, sea-borne trade, Hoffman (2002) found a negative correlation of 0.463 between distance and trade volume. He also found a positive correlation of 0.178 between distance and the costs of transport per ton (Hoffmann, 2002).

Although an increase in distance between countries elevates transportation costs, which reduces trade, the opposite is also true. If transportation costs decline (for example, the shipping rate goes down), countries will be able to increase trade with more distant countries, because the cost drawback of trading with distant countries is reduced. This is what has been happening in the trading environment since 2004 (Coughlin, 2004:1). Coughlin (2004:1) describes this phenomenon by stating that the "geography of trade is changing".

Even though there is a relationship between distance and transportation costs, Limão and Venables (2001:460), as well as Martìnez-Zarzoso *et al.* (2008:3145) found that distance is not

a good proxy to measure transport costs. Using distance alone explains only 10% of the variation of transport costs, whereas 50% of the variation in transport costs is explained by adding geography and infrastructure (Limão & Venables, 2001:460). Martìnez-Zarzoso *et al.* (2008:3145) found that for maritime as well as road transport, transport conditions are strong determinants in determining transport costs. For maritime transport costs specifically, efficiency and service quality are an important determinant. Therefore, distance falls short in explaining a large part of the variation in transport costs (Limão & Venables, 2001:460).

Besides the physical distance between two countries that influences trade costs, there are more reasons in practice why countries that are closer to one another trade more. It is more costly to access a market and establish a trade relationship with a market that is far away (Coughlin, 2004:1). Another reason is that if trading countries are situated close to each other, there is a wider range of possible transportation options (other than sea and air transport). More transportation options mean more competition and lower prices for transportation. This is why countries closer to each other trade more at a lower cost. More trade creates economies of scale, which reduce transport costs even more (Hoffmann, 2002). Lastly, countries that are situated closer to each other usually have analogous histories, cultures and languages (Hoffmann, 2002). This makes it easier to communicate and trade. Section 2.2.7 will focus more on culture and the impact that cultural distance has on trade.

2.2.7 Cultural distance

Sherriff, Brewer and Liesch (2010:79) define cultural distance as the influence that encourages a firm to do business with a comparable country, rather than with a country that is difficult to understand, because of dissimilarities. Another definition by Möhlmann, Ederveen, de Groot and Linder (2009:8) states that cultural distance is the degree to which the norms and values of two countries differ. The larger the gap, the more difficult trade and negotiations become. This is because it gets harder to understand, control, as well as predict the trading partner's behaviour. Different perceptions of the same situation are also part of the cultural distance (Möhlmann *et al.*, 2009:8).

According to Konya (2002:1-2), cultural difference plays a vital role in international trade. It may be expensive to transfer goods because of geographical distance and cultural, language and institutional differences between countries. There are numerous examples of large marketing

mistakes made due to cultural gaps (Sherriff *et al.,* 2010:80). Firms usually first expand into similar markets, before they diversify into different, distant markets (Sherriff *et al.,* 2010:80).

In the Lejour and De Paiva Verheijden (2004: 3) study on trade in Europe, they state that differences in language and the regulation of product markets hamper the trade of goods and services.

As mentioned in section 2.1, trade costs include transportation costs, tariffs, NTBs, information costs, contract costs, currency costs, legal and regulatory costs, and local distribution costs. Many of these costs are expected to increase as the cultural gap between two countries widen. This is because firms are less familiar with foreign cultures and markets. Furthermore, negotiation costs are more if two traders speak different languages, because they cannot understand what each other is saying (Anderson & Marcouiller, 2002).

It is interesting to note that Konya (2002:3) argues that cultural costs are different from other costs (mentioned in sections 2.1 to 2.2.8), because cultural costs can be reduced by learning. As soon as a trader learns a foreign language, the cultural gap and associated costs can decrease. When one trader in a country decides to learn a foreign language, it imposes an externality on its trading partner, because the trading partner can understand, without any input.

Another variable that has an effect on trade is the exchange rate. Section 2.2.8 considers the impact of exchange rates on trade.

2.2.8 Exchange rate

From 1944, all countries in the world used a system where they had fixed exchange rates. This system is known as the Bretton Wood system (Todani & Munyama, 2005:1). While using the Bretton Wood system, the trade between countries was not influenced by the fluctuations in the exchange rates. After this system failed in 1971, the fluctuating exchange rate of a country became increasingly important for international traders (Todani & Munyama, 2005:1).

The ever-changing exchange rate is seen as a difficulty for traders, because it can have a large impact on pricing (Papadopoulos *et al*., 2002:172). The volatility of the exchange rate has an impact on exporters as well as importers. The main argument behind trade and the volatility of the exchange rate is that the more the exchange rate fluctuates, the larger the risk and

uncertainty for exporters. Therefore, the exchange rate volatility has a negative effect on trade (Todani & Munyama, 2005:1). Other studies argue the opposite, stating that larger exchange rate risks create the possibility of making larger profits and therefore a volatile exchange rate can increase trade. These two contradicting theoretical arguments led to more empirically based studies to evaluate the situation (Todani & Munyama, 2005:1).

In 2004, the size of the impact that the exchange rate has on trade was examined by the DTI by means of a gravity model that was used to determine trade potential. The study noted that the exchange rate coefficient has a relatively small impact on trade. In the short run, the exchange rate has a higher effect on trade, but in the long run the effects of the exchange rate become less significant (DTI, 2004).

Todani and Munyama's (2005:1) study on the effect of the exchange rate volatility on South Africa's exports also indicated that there is no correlation between South Africa's exports and the volatility of the exchange rate. This can possibly be due to the availability of hedging facilities in South Africa, making it possible to fix the exchange rate in export contracts. (Todani & Munyama, 2005:17).

Tenreyro (2007:485) also studied the impact of the variability in the exchange rate on trade volumes. With the intention to contribute to international policy decisions, he used a new approach and a wide variety of countries' data from 1970 to 1997. The result of the study indicated that nominal exchange rate variability has no impact on trade flows (Tenreyro, 2007:485).

Section 2.3 will conclude this chapter by providing a summary.

2.3 Summary

Chapter 2 focused on defining and identifying the different barriers to trade and the influence that these barriers have on trade. Trade barriers are any part of the trading process that increases trade costs. The trade barriers focused on in this chapter are tariffs, NTBs, transport cost, time to import, infrastructure, logistics, distance, cultural distance and exchange rate. These costs inflate prices and can result in export products being un-competitively priced.

The literature describes the negative effect of tariffs on trade. Furthermore, it became clear that as countries are more concerned about environmental and sanitary risks, NTBs are becoming progressively important. Countries want to protect their markets and therefore use NTBs more.

Transport costs have a negative effect on trade. Transport costs inflate export prices and result in uncompetitively priced export products. High transport costs of imported products increase the input costs of domestic production, which can result in the uncompetitiveness of manufactured exports that have a large import content.

The time that it takes to trade is also an important part of the trading process. The longer a shipment takes, the more expensive the product becomes and can also result in uncompetitively priced export products.

Better infrastructure can help to lower transport costs as well as the time to import. Infrastructure includes a variety of factors, from roads, telecommunications to institutions. Infrastructure and high-quality logistics (known as the “backbone of international trade”) help to decrease trade costs. The opposite is also true: if the infrastructure and logistics are in a bad condition, it will increase trade costs.

Even though distance is not a good proxy to measure transport costs, as it only explains 10% of the variation in transport costs, it does have an influence on trade. This can be because countries that are situated closer to each other usually have analogous histories, cultures and languages and are positive for trade relations. The wider the cultural and language gap between countries, the more trade costs increase. This can be because traders from different countries are less familiar with each other and the negotiation process is more difficult. Cultural costs are, however, different from other trade costs, as they can be largely removed by learning.

Another trade barrier is the exchange rate. There are contradicting theoretical arguments on the effect that the volatility of the exchange rate has on trade. The volatility of the exchange rate creates uncertainty of the price and this is seen as a risk. Some studies argue that the risk has a negative effect on trade, where others argue that the risk holds the possibility of more profit and therefore a positive effect on trade. Empirically, the volatile exchange rate is found to have little effect on trade. This can possibly be due to the availability of hedging facilities in South Africa, making it possible to fix the exchange rate in export contracts.

Chapter 3 will investigate and measure the barriers to trade that South Africa encounters in its trade with South American countries.

CHAPTER 3: MEASURING TRADE BARRIERS BETWEEN SOUTH AFRICA AND SOUTH AMERICA

3.1 Introduction

From the discussions in Chapter 2, it is clear that there are numerous factors that impede trade. Some of these trade barriers are quantifiable and others not. The quality and effects of the trade barriers differ from one country to another.

This chapter investigates and measures the trade barriers (identified in Chapter 2) that South Africa faces when exporting to South American countries. There are twelve South American countries, namely Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela.

The South American countries' tariff and non-tariff averages are analysed in section 3.2.1. Section 3.2.2 considers the domestic and international transport cost, time and distances between South Africa and the South American countries. This section is divided into three sections, namely the domestic (3.2.2.1), international (3.2.2.2) and total (3.2.2.3) transport cost, time and distance.

Section 3.2.2.1 provides the South American countries' ratings according to the World Bank in their Doing Business Report's Trading Across Borders section. Three different aspects are taken into account, namely the number of documents needed to import, the cost to import a container and the number of days it takes to import domestically. In section 3.2.2.2, the international transport times and distances between South Africa and South America as well as South America and its top five importers are compared. The costs of international transport between South Africa and South America are also analysed in section 3.2.2.2. Section 3.2.2.3 compares the total (domestic and international) transport costs and times to trade between South Africa and the South American countries.

In section 3.2.3, the logistical aspects of trading with the South American countries are compared, namely customs clearance, infrastructure, arrangement of shipments, quality of logistical services, tracking and tracing of consignments and the timeliness of shipments.

Finally, section 3.2.4 investigates the South American countries' different cultural aspects and compares them to that of South Africa. The conclusion and summary are provided in section 3.3.

3.2 Measuring the South American countries' trade barriers

3.2.1 Tariff and non-tariff averages applied by the South American countries

As mentioned in section 2.2.1, tariff and non-tariff barriers are important trade barriers to consider when trading internationally. In this section, the average tariff and non-tariff barriers applied by the South American countries are described.

Table 3.1: Average AVE tariff[12] applied by South American countries to South Africa and the world.

	Average *ad valorem* equivalent tariff	
South American country	**World**	**South Africa**
Argentina	10.44%	12.78%
Bolivia	8.54%	11.17%
Brazil	11.15%	13.69%
Chile	4.65%	5.99%
Colombia	11.12%	8.35%
Ecuador	7.31%	10.05%
Guyana	10.43%	10.95%
Paraguay	6.65%	10.37%
Peru	2.86%	3.67%
Suriname	10.75%	9.94%
Uruguay	7.67%	10.52%
Venezuela	11.95%	13.33%
South America	**8.63%**	**10.07%**
World average	**7.88%**	**6.27%**

Source: ITC (2011a)

Table 3.1 indicates the average *ad valorem* equivalent tariff applied by the respective South American countries on products imported from the world as well as from South Africa.

[12] *Ad valorem* equivalent (AVE) tariffs are tariffs presented as a percentage of the value of goods cleared through customs. It is the equivalent of a corresponding specific tariff measure based on unit quantities such as weight, number or volume (ITC, 2011a).

From Table 3.1 it is clear that:

(i) Brazil and Venezuela are the South American countries that apply the highest average tariffs to South Africa, namely 13.69% and 13.33%, respectively.

(ii) Peru charges the lowest average tariff of 2.86% to the world and 3.67% to South Africa. Peru's average tariff to the world (2.86%) is about a third of the South American tariff average (8.63%).

(iii) The average tariff applied world-wide is 7.88%, which is lower than the average tariff that South America applies to the world, namely 8.63%. Therefore, South America, in general, applies higher tariffs on imported products than the world.

(iv) When comparing the average tariff that the South American countries apply to products imported from South Africa to those imported from the world, the tariffs applied to South Africa are higher for all the countries, except for Colombia and Suriname.

(v) The average tariff that South America applies to exports from South Africa (10.07%) is higher than the average tariff that the world applies to exports from South Africa (6.27%). Therefore, it is clear that South America applies relatively high tariffs for goods imported from South Africa.

Table 3.2 indicates the non-tariff averages applied by the respective South American countries on imports from South Africa.

Table 3.2: Non-tariff averages applied by South American countries to South Africa

Country	Non-tariff average
Argentina	5.3%
Bolivia	7.2%
Brazil	16.8%
Chile	5.5%
Colombia	15.1%
Ecuador	N/A[13]
Guyana	N/A
Paraguay	N/A
Peru	7.6%
Suriname	N/A
Uruguay	16.9%
Venezuela	10.4%
South America[14]	**7.1%**
World average	**11.85%**

Source: Kee *et al.,* (2008)

When considering the non-tariff averages of the different South American countries[15]:

(i) Argentina is the country with the lowest non-tariff average (5.3%).

(ii) Uruguay, on the other hand, is the country with the highest non-tariff average (16.9%).

(iii) The non-tariff average for South America is 7.1%, which is below the world average of 11.85%. South America is, therefore, applying lower non-tariff barriers to South Africa, compared to its non-tariff barriers to the world.

From section 2.1, it is clear that trade barriers do not only include tariff and non-tariff barriers, but also other factors such as cost, time, distance, infrastructure, logistics and culture (see sections 2.2.1 to 2.2.8). Section 3.2.2 considers the transport costs, times as well as distances involved in the trading process between South Africa and the South American countries.

[13] N/A. There were no data available from this source for these countries.
[14] The average has been calculated by using the available data.
[15] The following statements are made by using only the available data.

3.2.2 Domestic and international transport cost, time and distance between South Africa and the South American countries

International and domestic transport cost, time, as well as distance between two countries have an impact on trade (see sections 2.2.2, 2.2.3 and 2.2.6). Even though these variables do have an impact on one another, they have a low correlation (see sections 2.2.2.1 and 2.2.6). Since the focus of this study is to investigate the trade barriers faced by South Africa in the respective South American countries, sections 3.2.2.1 and 3.2.2.2 illustrate the times and distances to trade between South Africa and the twelve South American countries.

Section 3.2.2.1 focuses on the domestic transport cost, time and number of documents required by using data from the World Bank's "Doing Business Report" (World Bank, 2011).

3.2.2.1 Domestic cost and time to trade in the South American countries

The Doing Business Report is a report that measures the ease of doing business with, and in a specific country (World Bank, 2011). It measures the business regulations and their enforcement across 183 economies. The different divisions that the report focuses on are starting a business, dealing with a construction permit, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency (World Bank, 2011:17). To investigate the trade barriers that South African exporters face in the different South American countries, this study focuses on the "trading across borders" section.

Table 3.3 presents the data of the Doing Business 2012 report's "trading across borders" section (World Bank, 2011). These aspects are the time and cost associated with document preparation, customs clearance and technical control, ports and terminal handling and inland transportation and handling.

Table 3.3: Domestic cost and time to trade in the South American countries

Country	Documents for import (number)[16]	Domestic times to import (days)[17]	Domestic costs to import (US$)[18]
	1	2	3
Argentina	7	16	1 810
Bolivia	7	23	1 747
Brazil	7	17	1 730
Chile	7	21	795
Colombia	8	13	1 700
Ecuador	7	29	1 332
Guyana	8	22	745
Paraguay	10	33	1 750
Peru	8	17	880
Suriname	7	25	945
Uruguay	10	22	1 330
Venezuela	9	71	2 868
South American average	**8**	**26**	**1 469**
World average	**7**	**26**	**1 640**
Best 10 world average [19]	**3.4**	**5.3**	**565**
Worst 10 world average[20]	**12.4**	**79**	**5 285**

Source: World Bank (2011)

In terms of the number of documents required to import (column 1):

(i) Paraguay and Uruguay require the most documentation in comparison with the other South American countries. These countries require ten documents before an exporter can export to them. Although there are fewer documents than the average of the worst 10 countries in the world (12.4), it is more than the South American (8) and world averages (7).

[16] Import documents include: the number of bank documents, customs clearance documents as well as port and terminal handling documents.
[17] Domestic time include, time for: obtaining all the documents, inland transport and handling, customs clearance and inspections, port and terminal handling. It does not include ocean transport time.
[18] Cost measures the fees levied on a 20-foot container. Costs include fees for: documentation for customs clearance and technical control, customs broker, terminal handling and inland transport.
[19] The averages for the top 10 countries in the world in terms of lowest number of documents, days and cost are calculated for each category.
[20] The averages for the bottom 10 countries in the world in terms of largest number of documents, days and cost are calculated for each category.

(ii) Argentina, Bolivia, Brazil, Chile, Ecuador and Suriname all require seven documents to import. This is a larger number of documents than the best 10 countries in the world require, but about equal to the South American and world averages of 8 and 7, respectively.

Considering the time necessary for the preparation of documentation, inland transport and handling, customs clearance and inspections, port and terminal handling (column 2):

(i) Colombia takes the least time of the South American countries, requiring only 13 days. Compared to the world and the South American average of 26 days, Colombia performs well.

(ii) Venezuela, on the other hand, requires 71 days to import goods. This can have serious implications for time-sensitive products.

Comparing the different costs to import a 20-foot container of goods (costs associated with document preparation, inland transport and handling, customs clearance, brokers and inspections) (column 3):

(i) Guyana is the cheapest and Venezuela, once again, performed the worst by being the most expensive. It costs only US$ 745 to export a container of goods into Guyana. Although Guyana clearly outperforms other South American countries, with an average of US$ 1 469 per container, it is still not cheaper than the average of the best 10 countries in the world (US$ 565).

(ii) The world average cost to import a container is US$ 1 640. To export to Venezuela, the cost per container is almost double the world average, as it costs US$ 2 868 per container. Although US$ 2 868 appears high, the average of the worst 10 countries in the world is US$ 5 285.

(iii) When weighing South America's results against the world averages of the best and worst 10 countries, it is clear that South America's domestic import costs are relatively average.

In conclusion, the average number of documents needed to export from South Africa to South America is eight, which is one document above the world average of seven and in between the best and worst 10 countries in the world, which are 3.4 and 12.4 respectively.

In terms of the domestic time to import, the world average and South American average are the same (26 days). Considering domestic costs to import, the South American average (US$ 1 469) is again close to the world average of US$ 1 640.

Section 3.2.2.2 focuses on the international transport costs, times and distances of shipping cargo from South Africa to the South American countries.

3.2.2.2 International cost and time to trade between South Africa and the South American countries

Table 3.4 compares the times and distances between South Africa and the twelve South American countries. South Africa's international transportation times and distances to each of the South American countries are also compared to each South American country's top five importers.

Table 3.4: Time and distance of international shipments between South Africa and the South American countries as well as South America's top five competitors

	South Africa		Top five competitors' averages[21]	
Country	**Distance (NM)**	**Time (days)**	**Distance (NM)**	**Time (days)**
Argentina	4 437	29	6 080	23
Bolivia[22]	5 796	55	6 314	18
Brazil	4 152	19	6 760	22
Chile	5 796	55	6 204	27
Colombia	6 929	43	4 315	14
Ecuador	7 660	43	5 275	17
Guyana	5 888	48	2 674	19
Paraguay[23]	4 332	47	9 026	22
Peru	7 022	38	5 306	17
Suriname	5 718	52	5 841	31
Uruguay	4 332	47	4 413	21
Venezuela	6 481	44	3 589	14
South America	**5 814**	**43**	**5 483**	**20**

Sources: Linescape (2011); SeaRates (2011)

From Table 3.4, it is clear that in terms South Africa's trade distance and time to export to the different South American countries:

(i) Brazil is the closest country (4152 NM) to South Africa in terms of shipping, measured in nautical miles.

(ii) Ecuador, on the other hand, is the South American country with the longest shipping route (7660 NM) from South Africa.

(iii) In terms of the time it takes to travel from South Africa to the different South American countries, Brazil takes the shortest time (19 days), which is less than a half of the South American average time (43 days).

[21] The top five competitors are determined by considering each country's top five importers (ITC, 2011b). The average distance and time of these five countries to each South American country are displayed in the table. These averages are an indication of South Africa's relative advantage or disadvantage in terms of its competition in each South American country.
[22] Bolivia is landlocked. The time and distance are calculated by using the time and distance of Chile.
[23] Paraguay is landlocked. The time and distance are calculated by using the time and distance of Uruguay.

(iv) To travel to Chile and Bolivia takes the longest (55 days).

When considering South Africa's top five competitors' averages in each of the South American countries:

(i) Guyana is the closest (2 674 NM) and Paraguay the furthest (9 026 NM) from their main trading partners.

(ii) Considering the time it takes to ship a consignment, Columbia and Venezuela have the shortest average shipping times between them and their main trading partners (14 days), while Suriname's average shipping time to its main trading partners is the longest (31 days).

