Analysing the effectiveness of trade facilitation in South Africa

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DECLARATION

I, Chrislemien Groenewald, declare that the work contained in this dissertation is my own, original work, and that all the sources I have used or quoted have been indicated and acknowledged by means of references. I also declare that I have not previously submitted this dissertation or any part of it to any university in order to obtain a degree.

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SUMMARY

The export performance of Africa has declined over the past couple of decades as a result of an increase in trade costs and the time taken to complete a trade transaction. As a result of an increase in competition, countries need to improve their efforts in adopting and developing a trade development initiative. Trade facilitation has been recognised as an element of economic growth, and it is thus seen as the most prominent trade development initiative in stimulating exports.

The general objective of this study was to investigate the current state and effect of trade facilitation in South Africa and to develop a measurement to compare South Africa's state of trade facilitation performance with that of other countries in the world.

The purpose of this study was to analyse and present the importance of implementing a trade facilitation programme as a trade development initiative. The need to eliminate trade barriers such as increased trade costs and the time taken to complete a trade transaction were emphasised because of the threat that they pose to efficient trade facilitation reform.

Although the advantages of trade facilitation reform have long been recognised, studies on the measurement of trade facilitation are very scarce. Similar studies make use of a gravity model or a Computable General Equilibrium (CGE) model in order to quantify the effects, but due to indirect costs, statistical errors, incorrect proxies and other unrecognised variables, no exact index exists to measure the trade facilitation performance of world countries.

Four very relevant trade performance indexes, the Logistics Performance Index, the Doing Business Report, the Enabling Trade Index and the Global Competitiveness Report, are associated with measuring a country's domestic trade variables, present in either the "hard" or the "soft" infrastructure of a country. From these indexes, 18 relevant variables were chosen that were effectively used to construct the Trade Facilitation Index whereby the trade facilitation performance of world countries was compared to that of South Africa.

In South Africa, the urgency to improve the general trade environment has been recognised as trade performance in South Africa has declined considerably. Based on the relevance of trade facilitation and the beneficial effects it has on a country, the role of trade facilitation in South Africa was analysed, as well as its performance in the Trade Facilitation Index in comparison to that of other world countries.

The Trade Facilitation Index also correlates to a country's GDP and its exports, proving that an increase in the Trade Facilitation Index may lead to an increase in the country's GDP and also its exports. The Trade Facilitation Index therefore serves as a useful resource for policy makers who want to apply reform strategies to trade development initiatives.

Key words: Trade Facilitation, trade performance, exports, Trade Facilitation Index, South Africa

OPSOMMING

Die uitvoerprestasie van Afrika het gedurende die afgelope paar dekades afgeneem as gevolg van 'n toename in handelskoste en die tyd wat dit neem om 'n handelstransaksie te voltooi. As gevolg van 'n toename in mededinging is dit vir lande nodig om hulle pogings by die aanvaarding en die ontwikkeling van 'n handelsontwikkelingsinisiatief te verskerp. Handelsfasilitering is erken as 'n element van ekonomiese groei en dit word gevolglik as die prominentste handelsontwikkelingsinisiatief by die stimulering van uitvoere gesien.

Hierdie navorsing was daarop gerig om die huidige stand en uitwerking van handelsfasilitering in Suid-Afrika te ondersoek, en om 'n meting te ontwikkel waarmee die staat van die handelsprestasie met dié van ander lande in die wêreld vergelyk kan word.

Die doel van hierdie studie was die ontleding en aanbieding van die belangrikheid van die implementering van 'n handelsfasiliteringsprogram as 'n handelsontwikkelingsinisiatief. Die noodsaak om handelstruikelblokke, soos verhoogde handelskoste en die tyd wat dit neem om 'n handelstransaksie te voltooi is, beklemtoon as gevolg van die bedreiging wat dit vir doeltreffende hervorming van handelsfasilitering inhou.

Hoewel die voordele van handelshervorming reeds erken is, is studies oor die meting van handelsfasilitering baie skaars. Soortgelyke studies maak gebruik van 'n swaartekragmodel of 'n CGE-model om die gevolge te kwantifiseer, maar as gevolg van indirekte koste, statistiese foute, foutiewe gevolmagtigdes en ander onbekende veranderlikes bestaan daar geen presiese indeks wat die handelsfasiliteringsprestasie van wêreldlande kan meet nie.

Vier baie relevante handelsprestasie-indekse, naamlik die Logistics Performance Index, die Doing Business-verslag, die Enabling Trade-indeks en die Global Competitiveness Report, wat verband hou met die meting van 'n land se binnelandse handelsveranderlikes, wat die "harde" of "sagte" infrastruktuur van 'n land verteenwoordig. Uit hierdie indekse is 18 relevante veranderlikes gekies wat effektief gebruik word om die handelsfasiliteringsindeks te bou met behulp waarvan die handelsfasiliteringsprestasie van wêreldlande met dié van Suid-Afrika vergelyk is.

In Suid-Afrika is die dringendheid om die algemene handelsomgewing te verbeter, erken aangesien die Suid-Afrikaanse handelsprestasie aansienlik afgeneem het. Gebaseer op die relevansie van handel en die positiewe uitwerking wat dit op 'n land het, is die rol van handelsfasilitering in Suid-Afrika ontleed, sowel as die land se prestasie in die handelsfasiliteringsindeks in vergelyking met dié van ander wêreldlande.

Die handelsfasiliteringsindeks korreleer met en 'n land se bruto binnelandse produk (BBP) en so ook die uitvoere, wat bewys dat 'n toename in die handelsfasiliteringsindeks tot 'n toename in 'n land se BBP en terselfdertyd sy uitvoere sal lei. Die handelsfasiliteringsindeks dien dus as 'n nuttige hulpbron vir beleidmakers om hervorming toe te pas en ontwikkelingsinisiatiewe om handel te dryf toe te pas.

Sleutelwoorde: Handelsfasilitering, handelsprestasie, uitvoere, handelsfasiliteringsindeks, Suid-Afrika

ABBREVIATIONS

APEC	Asia Pacific Economic Cooperation
BRIC	Brazil Russia India China
CGE	Computable General Equilibrium
ETI	Enabling Trade Index
FDI	Foreign Direct Investment
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IT	Information Technology
ITC	International Trade Centre
LPI	Logistics Performance Index
OECD	Organization for Economic Co-operation and Development
SA	South Africa
SACU	Southern African Customs Union
SADC	Southern African Development Community
SME	Small Medium Enterprise
SPSS	Statistical Package for the Social Sciences
TFI	Trade Facilitation Index
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
US	United States
WTO	World Trade Organisation

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INTRODUCTION

1.1 BACKGROUND

1.1.1 Trade facilitation and exports

Economic theory indicates that a definite relationship exists between a country's trade flows and its current account (Sunanda, 2010). Further so, this relationship can be extended to the theory that increased exports positively contribute to the general economy of a country or region. International trade has evolved and expanded as a result of increased competition and multilateral trade negotiations (Wilson & Perez, 2008). Countries use various trade policies to lower trade costs and increase exports. The successful ability of countries to export and improve its global trade performance is directly related to that country's ability to provide low-cost trade services and moving freight effectively from the producer to the consumer (Wilson & Perez, 2008).

The export performance of Africa as a whole has declined considerably over the past five decades. An increase in the costs of trade, accompanied by various trade barriers and the geographical difficulty of landlocked developing countries have left efforts to increase exports rather unaccomplished (Edwards & Odendaal, 2008). The important gains from an increase in exports have thus placed much emphasis on improving trade practices in general, and the importance of trade facilitation in this process has been highlighted (Wilson & Perez, 2008).

To understand how the term "trade facilitation" forms part of this integrated trade picture remains an important but complex challenge. Trade facilitation can be described as the action that encourages trade liberalisation, by catalysing trade flows through the elimination of obstacles that interfere with the movement of goods (Wilson, Mann & Otsuki, 2004).

Wilson and Perez (2008) define trade facilitation as the measure where the 'hard' and 'soft' infrastructure of a country is improved in order to assist trade and the general flow of goods. The 'hard' infrastructure refers to the general state of a country's rails, roads and ports, whereas the 'soft' infrastructure represents the institutional reforms and management of trade such as customs administration and border regulations. Therefore, trade facilitation comprises various elements, of which the physical infrastructure, information technology, transport efficiency and the customs environment form a common phenomenon and this should always be considered simultaneously as the elements are dependent upon each other.

Trade facilitation addresses all-important aspects of trade such as improving the general infrastructure of trade, customs administration, regulatory barriers and information technology (Wilson & Perez, 2008).

Jackson (2004) highlights how the facilitation of trade is of utmost importance to stimulate economic integration successfully. Research by Jackson (2004) has shown that, through effective elimination of trade barriers and improving the trade facilitation process, the general imports and exports of a country or trade bloc will increase.

Trade costs and time delays have been recognised as two of the biggest export depressants, as they affect the volume of exports simultaneously. Trading on time is therefore of utmost importance if an aim to increase exports and its associated volumes are to be realised (Djankov, Freund & Pham, 2006).

Furthermore, trade facilitation does not only include border issues, but those issues found beyond borders as well (Wilson & Perez, 2008). The quality of infrastructure, the business environment and domestic regulations are all factors that influence a country's trade performance as many cost channels are involved (Buyonge & Kireeva, 2008).

1.1.2 The case of South Africa

Although South Africa has recently embarked on a new development agenda within the framework of the Economic Support and Employment Creation Programme (Davies, 2012), where trade facilitation is one of the main aims of the agenda, the fact remains that Africa's share of total world exports has decreased considerably in the last three decades (Morrissey & Mold, 2005).

South Africa`s economic development is dependent on the reduction of trade costs, which are currently very high. Trade costs and the time taken to complete a trade transaction have been recognised as two of the greatest barriers and threats to efficient trade facilitation in South Africa (Wilson *et al*., 2004). A decline in South Africa`s export volumes as a result of an increase in trade costs, combined with little progress towards customs reformation, have spurred the urgent need to consider applying trade facilitation initiatives as prescribed by the World Trade Organisation.

On average, the general customs transactions involved in executing a trade transaction includes up to 200 elements, whereby 30 different parties are involved and over 40 documents. Time delays have increased and as a result of inadequate infrastructure and poor national

governance structures, the trade arena in South Africa does not seem on par when compared to its competitors.

However, in its current state, South Africa still remains as a high-profile African country that needs to set the pace for implementing a good cross-national connection between customs management systems and infrastructural development (Davies, 2012).

1.2 PROBLEM STATEMENT

In South Africa, the need to develop and improve the general trade environment is most certainly recognised, but a lack in efficient infrastructure and sufficient related data have lead many studies to fail to understand how trade facilitation reform forms part of this complex picture (Djankov, Freund & Pham, 2006). Although a logical understanding may be gained from the correlation between infrastructure, exports and the economy, it is troublesome that a parallel network of economic terms makes measurement of the effects on trade facilitation performance and the link to economic growth and exports rather complicated.

The increase in global supply chains have made the aim of reducing trade costs a major concern, as the process between a producer and a consumer has become more lengthy, repetitive and therefore more complicated than before.

Because of its role in international trade, trade facilitation in South Africa was the focus of this study and why this research topic pertains to South Africa. South Africa is regarded as the window of trade into the African continent and as emerging economy, has the responsibility to set itself on a path of sustainable growth and development. Such goals are however only attainable if trade facilitation reform initiatives are applied to the trade areas of concern. Intra African trade will also be able to improve and become more of a reality, once South Africa and its regional partners have applied trade facilitation reform.

The benefits reaped from international trade are thus proof that all countries should invest in a proper trade development programme in order to boost exports, which should be one of South Africa`s and its regional trade partners greatest aims (Wilson *et al*., 2004). By applying a trade facilitation reform initiative, South Africa may gain a 0.26% in its real Gross Domestic Product (GDP) figures (Djankov, Freund & Pham, 2006). The need to therefore analyse the trade facilitation state of South Africa cannot be emphasised enough.

The study aimed to investigate the complicated nature of trade facilitation in South Africa and specifically its role in exports. Due to the lack of an index or measurement tool able to measure

the trade facilitation state, trade factors that have an impact on a trade transaction, cannot be identified in order to apply reformation. A trade facilitation index (TFI) was therefore developed by which the trade facilitation performance in South Africa can be measured. Measuring how South Africa performs in various aspects of trade facilitation, assisted to highlight areas of concern in the trade environment and possible improvement, in order to increase exports in the long term.

1.3 RESEARCH QUESTIONS

The following research questions were formulated based on the above background information of the study:

1. What is trade facilitation and what role does trade facilitation play in the international environment?
2. What is the impact and effect of trade facilitation reform?
3. How can the impact of trade facilitation be measured?
4. How can current trade indexes be used in measuring trade facilitation?
5. How does South Africa's trade facilitation compare to that of other countries?
6. What is the relationship between trade facilitation, economic growth and exports in South Africa?

In order to answer the research questions, certain research objectives were set.

1.4 RESEARCH OBJECTIVES

The research objectives were divided according to general and specific objectives that are described below.