The average shipping distances between South Africa and South America as well as South Africa's top five competitors' average are almost the same (5 814 vs. 5 483 nautical miles). However, the average time for trade between South Africa and the South American countries is double the time of trade between the South American countries and the top five competitors (43 vs. 20 days). Therefore, as mentioned in section 2.2.6, there is also a low correlation between distance and the time, as is the case with the distance between South Africa the different South American countries and the time it takes to export to these countries. Therefore, the time to export from South Africa to the South American countries should be a main concern for South African exporters and policy-makers wanting to enhance the exports of South Africa to the South American countries.

In Table 3.5, the international transport costs and shipment times are provided.

Table 3.5: International cost and time of shipments between South Africa and the South American countries

Destination	Landlocked[24]	Sea port used / via	International transport costs and times[25]	
			Cost (US$)	Time (days)[26]
Argentina		Buenos Aires	2 879	29
Bolivia	yes	Valparaiso, Chile	5 308	55
Brazil		Santos	2 795	19
Chile		Valparaiso	5 308	55
Colombia		Cartagena SPRC	3 244	43
Ecuador		Guayaquil	5 158	43
Guyana		Georgetown	8 128	48
Paraguay	yes	Montevideo, Uruguay	1 929	47
Peru		Callao	4 294	38
Suriname		Port Parimaribo	7 942	52
Uruguay		Montevideo	1 929	47
Venezuela		Puerto Cabello	5 529	44
South American average			**4 537**	**43**
World average			**3 132**	**30**

Sources: Author compiled data from Linescape (2011) and quotes obtained from freight forwarder

Table 3.5 shows the times and costs to ship a 20-foot general cargo container from Durban harbour in South Africa to the twelve different South American countries. The harbours of these countries are the same as those being used in the Doing Business Report (World Bank, 2011). From Table 3.5, it can be concluded that:

(i) It is most expensive to ship to Guyana, Georgetown (US$ 8 128) and least expensive to ship to Uruguay, Montevideo (US$ 1 929).

(ii) It takes only 19 days to export to Brazil, while exporting to Chile and Bolivia takes more than double the time (55 days).

[24] Bolivia and Paraguay are landlocked. The costs and times are calculated by using ports in Chile and Uruguay respectively.
[25] A word of gratitude to Ms Danielle le Clus who supplied this information.
[26] The time (days) is the same time (days) used in Table 3.4; it is presented in this table (3.5) in order to compare the time with cost (US$).

(iii) The average transport cost and time for South Africa to export to South America are higher and longer than the average cost and time for South Africa to export to the world (US$ 4 537 vs. US$ 3 132).

(iv) It takes on average 43 days to export from South Africa to South America and an average of 30 days for the world to export to South America.

From the above table, it is clear that there is a small correlation between the cost and time of shipping cargo. The cost will be mainly influenced by the number of shipping lines and main routes between two countries.

In section 3.2.2.3, the domestic (see Table 3.3) and international (see Tables 3.4 and 3.5) costs and times will be added to obtain the total cost and time of exporting from South Africa to the different South American countries.

3.2.2.3 Total transport cost and time to export from South Africa to the South American countries

In Table 3.6, the total transport costs and times of exports from South Africa to the South American countries are shown. These costs and times are obtained from Tables 3.3, 3.4 and 3.5.

Table 3.6: Total[27] costs and times to trade between South Africa and the South American countries

Destination	Total Costs (US$)	Total Times (days)
Argentina	4 689	45
Bolivia	7 055	78
Brazil	4 525	36
Chile	6 103	76
Colombia	4 944	56
Ecuador	6 490	72
Guyana	8 873	70
Paraguay	3 679	80
Peru	5 174	55
Suriname	8 887	77
Uruguay	3 259	69
Venezuela	8 397	115
South America	**6 006**	**69**
World average	**4 772**	**56**

Table 3.6 takes the domestic as well as international costs and times to export from South Africa to the South American countries into consideration.

From Table 3.6, it is clear that, in terms of cost to trade:

(i) Suriname (US$ 8 887) is the most expensive to export to, whereas Uruguay is the least expensive (US$ 3 259).

(ii) The South American average total cost is higher than the world average. Therefore, it is relatively more costly to export from South Africa to South America (US$ 6 006) compared to the world (US$ 4 772).

In terms of the time (number of days) to trade, it is clear that:

(i) Brazil is the country to which it takes the shortest time to export from South Africa, namely 36 days, while it takes 115 days to export to Venezuela.

[27] The total cost and times are calculated by adding the domestic and international costs and times per country in Tables 3.3 and 3.5, e.g. Argentina's total cost (US$ 4 689), is calculated by adding US$ 1 810 (from Table 3.3) to US$ 2 879 (from Table 3.5).

(ii) Compared to the world average of 56 days, it takes a relatively large number of days on average to export from South Africa to South America (69 days).

The next section focuses on the logistical aspects of the South American countries.

3.2.3 Logistics Performance Index (LPI) of South American countries

The Logistics Performance Index (LPI) was constructed for the World Bank by Arvis *et al.* and built on information from a web-based questionnaire completed by more than 1 000 logistic professionals worldwide (Arvis *et al.,* 2010:4). These logistics professionals include multinational freight forwarders and the main express carriers. Each respondent was asked to rate performance in six logistics areas for eight countries with which they conduct business (Arvis *et al.,* 2010:4).

The LPIs of the eight countries were automatically generated by the survey engine based on trade flows, income level, geographical position of respondent countries (coastal and landlocked) and random selection (Arvis *et al.,* 2010:4). The countries' performances were evaluated using a five-point scale (1 = the lowest score, 5 = the highest). As mentioned in 2.2.5, the six areas of performance are:

1. Efficiency of the clearance process by customs.
2. Quality of transport and trade-related infrastructure.
3. Ease of arranging competitively priced shipments.
4. Competence and quality of logistics services.
5. Ability to track and trace international shipments.
6. Timeliness of shipment in reaching destination.

More than 5 000 individual country evaluations were used to prepare the LPI, which covers 155 countries (Arvis *et al.,* 2010:1). The LPI was aggregated as a weighted average of the six areas of logistics performance. In Table 3.7, the LPIs (including the six areas of performance) of the South American countries are presented.

Table 3.7: LPI scores for South American countries

LPI rank in the world	Country	LPI	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
48	**Argentina**	3.1	2.63	2.75	3.15	3.03	3.15	3.82
112	**Bolivia**	2.51	2.26	2.24	2.53	2.38	2.38	3.20
41	**Brazil**	3.2	2.37	3.10	2.91	3.30	3.42	4.14
49	**Chile**	3.09	2.93	2.86	2.74	2.94	3.33	3.80
72	**Colombia**	2.77	2.50	2.59	2.54	2.75	2.75	3.52
71	**Ecuador**	2.77	2.32	2.38	2.86	2.60	2.84	3.55
140	**Guyana**	2.27	2.02	1.99	2.31	2.25	2.28	2.70
76	**Paraguay**	2.75	2.37	2.44	2.87	2.59	2.72	3.46
67	**Peru**[28]	2.80	2.50	2.66	2.75	2.61	2.89	3.38
77	**Uruguay**	2.75	2.71	2.58	2.77	2.59	2.78	3.06
84	**Venezuela**	2.68	2.06	2.44	3.05	2.53	2.84	3.05
	South America	**2.79**	**2.42**	**2.55**	**2.77**	**2.69**	**2.85**	**3.43**
	World average	**2.87**	**2.59**	**2.64**	**2.85**	**2.76**	**2.92**	**3.41**
	Top 10 average	**4.01**	**3.89**	**4.14**	**3.58**	**4.05**	**4.14**	**4.35**
	Bottom 10 average	**1.98**	**1.82**	**1.66**	**2.20**	**1.84**	**1.85**	**2.40**

Source: Arvis *et al.* (2010)

[28] No data available for Suriname.

From Table 3.7, it is clear that:

(i) Brazil is the South American country with the best LPI score of 3.2.

(ii) In comparison with the other South American countries, Brazil outperformed the South American countries in all the logistic performance areas, except for the customs and international shipment areas, where Chile and Argentina respectively scored better than Brazil did (2.93 and 3.15).

(iii) The country with the worst LPI score in South America is Guyana (2.27). Guyana has the worst score of all the South American countries in all six of the logistics performance areas.

(iv) When comparing South America's LPI scores with the world average, South America is just below average in terms of logistics. Throughout the six performance areas, the world average is a few decimals better than South America, except for timeliness of shipment in reaching destination, where South America is just above average. Of interest is that the South American average never falls below the bottom 10 countries' average.

In section 3.2.3, South Africa's cultures (in terms of language and religion) are compared to the different South American countries' languages and religions.

3.2.4 South African and South American countries' language and religion

As mentioned in section 2.2.7, cultural differences can also be a trade barrier. Different elements contribute to a country's culture, of which language and religion are two of the most important elements (ITRISA, 2011:48, 51). Table 3.8 provides an overview of the South African and South American languages and religions.

Table 3.8: South African and South American languages and religions

Country	Major language	Major religion
Argentina	Spanish	Christianity
Bolivia	Spanish, Quechua, Aymara, Guarani	Christianity
Brazil	Portuguese	Christianity
Chile	Spanish	Christianity
Colombia	Spanish	Christianity
Ecuador	Spanish, Indigenous languages	Christianity
Guyana	English, Indigenous languages, Creole, Hindi, Urdu	Christianity, Hinduism
Paraguay	Spanish, Guarani	Christianity
Peru	Spanish, Quechua, Aymara	Christianity
Suriname	Dutch , English, Sranang Tongo, Hindi, Javanese	Christianity, Hinduism, Islam
Uruguay	Spanish	Christianity
Venezuela	Spanish, Indigenous languages	Christianity
South Africa (official)	Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Sesotho sa Leboa, Sesotho, Setswana, SiSwati, Tshivenda, Xitsonga	Christianity, Islam, Hinduism, Judaism

Sources: BBC News (2011); Anon (2011)

From Table 3.8, it is clear that:

(i) Most South American countries' main language is Spanish, whereas South Africa has 11 official languages, with English being the language most commonly spoken. Since Spanish is generally not spoken in South Africa, language can be a significant trade barrier.

(ii) When considering religion, most South Africans, as well as South Americans, are Christians. Therefore, broadly speaking, as far as religion is concerned, it should not pose a serious trade barrier.

According to a firm-level survey undertaken by the DTI (2010b:35) on perceived export barriers, the results indicated that language barriers and making contact with potential buyers are the two most frequently mentioned perceived constraints by exporters from South Africa to Latin America (DTI, 2010b:35).

Section 3.3 will consequently summarise and conclude this chapter.

3.3 Summary

There are numerous factors that impede trade. This chapter focused on quantifying the trade barriers between South Africa's exports to the twelve different South American countries. The trade barriers were measures in terms of tariff barriers, non-tariff barriers, transport costs, time, distance, infrastructure, logistics and culture.

South American countries apply relatively high tariffs and lower non-tariff barriers for goods imported from South Africa, compared to what they apply to the world. Venezuela and Brazil are the South American countries with the highest tariff averages and Uruguay is the country with the highest non-tariff average. Peru charges the lowest average tariffs and Argentina is the country with the lowest non-tariff average.

In terms of the transport cost, time and distance, the data from the Doing Business Report evaluated the domestic costs and times. In this report, South America is in close range with the world average. The average number of documents required to export from South Africa to South America is eight, which is one document above the world average of seven. The world average and South American average domestic time to import are the same (26 days). The South American average domestic costs to import, US$ 1469, are again close to the world average of US$ 1640. When considering the number of documents required to import, Argentina, Bolivia, Brazil, Chile, Ecuador and Suriname outperformed the other South American countries, while Uruguay and Paraguay performed the worst in this category. Out of all the South American countries, Venezuela requires the longest domestic time and highest domestic cost to export to. Importing domestic cost is the lowest in Guyana.

The international transport costs data showed that Uruguay is the cheapest to export to and Guyana the most expensive. Overall, the average distance between South America and South Africa is almost the same as the distance between the South American countries' top five trading partners (5814 NM vs. 5483 NM). However, the average time for trade between South America and South Africa is double the time to trade between South America and its top five trading partners (importers) (43 vs. 20).

From the total (domestic as well as international) transport time and cost data, Uruguay is the cheapest and Suriname is the most expensive. It takes the fewest days to export to Brazil, and

the most days to export to Venezuela. Compared to the world average of 56 days, it takes on average 10 days longer to export from South Africa to South America.

According to the LPI, South America's logistic performance is in close range with the world average (2.79 vs. 2.87). Overall, Brazil outperformed all the other South American countries in terms of the LPI, whereas Guyana performed the worst. Brazil is the country that is the closest in distance as well as fastest in international shipment time to export from South Africa, whereas Ecuador is the furthest and Chile takes the longest.

The cultural gap between South Africa and the South American countries is large in terms of language, but small in terms of religion.

Over all the different trade barriers, the largest trade barriers from South Africa in trading with South America are tariffs, cost, time and culture. Compared to the world, South America applies relatively higher tariffs (Table 3.1) and lower non-tariffs (Table 3.2) for goods imported from South Africa. The total transport costs and time are higher than the world average (Table 3.6). The LPI scores of South American countries are in close range with the world average. Since most South Africans as well as South Americans are Christians, the possible religion gap is relatively small. The language gap, however, is large with Spanish being South America's overall most spoken language. This barrier can, however, be easily overcome by learning the foreign language (see section 2.2.7).

This chapter investigated and measured the barriers to trade for South Africa, specifically in South American countries. Chapter 4 will continue to the next objective of this study, which is to identify the realistic export opportunities for South Africa in the various South American countries (see section 1.3). The DSM methodology, developed by Cuyvers *et al.* (1995) and refined for South Africa by Viviers *et al.* (2009, 2010); Steenkamp *et al.* (2009) and Steenkamp (2011), will be used as a basis to identify realistic product-country combinations for South Africa's exports to the South American countries. The DSM will be updated by using the most recent (2010) data, and filter 3.2, which focuses on trade barriers, will be reconstructed for the circumstances of South Africa exporting to the different South American countries.

CHAPTER 4: THE DSM METHODOLOGY APPLIED TO IDENTIFY EXPORT OPPORTUNITIES FOR SOUTH AFRICA IN SOUTH AMERICA

4.1 Introduction

In Chapter 3, the trade barriers that South Africa faces when exporting to the different South American countries were described. This chapter continues to the next objective of this study, which is to update and run the DSM to identify the realistic export opportunities for South Africa in the various South American countries (see section 1.3), specifically focusing on filter 3.2, which considers trade barriers.

According to Steenkamp (2011: 37), the DSM is the only market selection method found in the literature that starts by taking all possible world-wide product-country combinations into consideration and sequentially eliminates uninteresting markets to leave only the markets that show the highest export potential. The DSM's methodology is therefore appropriate to apply in order to identify the product-country export opportunities for South Africa in the South American countries.

This chapter concentrates on the DSM methodology and its specific application to identify export opportunities between South Africa and the different South American countries.

The sequential elimination process of the DSM is grouped into four filters (see section 1.2). The first filter is divided into two parts, namely filter 1.1 that focuses on the countries' political and commercial risk ratings and filter 1.2 that eliminates countries that do not show macro-economic potential. Filter 1.2 includes GDP, GDP per capita values and growth in these economic indicators. The second filter considers import market size and growth. Market concentration (filter 3.1) and market accessibility (filter 3.2) are considered in filter 3. For each of these filters a cut-off value is determined for each criteria in order to eliminate product-country combinations with low export potential. The last filter (filter 4) firstly ensures that South Africa can produce and export the products for which export opportunities are identified. Then filter 4 also categorises all the selected product-country combinations in 20 cells according to market size and growth of the importing countries and the relative share of South Africa's actual exports (Cuyvers *et al.,* 1995; Cuyvers, 1997; Cuyvers, 2004).

This chapter will discuss the methodology of the DSM, as well as its specific application to identify South Africa's export opportunities in the South American countries.

4.2 The DSM methodology

4.2.1 Filter 1: Political and commercial risk, macro-economic size and growth

Countries with very high political and commercial risk and inadequate macro-economic size or growth are eliminated in filter 1 (Cuyvers *et al.*, 1995; Cuyvers, 1997; Cuyvers, 2004). Filter 1.1 considers all the countries' political and commercial risk ratings, while filter 1.2 eliminates countries based on macro-economic data.

4.2.1.1 Filter 1.1: Political and commercial risk rating

In filter 1.1, the political and commercial risks that exporters face when trading with a foreign country are considered. Commercial risk is the risk that the foreign buyer cannot meet his financial obligations and default on the payment for any reason (ONDD, 2012). Political risk can be defined as an event happening in the importing country, such as wars, natural disasters, currency shortages and government action (assuming the nature of *force majeure* for the importer) (ONDD, 2012). The political risks can be assessed by focusing on the government system, history of political riskiness and corruption, economic policies and the legal system. There are many institutions that rate countries according to their political and commercial risks (Steenkamp, 2011:42). The ratings of the ONDD (2012) are used in the DSM.

4.2.1.2 Filter 1.2: Macro-economic size and growth

Filter 1.2 eliminates countries that do not show general potential based on their macro-economic size and growth. There are different indicators that measure a country's macro-economic size and growth, which include: GDP, GDP per capita, GDP growth and GDP per capita growth. All of these factors are considered in this filter of the DSM.

In this application of the DSM for South America, filter 1.1 and filter 1.2 were not applied, because of the DTI's request for a special refinement to exclude filter 1 for the South American countries (see section 1.2). The request for this special refinement was due to the large number of countries that were eliminated in this filter in both the 2007 and 2009 re-run of the DSM (see Viviers & Pearson 2007; Viviers *et al.*, 2009). Therefore, for purposes of this study, all twelve South American countries were considered in filter 2. This application of the DSM for South

America therefore deviates from the original DSM, in the sense that filters 1.1 and 1.2 were not used.

4.2.2 Filter 2: Import market size and growth

The import *size* and *growth* of each product-country combination within the twelve South American countries are considered in filter 2.

The short-term growth in each market opportunity[29] is calculated by measuring the simple annual growth rate in imports from 2009 to 2010. The long-term growth rate is calculated by using import statistics of 2006 to 2010 and calculating the compounded annual percentage growth in the imports over the five-year period[30]. Import data per product-country combination is used as an indication of the size of import demand in each market.

In order to calculate the cut-off value for filter 2, it is firstly necessary to calculate South Africa's Revealed Comparative Advantage (RCA) in each market. According to Cuyvers *et al.* (1995:179), the reason for including this measure in calculating the cut-off values is that if South Africa is already specialised in exporting a specific product, the cut-off point for the market should be less rigid. The RCA can be calculated as follows:

$$RCA = \left(\frac{X_{i,j}}{X_{W,j}} \right) / \left(\frac{X_{i,tot}}{X_{W,tot}} \right)$$

where:

$X_{i,j}$: exports of South Africa *i* of product *j*;

$X_{W,j}$: world-wide exports of product *j*;

$X_{i,tot}$: total exports of South Africa *i*;

$X_{W,tot}$: world-wide exports of all product categories.

[29] Each product-country combination forms a market opportunity.
[30] 2003 to 2007 trade data was used in Viviers *et al.*'s (2010) application of the DSM to identify export opportunities for South Africa in South America. This was before the 2009 world-wide financial crisis (see section 1.3). Updating this data and reconstructing filter 3.2 (see section 4.2.3.2) are therefore important contributions of this study.

If the RCA value is closer to 0, it means that South Africa is only exporting a small amount of product *j* and is therefore not specialised in producing and exporting the product (Balassa, 1965; Krugell & Matthee, 2009:461). On the other hand, if the RCA is equal to or larger than 1, it means that South Africa is specialised in producing and exporting the specific product (Cuyvers *et al.,* 1995:179).

By using the RCA values, the cut-off values for the short- and long-term import *growth* can be calculated. Firstly, a scaling factor, s_j, is defined to take South Africa's degree of specialisation in the exports of a specific product *j* (RCA) into account (Cuyvers, 2004:260). The scaling factor (s_j) can be defined as follows:

$$s_j = 0.8 + \frac{1}{(RCA_j + 0.85)\exp^{(RCA_j - 0.01)}}$$

The cut-off values are then defined as:

$g_{ij} \geq G_j$;

with $g_{i,j}$ being the import growth rate of product category *j* by country *i*; and

$G_j = g_{W,j} s_j, if\ g_{W,j} > 0$; or

$G_j = g_{W,j} / s_j, if\ g_{W,j} < 0$

with $g_{w,j}$ being the growth in total world imports of product category *j*.

The cut-off point for the relative *size* of the import market is defined as follows. The import market of country *i* for product *j* is considered large enough if (Cuyvers, 2004:260):

$M_{i,j} \geq S_j$

where $M_{i,j}$ is the import market size of country *i* for product category *j*; and

$S_j = 0.02 M_{W,j}, if\ RCA_j \geq 1$; or

$S_j = [(3 - RCA_j)/100] M_{W,j}, if\ RCA_j < 1$

Each product-country combination is assigned a “0” when the above-mentioned criteria are not fulfilled and a “1” if the criteria are fulfilled. Each product-country combination is then categorised into one of seven categories, as illustrated in Table 4.1 (Cuyvers, 2004:261).

Table 4.1: Categorisation of product-country combinations in filter 2 in terms of market size and growth

Category	Short-term import market growth	Long-term import market growth	Relative import market size
0	0	0	0
1	1	0	0
2	0	1	0
3	**0**	**0**	**1**
4	**1**	**1**	**0**
5	**1**	**0**	**1**
6	**0**	**1**	**1**
7	**1**	**1**	**1**

Source: Cuyvers (2004:261)

The product-country combinations that fall into categories 0, 1 and 2 are not selected to go through to filter 3.1 (Cuyvers, 2004:261). Therefore, only the product-country combinations in categories 3 to 7 will enter filter 3.1, as these categories indicate that the possible markets are relatively large (category 3) or growing in the short and long term (category 4), growing in the short term and relatively large (category 5) or growing in the short and long term and relatively large (category 6).

In the application of the DSM to identify export opportunities for South Africa in South America, filter 2 was applied in the same manner as the original DSM (described above).

4.2.3 Filter 3: Market concentration and accessibility

Filter 3 is divided into two parts, namely filter 3.1 and filter 3.2. The first part considers the concentration of each market. In other words, it is determined whether there is a monopoly in the market or whether it is a competitive market. The second part of filter 3 considers the trade barriers that exist between two markets.

4.2.3.1 Filter 3.1: Market concentration

Although a product-country combination that was selected in filter 2 has large import demand and/or import growth, it does not mean that the market is easily accessible (Cuyvers *et al.,* 1995:180). It is therefore important to consider the concentration of a market[31] (filter 3.1) and the barriers to trade that will be faced in the market (filter 3.2). The more concentrated a market, the more difficult it becomes to enter. This has been proven by Cuyvers *et al.* (1995:180) who found a negative relationship between export performance and market concentration.

Hirshmann's (1964) Herfindahl-Hirshmann Index (HHI) is used to measure the degree of concentration in the different markets. The HHI is calculated as follows:

$$HHI_{ij} = \sum \left(\frac{X_{k,ij}}{M_{tot,ij}} \right)^2$$

where:

$X_{k,ij}$: the exports of country *k* to country *i* for product category *j*.

$M_{tot,ij}$: country *i*'s total imports of product category *j*.

When the HHI value is close to 0, it indicates a low market concentration and therefore the market can be easily penetrated, whereas an HHI value closer to 1 indicates a more concentrated market, which will be difficult to penetrate. Therefore, the larger the HHI value, the more difficult it is to enter the market (Cuyvers *et al.,* 1995:180; Cuyvers, 2004:261).

According to Cuyvers *et al.* (1995:180), when calculating the cut-off values for filter 3.1, it has to be kept in mind that the market concentration in a growing market is less of a problem than the market concentration in a non-growing market. For that reason, the cut-off values are calculated to depend on the category values of the markets in filter 2 (see Table 4.1).

[31] A highly concentrated market is one with one or two countries that are large suppliers, who are well known by the customers and have the know-how of the specific market (Steenkamp, 2011:50).

Cut-off point:

$h_k \geq HHI_{ij}$

with:

$h_k = \overline{x_h} - 0.05\alpha\sigma_h, \; for category 3;$

$h_k = \overline{x_h} + 0.05\alpha\sigma_h, \; for category \; 4,5, and \; 6;$

$h_k = \overline{x_h} + 0.15\alpha\sigma_h, \; for category \; 7;$

where:

$\overline{x_h}$: average of the HHI-values of all product-country combinations under investigation

σ_h: standard deviation of the HHI values of all product-country combinations under investigation

α: alpha value starting at α=0 and increases with increments of 0.001

An α-value is selected where there is a definite break in the number of product-country combinations selected.

In this application of the DSM for South America, filter 3.1 was applied in the same manner as in the original DSM as described above.

4.2.3.2 Filter 3.2: Market accessibility

The second part of filter 3 focuses on market accessibility (barriers to trade). In Cuyvers' (1995; 2004) applications of the DSM for Belgium and Thailand, a proxy called "revealed absence of trade barriers" was used to assess market accessibility. It was argued that if Belgium and Thailand's neighbouring countries can penetrate a market, Belgium and Thailand would also be able to do so.

This argument cannot be applied for South Africa and its neighbouring countries. The reason for this is that South Africa's neighbouring countries do not have characteristics similar to South Africa (Viviers & Pearson, 2007; Steenkamp *et al.*, 2009:22). Viviers and Pearson (2007) consequently used crow-fly distance between Pretoria (South Africa) and the capital city of the countries in this part of filter 3. However, distance does not take into consideration all the factors that influence market accessibility (see also section 2.2.6).

According to Steenkamp *et al.* (2009:68), distance alone is not a good evaluation of market accessibility, and therefore another proxy had to be found. In the 2009 application of the DSM for South Africa, Steenkamp *et al.* (2009) composed a new market accessibility index by using distance, transport cost, the World Bank's LPI, average applied tariffs and non-tariff barriers. All data on these variables was on a country level and the index was calculated by determining z-scores and assigning different weights to each variable. In 2011, Steenkamp (2011) improved on this by composing a market accessibility index on product-country level. Therefore, all product-country combinations were evaluated individually and not only on a country level. Three factors were identified as measures of market accessibility, namely a *tariff and non-tariff barrier factor*, a *domestic time and cost factor* and an *international factor*. A principal components analysis was applied to calculate an index value for each product-country combination under investigation. The three factor scores for each product-country combination were added to arrive at an index value for each product-country combination. The result is an index that indicates the accessibility of markets relative to one another (Steenkamp, 2011:71).

In this application of the DSM for South America, the same method as Steenkamp (2011) could not be used, because the number of data points was too small to run a reliable principle component analysis. Furthermore, for this study, the 2010 UN Comtrade world trade data was available versus the 2007 data used in Steenkamp's (2011) study, as well as the fact that the ITC's data on South Africa's top five competitors in the South American import market became available. Therefore, for purposes of this study, filter 3.2 needed to be reconstructed. Another method for filter 3.2 needed to be considered in this study and will be subsequently discussed.

4.2.3.2.1 Filter 3.2: ITC's method for market access

One of the market selection methods discussed in Steenkamp's (2011) literature review, is the ITC's market attractiveness index. This index is built by focusing on three main criteria: (i) market size, (ii) market growth, and (iii) ease of market access.

In this application of the DSM to identify South Africa's export opportunities in South America, the ITC's (2011b) method for measuring ease of market access will be used as the basis of filter 3.2.

The *ease of market access conditions* index of the ITC includes two criteria, namely the (i) *ad valorem* tariff applied to a particular product by the importing market to the specific exporting country, and (ii) the difference between the tariff applied to the exporting country in question and the average tariff faced by the top five competitors on the importing market (the preferential tariff) (ITC, 2011b:11).

From Chapters 2 and 3, it is clear that there are other factors that also influence market access, for example non-tariff barriers, transportation costs and time as well as logistical aspects (see 3.2.1 to 3.2.3 and 2.2.1 to 2.2.5). For the purposes of this study, a new market access index is therefore developed by expanding the ITC's (2011b) ease of *market access conditions index*.

The market access index in this study is calculated by using the following variables:

(i) *ad valorem* equivalent tariffs faced by South Africa per product-country combination. This data was gathered from Market Access Map and the UN Comtrade Database.

(ii) preferential tariffs, which is the difference between the tariff applied to the exporting country and the average tariff faced by the top five competitors on the importing market. The data was gathered from the ITC (Marty, 2012)[32].

(iii) *ad valorem* equivalent non-tariff barriers per product-country combination (data attained from Kee *et al.,* 2008).

(iv) transportation cost was calculated by adding the domestic transportation cost to the international cost (also see section 2.2.2). The domestic transportation cost measures the

[32] A word of gratitude to Oliver Marty and Kerfalla Conte of the ITC who supplied this information.

fees levied on a 20-foot container. The costs include fees for documentation for customs clearance and technical control, customs broker, terminal handling and inland transport (information obtained from Doing Business Report, The World Bank, 2009). International costs to ship a 20-foot general cargo container from Durban harbour in South Africa to the twelve different South American countries (quotes obtained from a freight forwarder)[33] were used.

(v) transport time was calculated by adding the domestic transportation time to the international time (also see section 2.2.3). Domestic time includes time for obtaining all the documents, inland transport and handling, customs clearance and inspections, port and terminal handling. The domestic time does not include ocean transport time (data gathered from the Doing Business Report, The World Bank, 2009). International time to ship a 20-foot general cargo container from Durban harbour in South Africa to the twelve different South American countries was also obtained from a freight forwarder.

(vi) LPI that assigns a score to a country according to their standard of the six most important areas of trade logistics (also see section 2.2.5), namely efficiency of the customs clearance process; quality of trade and transport-related infrastructure; ease of arranging competitively priced shipments; competence and quality of logistics services; ability to track and trace consignments; and the frequency with which shipments reach the consignee within the scheduled or expected time (information gathered from Arvis *et al.*, 2010:4).

The index values of these variables per product-country combination are calculated by using the standardising method of the ITC (2011b:9).

The standardising method is used to solve the problem of including variables in different measurement units in one index (e.g. tariffs in percentage and time in number of days). This method converts each value into a range from 0 to a 100, where 0 indicates weak performance and 100 best performance. The following formula is used:

$$100*\left(\frac{Value-Lower\lim}{Upper\lim-Lower\lim}\right)$$

[33] A word of gratitude to Ms Danielle le Clus who supplied this information.

where:

$Value$: Value of the different variables

$Lower\lim$: 5% weakest performing markets

$Upper\lim$: 5% best performing markets

For each of the six variables included in the market access index in this study, an upper limit is defined and an index value ranging from 0 to 100 is assigned to each product-country combination under consideration. A composite index is then calculated for each product-country combination by means of the simple average of the six index scores.

A cut-off value is determined by means of the average and standard deviation of the index values as follows:

$$CV = \overline{X} - \alpha\sigma_X$$

where:

$\overline{X}$: average index composite

α: alpha value

σ_X : standard deviation

A sensitivity analysis was done, starting with the alpha value being 0 and then increasing it by 0.001, progressively. For each alpha value, the number of countries eliminated is monitored (Cuyvers, 2004:258).

The precise cut-off value is determined where the number of countries eliminated shows a clear break (Cuyvers, 2004:256). In other words, where alpha is 0, the cut-off value will be the average of $\overline{X}$. As the alpha gets larger by increments of 0.001, the cut-off value decreases.

The ITC (2011b:9) specifies that the lower threshold/limit for the *ad valorem* tariffs is 30% and the upper threshold/limit is 0% (ITC, 2011b:9). For the preferential tariffs (*ad valorem* tariff of

South Africa - *ad valorem* tariff of top 5 competitors), the lower threshold is -10% and the upper threshold is 10% (ITC, 2011b:9).

A product-country combination is selected to enter filter 4 if it passes the cut-off criteria for both filter 3.1 and filter 3.2. Filter 4 will be discussed next.

4.2.4 Filter 4: Assessing, categorising and prioritising the realistic export opportunities of South Africa to the South American countries

Firstly, filter 4 assesses whether South Africa specialises in producing the product-country combinations selected in filter 3. This is done by using the Revealed Comparative Advantage (RCA) as explained in filter 2 (see section 4.2.2)[34]. Steenkamp (2011:84) stated that it is important to take into consideration the production capacity of South Africa when identifying realistic export opportunities. If the RCA value is larger than 1, it means that South Africa specialises in the production, as well as the exports of the specific product (Balassa, 1965; Krugell & Matthee, 2009:461; Steenkamp, 2011:61). By adding this criterion, it is ensured that South Africa can produce and export the products for which export opportunities are identified.

Filter 4 then categorises and prioritises all the product-country combinations identified that South Africa can produce and export. The product-country combinations are categorised in 20 cells according to potential demand in the market (import size and growth) and the size of South Africa's actual exports formulated into a market share (see Table 4.2). In this application of the DSM for South America, filter 4 is applied in the same way as the original DSM (Cuyvers, 2004).

According to Cuyvers (1995:181), one can determine a country's competitive advantage in a foreign market by compiling the country's market share relative to other exporting competitors. The relative market share of South Africa (country *n,* the exporting country in this study) for a specific product *j* in one of the twelve South American importing countries (*i)* is calculated as follows:

[34] The RCA in filter 2 was used to define a cut-off value in a market; less rigid cut-off points are assigned to markets in which South Africa already specialises in exporting. In filter 4, the RCA is used as an indication of production capacity.

$$\mu_{n,ij} = \left(\frac{X_{n,ij}}{X_{W,ij}} \right) / \left(\frac{X_{n,j}}{X_{W,j}} \right)$$

where:

$X_{n,ij}$: South Africa's *(n)* exports of product category *j* to country *i*.

$X_{W,ij}$: world exports of product category *j* to country *i*.

$X_{n,j}$: South Africa's *(n)* total exports of product category *j*.

$X_{W,j}$: world exports of product category *j*.

According to Cuyvers *et al.* (1995:182), a high relative market share ($\mu_{n,ij}$-value) shows that a country succeeded in attaining a strong position in that market, and therefore the country has a comparative strength in doing business in a market.

A relative market share ($\mu_{n,ij}$-value) is calculated for all the product-country combinations that entered filter 4. A relative market share value is also calculated for the top six countries that have the largest exports of each product-country combination. From these two relative market share values, $\mu_{n,ij}$ and $\mu_{Six,ij}$, a market importance value can be derived. The market importance value is calculated as follows:

$$\mu_{Six,ij} - \mu_{n,ij}$$

Where:

$\mu_{Six,ij}$: The average relative market share value of the top six competitors in country *i* for product *j*

$\mu_{n,ij}$: South Africa's (country *n*'s) relative market share in country *i* for product *j*

The market importance value can be categorised by level of importance as follows (Cuyvers, 2004:267):

$\mu_{SIX,ij} - \mu_{n,ij} > 3$: South Africa's *(n)* relative market share is relatively small.

$1.5 < \mu_{SIX,ij} - \mu_{n,ij} \leq 3$: South Africa's *(n)* relative market share is intermediately small.

$0 < \mu_{SIX,ij} - \mu_{n,ij} \leq 1.5$: South Africa's *(n)* relative market share is intermediately high.

$\mu_{SIX,ij} - \mu_{n,ij} \leq 0$: South Africa's *(n)* relative market share is relatively high.

Table 4.2 brings all the filters together, by summarising all the export opportunities identified in filters 2 to 3.2 in terms of market size and growth and South Africa's relative market share based on actual exports.

Table 4.2: Final categorisation of realistic export opportunities for South Africa in South America

	Market share of South Africa *(n)*			
	Relatively small	**Intermediately small**	**Intermediately high**	**Relatively high**
Large product market	Cell 1	Cell 6	Cell 11	Cell 16
Growing (short- & long-term) product market	Cell 2	Cell 7	Cell 12	Cell 17
Large product market with short-term growth	Cell 3	Cell 8	Cell 13	Cell 18
Large product market with long-term growth	Cell 4	Cell 9	Cell 14	Cell 19
Large product market with short- and long-term growth	Cell 5	Cell 10	Cell 15	Cell 20

Source: Cuyvers (2004:269)

In the columns of Table 4.2, South Africa's market share, based on level of importance, is indicated. The rows in Table 4.2 show the size as well as the growth of the importing markets. All of the markets that entered filter 4 are allocated into one of the 20 different kinds of markets/ cells (Cuyvers *et al.*, 1995:182; Cuyvers, 1997:15; 2004:269).

From Table 4.2, South Africa can derive what the demands in all the South American markets are and whether they have already utilised it or not. For example, if a market is assigned Cell

20, it means that there is a large import demand that is growing in the short- and long run, and South Africa's market share is already relatively high. Therefore, South Africa already utilised the opportunity and this opportunity should be maintained.

The categorisation can also help South Africa's export promoting agencies to decide on an export promotion strategy for each market. If the market lies in cells 1 to 10, an offensive market exploration strategy is recommended (Cuyvers *et al.,* 1995:183). The reason is that the export country has a small market share, which has the potential to be enlarged. An offensive market expansion strategy is suggested by Cuyvers *et al.* (1995:183) for cells 11 to 15, because South Africa has an intermediately high market share that can potentially be increased. For cells 16 to 20, a defensive export strategy is recommended in order to maintain the high market share (Cuyvers *et al.,* 1995:183).

Therefore, in filter 4, a potential export value is also assigned to each identified realistic export opportunity. The value calculation was introduced by Steenkamp (2011) in order to be able to prioritise between potential export opportunities. The potential export value is calculated as follows:

$$\text{Potential export value} = \frac{\textit{The total imports of country } i \textit{ of product } j}{\textit{Number of countries that contributes to } 80\% \textit{ of these imports} + 1}$$

This estimation of export potential gives an indication of the size of the import demand for each product-country combination. The "plus 1" in the formula indicates that it does take into account the possibility of South Africa being added as part of the group of countries that supplies 80% of the imports.

4.3 Summary

The methodology of the DSM (section 4.2) is described in this chapter. The DSM can be applied to identify realistic export opportunities for South Africa in the South American countries on a product-country level. There are four filters in the DSM. All the different variables used in each filter as well as their specific cut-off values and their formulae are discussed. Filter 2 and filter 3.1 have been applied in the same manner as the original DSM by Cuyvers *et al.* (1995), whereas filter 3.2 was reconstructed and included new data from the ITC, to make it a more accurate measure of trade barriers for South Africa exporting to the South American countries

(see section 4.2.3.2). In the last filter, filter 4, the RCA values are calculated to ensure that South Africa can produce and export the products for which export opportunities are identified in the same way as in the Steenkamp study (2011). Then the categorisation of export opportunities is done as in the Cuyvers *et al. (*1995) study and the determination of the potential export values as in the Steenkamp study (2011).

In Chapter 5, the results for this updated and reconstructed application of the DSM for South Africa in the 11 South American counties[35] will be described and analysed.

[35] There are 12 South American countries, but Suriname had no data available and therefore is excluded from this study.

CHAPTER 5: SOUTH AFRICA'S EXPORT OPPORTUNITIES TO THE DIFFERENT SOUTH AMERICAN COUNTRIES

5.1 Introduction

The methodology of the updated and reconstructed DSM to identify the realistic export opportunities for South Africa in the different South American countries was described in Chapter 4. This chapter will present the results of this application of the DSM for South America.

As mentioned in section 4.2, the DSM consists of four filters. It starts by taking all possible product-country combinations, and therefore, for purposes of this study included, 62 986 combinations (11 South American countries[36] times 5 726 HS 6-digit level products). The final results are the product-country combinations for which South Africa has realistic export potential into the different South American countries.

Section 5.2.1 will provide the results of each of the four filters. In section 5.2.2, the focus will be on South Africa's export opportunities to each of the different South American countries. Sector-level results will be analysed in section 5.2.3 and the highest ranked products, as well as product-country combinations in South America, will be presented in section 5.2.4. Finally, section 5.2.5 will give recommendations to export promotion organisations and industry associations in order to focus or prioritise their export promotion activities and instruments and also be aware of the existing South American trade barriers that should be taken into account in bilateral and multilateral trade negotiations.

5.2. Results of the DSM for South African exports to South America

5.2.1 Results of each filter

In sections 5.2.1.1 to 5.2.1.3, the results of each filter of the DSM, applied for South African exports to the South American countries, will be discussed

[36] There are 12 South American countries, but Suriname had no trade data available and therefore was excluded from the analysis.

5.2.1.1 Filter 2: Product-country combinations with adequate import market size and growth

In filter 2, the import size and growth of the 62 986 possible product-country combinations in South America are evaluated. The results of filter 2 are provided in Table 5.1.

Table 5.1: Distribution of the product-country combinations according to import market type

Category[37]	Short-term market growth	Long-term market growth	Relative market size	Number of product-country groupings
0	0	0	0	31 222
1	1	0	0	5 026
2	0	1	0	9 458
3	**0**	**0**	**1**	**2 087**
4	**1**	**1**	**0**	**13 688**
5	**1**	**0**	**1**	**146**
6	**0**	**1**	**1**	**477**
7	**1**	**1**	**1**	**882**
Number of products in each import market type	**19 742**	**24 505**	**3 592**	**62 986**
The sum of categories 3-7				**17 280**

As described in section 4.2.2, this filter categorises the product-country combinations according to import size and growth. There are seven different categories in this filter, but only the markets in categories 3 to 7 are selected to enter filter 3 (see section 4.2.2 for a detailed description). The sum of these four categories is 17 280 product-country combinations that continued to filter 3.