1.4.1 General objective

The general objective was to investigate the current state and impact of trade facilitation in the South African trade arena.

1.4.2 Specific objectives

The specific objectives of this research were:

- to define and establish the role that trade facilitation plays in an international trade environment;
- to define trade facilitation and its effect on economic growth;
- to examine the impact and effect of trade facilitation reform on an economy;
- to examine and establish the measurement of trade facilitation through existing trade performance indexes;
- to compare South Africa's trade facilitation performance with that of other countries; and
- to analyse the relationship between trade facilitation in South Africa and the effect on its economic growth and exports.

1.5 RESEARCH METHOD

The research pertaining to the specific objectives consisted of two phases, namely a literature review and an empirical study.

1.5.1 Phase 1: Literature review

In phase 1, a complete review regarding trade facilitation, its impact and measurement was conducted. The sources that were consulted included:

- economic journals
- books
- internet sources
- experts in the field of trade
- reports
- relevant news articles

1.5.2 Phase 2: Empirical study

The empirical study comprised the research method, selection of variables, collection of data and an econometric analysis.

1.5.2.1 Research method

Considering its relevance and increasing importance, a trade facilitation index (TFI) was composed during this study. The variables that were used during the composition of an integrated index consisted of various trade-related variables and those that specifically pertained to exports and the movement thereof. Such an index could be used to measure South Africa's performance in trade facilitation, and comparison with the rest of the world would highlight areas of concern or possible improvement.

The TFI incorporated various variables that could be linked to the definition of trade facilitation. The literature study identified which variables of trade were directly linked to the trade facilitation in a country. The variables were extracted from various sources such as the LPI (World Bank, 2012), the Doing Business Report (World Bank, 2012), the Enabling Trade Index (World Economic Forum, 2012) and the Global Competitiveness Report (World Economic Forum, 2012). The identified variables were combined into one TFI by conducting a principle component analysis in order to build a component score coefficient matrix that would represent the TFI. The index was calculated for all countries in the world in order to do a full comparison of South Africa's performance in each variable as well as in the composite index. This analysis highlighted which variables indicated areas where South Africa could be lacking in performance and might need further improvement when compared to South Africa`s top 10 export competitors, the BRIC countries and the SADC countries.

1.5.2.2 Data

Because trade facilitation was the core aspect of this study, information and more specifically, disaggregated trade data from the formal World Trade Organisation (WTO) negotiations regarding the mandate for trade facilitation negotiations and its objectives, inevitably served as the parameter for reaching a conclusion on efficient trade facilitation. Various trade facilitation variables were used during the methodological process, but variables related to the hard and soft infrastructural elements were of main interest.

Although no precise figures on the effects of poor trade facilitation and its secondary effects were available, various sources of information made it possible to define the effect trade facilitation have on businesses and consumers narrowly. The sources of data made available by the World Economic Forum such as the LPI, Enabling Trade Index and the Global Competitiveness Report and data from the Doing Business Report made available by the World Bank and the Economic Forum, covers various important aspects when it comes to trade and various export and import procedures. Data such as the time taken to start and finish a trade transaction and the number of documents required, including the trade costs, are some

of the variables that enabled the current study to compare South Africa's state of emergency when it comes to trade facilitation and the improvement thereof.

Furthermore, once the infrastructure and, more narrowly, the hard and soft elements, had been established as the primary variables in effecting trade facilitation, LP indexes and bilateral trade data established which problem areas to address and how this could be done.

1.5.2.3 Econometric analysis

The integrated index, namely the TFI, was developed by making use of a principle component analysis. The 18 variables extracted from the trade performance indexes, were transformed into z-scores and thereafter a Keiser-Meyer-Olkin measure and a Bartlett`s test of spherity was done in order to test whether a factor analysis can be done. Should the results prove that enough correlation between the variables are present, the component scores of the variables can be calculated. The results of the TFI are then used to compare South Africa to its top 10 export competitors, the BRIC countries and that of the SADC countries.

1.6 CHAPTER DIVISION

The chapters in this study will be presented as follows:

Chapter 1 provides the introduction

Chapter 2 focuses on the benefits of international trade and the role of trade facilitation

Chapter 3 highlights the effect of trade facilitation reform and refers to the different methods used in the literature to measure trade facilitation

Chapter 4 discusses the current state of trade facilitation in South Africa

Chapter 5 presents the empirical analysis by constructing a TFI through a Principle Component Analysis and comparing South Africa`s performance to other countries

Chapter 6: Conclusion

1.7 CONCLUSION

In this chapter, the main aim of this study was introduced and the importance of trade facilitation in the trade performance of a country was highlighted. As a result of an increase in trade costs and the time taken to complete a trade transaction, the volume of exports in Africa and especially in South Africa, has declined drastically. A trade development initiative is

therefore necessary to be recognised and implemented in order to overcome the barriers that hinder trade development and specifically that of growing export volumes. The effect of trade facilitation in South Africa therefore served as the main topic for this study, during which trade facilitation as a trade development initiative was analysed.

After highlighting the benefits and the importance of trade facilitation in the international trade arena, the measurement of trade facilitation through the trade indexes mentioned in section 1.5.2.1 serves as the basis when compiling the TFI reflected in Chapter 5. This index can subsequently be used as a benchmark to compare the state of trade facilitation in South Africa with that of other world economies.

After the measurement of trade facilitation through the development of a TFI, a correlation index was compiled to prove the positive effect that the improvement of the TFI would have on exports and a country's GDP.

In the following chapter, the benefits of international trade and the corresponding role of trade facilitation are discussed.

Chapter 2

BENEFITS OF INTERNATIONAL TRADE AND THE ROLE OF TRADE FACILITATION

2.1 INTRODUCTION

In Chapter 1, the importance of exports as a positive contributor towards trade was highlighted, emphasising also the ability to be able to trade at lower costs. The importance of countries to be able to trade internationally have become a major concern by the WTO and it is necessary for economies to be able to grow, as most trade theories and the development of economic theories also claim. This chapter mainly focuses on the benefits of international trade and the role of trade facilitation in trade.

Historians like Krugman and Obstfeld believe that the discipline of economics and finance began with the study of international trade (Krugman & Obstfeld, 2009). In 1758, the Scottish philosopher David Hume described his economic thoughts in an essay, "Of the balance of trade", which is believed to have been the start of transforming economics as an informal field, to something model-orientated as it is now. The study of international trade, as a sub-field of economics, has ever since been important and even more so today as global economies enable linkages between nations in order for the movement of goods, services and capital to take place(Krugman & Obstfeld, 2009).

According to Krugman and Obstfeld (2009), the importance of international trade has tripled over the last fifty years. In 2007, the total amount of goods produced worldwide was worth $50 trillion, of which more than 30 per cent were goods that were sold across borders. Although world trade has increased in general, Africa's share of total world exports has decreased considerably in the last three decades (Morrissey & Mold, 2005). The decrease in export performance in Africa can be attributed to the increase in trade costs and the lack of trade facilitation policies.

Therefore this chapter aims to describe the role of international trade in economic growth, as well as the importance of effective trade facilitation in international trade.

The outline of this chapter is as follows: in section 2.2, the importance of trade as an instrument for economic growth is discussed, followed by some applicable international trade theories. In section 2.3, trade facilitation as an element of trade is explained.

2.2 TRADE AS AN INSTRUMENT FOR ECONOMIC GROWTH

The general economic output of an economy functions as a dependent upon the productivity of factors such as human and physical capital and labour, which are combined to produce goods and services within a country (Sun & Heshmati, 2010). These factors alone do not however define the economic growth of a country, but rather define instruments such as that of geography, trade and institutions. These instruments are however dependent upon each other, as the geographical position of countries will affect the trade patterns and the volume of goods traded. Higher-quality institutions will also have the effect that a trade transaction will be able to function efficiently and thus smooth out a trade process. This dependency ratio can be explained as a two-way interaction, whereby an increase in international trade will lead to economic growth and simultaneously integration into the world economy, attracting foreign direct investment (Afonso, 2001). International trade and the facilitation thereof with the aim of trade reform for a more efficient trade process and the overall reduction in trade costs, are what will practically increase a country's exports (Cosgrove-Sacks & Apostolov, 2003).

International trade forms part of an economic phenomenon that results from human action, practically applied between persons from different countries. Furthermore, international trade includes the exchange of goods, services and ideas across borders, with the main objective to increase the gains from trade (Von Mises, 2004).

Primarily, countries will engage in the act of international trade for two reasons (Krugman & Obstfeld, 2009). The first reason relates to the differences in countries and the way resources are divided, which cause countries to trade over-supply of resources in exchange for shortages of other resources. The second is to achieve economies of scale in production, meaning that a country will produce a smaller range of products at a large scale, rather than trying to produce everything a country needs itself (Krugman & Obstfeld, 2009).

Today, as a result of globalisation, modern techniques, advanced technology and transportation systems, industrialisation and transnational corporations have made it possible to grow and speed up the process of international trade (Afonso, 2001). This has also encouraged countries to become more competitive in terms of production and trade, whereby many economies have grown so intensely in a specific area that they are dominating the world economy. Competition among countries is however important to increase the general quality of products and to keep prices low (Afonso, 2001; Anon, 2011).

Furthermore, international trade is seen as an explanatory variable of economic growth as introverted growth efforts, such as the improvement in trade practices, are directly related to increased economic growth rates (Afonso, 2001). An increase in the reliability of a country's

trade environment leads to goods that are produced and delivered at a faster rate, contributing to the overall trade and investment climate of a country. International trade and the improvement thereof result in various benefits, and these affect a country's economy at national, regional and international level (Butterly, 2001).

The benefits reaped from international trade are thus proof that all countries should invest in a proper trade development programme in order to boost exports. The benefits of international trade include the following (Butterly, 2001; Anon, 2011):

- stabilisation of fluctuations in exchange rates and market values;
- reduction of dependency on existing markets;
- gain of global market share;
- business expansion opportunities;
- potential to extend domestic sales;
- an increase in profits as sales increase; and
- enhancing of domestic competitiveness.

International trade provides people with a higher living standard by giving consumers access to a wider variety of goods and services, available at a lower cost and which are of a better quality (Marques 2001). Trading patterns exist as the gains from trade are expected to be positive, which is motivated by an increase in income and a reduction in costs (Anon, 2006; Marques 2001).

According to Jordaan (2011), economic growth can be augmented by an increase in trade among various countries. His study emphasises that the correct structures, such as trade development procedures and institutional reforms, should be in place in order to increase exports in any economy, which is ultimately the aim when improving trade infrastructures. This concept is also explained in many international trade theories, that are further discussed in sections 2.2.1 to 2.2.8.

Among the various international trade theories, there are some economic theories that explain the importance behind trade, exports and the advantages thereof. The theory of absolute advantage, the theory of comparative advantage, the Heckschler-Ohlin theory, Linder's spillover theory, the new trade theory (Krugman, 1980), new economic geography trade theory and the gravity theory model will be used to explain why countries trade.

2.2.1 The theory of absolute advantage

Adam Smith developed the theory of absolute advantage in 1776 (Anon, 2006). This theory states that a country will have absolute advantage over another country if its output of a good or service is greater than that of the other country, although the same amount of resources is present. A country should therefore concentrate on trading those products of which it has an absolute advantage, and trade will therefore increase because no country would be obliged to produce all the goods it consumes (Anon, 2006; Schumacher, 2012). The absolute advantage theory describes international trade as a "positive-sum game", due to the gains realised by both countries entering an exchange transaction (Krugman & Obstfeld, 2009:54).

The absolute advantage theory was later extended by the theory of comparative advantage, explained by the Ricardian model in the following section.

2.2.2 The theory of comparative advantage

The classical economist David Ricardo (1817:54) explained that, in the event of an international trade transaction, all parties such as companies, individuals and countries will benefit from trade; hence, the goods produced have different relative costs (Krugman & Obstfeld, 2009). The Ricardian model was developed on the theory of comparative advantage whereby countries will specialise in the production of products where it has a comparative advantage. According to Krugman and Obstfeld (2009), a comparative advantage exists when a country produces a good once that good's opportunity cost of producing it compared with other goods is lower in the home country than in others.

The benefit can be explained as the "gains from trade" (1817:54) and serves as a very important concept in international trade. Ricardo (1817) further explains that the law of comparative advantage is dependent upon the opportunity cost of production. The opportunity costs when producing goods are equal to the amount of reducing the production of one good, while simultaneously increasing the production of another by one unit (Krugman & Obstfeld, 2009).

The law of comparative advantage (Bernhofen, 2010) follows that mutual beneficial trade is normally present between nations under the condition that pre-trade relative costs and prices differ. Proof of static gains, according to Bernhofen (2010), follows as a result of trade, which forms part of important economic results. Additionally, Bernhofen (2010) stresses the importance of such gains and their magnitude, which is theoretically dependent upon the gravity model and the growth in GDP.

2.2.3 The Heckschler-Ohlin theory

Swedish economists, Eli Heckschler and Bertil Ohlin developed a theory according to which international trade is heavily dependent upon the differences in resources with which a country is endowed. This theory therefore highlights the interchange between the various proportions of resources available for production, which is why the theory is also known as the "factor-proportions theory" (Marques, 2001; Krugman & Obstfeld, 2009).

The Heckschler-Ohlin theory allows economists to explain various issues regarding income distribution and the patterns of trade of various countries. The theory stresses that factor endowments necessary for production are the key elements to international trade. Countries that are abundantly rich in a specific resource will consequently specialise in the products originating from these factors, intensively used to produce the goods being exported (Yuen, 2005).

Additionally, the Heckschler-Ohlin theory assumes that factors of production are traded indirectly through the goods and services being traded. In other words, a country would be a net exporter of the resources it abundantly owns and net importers of those factors which it does not stow. A country would therefore export factors where their share specifically exceeds the income share. The theory also emphasises that the most important element in determining trading patterns is that of technological differences (Yuen, 2005). The difference in relative costs is the result of different production techniques. The theory does however state that the costs of production are endogenous, regardless of whether countries use similar technologies for the production of goods or not (Krugman & Obstfeld, 2009).

2.2.4 Linder spillover theory

The Linder spillover theory was developed as a resolution for the Leontief paradox, which states that a country with a high capital per worker rate will have a lower capital/labour ratio in those goods exported to those imported (Frankel, 1997). The Linder spillover theory states that countries with a similar demand structure will trade with one another. The theory can further be explained by saying that countries with identical preferences and factor endowments will engage in trade. Linder's theory is based on that of a demand theory, rather than a supply-based theory when referring to factor endowment availability. Nations with similar demand patterns would therefore develop similar industries and consequently trade with one another by exchanging differentiated goods (Frankel, 1997).

2.2.5 New trade theory

The new trade theory was developed in the 1970s and 1980s from the comparative advantage-based model by explaining the empirical elements of trade (Krugman, 1980). The theory explains that the largest amount of trade will exist between countries of similar productivity levels and multinational production levels. The theory is based on the assumption that monopolistic competition and an increase in returns to scale are the result of the home-market effect, or intra-industry trade, which means that an industry with the highest returns to scale will minimise its overall costs by decreasing its transport costs as it is located in the country with the highest demand (Krugman, 1980).

Furthermore, the new trade theory explains that a growing trend in the volumes of intermediate goods is the result of decreased transport costs and an increase in protectionist measures (Khan, 2009).

2.2.6 New economic geography trade theory

The new economic geography trade theory refers to the formation of a wide variety of an economic agglomeration in a specific geographical space. Different types of agglomeration at different industry levels are normally present in larger economies. The theory focuses on explaining the concentration and dispersion of economic activity in and around a city or business district (Fujita & Krugman, 2004). It can further be explained that an increase in returns will exist due to spatial concentration, which is affected by centripetal and centrifugal forces. Transportation costs however, form part of one of these forces above and can be referred to as a micro-decision factor in the theory, as it alters the returns to scale and makes location matter. Agglomeration is therefore dependent upon the locational movement of production factors and consumers (Marques, 2001; Fujita & Krugman, 2004).

2.2.7 The gravity trade model

The gravity model provides a more empirical explanation of international trade where economic size and the geographic distance between countries determine a country's trade patterns. Thus, an empirical relationship exists between a country's economic size and its volume of imports and exports (Krugman & Obstfeld, 2009).

The gravity trade theory analyses trading patterns based on the Newtonian law of gravity and have been proved empirically to be a very strong model through econometric analysis (Khan, 2009). The gravity model identifies that larger volumes of goods and services are traded as the geographical distance between two trading partners decreases. The forces of gravity,

according to Bernhofen (2010), are aligned with the theory of the Ricardian mechanism (1817:54), as a decrease in the cost of trade will lead to increased volumes of trade, and thus the specialisation and export of the associated good or service, which can have productivity advantages, serve as an indirect gain of trade.

The gains of trade will normally exist between the producer of a good or a service and the consumer thereof, realised internationally by the concept of specialisation, the uniqueness of resources, the spread of technology and acceleration in capital and innovation formation, where the magnitudes of these gains are affected by the gravity model mentioned above Bernhofen (2010).

Krugman and Obstfeld (2009) add that larger economies are likely to spend more on imports as they have larger amounts of income available than smaller, less developed countries. These larger economies are also more likely to attract the increased spending of other economies, due to a large scope of product availability. The trade between two countries are said to be approximately proportional to the product of their GDPs.

A trade impediment recognised by the gravity model according to Bernhofen (2010) is therefore that of distance and the cost associated with an increase in distance. A strong negative effect exists between distance and international trade, as a 1 per cent increase in distance between countries will lead to a 0.7 per cent decrease in trade, as a result of increased transport costs.

Bernhofen (2010) concludes that, because the gravity model plays such a significant role in trade, for a country to exploit its comparative advantages and to gain the maximum welfare from exporting activities, there should be an improvement in the basic infrastructure for efficient transportation by making use of trade facilitation instruments.

The above conclusion by Bernhofen (2010) highlights the importance of the concept of trade facilitation in any country's exports. As Sun and Heshmati (2010) explain, the long-term benefit of trade is that of a dynamic gain. Thus, a change in trade processes, through trade facilitation reform, whereby new technologies and a decrease in production costs were applied in China, led to an increase in that country's economies of scale from the year 2002 to 2007 (Sun and Heshmati, 2010).

Although its geographical position and its contiguity to international markets affect a country's trade, as explained by the gravity theory (see section 2.2.7), trade facilitation focuses on the entire trade transaction, whereby the efficiency and cost reduction in the following series of activities have to be combined (Cosgrove-Sacks & Apostolov, 2003):

- the agreement between of a buyer and a seller;
- commercial documentation processing;
- health, safety and regulation compliancy;
- fulfilling customs and border documentation requirements;
- efficient movement of goods;
- fulfilling buyers' requirements;
- payment of goods sold; and
- redistribution and disposal of goods traded.

Wilson and Perez (2008) explain that the relationship between trade theory and trade facilitation comprises of a series of transactions, as described above, and is rather complex as a country's trade flows are affected by the depth of multi-dimensional reform policies applied by the country and its trading partners. Trade facilitation reform should therefore take centre stage when it comes to the development of a trade development policy, as a wide series of trade activities form part of an integral part of the exchange in goods and services and other national and international market dynamics (Sun & Heshmati, 2010).

The following section focuses on trade facilitation by defining it and discussing the role of trade facilitation as an element of trade.

2.3 TRADE FACILITATION AS AN ELEMENT OF TRADE

2.3.1 Defining trade facilitation

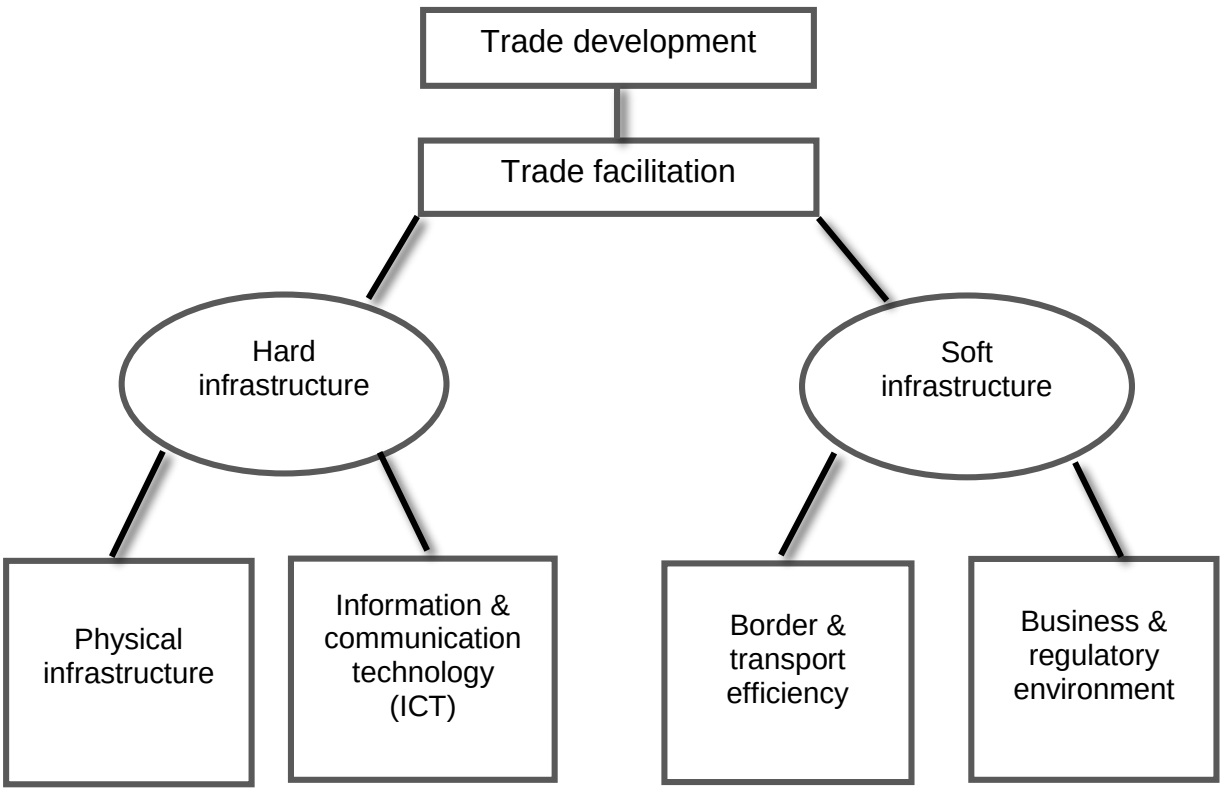
Wilson and Perez (2008) broadly refer to trade facilitation as a combination of economic policies that aim to minimise the costs associated with international trade transactions. In a narrow sense, trade facilitation can be related to the act of reducing transaction costs, not including tariff costs, while simplifying and standardising administration and custom procedures related to trade.

Buyonge and Kireeva (2008) define trade facilitation as an action where trade procedures are harmonised and simplified. Trade procedures would accordingly include the activities and practices followed by the formalities of moving goods between and across borders, the management, communication and administration thereof, including but not limited to various transport formalities. In general, one can conclude that trade facilitation can be described as the plumbing system of international trade.

Furthermore, trade facilitation does not only include border issues, but those issues found beyond borders as well (Wilson & Perez, 2008). The quality of infrastructure, the business environment and domestic regulations are all factors that influence a country's trade performance as many cost channels are involved (Buyonge & Kireeva, 2008).

It is therefore important to understand that trade facilitation is comprised of various domestic elements, which are all important in the efficient execution of successful trade development in a country (Portugal-Perez & Wilson, 2010). Trade facilitation measures may therefore be applied along two dimensions, namely hard infrastructure and soft infrastructure. The distinction between the two infrastructures makes it possible to define trade facilitation easily and to compare the costs and benefits of policy reform along both dimensions. The flow diagram below summarises the different aspects of trade facilitation (Portugal-Perez & Wilson, 2010):

Figure 2.1: Trade facilitation as part of the trade development process



(*Source*: Author's own configuration using information from Portugal-Perez & Wilson, 2010)

Although the relationship between developing a country's trade and the facilitation thereof is rather complex (Portugal-Perez & Wilson, 2010) the variables in the figure above explain that, in order for trade to take place, a hard and soft infrastructure should exist. These infrastructural variables are consequently further subdivided into four sub-groups that represent each aspect of trade along an international supply chain.

- Hard infrastructure refers to:

  Physical infrastructure, in other words, the quality and level of development of a country's roads, railways and port infrastructures.

  Information and communications technology, in other words, the extent to which an economy makes use of technology to improve productivity and lower transaction costs.

- Soft infrastructure refers to:

  Border efficiency, in other words, the time, cost and documentation needed to complete an export or import procedure.

  Regulatory business environment, in other words, the ease of doing business by measuring the level of transparency, regulations and corruption combating procedures.

Each of these four sub-groups can be used as a base when comparing the trade facilitation performances of countries across the globe. Keeping these variables and their role in trade in mind, policy makers and stakeholders can make more informed decisions when it comes to developing trade policies to increase trade (Portugal-Perez & Wilson, 2010).

In the changing and competitive international trade arena, it is important that countries develop their trade policies to adapt accordingly (Jordaan, 2011). Trade facilitation is one way of enhancing trade development by optimising the use of a country's trade infrastructure and simultaneously complementing export promotional efforts that help to improve the image of a country while at the same time highlighting the important role that trade facilitation plays in international trade (Jordaan, 2011).

In the next section, the role of trade facilitation in international trade is highlighted.

2.3.2 The role of trade facilitation in international trade

According to the World Bank (2003), the main goal of trade facilitation is to reduce transaction costs and the complexity of a general trade transaction. Trade facilitation is becoming a very attractive topic worldwide. African leaders have realised the importance of it, hence the

challenge of reducing trade costs in order to expand trade. Apart from the direct impact of improving trade activities, trade facilitation is significant for general economic welfare gained from streamlining trade activities.