5.2.1.2 Filter 3: Market concentration and accessibility

Filter 3 measures how easily the market can be entered by first assessing the degree of market concentration in filter 3.1 (for more detail, see section 4.2.3.1). Secondly, the market accessibility of each product-country combination is measured in terms of trade barriers in filter 3.2 (for more detail, see section 4.2.3.2). These results will subsequently be analysed.

[37] The data used are from 2006 to 2010 and are on HS 6-digit level.

5.2.1.2.1 Filter 3.1: Market concentration

The market concentration filter indicates how easy it is to enter a market. The more concentrated a market, the more difficult it becomes to enter. A highly concentrated market is one with one or two countries supplying the product that has the know-how of the specific market and is well known in the importing market. Table 5.2 indicates the percentage concentration allowed (therefore cut-off values) in filter 3.1 for categories 3 to 7 that entered filter 3.1. The cut-off values are uniquely calculated for each of the categories specified in filter 2 (see section 4.2.3.1 for the calculation of these cut-off values).

Table 5.2: Market concentration allowed per import market type

Category	Categories description (import market type)	Maximum concentration allowed (cut-off value)
3	Relatively large markets	48.1%
4	Growing short- and long term	49.9%
5	Relatively large markets and growing short term	49.9%
6	Relatively large markets and growing long term	49.9%
7	Relatively large markets and growing short- and long term	51.7%

Source: Steenkamp (2011:78)

From the 17 280 product-country combinations that entered filter 3.1, 8 994 had a market concentration below the maximum allowed cut-off value per category, as indicated in Table 5.2. These product-country combinations can possibly enter filter 4. However, for a product-country combination to enter filter 4, it has to pass filter 3.1 *as well as* filter 3.2's cut-off values (see section 4.2.3.2). Filter 3.2 (trade barriers) evaluates the product-country combinations' access into a market further by focusing on trade barriers and will subsequently be discussed.

5.2.1.2.2 Filter 3.2: Market accessibility

As mentioned in section 4.2.3.2.1, the market accessibility index consists of six variables (preferential *ad valorem* equivalent tariff, *ad valorem* equivalent tariff, *ad valorem* equivalent non-tariff barriers, international and domestic costs, international and domestic times and the LPI). Table 5.3 shows the average market accessibility index for South African exports to the different South American countries.

Table 5.3: The market accessibility index for South African products into the South American countries

Country	Average preferential *ad valorem* tariff % (index value)	Average *ad valorem* tariff % (index value)	Average NTBs % (index value)	International and domestic cost (US$) (index value)	International and domestic time (#days) (index value)	LPI38 (0-5) (index value)	Average Market accessibility index (0-100)	Rank
Argentina	4.19 (33.41)	12.78 (59.06)	10.16 (84.42)	4 689 (74.59)	45 (88.61)	3.10 (89.25)	71.56	2
Bolivia	6.40 (24.79)	11.17 (63.57)	8.33 (87.09)	7 005 (32.55)	78 (46.84)	2.51 (25.81)	46.78	9
Brazil	1.99 (41.57)	13.69 (55.38)	19.29 (71.03)	4 525 (77.51)	36 (100.00)	3.20 (100.00)	74.25	1
Chile	5.20 (24.04)	5.99 (80.03)	8.45 (86.92)	6 103 (49.47)	76 (49.37)	3.09 (88.17)	63.00	5
Colombia	-0.29 (52.86)	8.35 (72.90)	17.96 (71.70)	4 944 (70.06)	56 (74.68)	2.77 (53.76)	65.99	4
Ecuador	3.57 (38.33)	10.05 (66.93)	13.48 (67.93)	6 490 (42.59)	72 (54.43)	2.77 (53.76)	54.00	8
Guyana	5.13 (34.83)	10.95 (67.00)	13.48 (67.93)	8 873 (0.25)	70 (56.96)	2.27 (0.00)	37.83	10
Paraguay	5.56 (25.39)	10.37 (65.43)	16.16 (75.51)	3 679 (92.54)	80 (44.30)	2.75 (51.61)	59.13	7
Peru	0.15 (49.27)	3.67 (87.75)	9.38 (85.66)	5 174 (65.97)	55 (75.95)	2.8 (56.99)	70.27	3
Uruguay	5.20 (26.56)	10.52 (64.99)	20.56 (68.16)	3 259 (100.00)	69 (58.2)	2.75 (51.61)	61.59	6
Venezuela	3.96 (33.03)	13.33 (56.53)	11.03 (82.73)	8 397 (8.71)	115 (0.00)	2.68 (44.09)	37.52	11

Source: Author's own calculations

In Table 5.3, the average values of each category (see section 4.2.3.2.1 for the description of each variable) as well as the index value are provided. The index value indicates how accessible each country is in terms of each variable (see section 4.2.3.2. for the calculation of the index value). The higher the index value, the easier it is to access a market. For example, Bolivia has a higher *International and domestic cost* ($7 005) than Argentina ($4 689) and therefore it is more expensive to trade with Bolivia than with Argentina (see Table 3.6). Therefore, in terms of market accessibility, Argentina is more accessible. This can be seen in the index value of Argentina (74.59), which is higher than Bolivia's index value (32.55) in terms of *International and domestic cost.*

[38] The logistics performance index (LPI) is calculated on a five-point scale (1 is the lowest score and 5 is the highest score).

From Table 5.3, it is clear that for South Africa, Brazil is the most and Venezuela the least accessible of all the South American countries. This corresponds with the main findings of Chapter 3, which focused on the trade barriers between South Africa and South America in detail. See Appendix A (Tables A.1 to A.22) for the top and bottom 10 products per South American country in terms of market accessibility.[39]

Out of the 17 280 product-country combinations that entered filter 3, 15 400 showed high market accessibility and can possibly enter filter 4.

However, as product-country combinations have to meet the criteria of filters 3.1 *and* 3.2, there are only 9 116 product-country combinations that can enter filter 4. The categorisation and prioritisation of these product-country combinations will be discussed in the next section.

5.2.1.3 Filter 4: Categorisation and prioritisation of realistic export opportunities

Filter 4 firstly assesses whether South Africa specialises in producing the 9 116 product-country combinations that entered from filter 3. This is done by using the Revealed Comparative Advantage (RCA), as explained in section 4.2.4. Steenkamp (2011:84) stated that it is important to take the production capacity of South Africa into consideration when identifying realistic export opportunities. If the RCA value is larger than 1, it means that South Africa is specialising in the production as well as the exports of the specific product (Balassa, 1965; Krugell & Matthee, 2009:461; Steenkamp, 2011:61). From the 9 116 product-country combinations, only 1 756 product-country combinations showed an RCA value larger than 1. Therefore, by adding this criterion, export opportunities for only the products that South Africa can produce and export are identified.

The 1 756 product-country combinations are categorised based on the import market size and growth (rows of the matrixes in Tables 5.4 and 5.5) and South Africa's relative market share in each market (columns of the matrix in Table 5.4 and 5.5) in 20 different cells (also see 4.2.4 for more detail on the cells). The results of filter 4 are provided in Tables 5.4 and 5.5.

[39] All the products in Appendix A (Tables A.1 to A.22) are identified realistic export opportunities.

Table 5.4: Number of realistic export opportunities according to South Africa's relative market share and South America's market characteristics

	Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Large product/market	(Cell 1) 15 (0.85%)	(Cell 6) 1 (0.06%)	(Cell 11) 0 (0%)	(Cell 16) 1 (0.06%)	**17** **(0.97%)**
Growing (long- and short-term) product/market	**(Cell 2)** **1 341** **(76.37%)**	(Cell 7) 21 (1.20%)	(Cell 12) 18 (1.03%)	(Cell 17) 44 (2.51%)	**1 424** **(81.09%)**
Large product/market short-term growth	(Cell 3) 33 (1.88%)	(Cell 8) 0 (0%)	(Cell 13) 1 (0.06%)	(Cell 18) 1 (0.06%)	**35** **(1.99%)**
Large product/market long-term growth	(Cell 4) 43 (2.45%)	(Cell 9) 0 (0%)	(Cell 14) 2 (0.11%)	(Cell 19) 5 (0.28%)	**50** **(2.85%)**
Large product/market short- and long-term growth	(Cell 5) 208 (11.85%)	(Cell 10) 7 (0.40%)	(Cell 15) 2 (0.11%)	(Cell 20) 13 (0.74%)	**230** **(13.10%)**
Total	**1 640** **(93.39%)**	**29** **(1.65%)**	**23** **(1.31%)**	**64** **(3.64%)**	**1 756** **(100%)**

Table 5.5: Potential export values of realistic export opportunities according to South Africa's relative market share and South America's market characteristics (US$ thousands) [40]

	Market share of South Africa relatively small	Market share of South Africa intermediately small	Market share of South Africa intermediately high	Market share of South Africa relatively high	Total
Large product/market	(Cell 1) $122 195 (0.92%)	(Cell 6) $5 187 (0.04%)	(Cell 11) $0 (0%)	(Cell 16) $28 258 (0.21%)	**$155 640** **(1.17%)**
Growing (long- and short-term) product/market	**(Cell 2)** **$6 096 335** **(45.93%)**	(Cell 7) $71 243 (0.54%)	(Cell 12) $49 225 (0.37%)	(Cell 17) $89 715 (0.68%)	**$6 306 518** **(47.51%)**
Large product/market short-term growth	(Cell 3) $832 344 (6.27%)	(Cell 8) $0 (0%)	(Cell 13) $7 382 (0.06%)	(Cell 18) $29 430 (0.22%)	**$869 156** **(6.55%)**
Large product/market long-term growth	(Cell 4) $239 074 (1.80%)	(Cell 9) $0 (0%)	(Cell 14) $10 060 (0.08%)	(Cell 19) $21 733 (0.16%)	**$270 867** **(2.04%)**
Large product/market short- and long-term growth	**(Cell 5)** **$4 452 956** **(33.55%)**	(Cell 10) $49 647 (0.37%)	(Cell 15) $29 062 (0.22%)	(Cell 20) $1 140 028 (8.59%)	**$5 671 693** **(42.73%)**
Total	**$11 742 904** **(88.47%)**	**$126 077** **(0.95%)**	**$95 729** **(0.72%)**	**$1 309 164** **(9.86%)**	**$13 273 874** **(100%)**

[40] See section 4.2.4 for the details on the calculation of potential export values.

From Tables 5.4 and 5.5 it is clear that:

(i) Both in terms of the number of opportunities identified and the potential export value, most export opportunities fall into cells 1 to 5 (93.39% and 88.47% respectively). This means that South Africa has a small market share in the South American markets identified as export opportunities. This corresponds with the small percentage of actual South Africa to South America exports in 2009 (see section 1.2).

(ii) In terms of the number of opportunities selected, as well as the potential export value, the export opportunities are mostly in markets that are *growing in the long- and short term* (cell 2). The percentages are 76.37% and 45.93% respectively. This leads to the total opportunities classified under *growing long- and short-term product/markets* (cells 2, 7, 12 and 17) to be 81.09% in number and 47.51% in value.

(iii) In terms of the potential export value, 33.55% of the identified opportunities are in cell 5, (*large product/market* and *growing in the short- and long term*). This leads to 42.73% of total export opportunities being in large product markets that are sufficiently *growing in the short- and long term* (cells 5, 10, 15 and 20).

As mentioned by Steenkamp (2011:92,147), it is important to note that the DSM results should not be used in isolation. The DSM contains data on import market size, growth, main competitors and market access conditions. These variables should be taken into consideration together with specific qualitative market information that is not included in the DSM. Therefore, the exporter and trade promotion organisations' market intelligence, experience and in-depth market analysis should also be included in strategic decision-making on exports.

The DSM results for exports from South Africa to each South American country will be discussed in the following sections according to country, sector, product and product-country.

5.2.2 Country-level results of the DSM applied for South African exports to the South American countries

From the 62 986 possible product-country combinations that entered the South American DSM, 1 756 product-country combinations were identified as realistic export opportunities. The number of realistic export opportunities per country is listed in Table 5.6.

Table 5.6: South American countries ranked according to the number of export opportunities identified for South Africa

Country ranking i.t.o. number of export opportunities	Country	Number of products selected in this country	Share in total number of opportunities (%)
1	**Chile**	264	15.03
2	**Brazil**	228	12.98
3	**Peru**	227	12.93
4	**Argentina**	200	11.39
5	**Colombia**	200	11.39
6	**Ecuador**	163	9.28
7	**Uruguay**	151	8.60
8	**Bolivia**	123	7.00
9	**Paraguay**	117	6.66
10	**Venezuela**	51	2.90
11	**Guyana**	32	1.82
Total	**South America**	1 756	100.00

From Table 5.6, the following observations can be made:

(i) From all the South American countries, Chile is the country with the highest number of realistic export opportunities identified for South Africa (264). Chile's share in total number of opportunities is (15.03%)

(ii) Brazil is ranked second (228), with a share in total number of opportunities of 12.98% and Peru third (227), with a share in total number of opportunities of 12.93%.

(iii) Guyana and Venezuela, on the other hand, are the South American countries with the lowest number of export opportunities for South Africa, with only 32 and 51 opportunities respectively. Their shares in total number of opportunities are 1.82% and 2.90% respectively.

In Table 5.7 the South American countries are ranked according to the potential export value (see section 4.2.4 for the calculation of potential export values) of the identified realistic export opportunities. Their individual potential export values are also represented as a percentage share in the total potential export value of South America.

Table 5.7: South American countries ranked according to the total export potential value for South Africa

Country ranking i.t.o. potential export value	Country	Potential export value (2010) (US$ thousands)	Share in total potential export value (%)
1	**Brazil**	5 446 072	41.03
2	**Argentina**	2 669 790	20.11
3	**Chile**	1 625 455	12.25
4	**Peru**	1 298 934	9.79
5	**Colombia**	1 053 178	7.93
6	**Ecuador**	519 977	3.92
7	**Venezuela**	268 452	2.02
8	**Paraguay**	166 523	1.25
9	**Bolivia**	118 311	0.89
10	**Uruguay**	84 571	0.64
11	**Guyana**	22 611	0.17
Total	**South America**	13 273 874	100.00

From Table 5.7, it can be stated that:

(i) Brazil is the country with the largest potential export value ($5 446 072 000) and share in total potential export value (41.03%).

(ii) Argentina is ranked second ($2 669 790 000) and Chile third ($1 625 455 000). Guyana and Uruguay are the countries with the smallest potential export values, namely $22 611 000 and $84 571 000, respectively.

(iii) It is interesting to note that even though Brazil and Argentina were ranked second and fourth in terms of the number of products selected per country (Table 5.6), these countries have the first and second largest potential export value in Table 5.7. Therefore, the types of products identified for Brazil and Argentina are relatively higher in value.

Table 5.8 compares the potential export value (see section 4.2.4 for the calculation of potential export values) to the actual 2010 exports of South Africa to the different South American countries.

Table 5.8: Potential export value versus actual exports for South Africa per South American country

Ranking	Country	Potential export value (2010) (US$ thousand)	Actual export value (2010) (US$ thousand)	% of the total potential export value realised in actual exports
1	Brazil	5 446 072	259 978	4.77
2	Argentina	2 669 790	79 704	2.99
3	Chile	1 625 455	30 487	1.88
4	Peru	1 298 934	32 279	2.49
5	Colombia	1 053 178	11 513	1.09
6	Ecuador	519 977	7 827	1.51
7	Venezuela	268 452	1 848	0.69
8	Paraguay	166 523	1 966	1.18
9	Bolivia	118 311	2 561	2.16
10	Uruguay	84 571	3 241	3.83
11	Guyana	22 611	96	0.43
Total	**South America**	**13 273 874**	**431 501**	**3.25**

From Table 5.8, it is clear that:

(i) The percentages of the potential export value realised in actual exports are overall very low. For all countries the percentages are below 5%.

(ii) The countries with the highest percentage potential exports realised are Brazil (4.77%), Uruguay (3.83%), Argentina (2.99%) and Peru (2.49%). These figures once again indicate that South Africa is not utilising the export potential in the South American countries and this needs to be addressed (see also section 1.2).

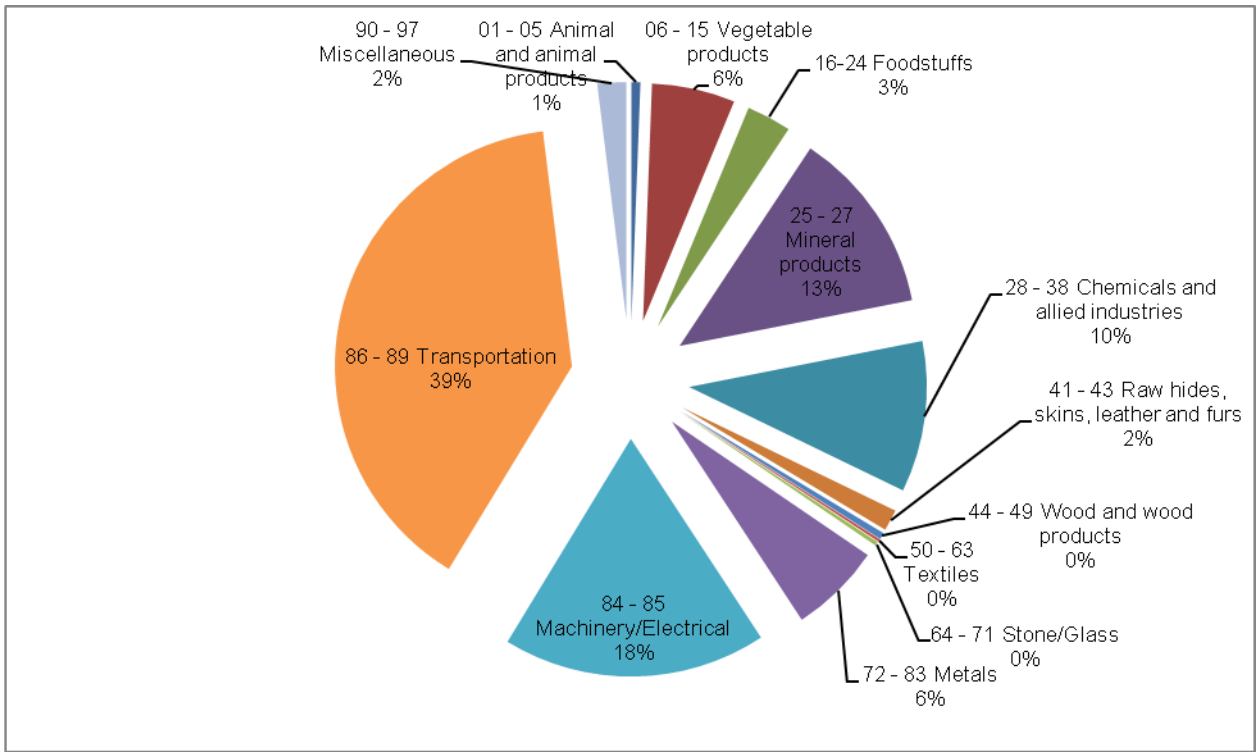
Although the analysis in Table 5.8 provides insightful information on the degree to which South Africa is exporting/utilising the export opportunities in South America, it is important to keep in mind that the potential export values are not “target” values, but only an estimation of export potential based on import size of each product-country combination, which is used to rank or prioritise between the different export opportunities (see section 4.2.4 for the calculation of potential export values).

The next section will focus on sector-level results. This will indicate which South African products should be prioritised in terms of export promotion to the different South American countries.

5.2.3 Sector-level (HS 2-digit) results of the DSM applied for South African exports to the South American countries

In order to determine in which sectors most of the realistic export opportunities are identified, the 1 756 product-country combinations can be grouped into the HS 2-digit level categorisation.

Figure 5.1: Comparison of potential export values[41] (US$ thousands) of South Africa per HS 2-digit product group in South America



From Figure 5.1, the following observations can be made:

(i) The top five sectors in terms of potential export values are transportation (HS 86 to 89: 39%), machinery/electrical (HS 84 to 85: 18%), mineral products (HS 25 to 27: 13%), chemicals and allied industries (HS 27 to 38: 10%) as well as metals (HS 72 to 83: 6%).

(ii) Textiles (HS 50 to 63: 0%), stone/glass (HS 64 to 71: 0%), wood and wood products (HS 44 to 49: 0%), as well as animal and animal products (HS 01 to 05: 1%) are the sectors that show the lowest potential export value.

[41] See section 4.2.4 for the calculation of potential export values.