Walker (2000:1), a previous vice chairman of the United Nations Centre for Trade Facilitation and Electronic Business, said, *"Trade facilitation and electronic business will have in coming years a much greater impact on the increase of world trade than many of the negotiations which take place in the World Trade Organization."*

Wilson, Mann and Otsuki (2004) also explain that trade facilitation, as part of a trade development procedure, is aimed at harmonising and simplifying trade procedures in order to increase exports through the following four pillars (Wilson *et al*., 2004):

- The employment of efficient and modern customs regimes

  The customs environment should function efficiently in other words it should be well able to direct customs costs and border crossings in a transparent administrative process. According to the GATT article VIII from the WTO, customs procedures should help minimise impediments to trade through limiting the fees charged by customs officials as hidden import barriers, extra irregular payments and bribes are major issues. Customs as an indicator is a good standpoint when one wants to examine the ability of trading internationally, as it affects both the importer and the exporter (Wilson *et al.*, 2004).

- The reduction of transport costs

  The reduction of transport costs is directly related to logistics as logistics are comprised of both hard and soft infrastructural elements. These elements contribute simultaneously to the increase in transport costs, as transport as a service is directly dependent upon infrastructure. The quality and efficiency of an infrastructure determine the amount of time it may take to transport a good from a producer to a consumer and thus transport costs will be directly related to a time element (Wilson *et al*., 2004).

  Ramos and Zarzozo (2008) state that transport costs and time delays are two of the greatest barriers that inhibit the overall success of a trade development initiative. As a result of an increase in the time delay during a trade transaction, transport costs, among others, will increase and thus the overall volume of goods that could have been exported will decrease. By lowering transport costs through trade facilitation initiatives, exports could increase and contribute to the overall economy.

- Improving port facilities

  Port efficiency can be described as the quality of the infrastructure of air and maritime ports (Wilson *et al*., 2004). The GATT article V (freedom of transit) from the WTO, states that all goods should be assured to be able to move along the most convenient route, free from unnecessary delays. According to Wilson *et al.* (2004), the improvement of port facilities through trade facilitation has a significant impact on trade flows. The improvement of port facilities will therefore ensure that exports will increase and attract investment.

- Improving information technology infrastructure

  Apart from improving the service sector, it is important for a country to improve its information networks to ensure that information flows more efficiently, thus enhancing economic activity. Wilson *et al.* (2004) also point out that regulatory transparency and control of corruption would reduce information costs and other barriers faced by private businesses when trading.

Ramos and Zarzozo (2008) explain that, by improving the strength of the above four pillars used to make a trade transaction a reality, trade flows will most certainly increase in all sectors. Furthermore, trade facilitation initiatives undertaken by trading partners will affect both exporters and importers, as export reforms undertaken by different economies all have the same aim, namely to decrease time and costs. In other words, the gains from an increase in exports are the sum of the simulated effect of both unilateral and multilateral reforms undertaken by a country and its trading partner (Wilson *et al*., 2004).

Applying initiatives, such as a trade facilitation reform which, according to Yuen (2005) refers to the improvement of trade variables contained within a trade transaction, will increase exports and simultaneously attract new potential trading partners, as world economies will regard trading as easy as it is facilitated, and thus these countries will benefit from the decrease in time and costs of trade. Njinkeu, Wilson and Fosso (2008) add that improvements in the service infrastructural area and of ports will expand intra-African trade, and thus all who part take in related regional trade agreements will experience an increase in trade flows.

An example of successful trade facilitation reform is highlighted by Ramos and Zarzozo (2008) who report that, after China had applied a trade facilitation reform, their export gains increased to $120.7 billion, while Mexico enjoyed a $17.3 billion gain from an increase in exports after improvements had been implemented at ports and in the service infrastructure.

Trade facilitation is a very important development aspect in developing and emerging economies, as it contributes to the growth of exports the competitiveness of the country's goods and services produced, an increase in foreign direct investment and the increase of small and medium enterprises who engage in international trade. These aspects are explained in more detail below (Wilson *et al*., 2004).

- The growth in exports

  Although governments have tried to implement various trade development strategies in order to boost exports and domestic sales, the lack of trade facilitation initiatives however still delayed the general export transactions to international customers. Trade facilitation is therefore important in order to speed up the process so that delays may decrease and larger volumes of exports may flow more efficiently (Walker, 2000:1; Hoekman, 2008).

- Increase in competitiveness

  After the WTO has created a fairer playing field by reducing tariffs and non-tariff barriers, it is essential the countries need new ways of promoting their exports (Bineau & Montalbano, 2011). Being competitive now means finding ways to cut costs, decrease delays, raising the quality of products and improving their flow, which is only possible through trade facilitation initiatives

  As a result of the implementation of a trade facilitation initiative, exports will be cheaper and therefore cost-competitive as their input costs will be lower. This will consequently boost the attractiveness of exports and thus foreign exchange earnings will rise, boosting the economy in turn (Parsons, 2009).

- An increase in foreign direct investment

  The foreign direct investment (FDI) activities in most developing countries normally involve projects of production with the aim to export the products produced (Bineau & Montalbano, 2011). Importing certain resources is also required, and therefore it is important for investors to establish how easy and quickly a country will be able to import and export in order to maximise profits (Walker, 2000). Once trade facilitation initiatives are applied and imports and exports can flow more efficiently at lower costs, FDI will increase as this is an attractive characteristic that investors regard as highly beneficial (Bineau & Montalbano, 2011).

- The increase in participation of SMEs

  In most developing and emerging economies, small and medium enterprises (SMEs) find it hard to enter international markets and therefore decline to make use of export opportunities as the process is often complicated and non-transparent (Walker, 2000). Once trade facilitation is applied, it will streamline procedures and make it easier for SMEs to comply with regulations and participate in international trade activities.

The benefits of trade facilitation can be divided into government and trader benefits (Walker, 2000; Butterly, 2003):

Government benefits:

- an increase in the effectiveness of control methods;
- more efficient deployment of resources;
- an improvement in the compliance of traders;
- a spur in economic development; and
- increased attraction for FDI.

Trader benefits:

- a reduction of costs and delays;
- faster release of goods through customs;
- a standard framework with guidelines set out for efficient domestic and international trade; and
- an increase in the general competitiveness.

Apart from government and traders who benefit from the application of trade facilitation initiatives, it is vital to understand that there are many more parties involved that connect the buyer and the seller. This connection is also affected by the role and importance of trade facilitation (Parsons, 2009).

Other parties that benefit from trade facilitation initiatives include that of carriers, freight forwarders, banks, manufacturers, customs, health, licensing and port authorities, insurance brokers, consulates and public administrations (Walker, 2000:1; Parsons, 2009). When it comes to international trade and the application of trade facilitation, traders, government and the service operators involved are the most important parties. These three parties differ

institutionally and therefore the role of trade facilitation must be constructively collaborated and understood to ensure that it is fostered throughout the whole transaction chain (Walker, 2000:1).

Due to the extensive number of parties involved in a trade transaction, traders have identified issues in certain areas that affect most of the parties mentioned above (Walker, 2000:1; Parsons, 2009). Should trade facilitation reform be initiated, the following problems may become something of the past, thus highlighting the importance of trade facilitation once again (Findlay, 2006).

- too many documentation procedures and requirements;
- insignificant use of information technology;
- transparency problems and unspecified requirements;
- lack of risk-assessment techniques;
- inadequate border procedures;
- lack of cooperation between government and customs agencies; and
- increased transport costs and low-quality port infrastructures

From the issues mentioned above, it is clear that the government of a country should work in collaboration with the private sector in order to reduce trade costs and that of doing business (Findlay, 2006). A country that does not strive to facilitate its trade better will prevent its economy from reaping the benefits of trade expansion through integrating into international supply chains (Hoekman, 2008). The comprehensive coverage of issues in trade facilitation is often overlooked when it comes to various regional and bilateral trade agreements. Trade facilitation should therefore play the role of summarising all efforts designed to reduce trade transaction costs at a national, regional and multilateral level (Wilson *et al.*, 2004).

The application of trade facilitation reform initiatives should however be guided by policy and research to identify the area that may contribute the most to increasing exports. Hoekman (2008) explains that a large amount of attention has been devoted to determine the effect trade costs have on trade literature and how much of these costs are service-related. One of the biggest non-tariff-related costs is that of moving goods from the producer to the consumer, assuming that such costs could obviously be logistically related. Hoekman (2008) adds that trade costs are also often exceeding those of just border barriers confronting a good or service

when being exported, as the amount of the trade cost is greater in ad valorem terms, meaning that there must be other service trade barriers that have a much larger effect on the trade in services.

A survey conducted by Hoekman (2008) in 75 countries has shown overall gains from the flow of trade in manufactured goods to estimate up to a mere $377 billion, should trade facilitation efforts be applied. This highlights the importance of trade facilitation in international trade transactions and the effect it has on competitiveness. Nelson (2011) adds to this by stating that a country such as South Africa, considering its geographical proximity and size, could increase their exports by 36%, if the trade facilitation process in the country is improved.

2.4 CONCLUSION

International trade has led to the integration of markets that are larger than any one economy nation, meaning that a wider variety of products are available at lower prices, while economies have the opportunity to gain economies of scale (Bineau & Montalbano, 2011). Economies of scale evidently allow countries to specialise and trade with other countries that are differently endowed with resources. This consequently enables countries to compete and engage in growing export opportunities so that the benefits of trade can realise and economic growth can take place (Bineau & Montalbano, 2011).

Given the changes in world trade and its development, the fundamental principles and theories of international trade still apply today. The logic behind why countries trade and the accompanying benefits is the key to why theories such as that of Ricardo and Heckschler-Ohlin (see 2.2.2 and 2.2.3) still apply to economics today. Countries want to expand their trade as that is the main recipe for economic growth through increased exports, as depicted by the trade theories (see 2.2.7). The trade theories discussed therefore serve as the pillars upon which international trade rests, meaning that an increase in a country`s trade transactions will have effect that economic growth will take place, hence the need to address the barriers of trade in a country by means of a trade facilitation program.

In Section 2.2, where exports are described as an instrument for economic growth, it was apparent that countries would export those goods in terms of which they have high productivity. Furthermore, any country will gain from trade, even if its productivity is lower than that of other countries, and the benefits gained from trade will always be realised, but with different magnitudes however.

Section 2.3.2 explained the role of trade facilitation in international trade. Considering economic policy and theory, the diagnostic assessment of trade facilitation and its effect on

exports, it can be assumed that by eliminating the strains placed on a trade transaction in both hard and soft infrastructural areas of trade facilitation, potential gains in investment and improved export performance may realise. The trade process is therefore harmonised and simplified through four sub-processes, namely employment of efficient and modern customs regimes, reduction of transport costs, improving port facilities and the improvement of information technology infrastructure.

In summary, one cannot ignore the importance of trade facilitation and its effect on a country's export performance, especially in developing countries. The benefits as described in Section 2.3.2, such as increased export volumes and an increase in a country's competitiveness are what developing countries should strive to achieve. Policy makers should therefore prioritise trade development strategies in such a way that maximum effort is devoted to applying trade facilitation to the correct areas of infrastructure.

In the following chapter, the measurement and the impact of trade facilitation reform will be discussed.

Chapter 3

MEASURING THE IMPACT OF TRADE FACILITATION AND ITS REFORM

3.1 INTRODUCTION

The previous chapter highlighted the importance of trade facilitation in the competitiveness of international trade and the importance of becoming part of an integrated market. The ability of countries to increase their exports has a direct effect on their economic growth, but what seems cumbersome to the international trade community, is how the impact of trade facilitation, its effectiveness, its costs and benefits can be measured as no index exist that specifically measures trade facilitation as a whole.

Conrad (2009) explains that although the measurement of the efficiency of trade facilitation reform might be a challenge, it will however have effect and add value to any product as a result of moving a good to a place where a high demand exists. Trade facilitation reform spurs economic development and specialisation due to an increase in the market accessibility. Furthermore, applying trade facilitation procedures to a logistical chain will not just improve operational procedures but also lower trade transaction costs both domestically and internationally. Conrad (2009) adds that although no exact unit can be associated with the effect, it cannot be ignored that a positive relationship between trade facilitation reform and the benefits mentioned exist.

Poor trade facilitation, according to Djankov *et al.* (2006), affects the type of products that countries may choose to export and specialise in, as time-sensitive and high value-added goods will decrease in volume, flagging export values of countries with poor trade facilitation efforts.

Improving a country's "hard" and "soft" infrastructure will most certainly lead to increased growth statistics, investment and increased competitiveness (Djankov *et al*., 2006). Boosting the performance of a country's physical infrastructure for example, could expand trade by 15 per cent, meaning that consumers will benefit from lower prices and countries from increased profits as a result of an increase in exports.

As mentioned in Section 2.3.2, the benefits can only be realised once a country commits itself to trade facilitation reform with the aim of moving goods efficiently, economically and reliably so that trade costs may decrease and competitiveness may increase. It is therefore important

that policy makers recognise the importance of improving a country's trade performance through trade facilitation, by improving all components associated with the trade infrastructure nationally, regionally and globally (Wilson *et al*., 2004). However, the question is how to measure the effectiveness of trade facilitation in a country.

In the sections to follow, Section 3.2 will highlight some relevant studies that have been done on the impact of trade facilitation reform and its effect on trade. Section 3.3 will highlight which techniques have been used to measure trade facilitation, while Section 3.4 will discuss various existing indexes used to measure the trade performance of a country.

3.2 THE IMPACT AND EFFECTIVENESS OF TRADE FACILITATION REFORM

All studies regarding trade facilitation are very recent and currently under investigation by various organisations. Various studies on the impact of trade facilitation have been done by organisations such as the United Nations Conference on Trade and Development (UNCTAD), the World Customs Organisation (WCO) and the United Nations Economic Commission for Europe (UNECE). These organisations have found that through the implementation of various trade facilitation programmes, GDP could increase by 0.26% (Portugal-Perez & Wilson, 2010).

Multilateral initiatives encouraged by the World Trade Organisation (WTO) include those of trade facilitation measures as it regards the prompting of trade, which is a major priority. Part of the Doha Development Agenda (Zarzoso & Ramos, 2008) showed great interest in the relationship between exports, general trade flows and their link to trade facilitation. A mandate for the WTO negotiated in July 2004, encourages developing and less developing countries to adopt all possible means of trade facilitation efforts to drive technical assistance, capacity building and better living standards through improved economic development (Zarzoso & Ramos, 2008).

An Asia-Pacific Economic Cooperation (APEC) study by Buyonge and Kireeva (2008) determined that time delays and trade costs are two of the major factors that hinder efficient trade facilitation reform. As a result of the cumbersome increasing trade costs caused by these factors, The International Chamber of Commerce (ICC) highlighted the importance of intergovernmental organisations and private sector individuals to address the urgency of adopting trade facilitation reform (Buyonge & Kireeva, 2008).

Some studies conducted on the effectiveness of trade facilitation on economic growth proved to be of great significance in various countries such as China and Mexico. A study by Nordas, Pinali and Geloso (2006) considered the effect of trade facilitation reform on China's export volumes. Improvements in logistics services proved to have increased export trade volumes.

Soloaga, Wilson and Mejia (2006) measured the impact of trade facilitation on Mexico and its trading partners' export levels by applying a gravity model. The study found that an improvement in trade facilitation reform measures would increase Mexican exports by $31.8 billion. Improvements in Mexico's trading partners' trade facilitation consequently led to an increase of $2 billion in Mexican exports. The combining impact amounted to a $33.8 billion increase, which was equivalent to a 23.8% increase in the average export level of Mexico in the years 2000 to 2003.

A research team from the World Bank contributed to the above by highlighting the aspects of a weak infrastructure and the urgency to address it in order to improve the flow and volume of exports (Wilson & Perez, 2008). Additionally, Taylor and Wilson (2009) explain that by seizing the opportunity to reform through the application of a trade facilitation programme, the following immediate advantages also previously mentioned in Section 2.3.2 were highlighted once again:

- lower trade costs;
- mitigation of the aftershocks of economic crises;
- increase in trade volumes;
- increase in economic development;
- increase investment in trade infrastructure;
- magnified trade sectors; and
- increase in productivity of exporters.

Wilson (2009) explains that, before a business decides to enter the export market, conscious decisions regarding costs and risk have to be made. A similar study to that of Wilson (2009) proved that smaller firms in developing countries facing increasing trade costs are obstructed from trading; thus, only larger, more productive firms take the risk to trade. As a result, increasing trade volumes are prevented from increasing trade costs. Should trade facilitation be applied, the number of firms that enter the export market and trade volumes will increase, due to a decrease in trade costs (Helble *et al.*, 2007).

Studies on trade facilitation, its role and its implementation in Africa are however very scarce, making it more challenging to introduce trade facilitation programmes as there are many barriers that limit its efficiency. Previous studies on trade facilitation, as those described above, mainly focused on how trade facilitation affects trade costs and the efficient delivery of goods and services.

A study by Perez and Wilson (2008) mainly focused on the importance of trade facilitation in an African economy. They found that trade expansion accompanied by lower trade costs, is vital in improving trade balances of various African economies. Ad valorem equivalents for various trade indicators were constructed and used in a gravity model (see 2.2.7) that proved that, in order for African countries to gain the same benefit from trade as those in the European Union (EU) for example, trade costs have to be cut by at least 7.6%. As a result, Perez and Wilson (2008) explain that finding a substantive trade policy that focuses on reducing trade costs will enhance the exports of economies and thus improve trade balances.

Taylor and Wilson (2009), report that the opportunity cost of not enforcing trade facilitation reforms has increased drastically as trade costs associated with that of infrastructure and administration exceed costs associated with tariffs. The study further explains that the distance and time between markets matter most as a higher demand means a more competitive environment as for every one additional day a product is delayed prior to its transport, trade is cut by 1%.

Additionally, Newfarmer, Bagai and Wilson (2004) found in a similar study that the greatest trade costs are those associated with the ability to move goods. Transport, documentation requirements and border delays are some of the costs that increase the overall trade cost of a transaction most. According to Newfarmer *et al.* (2004), the only sensible, economical way to enhance the efficient flow of goods in and out of a country, is to coordinate every trade procedure with that of a trade facilitation reform initiative as its favourable impact on trade is inevitable.

Kleitz (2003) and Wilson (2009) add to the study by Newfarmer (2004) which found that the importance of investing in an efficient infrastructure is emphasised if trade costs are to be decreased and the ease with which goods flow is to increase. A similar study (Wilson, 2009) showed that the implementation of a trade facilitation programme, specifically aimed at the upgrading of and investment in a Trans-African highway network, connecting 83 major cities, will increase intra-African trade from $10 billion in to $30 billion per year.

Measuring the effects of trade facilitation has however been a challenge as various factors were involved. The measurement and the various elements that form part of the trade facilitation process are discussed in Section 3.3.

3.3 MEASURING TRADE FACILITATION

As mentioned in Section 3.2, it is important to define and understand the impact that trade facilitation has on an economy, but even more so the measurement of it. To estimate the effect

or measuring the exact cost or benefit of trade facilitation has been a great challenge, although various studies (Lamy, 2012) have derived various trade indicators that are used to measure trade facilitation.

Lamy (2012) stresses that the Negotiating Group on Trade Facilitation (World Bank, 2012) have found that trade costs and specifically the hurdles that a weak infrastructure may pose, are the major constraints of trade in developing countries. Furthermore, Lamy (2012) stresses the importance of placing the different economic terms such as trade facilitation, logistics, supply chains and transport in perspective in order to understand the link between them. Trade facilitation is therefore developed to smooth out all the steps involved in a trade transaction to ensure the collecting, presenting, communicating and movement of goods, making the ability to measure the performance of these trade variables rather important.

From previous studies, such as that by Wilson (2009), it was found that the most common way of measuring trade facilitation is by generating various trade facilitation indicators in order to reduce the dependency on one trade variable. These trade indicators were consequently derived from multiple data inputs that represented the various actions in a trade transaction as mentioned above. In order to model these effects, two models are most commonly used:

- Gravity model: designed to predict the bilateral trade flow between two countries based on their economic size and distance between them.
- Computable general equilibrium (CGE) model: used to estimate how an economy will react to changes in a certain variable such as technology or government policy by quantifying the benefits or costs of trade facilitation.

Similar to the study described in Section 3.2 on trade in Mexico, Wilson *et al.* (2006) analysed the relationship between a country's GDP, its trade flows and the trade facilitation in the member countries of the APEC areas. A gravity model (1962) was implemented by using four representative indicators of trade facilitation, namely port efficiency, customs environment, electronic business usage and the regulatory environment. The study found that all four representative indicators had a positive effect on trade flows, while an improvement in port efficiency enhanced trade the most. The results showed that should trade facilitation be applied to all four indicators, trade would increase by $254 billion through intra-APEC trade and a 4.3% increase in its average per capita GDP.

Zaki (2013) made use of a CGE model to introduce various trade facilitation aspects in Egypt. He measured the cost and benefit of trade facilitation in two alternative ways whereby trade facilitation was first considered as a deadweight loss and then as a rent-generating process.

The model was then calibrated on the social accounting matrix of Egypt 2001/2002 in order for the costs and welfare gains to be jointly modelled. The results showed that trade facilitation boosted exports and economic welfare, while the cost of corruption, for example, lowered the positive gains.

Kleitz (2003), however, argues that, by using a proxy such as port efficiency or a certain cost to estimate, the effect of trade facilitation is not sufficient as indirect costs and other aspects that affect a trade transaction indirectly also contribute to the effect of trade facilitation in an economy.

In order for the Organization for Economic Co-operation and Development (OECD) countries to improve their trade performance ratings, a set of trade facilitation indicators was identified by the OECD that could be used by governments to improve border procedures, increase trade and reduce trade costs (Anon, 2013). These indicators, although mainly focused on the "soft" infrastructural variables, comprise a broad spectrum of the different variables present in a trade transaction, and thus the quality affects the outcome of a country's trade performance. The various indicators identified by the OECD that could be used to assess a country's trade performance include the following (Anon, 2013; Moise & Sorescu, 2013):

- availability of information;
- involvement of trade in community;
- advance rulings;
- appeal procedures;
- fees and charges;
- trade documents;
- internal and external co-operation; and
- governance and impartiality.

Quantifying the importance and the effect that these variables have is, however, a challenge as no complete Trade Facilitation Index exists, apart from that of the various economic performance indexes, to be discussed in Section 3.4. A quantitative analysis is therefore important to be able to evaluate the effect of trade facilitation variables on trade flows (Cosgrove & Apostolov, 2003).

A country's competitiveness and its trade effectiveness are measured by the World Bank and the Economic Forum through various indexes, such as the Logistics Performance Index and

the Doing Business Report. The challenge, however, is that these indexes still do not compute a single trade facilitation statistic. Therefore, the challenge currently faced by many economists to find an effective way to measure trade facilitation, has taken centre stage in the global economic arena (Kiek, 2013).

As mentioned, some economic indexes rate countries' performance in a variety of fields, some of which include trade facilitation variables. It may be useful to identify which of these existing indexes contain trade facilitation variables, as it may be possible to use these in combination to develop a trade facilitation measurement tool or index. Such a tool or index could be useful in measuring countries' trade facilitation as a whole and also identify the areas that may need intervention in order to increase trade. This could be very useful in the South African context as well.

This study therefore aimed to develop a trade facilitation measurement tool or trade facilitation index, which can contribute greatly to the understanding of how countries perform in each of the areas of trade facilitation, thereby highlighting the possible areas of improvement. This is reported on in Chapter 4. However, it is necessary to identify the variables that could be used in such a tool first. Section 3.4 will highlight the various data sources or indexes that contain data that refer to the various aspects of trade facilitation.

3.4 EXISTING INDEXES ON THE ELEMENTS OF TRADE FACILITATION IN DIFFERENT COUNTRIES

The measurement and quantification of trade facilitation have been investigated only recently. A study by Martinez-Zarzoso and Márques-Ramos (2013) found that, using various trade performance indexes to measure trade performance in various countries, has given an indication as to which elements in a trade process need to be improved.

The most relevant indexes that will be discussed in this section are:

- Logistics Performance Index (LPI)
- Doing Business Report
- Enabling Trade Index
- Global Competitiveness Report Index

According to Cosgrove and Apostolov (2003), it is important that countries establish a long-term trade facilitation strategy that is integrated into the country's national trade policy, as domestic trade variables will influence the state of how efficient regional and international trade

can take place. A good domestic trade facilitation structure is therefore essential to promote competitiveness and be able to perform in international trade markets.

For the purpose of the current study, it was important to keep in mind that trade facilitation aspects are mostly associated with domestic aspects of a country, which can be controlled or influenced by that country's government, thus why only the variables that are directly associated with trade within each index will be discussed below.

3.4.1 Logistics Performance Index (LPI)

The Logistics Performance Index, produced by the World Bank, measures the performance of on-the-ground trade logistics in 155 different countries worldwide. The aim of the index is to identify areas of improvement so that policy makers can understand the challenges faced when trading and adjust policy in such a way as to benefit the commerce industry and the economy in turn (Anon, 2011). The LPI provides a global benchmark through cross-country comparisons that reflect how countries are connected globally through trade gateways, a country's ability to trade and the ease of moving goods internationally.

A Logistics Performance Index is an average weight dictated to a country and its performance in six various areas, demonstrating a comparative performance where 1 is the weakest score and 5 the strongest. The rationale behind using an LPI is based on the fact that LPI indicators reveal how countries have performed in each of their logistical sectors. Countries with higher LPI scores clearly have the upper hand in the logistical industry, while those countries with lower scores suffer the consequences of overregulation and poor quality services (Anon, 2011a).