The percentage of potential South African export value realised in actual export values per HS 2-digit product group in South America is presented in Table 5.9.

Table 5.9: Potential South African export value (US$ thousands) realised in actual export values per HS 2-digit product group in South America

	Potential export value (2010) (US$ thousand)	Actual export value (2010) (US$ thousand)	% of the total potential export value realised in actual exports
01 - 05 Animal and animal products	78 441	2 792	3.56
06 - 15 Vegetable products	746 432	4 502	0.60
16 - 24 Foodstuffs	396 780	12 398	3.12
25 - 27 Mineral products	1 639 386	161 409	9.85
28 - 38 Chemicals and allied industries	1 419 085	80 479	5.67
41 - 43 Raw hides, skins, leather and furs	191 449	2 152	1.12
44 - 49 Wood and wood products	58 028	1 347	2.32
50 - 63 Textiles	23 779	84	0.35
64 - 71 Stone/Glass	35 027	464	1.32
72 - 83 Metals	804 157	128 023	15.92
84 - 85 Machinery/Electrical	2 389 547	29 157	1.22
86 - 89 Transportation	5 185 084	3 717	0.07
90 - 97 Miscellaneous	306 679	4 979	1.62
Total	13 273 874	431 501	3.25

From Table 5.9, it is found that:

(i) Metals (HS 72 to 83: 15.92%) as well as mineral (HS 25 to 27: 9.85%) products are the two sectors that have the highest percentage of potential export value realised in actual exports in 2010.

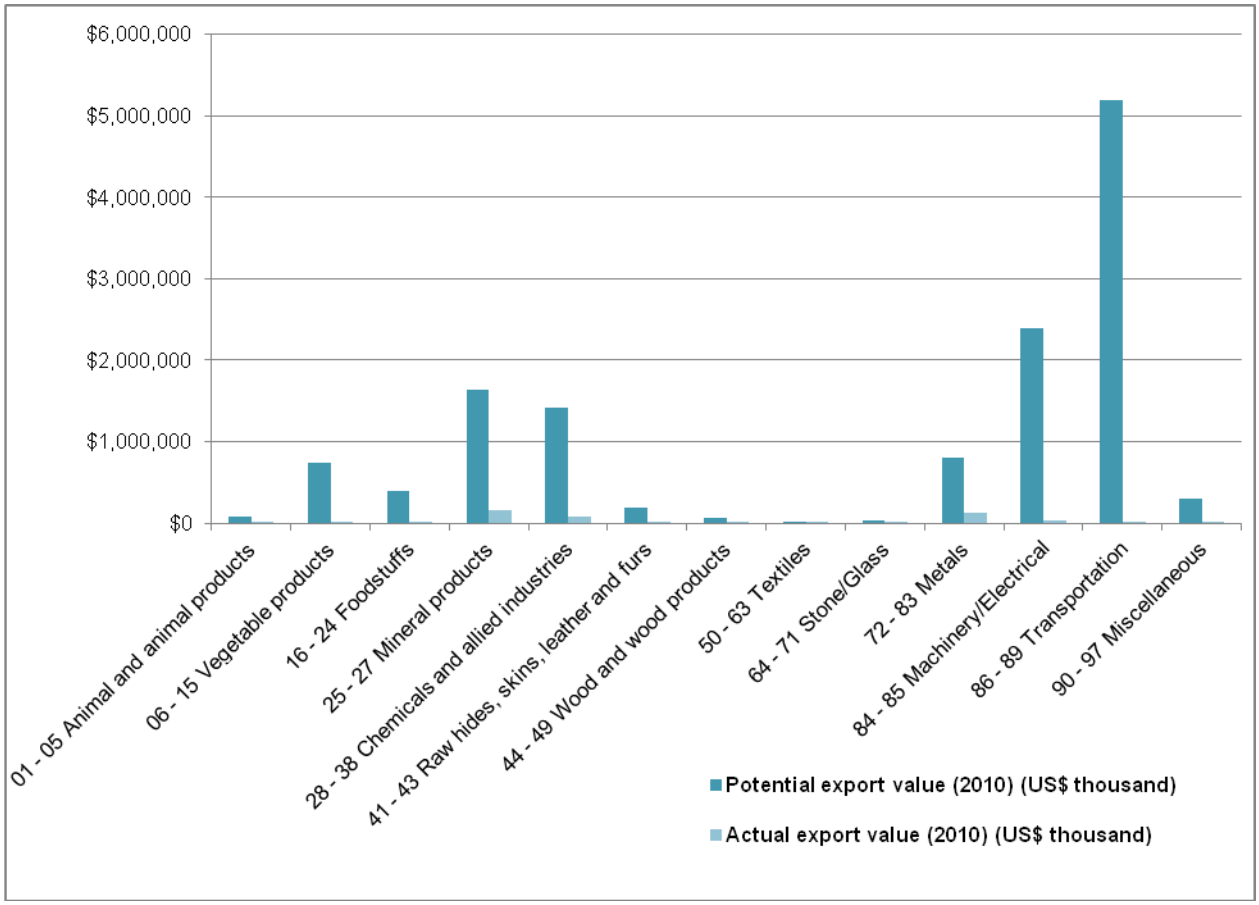
(ii) As these two sectors also have a high potential export value, it shows that even though the overall percentage potential value realised in actual exports is low, South Africa is utilising the export opportunities the most in these two sectors.

(iii) Although transportation (HS 86 to 89) has the highest export potential, it has the lowest percentage of potential export value realised in actual exports (0.07%).

Figure 5.2 shows these results graphically.

Figure 5.2: South Africa's potential export values (US$ thousands) per HS 2-digit product group versus actual export value in South

America



From Figure 5.2, it is once again clear that South Africa's actual exports to the markets in South America that have high export potential, are still very low. This means that South Africa is not utilising the export opportunities in South America. As mentioned in section 5.2.2, the potential export values are not a "target" value, but only an estimation of export potential based on import size used to rank/prioritise between export opportunities.

In Figure 5.2, there are four product groups/sectors that show high potential export value. The top 10 product-country combinations for each of these sectors (transportation, machinery/ electrical, mineral products and chemical products) are given in Tables 5.10 to 5.13. The results in these tables can assist the various export promotion organisations and industry associations to focus their export promotion activities on the products with larger potential for export success (see Appendix B for a complete list of Export Councils, Industry Associations and Joint Action Groups).

Table 5.10: The top 10 product-country combinations of the transportation sector in South America in terms of potential export value (US$ thousands).

Rank	Country	HS 6-digit product code and description	Potential export value (2010) (US$ thousand)	Actual SA Exports (2010) (US$ thousand)
1	Argentina	870323 - Automobiles, spark ignition engine of 1500-3000 cc	1 608 281	0[42]
2	Brazil	870323 - Automobiles, spark ignition engine of 1500-3000 cc	1 545 458	0
3	Chile	870323 - Automobiles, spark ignition engine of 1500-3000 cc	428 658	0
4	Colombia	870323 - Automobiles, spark ignition engine of 1500-3000 cc	223 340	28
5	Chile	870421 - Diesel powered trucks weighing < 5 tonnes	222 504	0
6	Ecuador	870323 - Automobiles, spark ignition engine of 1500-3000 cc	208 735	0
7	Chile	870322 - Automobiles, spark ignition engine of 1000-1500 cc	208 032	0
8	Peru	870322 - Automobiles, spark ignition engine of 1000-1500 cc	155 020	0
9	Peru	870323 - Automobiles, spark ignition engine of 1500-3000 cc	154 244	0
10	Peru	870421 - Diesel powered trucks weighing < 5 tonnes	151 778	0

From Table 5.10, it is clear that:

(i) The top 10 product-country combinations for the transport sectors are in Argentina, Brazil, Chile, Colombia, Ecuador and Peru.

(ii) There are only two products within the top 10, namely; automobiles spark ignition engine of 1500-3000 cc and diesel powered trucks weighing < 5 tonnes.

(iii) South Africa is not currently significantly exporting any of these products (except for automobiles, spark ignition engine of 1500-3000 cc to Colombia ($ 28 000)). This can be due to the high tariffs charged by Brazil (35%) and Argentina (35%) on the South African automobile industry (see table A.2 and A.6).

(iv) These results can specifically assist the Automotive Industry Export Council (AIEC) in focusing their export promotion activities.

The following table lists the top 10 product-country combinations of the machinery/ electrical sector.

[42] Although South Africa specialises in producing and exporting automobiles (RCA>1), South Africa did not export to Argentina specifically in 2010.

Table 5.11: The top 10 product-country combinations of the machinery/ electrical sector in South America in terms of potential export value (US$ thousands).

Rank	Country	HS 6-digit product code and description	Potential export value (2010) (US$ thousand)	Actual SA Exports (2010) (US$ thousand)
1	Argentina	840820 - Engines, diesel, for motor vehicles	240 971	0
2	Brazil	850213 - Generating sets, diesel, output > 375 kVA	99 309	0
3	Brazil	841710 - Furnaces/ovens non-electric for ores/pyrites/metals	94 516	0
4	Brazil	840820 - Engines, diesel, for motor vehicles	83 532	0
5	Colombia	843049 - Boring or sinking machinery nes, not self-propelled	60 169	0
6	Argentina	850213 - Generating sets, diesel, output > 375 kVA	57 868	0
7	Venezuela	850213 - Generating sets, diesel, output > 375 kVA	45 791	0
8	Brazil	848340 - Gearing, ball screws, speed changers, torque converter	45 668	124
9	Brazil	848310 - Transmission shafts and cranks, cam and crank shafts	40 348	3 220
10	Colombia	850213 - Generating sets, diesel, output > 375 kVA	38 199	0

From Table 5.11, it can be concluded that:

(i) The product-country combinations for the machinery/electrical sector are in Argentina, Brazil, Colombia and Venezuela.

(ii) There is a wider variety of products within the top 10 and only two of them are currently being exported by South Africa to Brazil (gearing, ball screws, speed changers, torque converter and transmission shafts and cranks, cam and crank shafts).

(iii) These results can assist the Capital Equipment Export Council and the SA Electrotechnical Export Council (SAEEC) in focusing their export promotion activities.

Table 5.12 focuses on the top 10 product-country combinations of the mineral products sector.

Table 5.12: The top 10 product-country combinations of the mineral products sector in South America in terms of potential export value (US$ thousands)

Rank	Country	HS 6-digit product code and description	Potential export value (2010) (US$ thousand)	Actual SA Exports (2010) (US$ thousand)
1	Brazil	270112 - Bituminous coal, not agglomerated	950 502	3 267
2	Brazil	270119 - Coal except anthracite or bituminous, not agglomerate	262 139	0
3	Argentina	270112 - Bituminous coal, not agglomerated	133 881	58 027
4	Brazil	270111 - Anthracite, not agglomerated	82 613	82 613
5	Brazil	270799 - Coal tar distillation products nes(not elsewhere specified)	68 301	5 413
6	Brazil	250300 - Sulphur of all kinds	56 302	0
7	Chile	270119 - Coal except anthracite or bituminous, not agglomerate	55 712	0
8	Brazil	251020 - Natural calcium phosphates, ground	12 322	0
9	Brazil	261400 - Titanium ores and concentrates	9 406	1 968
10	Brazil	271290 - Mineral waxes nes	6 800	6 800

Table 5.12 shows:

(i) The identified product-country combinations are all in Argentina, Brazil or Chile.

(ii) The different forms of coal are in most of the top 10 product-country combinations.

(iii) Compared to the transportation and machinery/electrical sectors, most of the mineral products in the top 10 are currently being exported by South Africa.

The next table presents the top 10 product-country combinations of the chemical product sector.

Table 5.13: The top 10 product-country combinations of the chemical products sector in South America in terms of potential export value (US$ thousands)

Rank	Country	HS 6-digit product code and description	Potential export value (2010) (US$ thousand)	Actual SA exports (2010) (US$ thousand)
1	Brazil	310230 - Ammonium nitrate, including solution, in pack >10 kg	214 163	0
2	Brazil	310540 - Monoammonium phosphate & mix with diammonium, <=10 kg	159 780	0
3	Brazil	292800 - Organic derivatives of hydrazine or of hydroxylamine	123 810	0
4	Argentina	310540 - Monoammonium phosphate & mix with diammonium, <=10 kg	99 430	0
5	Brazil	291612 - Acrylic acid esters	48 876	15 ,497
6	Brazil	280920 - Phosphoric acid and polyphosphoric acids	38 886	0
7	Brazil	310520 - Nitrogen-phosphorus-potassium fertilizers, pack >10kg	37 086	126
8	Peru	310230 - Ammonium nitrate, including solution, in pack >10 kg	34 734	0
9	Colombia	310230 - Ammonium nitrate, including solution, in pack >10 kg	31 605	0
10	Brazil	290513 - N-butyl alcohol	29 430	3 996

From Table 5.13, it is clear that:

(i) The top 10 product-country combinations of the chemical product sector are in Argentina, Brazil, Colombia and Peru.

(ii) Ammonium nitrate, including solution, in pack >10 kg is the product that is identified the most.

(iii) Only acrylic acid esters and N-butyl alcohol are currently being exported to Brazil.

Section 5.2.4 focuses on the realistic export opportunities per product as well as per product-country combination on an HS 6-digit product level.

5.2.4 Product and product-country level results of the DSM applied for South African exports to the South American countries

Table 5.14 provides information on all the products that have been identified as export opportunities. There are 49 different products that are ranked according to potential export value per product.

Table 5.14: Products with the highest export potential value (US$) for South Africa in South America

Rank	HS 6-digit product code and description	Potential export value (2010) (US$ thousand) 1	Actual exports (2010)(US$ thousand) 2	2/1 (%)[43]
1	870323 - Automobiles, spark ignition engine of 1500-3000 cc	4 239 158	28	0.00
2	270112 - Bituminous coal, not agglomerated	1 084 383	61 294	5.65
3	870421 - Diesel powered trucks weighing < 5 tonnes	486 345	0	0.00
4	100590 - Maize except seed corn	484 976	0	0.00
5	870322 - Automobiles, spark ignition engine of 1000-1500 cc	363 052	0	0.00
6	840820 - Engines, diesel, for motor vehicles	324 836	0	0.00
7	270119 - Coal except anthracite or bituminous, not agglomerate	317 851	0	0.00
8	310230 - Ammonium nitrate, including solution, in pack >10 kg	284 198	0	0.00
9	310540 - Monoammonium phosphate & mix with diammonium, <=10 kg	259 210	0	0.00
10	850213 - Generating sets, diesel, output > 375 kVA	244 626	0	0.00
11	292800 - Organic derivatives of hydrazine or of hydroxylamine	124 293	0	0.00
12	841710 - Furnaces/ovens non-electric for ores/pyrites/metals	97 034	0	0.00
13	170199 - Refined sugar, in solid form, nes, pure sucrose	93 444	0	0.00
14	080820 - Pears and quinces, fresh	88 245	0	0.00

[43] Percentage of the total potential export value realised in actual exports (actual exports/potential export value).

Rank	HS 6-digit product code and description	Potential export value(2010) (US$ thousand) 1	Actual exports(2010)(US$ thousand) 2	2/1 (%)[44]
15	390210 - Polypropylene in primary forms	86 099	1 360	1.58
16	760612 - Aluminium alloy rectangular plate/sheet/strip,tickness >0.2m	83 724	57 766	69.00
17	270111 - Anthracite, not agglomerated	83 606	82 613	98.81
18	847420 - Machines to crush or grind stone, ores and minerals	81 526	47	0.06
19	842959 - Earth moving/road making equipment, self-propelled nes	78 029	0	0.00
20	720839 - Hot roll iron/steel nes, coil >600mm x <3mm	77 750	969	1.25
21	842139 - Filtering or purifying machinery for gases nes (not elsewhere specified)	76 835	2 200	2.86
22	843041 - Boring or sinking machinery nes, self-propelled	72 819	308	0.42
23	390230 - Propylene copolymers in primary forms	72 273	203	0.28
24	843049 - Boring or sinking machinery nes, not self-propelled	69 628	619	0.89
25	270799 - Coal tar distillation products nes	68 301	5 413	7.92
26	842481 - Agricultural sprays and powder dispersers	66 108	1	0.00
27	842920 - Graders and levellers, self-propelled	62 712	0	0.00
28	220421 - Grape wines nes, fortified wine or must, pack < 2l	61 810	3 638	5.89
29	820719 - Rock drillg nes & parts	59 596	4 698	7.88
30	848310 - Transmission shafts and cranks, cam and crank shafts	59 455	3 328	5.60
31	848340 - Gearing, ball screws, speed changers, torque converter	58 700	393	0.67
32	310520 - Nitrogen-phosphorus-potassium fertilizers, pack >10kg	58 599	1 429	2.44
33	250300 - Sulphur of all kinds	56 302	0	0.00
34	940190 - Parts of seats	56 217	8	0.01
35	280920 - Phosphoric acid and polyphosphoric acids	52 420	0	0.00
36	291612 - Acrylic acid esters	52 212	16 695	31.98
37	721049 - Flat rolled iron or non-alloy steel, coated with zinc, width >600mm, nes	51 478	2 572	5.00
38	842641 - Cranes & lifting frames, self-propelled, on tyres	50 674	0	0.00
39	903180 - Measuring or checking equipment, nes	49 580	348	0.70
40	240120 - Tobacco, unmanufactured, stemmed or stripped	47 698	28	0.06
41	901819 - Electro-diagnostic apparatus, nes	47 694	0	0.00
42	721391 - Bars&rods,circular cross	46 858	50	0.11
43	848220 - Bearings, tapered roller, including assemblies	46 139	708	1.53
44	720917 - Flat rolled prod/coils<.5<1	44 635	2 235	5.01
45	310590 - Fertilizers, mixes, nes	43 149	328	0.76
46	847490 - Parts for mineral sort, screen, mix, etc machines	42 551	4 208	9.89
47	841221 - Hydraulic power engines/motors, linear acting	42 545	24	0.06
48	220710 - Undenatured ethyl alcohol > 80% by volume	41 877	0	0.00
49	940600 - Prefabricated buildings	40 663	0	0.00

From Table 5.14, it is clear that:

(i) From the top five products, three are from the transport sector (automobiles, spark ignition engine of 1500-3000 cc and diesel powered trucks weighing < 5 tonnes) and one from the mineral products sector (bituminous coal, not agglomerated). One product from the top five is in the vegetable products group (maize except seed corn). These results can for example assist the Automotive Industry Export Council (AIEC), Farmed Abalone Export Council as well as the Department of Agriculture, Forestry and Fisheries (DAFF) in

[44] Percentage of the total potential export value realised in actual exports (actual exports/potential export value).

allocating their priorities in terms of exports to South America (for complete list see Appendix B).

(ii) The bottom five products are from miscellaneous sector (prefabricated buildings), the foodstuffs sector (undenatured ethyl alcohol > 80% by volume), the machinery/electrical sector (parts for mineral sort, screen, mix, etc. machines and hydraulic power engines/motors, linear acting) and chemical products (fertilizers, mixes, nes).

(iii) South Africa has not adequately tapped into the export potential of most of the identified products. There are only two products that have been tapped into, namely: anthracite not agglomerated by 98.81% and aluminium alloy rectangular plate/sheet/strip, thickness >0.2m by 69%.

In Table 5.15 the top 50 product-country combinations based on their potential export value are listed. The actual exports values as well as the percentage of the total potential value realised in actual exports figures are also provided.

Table 5.15: Top 50 product-country combinations with the highest export potential value (US$) for South Africa in South America

Rank	Country	HS 6-digit product code and description	Potential export value (2010) (US$ thousand) 1	Actual exports (2010) (US $ thousand) 2	2/1 (%)[45]
1	Argentina	870323 - Automobiles, spark ignition engine of 1500-3000 cc	1 608 281	0[46]	0.00
2	Brazil	870323 - Automobiles, spark ignition engine of 1500-3000 cc	1 545 458	0[46]	0.00
3	Brazil	270112 - Bituminous coal, not agglomerated	950 502	3 267	0.34
4	Chile	870323 - Automobiles, spark ignition engine of 1500-3000 cc	428 658	0	0.00
5	Colombia	100590 - Maize except seed corn	265 593	0	0.00
6	Brazil	270119 - Coal except anthracite or bituminous, not agglomerate	262 139	0	0.00
7	Argentina	840820 - Engines, diesel, for motor vehicles	240 971	0	0.00
8	Colombia	870323 - Automobiles, spark ignition engine of 1500-3000 cc	223 340	28	0.01
9	Chile	870421 - Diesel powered trucks weighing < 5 tonnes	222 504	0	0.00
10	Peru	100590 - Maize except seed corn	219 375	0	0.00
11	Brazil	310230 - Ammonium nitrate, including solution, in pack >10 kg	214 163	0	0.00
12	Ecuador	870323 - Automobiles, spark ignition engine of 1500-3000 cc	208 735	0	0.00
13	Chile	870322 - Automobiles, spark ignition engine of 1000-1500 cc	208 032	0	0.00

[45] Percentage of the total potential export value realised in actual exports (actual exports/potential export value).