Furthermore, the LPI provides understanding of the sources of cost-occurring factors that may cause uncertainty and induce insignificant costs in the supply chains of countries (Helble *et al*., 2007). Having identified the source of cost-incurring factors, economies such as less developed nations, may observe and identify areas of improvement in their own supply chains, as a direct relationship exists between good logistics and increasing trade.

The LPI also adds value to policy makers as it can be used as a benchmark in the global arena when it comes to the efficiency and quality of logistics, which are not specifically treated or measured by any other index.

The areas that comprise the overall score of the LPI consist of the following criteria (World Bank, 2012):

- the efficiency of the customs clearance process;

- the transport infrastructure and related quality of trade;
- the ease with which a competitive price can be assigned to a consignment;
- the quality and competence of the transport service industry;
- the ability to trace and track consignments; and
- timeliness associated with the delivery time of a consignment.

Furthermore, the LPI measures the perspective of "friendliness" of a country's logistics, both domestically and internationally.

The international LPI is a qualitative evaluation of a country's performance in all six LPI areas, in accordance with that country's trading partners, as a service or goods flow outside the country.

The domestic LPI is both a qualitative and quantitative measure of a country's logistical performance, its trading environment, logistical processes, institutions and various time and cost elements.

Considering the above criteria that comprise the overall LPI score, it is clear that the LPI focuses on both the 'hard' and 'soft' infrastructural elements as discussed in Section 2.3.1. It may be useful to apply some of these variables when developing a trade facilitation measurement tool, or trade facilitation index, such as the variables relating to customs processes, transport infrastructure and delivery time.

3.4.2 Enabling Trade Index (ETI)

The Enabling Trade Index compiled by the World Economic Forum (World Economic Forum, 2012), measures the free flow of goods internationally, a country's policies and institutions and the extent to which a country's services are facilitated to enable trade (Doherty, Blanke & Hanouz, 2012). The index is constructed by four sub-indexes that represent the main factors that are necessary for trade to take place. Each sub-index is also subsequently made up of pillars that represent various "hard" and "soft" infrastructural variables (Doherty, Blanke & Hanouz, 2012).

The sub-indexes as per the ETI are constructed by the World Economic Forum as follows (Doherty *et al.,* 2012):

A. Market access:

This sub-index measures the ability of a country's policy framework to welcome imported goods, thus enabling access into a country for foreign exporters.

B. Border administration:

This sub-index assesses the state of the administration processes at the border by measuring the efficiency of import and export procedures as well as the transparency of customs administration procedures.

C. Transport and communications infrastructure:

This sub-index measures the country's quality of infrastructure to support transport services in the process of moving goods domestically and internationally.

D. The business environment:

This sub-index measures the regulatory environment and security through the country's governance that has an effect on both importers and exporters.

The above four sub-indexes are furthermore comprised of nine pillars, namely (Doherty *et al.*, 2012):

- domestic and foreign market access;
- efficiency of customs administration;
- efficiency of import-export procedures;
- transparency of border administration;
- availability and quality of transport services;
- availability and use of ICTs;
- regulatory environment; and
- physical security

From the above pillars, a total score was calculated by the World Economic Forum (2012) to project the performance in each of the sub-indexes individually. The methodology for the calculation combines a large number of variables that affect trade and its development; therefore, it evidently recognises the areas of improvement according to performance statistics. The World Economic Forum (2012) also describes the content of the ETI as a

contributed platform for the inclusion of trade facilitation reform through the support of the Doha Round negotiations, by dealing with trade barriers and a country's national trade performance (Doherty *et al.*, 2012). Some of the variables from the ETI, relevant to Figure 2.1, could therefore be used when compiling a trade facilitation index.

3.4.3 Doing Business Report (DBR)

The Doing Business Report (DBR) is compiled annually by the World Bank and is constructed by using various quantitative indicators that enhance the business activities within a country. It consists of five indicators that mainly measure the different reforms of business regulations and the ease with which business is conducted within a country. The DBR is designed to inform policy makers and economic researchers about the areas within the business arena that needs improvement. It therefore also serves as a basis upon which decisions regarding business regulatory reform should be based (Devan, 2013).

Devan (2013:16) describes doing business in a SMART way, whereby **s**treamlined, **m**eaningful, **a**daptable, **r**elevant and **t**ransparent regulations provide a sound business environment for traders. Nonetheless, doing business SMARTLY has become a challenge, but a benchmark simultaneously, enabling countries to compare the state of their business environment with other economies. The DBR provides trade performances of countries that may be used to compare and identify the potential obstacles and opportunities that exist in a country's business environment.

For the purpose of the current study, only certain indexes were directly related to trade facilitation, whereby the criteria below explains how trade can be made easier.

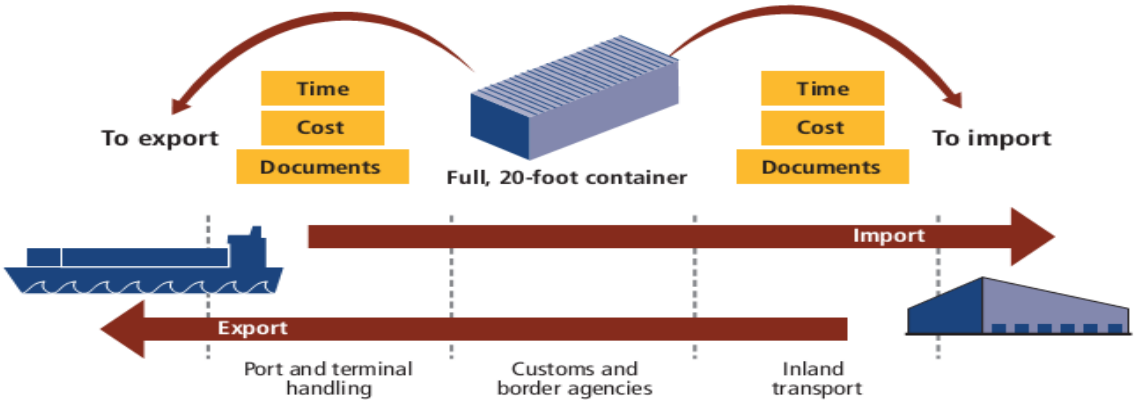
Making it easy to trade across borders by:

- allowing electronic submission and processing;
- using risk-based inspections; and
- providing a single window.

Considering the above criteria, quantitative reasoning is important as statistics are needed for the analyses of how a country may or may not trade easily. Certain variables have therefore been assigned by the World Bank (2012) to represent and quantify the ability to trade across borders:

- The number of documents needed to import/export;
- The time in days required to import/export; and
- The cost per container required to import/export (US$).

Figure 3.1: The Doing Business Report variables



(*Source:* Doing Business Report, 2012)

3.4.4 Competitiveness Report (CR)

The Global Competitiveness Report (GCR) is published on a yearly basis by the World Economic Forum. This report is mainly used as most of its variables influence the competitiveness of a country; implying that, should trade facilitation be applied to the relevant trade variables in the report, a country's competitiveness will increase. The main aim of the Global Competitiveness Report is to measure all aspects of a country's economy that have an influence on that country's competitive state and its ability to compete against international markets (Global Competitiveness Report, 2012/2013).

The variables of the Global Competitiveness Report are based on various aggregates of scores compiled from different categories, called pillars. The GCR consists of 9 pillars whereby the second pillar, namely infrastructure, will for the purpose of the current study be useful to calculate the quality of a countries' infrastructure. The infrastructural pillar consists of the following variables (Global Competitiveness Report, 2012/2013):

1. Transport Infrastructure:
    - quality of overall infrastructure;
    - quality of roads;
    - quality of railroad infrastructure;
    - quality of port infrastructure;
    - quality of air transport infrastructure; and
    - available seat kilometres.
2. Energy and telephony infrastructure:
    - quality of electricity supply;
    - fixed telephone lines; and
    - mobile telephone subscriptions.

As mentioned in Section 2.3.2, for a country's economy to function effectively an efficient infrastructure is highly important as many economic sectors are dependent upon it (Wilson & Perez, 2011). A well-developed infrastructure can increase the integration of national markets and thus enlarge both consumer and supplier bases, increasing competition and thus the quality of goods and services.

Furthermore, infrastructural support structures, such as a constant electrical supply and a solid telecommunication system, will enable the effective and continuous production of goods. A high-quality infrastructure accompanied by sound supportive structures as mentioned, will have the effect that both hard and soft infrastructures are in place, ensuring the efficient flow of goods, workers and information. As a result of a smooth supply chain, the costs and time involved may decrease and trade will increase, consequently improving the state of a country's economy (Wilson & Perez, 2011).

Based on the above it is important to understand that all the aspects discussed in the different indexes above relate to trade facilitation and could be used to measure a country's performance in trade facilitation. The indexes will also simultaneously provide a clearer picture as to how effective trade facilitation reform is in trading goods nationally and internationally.

Given the fact that "trade facilitation" mostly refers to domestic issues in an economy that may hinder trade, some variables from the above indexes that relate to domestic trade aspects may be used to compile a single trade facilitation measure, based on the definition of what trade facilitation is made up of as described in Fig. 2.1. The factors from the different indexes and

reports that could effectively be used to measure trade facilitation or compile a trade facilitation measurement tool are:

1. customs;
2. infrastructure;
3. international shipments;
4. logistics competence;
5. tracking;
6. timeliness;
7. documents required to export;
8. time to export;
9. cost to export;
10. market access;
11. border administration;
12. transport and communication;
13. business environment;
14. quality of roads;
15. quality of ports;
16. quality of rail infrastructure;
17. quality of air transport infrastructure;
18. quality of electricity supply

The possible measurement of these aspects and of South Africa's trade facilitation performance will be discussed in more detail in Chapter 4.

3.5 CONCLUSION

In this chapter, trade facilitation was described as the most important part of any trade reform strategy as it is directly linked to a country's trade flows. A broad view regarding trade facilitation has emerged in many recent discussions that focused on trade development. In Section 3.2, the importance and benefits of trade facilitation were highlighted and its difficulty in measurement was recognised.

Various trade facilitation policies aimed at targeting a specific variable such as customs regulation and the enhancement of IT services in the industry have been expanded, although it is however important to keep in mind that all aspects of a trade transaction are directly dependent upon one another. Various measures should interact as most of these variables correlate with each other and thus form a global supply chain in a trade transaction that involves the collecting, presenting, communicating and movement of goods as mentioned in Section 3.3.

The increase in global supply chains have made the aim of reducing trade costs a major concern, as the process between a producer and a consumer has become more lengthy, repetitive and therefore more complicated than before. The successful integration of logistical supply chains within an international market depends on minimising the series of costs realised within this process by applying regulated trade facilitation measures.

In Section 3.4, existing indexes, such as the Logistics Performance Index, the Doing Business Report, the Enabling Trade Index and the Global Competitiveness Report were used to discuss the elements of trade facilitation in different countries. What is apparent is that domestic trade variables, of which some are widely present in each of the indexes, can be used to develop a country's national trade policy. Furthermore, the performance in the variables that are directly associated with trade from each index was discussed.

From the performance trade indexes discussed in Section 3.4, it can be concluded that trade facilitation works through a cost channel to increase exports by having a positive effect on all factors that make up a trade transaction, with the specific focus on the movement of goods and the administration thereof. The performance of these domestic variables can then be used as a benchmark to compare a country's performances and consequently to establish a long-term trade facilitation strategy aimed at promoting competitiveness and increasing exports.

In the next chapter, the above trade performance indexes will be used to describe the trade performance of South Africa and that of the rest of the world. The aim is to compare the way South Africa performed in various trade facilitation indicators in comparison with its top 10 export competitors and the BRIC and SADC countries.

Chapter 4

TRADE FACILITATION IN SOUTH AFRICA

4.1 INTRODUCTION

In the previous chapter, the measurement of trade facilitation and its effect on an economy were highlighted. The measurement of trade facilitation through gravity models, CGE models and trade performance indexes was recognised as a common method to represent the costs and benefits of trade facilitation reform, with the absence of a single Trade Facilitation Index also being recognised.

Recent studies on trade facilitation largely focused on the aggregate effect of reform and the literature behind the expansion of trade, causing a gap between the effect trade facilitation has on an economy, its measurement in performance and the way trade facilitation should be applied. As trade facilitation is a multi-faceted area, its performance will be influenced by an array of variables present in the execution of a trade transaction (Hoekman, 2008). Every country's individual reform needs will also differ when it comes to applying a trade facilitation programme, hence the importance of being able to measure its impact and performance.

Hoekman (2008) explains that various processes serve as inputs in the execution process of a trade transaction. The efficiency of fundamental functions that pose as services in a trade transaction, directly affects the economic growth of a country such as South Africa. An important point here is that these input factors that pose as services, function through space and time when facilitating a transaction and act as one of the most important contributors to economic growth through the expansion of services as inputs to a production chain. This is of profound importance when it comes to the execution of a trade transaction, and will therefore be discussed again in Section 4.3.

Furthermore, economic theory and policy as described in Section 2.2.1 claim that overall economic growth is highly dependent upon the theory of specialisation. Hoekman (2008) explains that indirect inputs and intermediary services, such as efficient transportation and customs regulation, allow for specialisation to occur and therefore act as a catalyst and important determinant in the growth of a country such as South Africa. As firms expand and increase in size, labour needs to become specialised, and thus more business activities need to be coordinated and organised. The additional business functions that exist in a trade transaction provide opportunities of outsourcing, which in turn creates a market for external service providers who simultaneously spur innovation, expansion and exporting of services

that will yield solid productivity gains and wholly contribute to the economy-wide growth performance (Hoekman, 2008).

Additionally, after determining the challenge that the measurement of trade facilitation within a multi-functional trade transaction brings as also described above, the aim of this chapter is to fill the gap between aggregated data and existing trade indexes by comparing the trade performance of South Africa to that of other countries.

4.2 TRADE FACILITATION IN SOUTH AFRICA

The economic growth forecasts for South Africa for 2014 (Edwards, 2012) have indicated a potential decrease in growth as a result of an increase in various domestic problems and weaker external demand. Global financial problems such the current American fiscal crisis and the Eurozone crisis had a great negative effect on international trade as a whole, although the need for South Africa to invest in spurring its economic growth and driving exports is rather urgent as the country's ability to compete in international markets seems rather bleak. In addition, considering that South Africa's export share in African markets fell from 17.4% in 1997 to 13% in 2010, it is crucial to investigate how to recover and drive export growth (Edwards, 2012).

South Africa has recently embarked on a new development agenda within the framework of the Economic Support and Employment Creation Programme (Davies, 2012), where trade facilitation is one of the main aims of the agenda. Interventions in the hard and soft infrastructural areas, specifically the area of moving goods effectively, accompanied by improved customs cooperation is the general direction improvement is aimed at (Davies, 2012).

Rick Gurley, trade programme manager of the US Agency for International Development said at a recent Southern African Trade Facilitation Conference in Johannesburg that, although efforts to simplify customs procedures have been undertaken, time and cost factors involved in a trade transaction are hampering the trade potential of South Africa (Gurley, 2013). Interventions in hard and soft infrastructure to facilitate the movement of goods are what should ultimately be aimed for.

Gurley (2013) adds that time and cost factors in South Africa are becoming a major concern as regional trade is constrained and thus requires serious reform attention in improving the quality of trade variables. Limited attention has been given by the South African government in tackling factors that undermine economic growth, such as decreasing export volumes and consequently South Africa will seem a less attractive investment destination.

South Africa`s transformation in its trade and specifically its infrastructural platform, is unfortunately not progressing as well as planned (Havenga, 2010). Logistical costs as a percentage of the GDP remains very high at 13.5% in 2010, compared to 7.5% in Europe (Portugal-Perez & Wilson, 2010). Various studies by the World Bank indicate that other emerging countries, such as Mexico and Brazil are improving their overall trade performance ratings much faster than South Africa (Portugal-Perez & Wilson, 2010).

A study by Havenga (2010) emphasises the need for urgent infrastructural investment within South Africa. A successful logistics trade cycle needs to be created, which will be dependent on government measures for improving the efficiency of the different elements of trade facilitation.

The results of Havenga's (2010) study show that trade facilitation as a trade incentive to increase exports through infrastructural investment may increase trade in South Africa. Seeing that a country's trade process involves a system, whether integrated or not, every element involved in a trade transaction contributes to the efficient/inefficient flow of goods nationally and internationally.

South Africa's Trade and Industry Minister, Rob Davies (2012), says that South Africa is attempting to advance its customs cooperation within both its regional trade blocs, namely the Southern African Development Community (SADC) and that of the Southern African Customs Union (SACU). Davies explains that, by pursuing a customs cooperation incentive, trade facilitation is applied to some extent, although a large number of trade-based growth factors are still severely undermined.

However, in its current state, South Africa still remains as a high-profile African country that needs to set the pace for implementing a good cross-national connection between customs management systems and infrastructural development (Davies, 2012). The importance of creating a regional integrated market has been emphasised by the WTO and the importance of applying an efficient trade facilitation programme even more so (Kiek, 2012a).

The following section will show in more detail how efficient South Africa's trade facilitation has been, by discussing the relevant elements of the indexes explained in Section 3.4.

4.3 SOUTH AFRICA'S PERFORMANCE IN THE VARIOUS ELEMENTS OF TRADE FACILITATION

The World Economic Forum in collaboration with various other trade expansion leaders has conducted various studies in the research fields of streamlining the free flow of goods, such as the identifying and eliminating of trade barriers in order to build a firmer foundation for nations to trade, simultaneously highlighting the necessity of trade development and the advantages that it brings (Wilson & Perez, 2008). Having identified the importance of trade, the awareness of identifying the areas of improvement in the trade arena has been recognised. Many factors that hinder trade have however been recognised through the construction of various performance indexes and thus countries can benefit from these results by applying diverse reform policies (Wilson & Perez, 2008).

Although various visionary policies for South Africa's trade environment have been applied over the past two decades (2001 to 2011), trade costs remain high and the long-term demand for meeting freight transport unsatisfied. The inabilities of South Africa's trade arena have been identified as the time and cost elements that prevent the country's trade arena from functioning at an optimum level (Havenga, 2010). The challenge is to identify an appropriate trade development policy that works to decrease the time and cost elements.

Trade facilitation has been recognised by the WTO as the most prominent intervention or framework that has improved the trade performance of various countries. Considering South Africa's performance, which will be discussed in Section 4.4, the implementation of trade facilitation reforms will improve the state of trade efficiency in South Africa and the access to established corridor transport networks (Havenga, 2011).

Furthermore, Havenga (2011) explains that, even though South Africa has employed various trade policies in the twentieth century, it was mostly to support internal governmental and political obligations that relied greatly on exporting primary products. Recently, South Africa has however shifted its focus from an inward-focused economy to a service-based and manufacturing-focused export strategy.

In Section 4.4, the various indexes and reports as described in Chapter 3 are used to describe the trade performance of South Africa domestically and internationally, by referring to the trade facilitation factors identified in Section 3.4. These results will then be compared to the performance of South Africa`s top 10 export competitors, available from the International Trade Centre (2014), which will rank South Africa against the world`s best exporters. Additionally, South Africa will also be compared to the BRIC countries and that of the SADC countries, of

which South Africa is a member, making it relevant to effectively analyse the trade facilitation position of South Africa.

For the purpose of this study, some years and countries have however been excluded from the calculations due to a lack of data availability.

4.4 SOUTH AFRICA'S TRADE FACILITATION PERFORMANCE AS PER THE LPI

As explained in Section 3.4.1, the Logistics Performance Index is an average weight dictated to a country and its performance in six various areas, demonstrating a comparative performance where 1 is the weakest score and 5 the strongest. The rationale behind using the LPI is based on the fact that the LPI indicators reveal how countries have performed in each of their logistical sectors. Countries with high LPI scores clearly have the upper hand in the logistical industry, while those countries with low scores suffer the consequences of overregulation and poor quality services (Anon, 2011a).

The insight that was gained from the results of South Africa's LPI score therefore indicates how poorly South Africa performed in variables directly related to trade facilitation. The areas within which performance was the weakest should consequently be improved as this obviously has repercussions on the competiveness of the region, which will simultaneously serve as a barrier to the trade industry and its growth.

A country`s international LPI is constructed by the following indicators, mostly representative of soft infrastructural variables that prove the ability of a country to be able to trade in a timely and costly manner:

- clearance time with physical inspection;
- clearance time without physical inspection;
- lead time to export;
- lead time to import;
- number of agencies to export;
- number of agencies to import;
- cost for a 40-foot (12m) container to export; and
- cost for a 40-foot (12m) container to import.

In the tables and discussions below, the LPI of South Africa, South Africa`s top 10 export competitors, the BRIC countries and SADC countries, will be presented and compared in order to show a realistic reflection of their improved or weakened performances from 2007 to 2012.

Table 4.1: The international LPI of South Africa

Year	LPI rank	LPI score	Customs	Infrastructure	International shipments	Logistics competence	Tracking	Timeliness
2007	23	3.53	3.22	3.42	3.56	3.54	3.71	3.78
2010	28	3.46	3.22	3.42	3.26	3.59	3.73	3.57
2012	24	3.67	3.35	3.79	3.5	3.56	3.83	4.03

(*Source*: World Trade Organization, 2011)

Table 4.2: The domestic LPI of South Africa as constructed by the six LPI areas

Year	Clearance time	Clearance time	Lead time	Lead time	Agencies	Agencies	Cost 40" Full ContainerL oad	Cost 40" Full ContainerL oad
	with inspection	without inspection	export	import	export	imports	export	import
2007	3	1	2.2	4	4.5	3.2	$619	$515
2010	2.67	0.5	2.28	3.25	3.2	3.08	$907	$1,516
2012	2	1	2	3	2	2	$1,861	$2,000

(*Source*: World Trade Organization, 2011)

All areas of the LPI are directly linked to the efficiency of moving goods domestically and internationally. Trade facilitation can therefore be measured by evaluating all six areas (customs, infrastructure, international shipments, logistics competence, tracking timeliness) simultaneously.

From an international LPI context, South Africa has improved in its overall ranking between 2010 and 2012, although the overall ranking in 2007 was better. Regarding the areas of the LPI, South Africa has performed weakest in the customs and logistical competence arenas. According to the World Economic Forum (Arvis *et al.*, 2012), customs make out a third of export time and therefore inefficient customs regimes will prolong a trade procedure and cause costs to increase. High logistical costs and low quality of services will pose additional barriers to trade and thus render the logistic supply chains of South Africa rather inefficient.

The cost of importing and exporting a 12m container has also nearly doubled in the past two years from 2010 to 2012. Arvis *et al.* (2012) ascribe this increase to an array of other costs, such as the additional handling of cargo and warehouse storage due to an increase in cargo dwell time, as a result of inefficient infrastructure and technology.

Table 4.3: The international LPI of South Africa compared to its Top 10 export competitors:

Country	Year	LPI rank	LPI score	Customs	Infrastructure	International shipments	Logistics competence	Tracking	Timeliness
SA	2007	23	3.53	3.22	3.42	3.56	3.54	3.71	3.78
	2010	28	3.46	3.22	3.42	3.26	3.59	3.73	3.57
	2012	24	3.67	3.35	3.79	3.5	3.56	3.83	4.03
Singapore	2007	1	4.19	3.90	4.27	4.04	4.21	4.25	4.53
	2010	2	4.09	4.02	4.22	3.86	4.12	4.15	4.23
	2012	1	4.13	4.10	4.15	3.99	4.07	4.07	4.39
Netherlands	2007	2	4.18	3.99	4.29	4.05	4.25	4.14	4.38
	2010	4	4.07	3.98	4.25	3.61	4.15	4.12	4.41
	2012	5	4.02	3.85	4.15	3.86	4.05	4.12	4.15
Germany	2007	3	4.10	3.88	4.19	3.91	4.21	4.12	4.33
	2010	1	4.11	4.00	4.34	3.66	4.14	4.18	4.48
	2012	4	4.03	3.87	4.26	3.67	4.09	4.05	4.32
Switzerland	2007	7	4.02	3.85	4.13	3.67	4.00	4.04	4.48
	2010	6	3.97	3.73	4.17	3.32	4.32	4.27	4.20
	2012	16	3.80	3.88	3.98	3.46	3.71	3.83	4.01
Japan	2007	6	4.02	3.79	4.11	3.77	4.12	4.08	4.34
	2010	7	3.97	3.79	4.19	3.55	4.00	4.13	4.26

	2012	8	3.93	3.72	4.11	3.61	3.97	4.03	4.21
Belgium	2007	12	3.89	3.61	4.00	3.65	3.95	3.96	4.25
	2010	9	3.94	3.83	4.01	3.31	4.13	4.22	4.29
	2012	7	3.98	3.85	4.12	3.73	3.98	4.05	4.20
UK	2007	9	3.99	3.74	4.05	3.85	4.02	4.10	4.25
	2010	8	3.95	3.74	3.95	3.66	3.92	4.13	4.37
	2012	10	3.90	3.73	3.95	3.63	3.93	4.00	4.19
US	2007	14	3.38	3.52	4.07	3.58	3.85	4.01	4.11
	2010	15	3.86	3.68	4.15	3.21	3.92	4.17	4.19
	2012	9	3.93	3.67	4.14	3.56	3.96	4.11	4.21

(*Source*: World Trade Organization, 2012)

From the above table it is evident that South Africa has scored the lowest overall when compared to its Top 10 export competitors. The category that South Africa has scored the lowest in when compared to these countries is the “Logistics Competence” area, which proves that for South Africa to be able to perform better in comparison to these countries, this sector is certainly one that will require an urgent trade facilitation reform initiative.

The recommended action would consequently be to increase the attraction of South Africa's logistical quality so that firms would be able to increase global production as goods will be able to move in a more timely and cost-effective way (Doherty *et al*., 2012). Through this, firms will see South Africa as a country to locate to, enabling South Africa to become a supplier-based country and an attractive consumer market simultaneously (Doherty *et al.*, 2012).