[46] The low actual exports can be due to the high tariffs charged by Brazil (35%) and Argentina (35%) on the South African automobile industry (see table A.2 and A.6)

Rank	Country	HS 6-digit product code and description	Potential export value (2010) (US$ thousand) 1	Actual exports (2010) (US $ thousand) 2	2/1 (%)[47]
14	Brazil	310540 - Monoammonium phosphate & mix with diammonium, <=10 kg	159 780	0	0.00
15	Peru	870322 - Automobiles, spark ignition engine of 1000-1500 cc	155 020	0	0.00
16	Peru	870323 - Automobiles, spark ignition engine of 1500-3000 cc	154 244	0	0.00
17	Peru	870421 - Diesel powered trucks weighing < 5 tonnes	151 778	0	0.00
18	Argentina	270112 - Bituminous coal, not agglomerated	133 881	58 027	43.34
19	Brazil	292800 - Organic derivatives of hydrazine or of hydroxylamine	123 810	0	0.00
20	Argentina	310540 - Monoammonium phosphate & mix with diammonium, <=10 kg	99 430	0	0.00
21	Brazil	850213 - Generating sets, diesel, output > 375 kVA	99 309	0	0.00
22	Brazil	841710 - Furnaces/ovens non-electric for ores/pyrites/metals	94 516	0	0.00
23	Brazil	080820 - Pears and quinces, fresh	88 245	0	0.00
24	Brazil	840820 - Engines, diesel, for motor vehicles	83 532	0	0.00
25	Brazil	270111 - Anthracite, not agglomerated	82 613	82 613	100.00
26	Ecuador	870421 - Diesel powered trucks weighing < 5 tonnes	70 620	0	0.00
27	Brazil	270799 - Coal tar distillation products nes	68 301	5 413	7.92
28	Colombia	843049 - Boring or sinking machinery nes, not self-propelled	60 169	0	0.00
29	Peru	170199 - Refined sugar, in solid form, nes, pure sucrose	57 917	0	0.00
30	Argentina	850213 - Generating sets, diesel, output > 375 kVA	57 868	0	0.00
31	Brazil	760612 - Aluminium alloy rectangular plate/sheet/strip, thickness>0.2m	57 764	57 764	100.00
32	Brazil	250300 - Sulphur of all kinds	56 302	0	0.00
33	Chile	270119 - Coal except anthracite or bituminous, not agglomerate	55 712	0	0.00
34	Brazil	220421 - Grape wines nes, fortified wine or must, pack < 2litre	51 858	3 601	6.94
35	Brazil	291612 - Acrylic acid esters	48 876	15 497	31.71
36	Venezuela	850213 - Generating sets, diesel, output > 375 kVA	45 791	0	0.00
37	Brazil	848340 - Gearing, ball screws, speed changers, torque converter	45 668	124	0.27
38	Peru	390210 - Polypropylene in primary forms	41 121	569	1.38
39	Brazil	848310 - Transmission shafts and cranks, cam and crank shafts	40 348	3 220	7.98
40	Brazil	901819 - Electro-diagnostic apparatus, nes	39 954	0	0.00
41	Brazil	903180 - Measuring or checking equipment, nes	39 750	88	0.22
42	Paraguay	240120 - Tobacco, unmanufactured, stemmed or stripped	38 982	0	0.00
43	Brazil	280920 - Phosphoric acid and polyphosphoric acids	38 886	0	0.00
44	Colombia	850213 - Generating sets, diesel, output > 375 kVA	38 199	0	0.00
45	Brazil	310520 - Nitrogen-phosphorus-potassium fertilizers, pack >10kg	37 086	126	0.34
46	Brazil	847420 - Machines to crush or grind stone, ores and minerals	36 479	47	0.13
47	Peru	310230 - Ammonium nitrate, including solution, in pack >10 kg	34 734	0	0.00
48	Brazil	841221 - Hydraulic power engines/motors, linear acting	34 419	0	0.00
49	Paraguay	870421 - Diesel powered trucks weighing < 5 tonnes	34 333	0	0.00
50	Brazil	844520 - Textile yarn spinning machines	34 166	0	0.00

Table 5.15 shows that:

(i) Eight of the eleven South American countries are possible markets for the top 50 product-country combinations.

[47] Percentage of the total potential export value realised in actual exports (actual exports/potential export value).

(ii) Brazil is the country with the most identified product-country combinations (25) and Peru (7) and Argentina (5) to follow. Chile and Colombia both have four product-country combinations in the top 50 and Ecuador and Paraguay have two. Venezuela has only one identified product-country combination in the top 50.

(iii) The three countries that are not in the top 50 product-country combinations identified are Bolivia, Guyana and Uruguay.

The identified products are diverse, but those with the highest potential export values include transportation products (e.g. 1500 cc-3000 cc automobiles and diesel trucks weighing less than five tons), mineral products (e.g. different variations of coal, anthracite and sulphurs), vegetable products (e.g. maize (except seed corn) and fresh pears and quinces), chemicals (e.g. polypropylene, ammonium, monoammonium, nitrogen-phosphorus-potassium), machinery (e.g. generators, engines, furnaces and boring machines) and foodstuffs (wine, sugar and tobacco). These results can assist the Automotive Industry Export Council (AIEC), Farmed Abalone Export Council, Department of Agriculture, Forestry and Fisheries (DAFF), Capital Equipment Export Council, SA Electrotechnical Export Council (SAEEC) and the Wines of South Africa export councils in focusing their export promotion activities.

As indicated earlier (section 5.2.2), South Africa has not yet tapped into the export potential of most of the top 50 product-country combinations with the highest export potential. Only a few product-country combinations have already been utilised. These include anthracite, not agglomerated to Brazil (100%), aluminium alloy rectangular plate/sheet or strip to Brazil (100%), bituminous coal, not agglomerated to Argentina (43.34%) and acrylic acid esters to Brazil (31.71%). All these products can be classified under the minerals, metals and chemicals sector.

Section 5.2.5 will make recommendations to export promotion organisations and industry associations.

5.2.5 Recommendations to the trade promotion organisations and industry associations

5.2.5.1 Broad recommendations to trade promotion organisations and industry associations

In Table 5.16, the South American countries are listed according to their potential export value ranking (see Table 5.7), as well as their market accessibility ranking (see Table 5.3). This will

give an indication to trade promotion organisations and industry associations of the export opportunity in each country, while taking into account the market accessibility.

Table 5.16: South American countries' ranking in terms of potential export value and market accessibility

Potential export value		Market accessibility	
Rank	**Country**	**Rank**	**Country**
1	Brazil	1	Brazil
2	Argentina	2	Argentina
3	Chile	3	Peru
4	Peru	4	Colombia
5	Colombia	5	Chile
6	Ecuador	6	Uruguay
7	Venezuela	7	Paraguay
8	Paraguay	8	Ecuador
9	Bolivia	9	Bolivia
10	Uruguay	10	Guyana
11	Guyana	11	Venezuela

From Table 5.16, it is clear that:

(i) Brazil and Argentina are the first two top countries in terms of potential export value, as well as market accessibility.[48]

(ii) The top five countries in terms of potential export value are also the top five countries in terms of market accessibility (just in another order). These are Argentina, Brazil, Chile, Colombia and Peru.

When South African trade promotion organisations and industry associations want to export a specific product-country combination to South America, it is always important to take into account the market accessibility[49]. If the trade promotion organisations know which countries and products hold the highest export potential, they will be better informed to negotiate lower trade barriers for these opportunities. The information on market accessibility provided in this study can also inform these negotiations.

[48] Even though these countries have a high overall market accessibility certain products may be low (see tables A.2, A.4, A.6, A.8, A.10, A.12, A.14, A.16, A.18, A.20 and A.22 for each country's 10 least accessible products). For example, although Brazil is considered the most accessible South American country, the automobile industry is highly protected (see table A.6).

[49] If detailed information on the market accessibility of specific product-country combinations should be required, this can be obtained from the author, Carli.Jacobs@nwu.ac.za.

Section 5.2.5.2 will make more specific product-country level recommendations to export promotion organisations and industry associations in order to focus or prioritise their export promotion activities and instruments.

5.2.5.2 Specific product-country level recommendations to trade promotion organisations and industry associations

As mentioned in section 4.2.4, if an export opportunity is categorised in cells 1 to 10 of Table 4.2 (also see Tables 5.4 and 5.5), it is recommended for export promotion organisations to follow an offensive market exploration strategy, because South Africa has a small market share with the potential to be higher. In the case where a market is categorised in cells 11 to 15, an offensive market expansion strategy is suggested, because South Africa has an intermediately high market share, that potentially can be increased. For cells 16 to 20, a defensive export strategy is recommended in order to maintain the high market share.

For a country that has limited export promotion resources (financial and human), it is recommended that the export promotion organisation focuses on cells 11 to 15, rather than cells 1 to 10 (that acquire a large amount of export promotion resources) or cells 16 to 20 (that do not need export assistance, as they are established markets) (Cuyvers *et al.*, 1995:183; Cuyvers, 1997:14-15; 2004:270). As South Africa is a country with limited export promotion resources, it is recommended that the export promotion organisations focus their export promotion strategies on cells 11 to 15. Therefore, Table 5.17 lists the 23 product-country combinations that fall into cells 11 to 15. The products are ranked according to their respective potential export values.

Table 5.17: The identified product-country combinations in cells 11 to 15

Country	HS 6-digit product code and description	Filter 4 cell classifica-tion	Potential export value (2010) (US$ thousand)	Actual SA exports (2010) (US$ thousand)
Chile	732611 - Balls, iron/steel, forged/stamped for grinding mills	15	19 583	1 612
Brazil	220410 - Grape wines, sparkling	12	12 613	37
Chile	848310 - Transmission shafts and cranks, cam and crank shafts	15	9 479	101
Colombia	848220 - Bearings, tapered roller, including assemblies	12	8 070	53
Argentina	100510 - Maize (corn) seed	12	7 680	1 002
Argentina	842890 - Lifting, handling, loading or unloading machinery nes	13	7 382	199
Colombia	842123 - Oil/petrol filters for internal combustion engines	12	6 738	0
Brazil	310260 - Calcium-ammonium nitrate mix, double salts pack >10kg	14	5 303	91
Colombia	901310 - Telescopes for arms/other equipment, periscopes	14	4 757	119
Chile	848220 - Bearings, tapered roller, including assemblies	12	3 185	61
Colombia	870891 - Radiators for motor vehicles	12	1 706	4
Peru	820412 - Wrenches, hand-operated, with adjustable jaws	12	1 442	0
Colombia	846711 - Tools for working in the hand, pneumatic rotary type	12	1 367	31
Colombia	721923 - Hot rolled stainless steel flat, w >600mm, t 3-4.75mm	12	1 178	572
Argentina	330112 - Essential oils of orange	12	989	1
Argentina	282110 - Iron oxides and hydroxides	12	926	15
Chile	851230 - Sound signalling equipment	12	839	1
Argentina	950629 - Water-ski's, surf-boards, other water sport equipment	12	673	0
Bolivia	820713 - Rock drilling w/wk p cerme	12	552	150
Peru	902920 - Speed indicators, tachometers, stroboscopes	12	519	16
Colombia	720292 - Ferro-vanadium	12	413	392
Peru	261510 - Zirconium ores and concentrates	12	170	153
Argentina	220421 - Grape wines nes, fortified wine or must, pack < 2litre	12	165	37

From Table 5.17, it can be recommended that:

(i) The product-country combinations belonging to cells 11 to 15 lie in six of the eleven South American countries, namely Argentina, Bolivia, Brazil, Chile, Colombia and Peru.

(ii) The top five products in terms of potential export value, are maize (corn) seed, grape wines, sparkling, grape wines nes, fortified wine or must, pack < 2litre, zirconium ores and concentrates, iron oxides and hydroxides. Once again, these results may assist, for instance, the Farmed Abalone Export Council, Department of Agriculture, Forestry and Fisheries (DAFF) and the Wines of South Africa export councils in allocating their priorities in terms of export promotion to South American countries.

It is important for the South African export promotion organisations and industry associations to still take the trade barriers of Argentina, Bolivia, Brazil, Chile, Colombia and Peru into account,

even though these countries are the top six to focus on. From Table 3.2, Bolivia is the least accessible, with a market accessibility index of only 46.78, followed by Chile (63.00) and Colombia (65.99) (see Table 5.3). The trade barriers that should be focused on in bilateral/multilateral trade negotiations are tariffs, cost, time and culture (see section 3.3)[50].

As mentioned in section 5.2.1.3, it is important to use exporter and trade promotion organisations' market intelligence, as well as experience together with the DSM results. A detailed market profile for each chosen product-country combination should also be developed and used in combination with the DSM results.

Therefore, the exporter and trade promotion organisations' market intelligence, experience and in-depth market analysis should also be included in strategic decision-making on exports.

The following section will conclude this chapter.

5.3 Summary

In this chapter, the main results of the updated and reconstructed DSM applied for South Africa to identify realistic export opportunities in the South American countries were analysed.

In section 5.2.1, the filtering process explained how the 62 986 product-country combinations that entered this DSM were filtered to a total of 1 756 realistic export opportunities for South Africa in South America.

Filter 3.2 measured the market accessibility in terms of six variables (see Table 5.3). Brazil is found to be the most accessible and Venezuela the least accessible. The market accessibility index of the top and bottom ten South African products per South American country in terms of market accessibility is summarised in Appendix A.

Section 5.2.2 provided the export opportunities' results on country level. Chile is the South American country with the highest number of identified realistic export opportunities identified for South Africa (264 – see Table 5.6). In terms of the share in the total potential export value (see Table 5.7), Brazil has the largest share (41.03%). For all South American countries, the percentages of the potential export value realised in actual exports are very low.

[50] If detailed information on the market accessibility of specific product-country combinations should be required, this can be obtained from the authors.

The sector-level results were discussed in section 5.2.3. The sectors with the highest potential export value are: transportation, machinery/electrical, mineral products, chemicals and allied industries, as well as metals. The top 10 product-country combinations of the transportation, machinery/electrical, mineral products, chemicals sectors are provided in Tables 5.10 to 5.13.

The focus of section 5.2.4 was on product-country level results. From the top five products, three are from the transport sector, one from mineral products sector, and one from the vegetable products sector.

The South American countries in the top 50 product-country combinations, ranked according to the highest export potential, are Brazil (25), Peru (7), Argentina (5), Colombia (4), Chile (4), Ecuador (2), Paraguay (2) and Venezuela (1). The products with the highest potential export values include transportation products (e.g. 1500 cc-3000 cc automobiles and diesel trucks weighing less than five tons), mineral products (e.g. different variations of coal, anthracite and sulphurs), vegetable products (e.g. maize (except seed corn) and fresh pears and quinces), chemicals (e.g. polypropylene, ammonium, monoammonium, nitrogen-phosphorus-potassium), machinery (e.g. generators, engines, furnaces, boring machines etc.) and foodstuffs (wine, sugar and tobacco).

Section 5.2.5 made recommendations to export promotion organisations and industry associations. From the broad recommendations it is important to note that the top five countries in terms of potential export value are also the top five countries in terms of market accessibility. These are Argentina, Brazil, Chile, Colombia and Peru. When South African trade promotion organisations and industry associations want to export a specific product-country combination to South America, it is always important to take into account the market accessibility.

In section 5.2.5.2, a list of 23 product-country combinations was given as possible priorities for the trade promotion organisations and industry associations. In this study, these product-country combinations fall in six of the eleven South American countries, namely Argentina, Bolivia, Brazil, Chile, Colombia and Peru. The top five products are maize (corn) seed, grape wines, sparkling, grape wines nes, fortified wine or must, pack < 2litres, zirconium ores and concentrates, iron oxides and hydroxides.

The results on sector level, as well as product-country and product level, can assist the various export promotion organisations and industry associations to focus their export promotion

activities on the products with larger potential for export success. Specific export councils that were identified are: Automotive Industry Export Council (AIEC), Farmed Abalone Export Council, Department of Agriculture, Forestry and Fisheries (DAFF), Capital Equipment Export Council, SA Electrotechnical Export Council (SAEEC) and the Wines of South Africa Export Council. See Appendix B for a complete list of South African Export Councils, Industry Associations and Joint Action Groups.

As mentioned in section 5.2.1.3, it is important to note that the DSM results should not be used in isolation, but together with exporters' market intelligence, experience and in-depth market profiling. The reason for this is that the DSM focuses on market size, growth, main competitors and market access conditions and not on specific qualitative market information.

The summary, conclusions and recommendations of this study will follow in Chapter 6.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The main objectives of this study are, firstly, to determine and measure the barriers to trade for South Africa in the different South American countries; secondly, to identify the realistic export opportunities for South Africa in the South American countries, and thridly, to assist the various export promotion organisations and industry associations to focus their export promotion activities on the product-country combinations with a realistic potential for export success, while taking into account the market accessibility (see section 1.3).

The research method used included a literature and empirical study. In the literature study, the different barriers to trade identified in the international trade literature were discussed. From the literature, an overview of the empirical evidence of each barrier's impact on international trade was also provided. The empirical study investigated, measured and compared the barriers to export from South Africa to the South American countries versus South Africa's exports to the world. The DSM was chosen as the methodology to identify the most recent realistic export opportunities for South Africa in the South American countries.

In the first chapter, an introduction to this study was provided, by stating the background, problem statement, motivation, objectives, method, as well as the outline of the chapters. The literature study, in Chapter 2, provided an overview of the current literature on the barriers to trade, and the impact of these barriers on international trade. Chapter 3 investigated and measured the trade barriers (identified in the Chapter 2) that South Africa faces when exporting to the South American countries. In Chapter 4, the methodology of the DSM, applied to identify realistic export opportunities for South Africa in the South American countries, was described. Filter 3.2 of the DSM methodology, which focuses on trade barriers, was reconstructed to make it more applicable for South Africa's exports to the South American countries (see section 4.2.3.2). The results of this updated and reconstructed DSM, applied to identify export opportunities for South Africa in the South American countries, were provided in Chapter 5.

The objectives of this study are provided in Table 6.1, together with the different chapters in which each objective was addressed.

Table 6.1: Objectives met in each chapter

Objective	Chapter
To provide a literature overview of the: • Different barriers to trade; and • Empirical evidence of each barrier's impact on trade.	Chapter 2
Investigate, measure and compare the barriers to export from South Africa to the South American countries versus South Africa's exports to the world.	Chapter 3
To identify realistic export opportunities, by reconstructing and updating the DSM for South Africa to the different South American countries (using the latest data and reconstructing filter 3.2 on trade barriers).	Chapter 4
Provide recommendations for the South African export promotion organisations and industry associations firstly in terms of: • The number and potential export value of the realistic export opportunities in the different South American countries; • The status of South American trade barriers that could be addressed in bilateral and multilateral trade negotiations and discussions.	Chapter 5

6.2 Summary of the results and conclusions of the study

Chapter 2 focused on defining and identifying the different barriers to trade and the influence these barriers have on trade. Trade barriers are any parts of the trading process that increase trade costs. The trade barriers focused on in this study are tariffs, NTBs, transport cost, time to import, infrastructure, logistics, distance, cultural distance and exchange rates. These costs inflate prices and can result in export products being uncompetitively priced.

The literature describes the negative effect of tariffs on trade (see section 2.2.1.1). Furthermore, it became clear that as countries are more concerned about environmental and sanitary risks, NTBs are becoming progressively important. Countries want to protect their markets and therefore use NTBs more regularly (see section 2.2.1.2).

Transport costs have a negative effect on trade. Transport costs inflate export prices and result in uncompetitively priced export products. High transport costs of imported products increase the input costs of domestic production, which can result in the uncompetitiveness of manufactured exports that have a large import content (see section 2.2.2).

The time that it takes to trade is also an important part of the trading process (see section 2.2.3). The longer a shipment takes, the more expensive the product becomes and can also result in uncompetitive prices of export products.

Better infrastructure can help to lower transport costs as well as the time to import. Infrastructure includes a variety of factors, from roads and telecommunications to institutions.

Infrastructure, together with high-quality logistics, which is known to be the “backbone of international trade”, helps to decrease trade costs. The opposite is also true; if the infrastructure and logistics are in a bad condition, it will increase trade costs (see sections 2.2.4 and 2.2.5).

Even though distance is not a good proxy to measure transport costs, as it only explains 10% of the variation in transport costs, it does have an influence on trade (see section 2.2.6). This can be because countries that are situated closer to each other usually have analogous histories, cultures and languages, which are all positive for trade relations. The wider the cultural and language gap between countries, the more trade costs increase. This can be because traders from different countries are less familiar with each other and the negotiation process is more difficult. Cultural costs are, however, different from other trade costs, as they can be largely removed by learning (see section 2.2.7).

Another trade barrier is the exchange rate. There are very contradicting theoretical arguments on the effect that the volatility of the exchange rate has on trade. The volatility of the exchange rate creates uncertainty of the price and this is seen as a risk. Some studies argue that the risk has a negative effect on trade, where others argue that the risk holds the possibility of more profit and therefore a positive effect on trade. Empirically, the volatile exchange rate is found to have a very small effect on trade (see section 2.2.8).

There are, therefore, numerous factors that impede trade. Chapter 3 focused on quantifying these trade barriers between South Africa and the twelve South American countries. The trade barriers of South America were measured in terms of tariff barriers, non-tariff barriers, transport costs, time, distance, infrastructure, logistics and culture.

South American countries apply relatively high tariffs and lower non-tariff barriers to goods imported from South Africa, compared to what they apply on average to the world. Venezuela and Brazil are the South American countries with the highest tariff averages and Uruguay is the country with the highest non-tariff average. Peru charges the lowest average tariff and Argentina is the country with the lowest non-tariff average (see Tables 3.1 and 3.2).

In terms of the cost, time and distance, the data from the Doing Business Report evaluated the domestic costs and times (see Table 3.3). In this report, South America is in close range with the world average. When considering the number of documents required to import, Argentina, Bolivia, Brazil, Chile, Ecuador and Suriname outperformed the other South American countries,

while Uruguay and Paraguay performed the worst in this category. Out of all the South American countries, Venezuela requires the longest domestic time and highest domestic cost to export to. Domestic cost is the lowest in Guyana. The average number of documents needed to export from South Africa to South America is eight, which is one document above the world average of seven.

The international transport costs data showed that Uruguay is the cheapest to export to and Guyana is the most expensive. Overall, the average distance between South America and South Africa is almost the same as the distance between the South American countries' top five trading partners (5814 vs. 5483 nautical miles). However, the average time for trade between South America and South Africa is double the time to trade between South America and its top five trading partners (43 vs. 20 days) (see Tables 3.4 and 3.5).

From the total (domestic as well as international) transport time and cost data, Uruguay is the cheapest and Suriname is the most expensive. It takes the fewest number of days to export to Brazil, and the greatest number of days to export to Venezuela (see Table 3.6). Compared to the world average of 56 days, it takes a relatively large number of days on average to export from South Africa to South America (69 days). The South American average total cost is higher than the world average. Therefore, it is relatively more costly to export a 20-foot general cargo container from South Africa to South America (US$ 6 006) compared to the world (US$ 4 772).

According to the LPI, South America's logistic performance (2.79) is in close range with the world average (2.87). Overall, Brazil outperformed all the other South American countries in terms of the LPI, whereas Guyana performed the worst. From all the South American countries, Brazil is the clostest and takes the shortest time for international shipments from South Africa. Ecuador is the furthest away from South Africa and Chile takes the longest time to export to (see Table 3.7).

The cultural gap between South Africa and the South American countries is large in terms of language, but small in terms of religion (see Table 3.8).

Once all the trade barriers that South Africa faces when exporting to the different South American countries were described, the study continued to the next objective, which is to update and run the DSM to identify the realistic export opportunities for South Africa in the

various South American countries (see section 1.3), specifically focussing on reconstructing filter 3.2, which considers trade barriers.

The methodology of the DSM was described in Chapter 4. The updated[51] DSM was applied to identify realistic export opportunities for South Africa in the South American countries on a product-country level. There are four filters in the DSM. All the different variables used in each filter, as well as their specific cut-off values and their formulae, were discussed in Chapter 4. Filter 2 and filter 3.1 were applied in the same manner as the original DSM by Cuyvers *et al.* (1995), whereas filter 3.2 was reconstructed and included new data from the ITC, to make it a more accurate measure of trade barriers for South Africa exporting to the South American countries (see section 4.2.3.2). In filter 4, South Africa's RCA in each product identified as a realistic export opportunity was calculated to ensure that South Africa can produce and export the products for which export opportunities are identified in the same way as in the Steenkamp study (2011). Then the categorisation of export opportunities was done as in the Cuyvers *et al.* study (1995) and the determination of the potential export values as in the Steenkamp study (2011).

In Chapter 5, the results from this application of the DSM for South Africa in the 11 South American counties[52] were described and analysed.

In section 5.2.1, the filtering process explained how the 62 986 product-country combinations that entered this DSM were filtered to a total of 1 756 realistic export opportunities for South Africa in South America.

Filter 3.2 measures the market accessibility in terms of six variables (see Table 5.3). Brazil is found to be the most accessible country and Venezuela the least accessible. The top and bottom 10 products per country in terms of market accessibility are provided in Appendix A.

Section 5.2.2 provided the results of the DSM for South Africa in the 11 South American counties on a country level. Chile is the South American country with the highest number of identified realistic export opportunities identified for South Africa (264 – see Table 5.6). In terms of the share in the total potential export value (see Table 5.7), Brazil has the largest share

[51] 2007 trade data were used in Viviers *et al.* (2010). This was before the world-wide economic crisis in 2009. This study aims to update these results with 2010 data.
[52] There are 12 South American countries, but Suriname had no trade data available and therefore was excluded from the analysis.

(41.03%). Guyana is the South American country with the smallest number of export opportunities for South Africa (32), as well as the smallest share in potential export value (0.17%) (see Tables 5.6 and 5.7). For all South American countries, the percentages of the potential export value realised in actual exports, are very low.

The sector-level results were discussed in section 5.2.3. The sectors with the highest potential export value are: transportation, machinery/electrical, mineral products, chemicals and allied industries, as well as metals. Textiles, stone/glass, wood and wood products, and animal and animal products are the sectors that show the least export potential in terms of value. The top 10 product-country combinations of the transportation, machinery/electrical, mineral products, chemicals sectors are provided in Tables 5.10 to 5.13.

The focus of section 5.2.4 was on product-country level results. From the top five products, three are from the transport sector, one from the minerals sector and one from the vegetable products sector. The bottom five products are from the miscellaneous sector, the foodstuffs sector, the machinery/ electrical sector and chemical products.

The South American countries in the top 50 product-country combinations, ranked according to the highest export potential value, are Brazil (25), Peru (7), Argentina (5), Colombia (4), Chile (4), Ecuador (2), Paraguay (2) and Venezuela (1). The products with the highest potential export values include transportation products (e.g. 1500 cc-3000 cc automobiles and diesel trucks weighing less than five tons), mineral products (e.g. different variations of coal, anthracite and sulphurs), vegetable products (e.g. maize (except seed corn) and fresh pears and quinces), chemicals (e.g. polypropylene, ammonium, monoammonium, nitrogen-phosphorus-potassium), machinery (e.g. generators, engines, furnaces, boring machines etc.) and foodstuffs (e.g. wine, sugar and tobacco).

It is important to note that the DSM results should not be used in isolation, but in combination with exporters' market intelligence, experience and in-depth market profiling. The reason for this is that the DSM only focuses on market size, growth, main competitors and market access conditions and not on specific qualitative market information.

The following section will conclude the study by providing the recommendations that can be made from this study.

6.3 Recommendations

From this study, there are two levels of recommendations to be made to the South African export promotion organisations and industry associations. The first level of recommendations is in terms of the realistic export opportunities identified in the different South American countries; and the second level of recommendations is in terms of the status of South American trade barriers that could be addressed in bilateral and multilateral trade negotiations and discussions.

In terms of the realistic export opportunities identified in this study for South Africa in the different South American countries, trade promotion organisations and industry associations can focus on the top countries (see Tables 5.6 and 5.7), top sectors (see Figures 5.1 and 5.2, as well as Table 5.9) and top product-country combinations (see Table 5.14.). They can also focus on the entire list of 1 756 realistic export opportunities for South Africa in South America if resources allow. The specific export councils that can focus their export promotion activities on the products with larger potential for export success identified in Chapter 5 are the: Automotive Industry Export Council (AIEC), Farmed Abalone Export Council, Department of Agriculture, Forestry and Fisheries (DAFF), Capital Equipment Export Council, SA Electrotechnical Export Council and the Wines of South Africa export council. See Appendix B for a complete list of South African Export Councils, Industry Associations and Joint Action Groups.

Furthermore, according to Cuyvers *et al.* (1995:183) and Cuyvers (1997:14-15; 2004:270), trade promotion organisations that want to focus their resources, should focus on product-country combinations in cells 11 to 15 as a first priority (see Table 5.16 and section 5.2.5). In this study, these product-country combinations lie in six of the 11 South American countries, namely Argentina, Bolivia, Brazil, Chile, Colombia and Peru. The top five products are maize (corn) seed, grape wines, sparkling grape wines not elsewhere specified (nes), fortified wine or must in packs smaller than two litres, zirconium ores and concentrates, iron oxides and hydroxides. The South African trade promotion organisations, namely the DTI, provincial trade promotion organisations and industry associations should use these results in order to plan export promotion strategies.

It is also important to take the market accessibility into account when South African trade promotion organisations and industry associations want to export a specific product-country

combination to South America. The top five countries in terms of potential export value are also the top five countries in terms of market accessibility. These are Argentina, Brazil, Chile, Colombia and Peru (see Table 5.16). Chile is the least accessible, with an average market accessibility index of 63.00, followed by Colombia (65.99), Peru (70.27), Argentina (71.56) and Brazil (74.25) (see Table 5.3). For more product-specific information on the trade barriers faced in each country, see Appendix A (Tables A.1 to A.22)[53].

This study found that the highest trade barriers that South Africa faces in exporting to the different South American countries are tariffs, cost, time and language. More specifically, the average *ad valorem* equivalent tariff applied by the South American countries to South Africa (10.07%) is higher than the world average (8.63%). Furthermore, the average total time for South Africa to export to South America (69 days) is more than 10 days higher than the world average (56 days). The average total cost for South Africa to export to South America (US$6 006 per 20-foot general cargo container) is also above the world average of US$ 4 772 per 20-foot general cargo container. These trade barriers should be the focus in bilateral and multilateral trade negotiations.

[53] If detailed information on the market accessibility of specific product-country combinations should be required, this can be obtained from the authors.

APPENDIX A: THE MARKET ACCESSIBILITY INDEX FOR THE TOP AND BOTTOM 10 SOUTH AFRICAN PRODUCTS PER SOUTH AMERICAN COUNTRY

Table A.1: The market accessibility index of the top 10 most accessible South African products into Argentina

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	901480 - Navigational instruments and appliances nes	-8.59	0.00	0.00	4 689	45	3.1	90.90
2	470200 - Chemical wood pulp, dissolving grades	-4.59	4.00	0.00	4 689	45	3.1	85.34
3	283429 - Nitrates of metals except potassium and bismuth	-4.09	4.50	0.00	4 689	45	3.1	84.65
4	120999 - Seed, fruits and spores for sowing, nes	0.00	0.00	0.00	4 689	45	3.1	83.74
5	270112 - Bituminous coal, not agglomerated	0.00	0.00	0.00	4 689	45	3.1	83.74
6	270740 - Naphthalene	0.00	0.00	0.00	4 689	45	3.1	83.74
7	271500 - Bituminous mix, mastic from asphalt, bitumen/tar/pitc	0.00	0.00	0.00	4 689	45	3.1	83.74
8	283711 - Cyanides and cyanide oxides of sodium	0.00	0.00	0.00	4 689	45	3.1	83.74
9	310540 - Monoammonium phosphate & mix with diammonium, <=10 kg	0.00	0.00	0.00	4 689	45	3.1	83.74
10	720241 - Ferro-chromium, >4% carbon	0.00	0.00	0.00	4 689	45	3.1	83.74

Table A.2: The market accessibility index of the bottom 10 least accessible South African products into Argentina

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	630720 - Life jackets and life belts, textile material	7.00	35.00	0.49	4 689	45	3.1	60.97
2	843110 - Parts of hoists and winches	0.00	15.00	92.92	4 689	45	3.1	58.74
3	870323 - Automobiles, spark ignition engine of 1500-3000 cc	14.00	35.00	0.00	4 689	45	3.1	58.74
4	870520 - Mobile drilling derricks	14.00	35.00	0.00	4 689	45	3.1	58.74
5	848310 - Transmission shafts and cranks, cam and crank shafts	2.69	13.33	33.82	4 689	45	3.1	57.43
6	846810 - Torches, hand-held, for soldering/brazing/welding	3.20	16.00	64.85	4 689	45	3.1	55.52
7	848220 - Bearings, tapered roller, including assemblies	3.20	16.00	96.45	4 689	45	3.1	55.52
8	848320 - Bearing housings etc incorporating ball/roller bearing	3.20	16.00	91.36	4 689	45	3.1	55.52
9	840820 - Engines, diesel, for motor vehicles	3.60	18.00	36.76	4 689	45	3.1	54.07
10	630120 - Blankets (non-electric) & travelling rug, wool or hair	6.30	35.00	35.32	4 689	45	3.1	45.16

Table A.3: The market accessibility index of the top 10 most accessible South African products into Bolivia

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	290513 - N-butyl alcohol	0.00	0.00	0.00	7 055	78	2.51	59.20
2	310290 - Nitrogenous fertilizers, mixes, nes, pack >10 kg	0.00	0.00	0.00	7 055	78	2.51	59.20
3	310520 - Nitrogen-phosphorus-potassium fertilizers, pack >10kg	0.00	0.00	0.00	7 055	78	2.51	59.20
4	843280 - Rollers, soil preparation, cultivation machinery, nes	0.00	0.00	0.00	7 055	78	2.51	59.20
5	843410 - Milking machines	0.00	0.00	0.00	7 055	78	2.51	59.20
6	845140 - Washing, bleaching or dyeing machines (non-domestic)	0.00	0.00	0.00	7 055	78	2.51	59.20
7	845180 - Machinery to impregnate textiles, make linoleum, etc	0.00	0.00	0.00	7 055	78	2.51	59.20
8	845929 - Drilling machines for metal, except num controlled	0.00	0.00	0.00	7 055	78	2.51	59.20
9	846190 - Metal cutting, shaping, filing, engrave machines, nes	0.00	0.00	0.00	7 055	78	2.51	59.20
10	290513 - N-butyl alcohol	0.00	0.00	0.00	7 055	78	2.51	59.20

Table A.4: The market accessibility index of the bottom 10 least accessible South African products into Bolivia

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	080620 - Grapes, dried	9.00	15.00	0.00	7 055	78	2.51	43.37
2	630590 - Sacks & bags, packing, of materials nes	9.00	15.00	0.00	7 055	78	2.51	43.37
3	731029 - Cans, iron or steel, capacity <50 litres nes	9.00	15.00	0.00	7 055	78	2.51	43.37
4	820580 - Anvils, portable forges, hand operated grinders	9.00	15.00	0.00	7 055	78	2.51	43.37
5	510219 - Fine animal hair, not carded/combed, other than of Kashmir (cashmere) goats	5.35	13.33	8.33	7 055	78	2.51	42.71
6	481930 - Sacks and bags, of paper, having a width > 40 cm	12.00	15.00	0.00	7 055	78	2.51	42.53
7	392210 - Baths, shower-baths and wash basins, of plastics	8.00	20.00	0.00	7 055	78	2.51	41.42
8	970110 - Paintings/drawings/pastels executed by hand	8.00	20.00	0.00	7 055	78	2.51	41.42
9	970300 - Original sculptures and statuary, in any material	8.00	20.00	0.00	7 055	78	2.51	41.42
10	200190 - Vegetable, fruit, nuts nes prepared or preserved by vinegar	8.00	20.00	0.00	7,055	78	2.51	41.42

Table A.5: The market accessibility index of the top 10 most accessible South African products into Brazil

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	270500 - Coal gas, water gas, etc. (not gaseous hydrocarbons)	-11.70	0.00	0.00	4 525	36	3.2	96.25
2	310290 - Nitrogenous fertilizers, mixes, nes, pack >10 kg	-11.70	0.00	0.00	4 525	36	3.2	96.25
3	310260 - Calcium-ammonium nitrate mix, double salts pack >10kg	-11.70	0.00	0.08	4 525	36	3.2	96.21
4	261400 - Titanium ores and concentrates	-9.70	2.00	0.00	4 525	36	3.2	94.89
5	284130 - Sodium dichromate	-6.00	2.00	0.00	4 525	36	3.2	91.81
6	284290 - Metallic salts of inorganic acids nes, except azides	-4.80	2.00	0.01	4 525	36	3.2	90.80
7	270111 - Anthracite, not agglomerated	0.00	0.00	0.00	4 525	36	3.2	87.92
8	270112 - Bituminous coal, not agglomerated	0.00	0.00	0.00	4 525	36	3.2	87.92
9	270119 - Coal except anthracite or bituminous, not agglomerate	0.00	0.00	0.00	4 525	36	3.2	87.92
10	270799 - Coal tar distillation products nes	0.00	0.00	0.00	4 525	36	3.2	87.92

Table A.6: The market accessibility index of the bottom 10 least accessible South African products into Brazil

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	840820 - Engines, diesel, for motor vehicles	3.60	18.00	25.73	4 525	36	3.2	60.62
2	200919 - Orange juice, not fermented, spirited, or frozen	8.40	14.00	22.74	4 525	36	3.2	60.51
3	180631 - Chocolate, cocoa preps, block, slab, bar, filled, >2k	0.00	20.00	40.02	4 525	36	3.2	60.14
4	842123 - Oil/petrol filters for internal combustion engines	3.20	16.00	66.50	4 525	36	3.2	59.70
5	220720 - Ethyl alcohol and other spirits, denatured	0.80	20.00	102.90	4 525	36	3.2	59.47
6	200892 - Fruit mixtures, otherwise prepared or preserved	5.60	14.00	128.12	4 525	36	3.2	58.81
7	200990 - Mixtures of juices not fermented or spirited	5.60	14.00	153.61	4 525	36	3.2	58.81
8	853110 - Burglar or fire alarms and similar apparatus	3.60	18.00	73.83	4 525	36	3.2	58.25
9	220710 - Undenatured ethyl alcohol > 80% by volume	4.00	20.00	68.11	4 525	36	3.2	56.81
10	871640 - Trailers, semi-trailers nes	0.00	35.00	60.81	4 525	36	3.2	54.58

Table A.7: The market accessibility index of the top 10 most accessible South African products into Chile

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	360500 - Matches	2.40	6.00	0.00	6 103	76	3.09	67.50
2	710239 - Diamonds (jewellery) worked but not mounted or set	2.40	6.00	0.00	6 103	76	3.09	67.50
3	720241 - Ferro-chromium, >4% carbon	2.40	6.00	0.00	6 103	76	3.09	67.50
4	950621 - Sailboards	2.40	6.00	0.00	6 103	76	3.09	67.50
5	551521 - Woven fabric acrylics + manmade filament, nes	2.46	6.00	0.00	6 103	76	3.09	67.45
6	482020 - School, etc, exercise books	2.76	6.00	0.00	6 103	76	3.09	67.20
7	540710 - Woven hi-ten filament, nylon, polyamide or polyester	2.76	6.00	0.00	6 103	76	3.09	67.20
8	620590 - Men's, boys shirts, of material nes, not knit	2.76	6.00	0.00	6 103	76	3.09	67.20
9	730820 - Towers and lattice masts, iron or steel	2.94	6.00	0.00	6 103	76	3.09	67.05
10	851230 - Sound signalling equipment	3.06	6.00	0.00	6 103	76	3.09	66.95

Table A.8: The market accessibility index of the bottom 10 least accessible South African products into Chile

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	853180 - Electric sound or visual signalling apparatus, nes	4.80	6.00	63.39	6 103	76	3.09	48.83
2	901580 - Surveying, etc instruments nes	4.80	6.00	111.50	6 103	76	3.09	48.83
3	091091 - Mixtures of spices	5.20	6.00	61.25	6 103	76	3.09	48.50
4	901310 - Telescopes for arms/other equipment, periscopes	6.00	6.00	29.05	6 103	76	3.09	48.36
5	030799 - Aquatic invertebrates nes, frozen or preserved	6.00	6.00	92.40	6 103	76	3.09	47.83
6	110812 - Maize (corn) starch	6.00	6.00	98.65	6 103	76	3.09	47.83
7	283210 - Sodium sulphites	6.00	6.00	51.29	6 103	76	3.09	47.83
8	310590 - Fertilizers, mixes, nes	6.00	6.00	162.46	6 103	76	3.09	47.83
9	330720 - Personal deodorants and antiperspirants	6.00	6.00	201.46	6 103	76	3.09	47.83
10	853080 - Electric signal, safety & traffic controls, nes	6.00	6.00	99.64	6 103	76	3.09	47.83

Table A.9: The market accessibility index of the top 10 most accessible South African products into Colombia

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	750210 - Nickel unwrought, not alloyed	-8.64	0.00	0.00	4 944	56	2.77	81.95
2	730840 - Props etc for scaffold, shuttering, pits, iron/steel	-10.00	5.00	0.00	4 944	56	2.77	80.31
3	731290 - Plaited bands/etc, iron/steel, no electric insulation	-10.00	5.00	0.00	4 944	56	2.77	80.31
4	731600 - Anchors, grapnels and parts thereof of iron or steel	-10.00	5.00	0.00	4 944	56	2.77	80.31
5	820412 - Wrenches, hand-operated, with adjustable jaws	-10.00	5.00	0.00	4 944	56	2.77	80.31
6	841440 - Air compressors mounted on wheeled chassis for towing	-10.00	5.00	0.00	4 944	56	2.77	80.31
7	841780 - Industrial furnace, oven, incinerator non-electric nes	-10.00	5.00	0.00	4 944	56	2.77	80.31
8	842131 - Intake air filters for internal combustion engines	-10.00	5.00	0.00	4 944	56	2.77	80.31
9	846719 - Tools for working in the hand, pneumatic type nes	-10.00	5.00	0.00	4 944	56	2.77	80.31
10	847431 - Concrete or mortar mixing machines	-10.00	5.00	0.00	4 944	56	2.77	80.31

Table A.10: The market accessibility index of the bottom 10 least accessible South African products into Colombia

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	200840 - Pears, otherwise prepared or preserved	3.00	15.00	43.05	4 944	56	2.77	47.25
2	210330 - Mustard flour or meal and prepared mustard	3.00	15.00	64.46	4 944	56	2.77	47.25
3	210410 - Soups and broths and preparations thereof	3.00	15.00	48.09	4 944	56	2.77	47.25
4	170111 - Raw sugar, cane	5.40	15.00	162.10	4 944	56	2.77	45.25
5	080940 - Plums, sloes, fresh	6.00	15.00	108.21	4 944	56	2.77	44.75
6	100590 - Maize except seed corn	6.23	18.33	78.15	4 944	56	2.77	42.71
7	030799 - Aquatic invertebrates nes, frozen or preserved	9.16	15.00	71.76	4 944	56	2.77	42.12
8	081330 - Apples, dried	12.00	15.00	123.34	4 944	56	2.77	41.42
9	330720 - Personal deodorants and antiperspirants	10.44	15.00	200.59	4 944	56	2.77	41.42
10	640110 - Waterproof footwear (Wellingtons etc), metal toe cap	11.00	15.00	200.36	4 944	56	2.77	41.42

Table A.11: The market accessibility index of the top 10 most accessible South African products into Ecuador

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	120999 - Seed, fruits and spores for sowing, nes	0.00	0.00	0.00	6 490	72	2.77	66.80
2	282300 - Titanium oxides	0.00	0.00	0.00	6 490	72	2.77	66.80
3	292800 - Organic derivatives of hydrazine or of hydroxylamine	0.00	0.00	0.00	6 490	72	2.77	66.80
4	380190 - Graphite based products nes	0.00	0.00	0.00	6 490	72	2.77	66.80
5	390210 - Polypropylene in primary forms	0.00	0.00	0.00	6 490	72	2.77	66.80
6	390230 - Propylene copolymers in primary forms	0.00	0.00	0.00	6 490	72	2.77	66.80
7	700319 - Cast glass sheet, non-wired, clear	0.00	0.00	0.00	6 490	72	2.77	66.80
8	700521 - Float glass etc sheets, coloured throughout	0.00	0.00	0.00	6 490	72	2.77	66.80
9	710310 - Precious, semi-precious stones unworked, partly worked	0.00	0.00	0.00	6 490	72	2.77	66.80
10	720510 - Granules of pig iron or spiegeleisen	0.00	0.00	0.00	6 490	72	2.77	66.80

Table A.12: The market accessibility index of the bottom 10 least accessible South African products into Ecuador

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	080930 - Peaches, nectarines, fresh	20.00	25.00	0.00	6 490	72	2.77	44.57
2	220429 - Grape wines, alcoholic grape must nes	13.50	22.50	3.33	6 490	72	2.77	44.11
3	490810 - Transfers (decalcomanias), vitrifiable	6.00	30.00	2.20	6 490	72	2.77	43.91
4	210610 - Protein concentrates and textured protein substances	2.04	20.00	20.17	6 490	72	2.77	42.78
5	870421 - Diesel powered trucks weighing < 5 tonnes	3.92	12.50	25.36	6 490	72	2.77	42.50
6	401290 - Solid or cushioned tyres, interchangeable treads	6.72	12.00	21.87	6 490	72	2.77	42.38
7	391721 - Tube, pipe or hose, rigid, of polyethylene	4.50	7.50	64.78	6 490	72	2.77	42.21
8	691190 - Household & toilet articles nes of porcelain or china	12.00	30.00	0.00	6 490	72	2.77	41.80
9	850680 - Primary cells & primary	16.67	16.67	13.48	6 490	72	2.77	41.71
10	731010 - Tank, cask or container, iron/steel, capacity 50-300l	8.00	20.00	13.15	6 490	72	2.77	41.71

Table A.13: The market accessibility index of the top 10 most accessible South African products into Guyana

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	842481 - Agricultural sprays and powder dispersers	0.00	0.00	0.66	8 873	70	2.27	50.83
2	842410 - Fire extinguishers, whether or not charged	0.00	0.00	2.49	8 873	70	2.27	49.82
3	730590 - Tube/pipe nes,iron/steel riveted etc, diameter>406.4meter	0.00	5.00	0.00	8 873	70	2.27	48.42
4	790500 - Zinc plates, sheets, strip and foil	0.00	5.00	0.00	8 873	70	2.27	48.42
5	820530 - Planes, chisels, gouges and similar wood cutting tool	0.00	5.00	0.00	8 873	70	2.27	48.42
6	848280 - Bearings, ball or roller, nes, including combinations	0.00	5.00	0.00	8 873	70	2.27	48.42
7	730290 - Rail/tramway construction material of iron/steel, nes	1.00	5.00	0.00	8 873	70	2.27	47.59
8	730900 - Reservoirs/tanks/vats/etc, iron/steel capacity >300liter	1.00	5.00	0.00	8 873	70	2.27	47.59
9	731582 - Chain, welded link, iron or steel	1.00	5.00	0.00	8 873	70	2.27	47.59
10	731600 - Anchors, grapnels and parts thereof of iron or steel	1.00	5.00	0.00	8 873	70	2.27	47.59

Table A.14: The market accessibility index of the bottom 10 least accessible South African products into Guyana

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	842121 - Water filtering or purifying machinery or apparatus	0.00	0.00	11.28	8 873	70	2.27	44.94
2	940600 - Prefabricated buildings	3.73	6.25	0.00	8 873	70	2.27	44.62
3	871640 - Trailers, semi-trailers nes	0.00	5.00	8.16	8 873	70	2.27	43.89
4	282990 - Perchlorates, bromates & per-,iodates & per- of metal	1.00	5.00	8.16	8 873	70	2.27	43.06
5	721049 - Flat rolled iron or non-alloy steel, coated with zinc, width >600mm, nes	4.00	10.00	0.00	8 873	70	2.27	42.31
6	830621 - Statuettes, other ornaments plated with precious meta	4.00	10.00	0.00	8 873	70	2.27	42.31
7	731300 - Wire for fencing, including barbed wire	0.74	15.00	0.00	8 873	70	2.27	42.25
8	843110 - Parts of hoists and winches	1.00	5.00	10.32	8 873	70	2.27	41.86
9	840820 - Engines, diesel, for motor vehicles	0.00	10.00	6.94	8 873	70	2.27	41.79
10	842959 - Earth moving/road making equipment, self-propelled nes	0.00	0.00	17.28	8,873	70	2.27	41.60

Table A.15: The market accessibility index of the top 10 most accessible South African products into Paraguay

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	843139 - Parts of lifting/handling machinery nes	-1.80	0.00	0.00	3 679	80	2.75	74.58
2	842890 - Lifting, handling, loading or unloading machinery nes	-1.78	0.50	0.00	3 679	80	2.75	74.28
3	851529 - Electric resistance welding equipment, non-automatic	-1.20	0.00	0.00	3 679	80	2.75	74.08
4	846820 - Gas-operated machinery for welding nes	-1.60	2.00	0.00	3 679	80	2.75	73.30
5	843420 - Dairy machinery	-0.80	1.00	0.00	3 679	80	2.75	73.19
6	481390 - Paper, cigarette, except in rolls < 5 cm wide	0.00	0.00	0.00	3 679	80	2.75	73.08
7	730900 - Reservoirs/tanks/vats/etc, iron/steel capacity >300l	0.00	0.00	0.00	3 679	80	2.75	73.08
8	842121 - Water filtering or purifying machinery or apparatus	0.00	0.00	0.00	3 679	80	2.75	73.08
9	843061 - Tamping or compacting machinery, not self-propelled	0.00	0.00	0.00	3 679	80	2.75	73.08
10	843410 - Milking machines	0.00	0.00	0.00	3 679	80	2.75	73.08

Table A.16: The market accessibility index of the bottom 10 least accessible South African products into Paraguay

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	091099 - Spices nes	4.00	10.00	41.69	3 679	80	2.75	47.52
2	283210 - Sodium sulphites	4.00	10.00	158.38	3 679	80	2.75	47.52
3	190420 - Prep foods from unroasted	15.20	16.00	16.16	3 679	80	2.75	46.88
4	820590 - Sets of hand tools	0.00	18.00	74.77	3 679	80	2.75	46.41
5	820713 - Rock drilling w/wk p crème	10.80	18.00	16.16	3 679	80	2.75	45.77
6	820719 - Rock drilling nes & parts	10.80	18.00	16.16	3 679	80	2.75	45.77
7	200520 - Potatoes, prepared or preserved, not frozen/vinegar	6.20	14.00	95.78	3 679	80	2.75	43.46
8	200870 - Peaches, otherwise prepared or preserved	7.16	14.00	75.99	3 679	80	2.75	42.66
9	690990 - Ceramic troughs, etc (agriculture), ceramic pots etc	9.60	12.00	90.74	3 679	80	2.75	41.74
10	200919 - Orange juice, not fermented, spirited, or frozen	8.40	14.00	60.35	3 679	80	2.75	41.63

Table A.17: The market accessibility index of the top 10 most accessible South African products into Peru

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	741129 - Pipes or tubes, copper alloy except nickel/zinc alloy	-7.20	0.00	0.00	5 174	55	2.8	80.82
2	030379 - Fish nes, frozen, whole	-3.52	0.00	0.00	5 174	55	2.8	77.76
3	870892 - Mufflers and exhaust pipes for motor vehicles	-3.52	0.00	0.00	5 174	55	2.8	77.76
4	170199 - Refined sugar, in solid form, nes, pure sucrose	-2.64	0.00	0.28	5 174	55	2.8	76.86
5	848420 - Mechanical seals	-8.10	0.00	9.38	5 174	55	2.8	76.36
6	284990 - Carbides except calcium and silicon	-1.00	0.00	0.00	5 174	55	2.8	75.65
7	285000 - Hydrides, nitrides, azides, silicides and borides	-0.80	0.00	0.00	5 174	55	2.8	75.49
8	120999 - Seed, fruits and spores for sowing, nes	0.00	0.00	0.00	5 174	55	2.8	74.82
9	251910 - Natural magnesium carbonate (magnesite)	0.00	0.00	0.00	5 174	55	2.8	74.82
10	261400 - Titanium ores and concentrates	0.00	0.00	0.00	5 174	55	2.8	74.82

Table A.18: The market accessibility index of the bottom 10 least accessible South African products into Peru

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	150890 - Refined ground-nut oil not chemically modified	0.00	0.00	143.93	5 174	55	2.8	58.15
2	200969 - Grape juice, including. grape must, unfermented.	5.34	13.00	9.38	5 174	55	2.8	57.94
3	480419 - Paper, Kraftliner, other than unbleached, uncoated	-3.00	6.00	182.50	5 174	55	2.8	57.32
4	330690 - Oral & dental hygiene preparations, except dentifrice	-0.30	6.00	26.15	5 174	55	2.8	57.21
5	091091 - Mixtures of spices	-1.20	6.00	71.28	5 174	55	2.8	55.82
6	330720 - Personal deodorants and antiperspirants	0.60	6.00	200.85	5 174	55	2.8	54.32
7	100590 - Maize except seed corn	0.86	6.00	118.43	5 174	55	2.8	54.10
8	200980 - Single fruit, vegetable juice nes, not fermented or spirite	1.50	6.00	182.33	5 174	55	2.8	53.57
9	271500 - Bituminous mix, mastic from asphalt, bitumen/tar/pitc	2.40	6.00	127.79	5 174	55	2.8	52.82
10	150890 - Refined ground-nut oil not chemically modified	0.00	0.00	143.93	5 174	55	2.8	58.15

Table A.19: The market accessibility index of the top 10 most accessible South African products into Uruguay

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	842890 - Lifting, handling, loading or unloading machinery nes	-0.60	0.00	0.00	3 259	69	2.75	77.14
2	851529 - Electric resistance welding equipment, non-automatic	-0.60	0.00	0.00	3 259	69	2.75	77.14
3	291531 - Ethyl acetate	0.00	0.00	0.00	3 259	69	2.75	76.64
4	721631 - Sections, U, iron or non-alloy steel, hot-roll/drawn/extruded > 80m	0.00	0.00	0.00	3 259	69	2.75	76.64
5	730900 - Reservoirs/tanks/vats/etc, iron/steel capacity >300litres	0.00	0.00	0.00	3 259	69	2.75	76.64
6	841931 - Dryers for agricultural products	0.00	0.00	0.00	3 259	69	2.75	76.64
7	842121 - Water filtering or purifying machinery or apparatus	0.00	0.00	0.00	3 259	69	2.75	76.64
8	842641 - Cranes & lifting frames, self-propelled, on tyres	0.00	0.00	0.00	3 259	69	2.75	76.64
9	843049 - Boring or sinking machinery nes, not self-propelled	0.00	0.00	0.00	3 259	69	2.75	76.64
10	843061 - Tamping or compacting machinery, not self-propelled	0.00	0.00	0.00	3,259	69	2.75	76.64

Table A.20: The market accessibility index of the bottom 10 least accessible South African products into Uruguay

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	151710 - Margarine, except liquid margarine	9.60	12.00	59.86	3 259	69	2.75	45.31
2	210330 - Mustard flour or meal and prepared mustard	6.65	16.67	54.82	3 259	69	2.75	45.17
3	330690 - Oral & dental hygiene preparations, except dentifrice	7.20	18.00	58.99	3 259	69	2.75	43.97
4	340120 - Soaps nes	7.20	18.00	57.15	3 259	69	2.75	43.97
5	902920 - Speed indicators, tachometers, stroboscopes	7.20	18.00	62.35	3 259	69	2.75	43.97
6	620349 - Mens, boys trousers & shorts, material nes, not knit	8.00	20.00	34.50	3 259	69	2.75	42.20
7	330520 - Hair waving or straightening preparations	10.80	18.00	136.00	3 259	69	2.75	41.64
8	340111 - Soaps, for toilet use, solid	10.80	18.00	47.87	3 259	69	2.75	41.64
9	540791 - Woven fabric synthetic filament nes	10.80	18.00	171.13	3 259	69	2.75	41.64
10	151710 - Margarine, except liquid margarine	9.60	12.00	59.86	3 259	69	2.75	45.31

Table A.21: The market accessibility index of the top 10 most accessible South African products into Venezuela

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	970110 - Paintings/drawings/pastels executed by hand	-9.37	0.00	0.00	8 397	115	2.68	58.28
2	970190 - Collages, similar decorative plaques	-9.37	0.00	0.00	8 397	115	2.68	58.28
3	901540 - Photogrammetrical surveying instruments, appliances	0.00	5.00	0.00	8 397	115	2.68	47.69
4	901819 - Electro-diagnostic apparatus, nes	0.00	5.00	0.00	8 397	115	2.68	47.69
5	290514 - Butanols nes	0.00	5.00	0.00	8 397	115	2.68	47.69
6	848280 - Bearings, ball or roller, nes, including combinations	0.12	5.00	0.00	8 397	115	2.68	47.59
7	845380 - Machinery for leather, skin goods making except sewing	0.54	5.00	0.00	8 397	115	2.68	47.24
8	854790 - Electrical insulating fittings except plastic/ceramic	0.54	5.00	0.00	8 397	115	2.68	47.24
9	284440 - Radio-actives nes, their mixtures and compounds	0.76	5.00	0.00	8 397	115	2.68	47.05
10	841280 - Engines and motors nes	0.78	5.00	0.00	8 397	115	2.68	47.04

Table A.22: The market accessibility index of the bottom 10 least accessible South African products into Venezuela

Rank	Product codes	Preferential *ad valorem* Tariff %	*ad valorem* Tariff %	NTBs %	International and domestic cost (US$)	International & domestic time (day)	LPI (0-5)	Market accessibility index (%)
1	853080 - Electric signal, safety & traffic controls, nes	0.00	15.00	0.00	8 397	115	2.68	42.13
2	842112 - Clothes-dryers, centrifugal	0.00	15.00	0.00	8 397	115	2.68	42.13
3	850211 - Generating sets, diesel, output < 75 kVA	1.72	12.50	0.00	8 397	115	2.68	42.09
4	843790 - Parts grain, seed, dry legumes processing equipment	3.56	10.00	0.00	8 397	115	2.68	41.94
5	841381 - Pumps nes	0.36	15.00	0.00	8 397	115	2.68	41.83
6	842139 - Filtering or purifying machinery for gases nes	0.36	15.00	0.00	8 397	115	2.68	41.83
7	843780 - Machines to mill or work cereals or dried legumes nes	3.82	10.00	0.00	8 397	115	2.68	41.73
8	283526 - Calcium phosphates except hydrogen-orthophosphate	4.00	10.00	0.00	8 397	115	2.68	41.58
9	721049 - Flat rolled iron or non-alloy steel, coated with zinc, width >600mm, nes	4.00	10.00	0.00	8 397	115	2.68	41.58
10	293333 - Alfentanil, anileridine, bezitramide, bromazepam, difenoxin	0.00	5.00	11.03	8 397	115	2.68	41.56

APPENDIX B: SOUTH AFRICAN EXPORT COUNCILS, INDUSTRY ASSOCIATIONS AND JOINT ACTION GROUPS

Table B.1: List of South African export councils, industry associations and joint action groups

	NAME	WEBSITE
EXPORT COUNCILS		
1.	Automotive Industry Export Council (AIEC)	www.naamsa.co.za
2.	Built Environment Professions Export Council (BEPEC)	www.bepec.co.za
3.	SA Capital Equipment Export Council	www.saceec.com
4.	Fresh Produce Exporters' Forum / Fruit South Africa	www.fpef.co.za
5.	Farmed Abalone Export Council	www.southafricanabalone.com
6.	South African Boatbuilders Export Council (SABBEX)	www.sabbex.co.za
7.	Cosmetic Export Council of South Africa (CECOSA)	www.cecosa.co.za
8.	SA Electrotechnical Export Council (SAEEC)	www.saeec.org.za
9.	SA Flower Export Council (ASSO Flowers)	www.saflower.co.za
10.	SA Footwear & Leather Export Council	www.saflec.co.za
11.	SA International Steel Fabricators (ISF)	www.isf.co.za
12.	South African Textile Industry Export Council (SATIEC)	www.satiec.co.za
15	South African Wire Business Council (SAWA)	www.sawa.co.za
16	Wines of South Africa	www.wosa.co.za
17	Steel Tube Export Council	www.astpm.com
18	SA Equine Trade Council	www.racingsouthafrica.co.za
19	SA Fruit & Vegetable Canners' Export Council	www.safvca.co.za
INDUSTRY ASSOCIATIONS		
1.	Aluminium Federation of South Africa (AFSA)	www.afsa.org.za
2.	Plastics Federation of SA	www.plasticsinfo.co.za
3.	SA Dairy Foundation	N/A
4.	SA Aerospace Maritime & Defence Industries Association (AMD)	www.amd.org.za
5.	SA Iron & Steel Institute (SAISI)	www.saisi.co.za
6.	South African Print & Packaging Federation	www.pifsa.org
7.	South African Stainless Steel Development Association (SASSDA)	www.sassda.co.za
JOINT ACTION GROUPS		
1.	Meat Exporters of South Africa	www.samic.co.za
2.	Jewellery Council of SA	www.jewellery.org.za
3.	South African Music Exportation (SAMEX)	www.samex.org.za

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