Table 4.4: The international LPI of South Africa compared to the BRIC countries:

Country	Year	LPI rank	LPI score	Customs	Infrastructure	International shipments	Logistics competence	Tracking	Timeliness
SA	2007	23	3.53	3.22	3.42	3.56	3.54	3.71	3.78
	2010	28	3.46	3.22	3.42	3.26	3.59	3.73	3.57
	2012	24	3.67	3.35	3.79	3.5	3.56	3.83	4.03
Brazil	2007	61	2.75	2.39	2.75	2.61	2.94	2.77	3.10
	2010	41	3.20	2.37	3.10	2.91	3.30	3.42	4.14
	2012	45	3.13	2.51	3.07	3.12	3.12	3.42	3.55

Russia	2007	99	2.37	1.94	2.23	2.48	2.46	2.17	2.94
	2010	94	2.61	2.15	2.38	2.72	2.51	2.60	3.23
	2012	95	2.58	2.04	2.45	2.59	2.65	2.76	3.02
India	2007	39	3.07	2.69	2.90	3.08	3.27	3.03	3.47
	2010	47	3.12	2.70	2.91	3.13	3.16	3.14	3.61
	2012	46	3.08	2.77	2.87	2.98	3.14	3.09	3.58
China	2007	30	3.32	2.99	3.20	3.31	3.40	3.37	3.68
	2010	27	3.49	3.16	3.54	3.31	3.49	3.55	3.91
	2012	26	3.52	3.25	3.61	3.46	3.47	3.52	3.80

(Source: World Trade Organization, 2012)

In comparison to the BRIC countries, South Africa has performed the best in each year, except for the year 2010, where China scored higher. Brazil and especially Russia, have scored particularly lower in each category when compared to the rest of the BRIC countries. Their "Customs" score is also prominently lower than the rest of the countries. Overall, the scores in the various areas are rather similar and thus logistics as a whole should be given attention to regarding that these emerging economies are aimed at improving their development.

Table 4.5: The international LPI of South Africa compared to the SADC countries:

Country	Year	LPI rank /150	LPI score /5	Customs	Infrastructure	International shipments	Logistics competence	Tracking	Timeliness
SA	2007	23	3.53	3.22	3.42	3.56	3.54	3.71	3.78
	2010	28	3.46	3.22	3.42	3.26	3.59	3.73	3.57
	2012	24	3.67	3.35	3.79	3.5	3.56	3.83	4.03
Mauritius	2007	94	2.38	2.20	2.33	2.75	2.13	2.00	2.86
	2010	82	2.72	2.71	2.29	3.24	2.43	2.57	2.91
	2012	72	2.82	2.58	2.83	2.50	2.67	2.83	3.52
Botswana	2007	128	2.16	1.95	1.95	2.06	2.18	2.27	2.57
	2010	134	2.32	2.09	2.09	1.91	2.29	2.59	2.99
	2012	68	2.84	2.82	2.82	2.53	2.74	2.73	3.43
Namibia	2007	126	2.16	2.14	2.00	2.14	1.83	1.83	3.00
	2010	152	1.52	1.68	1.71	2.20	2.04	2.04	2.38
	2012	89	2.65	2.73	2.72	2.49	2.65	2.85	2.52

Tanzania	2007	137	2.08	2.07	2.00	2.08	1.92	2.17	2.27
	2010	95	2.61	2.42	2.00	2.78	2.38	2.56	3.33
	2012	88	2.65	2.17	2.41	2.91	2.64	2.77	2.97
Madagascar	2007	106	2.31	2.14	1.94	2.36	2.21	2.50	2.73
	2010	88	2.61	2.35	2.63	3.06	2.40	2.51	2.90
	2012	84	2.72	2.80	2.40	2.40	2.80	2.80	3.13
Malawi	2007	109	2.29	2.17	1.90	2.23	2.21	2.38	2.88
	2010	-	-	-	-	-	-	-	-
	2012	73	2.81	2.51	2.78	3.01	2.85	2.56	3.09
Zimbabwe	2007	100	2.37	2.08	2.00	2.40	2.44	2.80	2.50
	2010	-	-	-	-	-	-	-	-
	2012	103	2.55	2.31	2.20	2.67	2.27	2.50	3.27

(Source: World Trade Organization, 2012)

In comparison with the SADC countries, South Africa has scored the highest in the overall ranking. When it comes to the LPI performance of the above countries, South Africa`s logistical infrastructure is certainly far more developed. Should trade facilitation reform be applied, it can be assumed that these countries will perform much better and that the trade in within the SADC region itself may also increase.

4.5 SOUTH AFRICA'S TRADE FACILITATION PERFORMANCE AS PER THE ENABLING TRADE INDEX

For the purpose of this study, the years 2010 and 2012 are compared below to analyse the increase or decrease in performance in the Enabling Trade Index of South Africa and that of South Africa`s Top 10 export competitors, the BRIC countries and the relevant SADC countries.

Table 4.6: The comparison in South Africa's Enabling Trade Index performance for 2010 and 2012

Year	Overall rank	Market access	Border administration	Transport and communications	Business environment
2010	72	87	53	65	79
2012	63	66	59	55	71

(*Source:* World Economic Forum, 2012)

From the above table, it is evident that South Africa has moved up nine positions in the index from 2010 to 2012, due to an improvement in both the transport, communications and security services. Border administration, however, has declined in rank by six positions, and still seems rather inefficient, which poses a great threat to improving the general time taken to complete a trade transaction, as an increase in the time taken to trade, increases the costs. An even greater concern would be related to the business environment and its regulation as its rankings are rather weaker than the rest of the pillars and definitely raises concern for the safety and high costs of crime in the business arena of the country.

The simplification of import and export procedures is still a concern as South Africa is not very open to foreign participation (Bezuidenhout, 2012). Restricted regulations and limited market openness occur as a result of the high volume of documentation required and time taken to trade, which is why the ease of trade is still a process long overdue.

Table 4.7: The comparison in South Africa's Enabling Trade Index performance to that of its Top 10 export competitors:

Country	Year	Overall rank	Market access	Border administration	Transport and communications	Business environment
SA	2010	72	87	53	65	79
	2012	63	66	59	55	71
Singapore	2010	1	1	1	7	2
	2012	1	1	1	1	5
Netherlands	2010	10	85	4	6	17
	2012	7	67	5	2	14
Germany	2010	13	101	15	1	15
	2012	13	67	18	5	21
Switzerland	2010	5	58	10	10	8
	2012	8	56	12	10	3
Japan	2010	25	121	16	14	34
	2012	18	98	8	14	26
Belgium	2010	24	99	30	13	22
	2012	21	67	27	13	24
UK	2010	17	91	13	2	32
	2012	11	67	9	4	28
US	2010	19	62	19	11	37
	2012	23	60	20	15	42
China	2010	48	79	48	43	41
	2012	56	108	45	48	45
India	2010	84	115	68	81	58
	2012	100	130	77	84	74

(*Source:* World Economic Forum, 2012)

From the above table it is evident that the performance of South Africa is much weaker than that of its Top 10 export competitors, excluding India however. Making trade possible and easier, through increased market access, improved border administration processes, cheaper

transport and communication services, accompanied by a regulated business environment, are factors that these Top 10 export competitors have already developed and improved, making trade very easy. South Africa is rather far behind in comparison, which can be attributed to the trade barriers and costs associated with the transporting of goods.

Table 4.8: The comparison in South Africa's Enabling Trade Index performance to that of the BRIC countries:

Country	Year	Overall rank	Market access	Border administration	Transport and communications	Business environment
SA	2010	72	87	53	65	79
	2012	63	66	59	55	71
Brazil	2010	87	104	80	66	83
	2012	84	104	83	73	75
Russia	2010	114	125	109	48	92
	2012	112	129	111	51	113
India	2010	84	115	68	81	58
	2012	100	130	77	84	74
China	2010	48	79	48	43	41
	2012	56	108	45	48	45

(*Source:* World Economic Forum, 2012)

Table 4.8 shows South Africa in a fairly better light, as it has been ranked second best, after China. Considering the fact that these countries are all classified as emerging economies with similar economic conditions, market access is still one of the biggest factors that are currently a concern when it comes to trade development. Trade barriers should therefore be recognised in order to improve the inflow and outflow of goods. Trade quotas and restrictions may also decrease the market accessibility where countries often have policies implemented that protect their infant industries.

Table 4.9: The comparison in South Africa's Enabling Trade Index performance to that of the SADC countries:

Country	Year	Overall rank	Market access	Border administration	Transport and communications	Business environment
SA	2010	72	87	53	65	79
	2012	63	66	59	55	71
Mauritius	2010	33	8	39	58	36
	2012	36	6	42	65	43
Botswana	2010	53	32	70	84	35
	2012	54	40	60	74	33
Namibia	2010	70	41	89	90	47
	2012	75	50	90	90	49
Tanzania	2010	97	55	98	113	69
	2012	94	30	99	114	90
Madagascar	2010	86	6	94	103	104
	2012	107	29	106	119	124
Malawi	2010	83	19	101	118	55
	2012	85	12	109	115	68
Zimbabwe	2010	122	118	120	121	108
	2012	129	131	122	122	96

(*Source:* World Economic Forum, 2012)

Dowie (2012) states that the large difference in index values in South Africa from 2010 to 2012 is as a result of time and cost differences. Compared to the other SADC countries, South Africa has performed second best, after Mauritius. All countries did however score very low in the transport and communication division, which can be attributed to the large amounts of costs related to moving goods.

The solution to rectifying the spur in logistical weakness will depend on the implementation of higher-quality services and a more functional and effective operating environment, especially with regard to border management and custom regulations. Dowie (2012) explains that this is however only possible through the proper implementation of a trade facilitation regime.

4.6 SOUTH AFRICA'S TRADE FACILITATION PERFORMANCE AS PER THE DOING BUSINESS REPORT

As mentioned in Section 3.4, the Doing Business Report comprises various quantitative indicators that enhance the business activities within a country. Good business regulations, according to Devan (2013), enable the private sector of a country to thrive and expand their trade network that will ultimately have a positive effect on a country's production and trade. Sound business regulations ensure that business operations run effectively, safeguarding economic activity and ensuring better interaction in the market place.

According to the Doing Business Report of 2013, South Africa is one of the economies that has converged most, from being one of the poorest performers in 2005, to one that has shown the biggest improvement over the last five years. Great attention was given by the Economic Forum to the reformation of processes such as trade procedures, which have been recognised as one of the most important regulatory processes in terms of creating new businesses and accelerating trade. The Doing Business Report (2013) however also states that South Africa has a more complex and costly regulatory system in comparison with other emerging economies. It is however decided to only show the results of the year 2011 and 2012 for the following tables due to the limited amount of data availability of the SADC countries.

Table 4.10: South Africa's trade facilitation performance as per the Doing Business Report:

Year	Rank	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
2011	115	6	16	1620	7	23	1940
2012	144	8	30	1531	8	32	1795

(*Source:* The World Bank, 2012)

The table above explains how certain "soft" infrastructural variables, specifically the ones pertaining to border efficiency and the regulatory business environment, function as independent services within an integrated supply chain. Additionally, each step of the trade transaction functions as an individual business service, all adding time and costs to the process of moving goods, as also explained by Figure 2.1. Once trade facilitation measures are applied,

these functions may increase their functionality and efficiency whereby the time and costs to export will decrease.

Currently, however, the time taken to trade has increased, which could be dependent on the documentation needed to trade (Devan, 2013). This consequently means that trading across the borders of South Africa has not been made easier as no single window has been provided. Electronic submission and processing in order to enable a smoother, more regulated trade regime will need to increase greatly in order for South Africa's trade environment to contribute positively towards its business arena (Devan, 2013).

Additionally, Devan (2013) also explains that a new company law, implemented in 2012, has simplified the incorporation of documents and the transfer of property much easier and less costly. Although the introduction of electronic filing has made business processes more efficient, the general time taken to start a new business, accompanied by weaker legal institutions compared to those in more developed countries and more expensive regulatory processes, is still a concern in South Africa (Devan, 2013).

Table 4.11: South Africa's trade facilitation performance as per the Doing Business Report compared to that of its Top 10 export competitors:

Country	Year	Rank/185	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
SA	2011	115	6	16	1620	7	23	1940
	2012	144	8	30	1531	8	32	1795
Singapore	2011	1	4	5	456	4	4	439
	2012	1	4	5	456	4	4	439
Netherlands	2011	13	4	6	895	5	6	942
	2012	13	4	6	895	5	6	975
Germany	2011	14	4	7	872	5	7	937
	2012	12	4	7	872	5	7	937
Switzerland	2011	43	4	8	1537	5	9	1540
	2012	41	4	8	1537	5	9	1540
Japan	2011	24	4	10	1010	5	11	1060
	2012	16	3	10	880	5	11	970

Country	Year	Rank/185	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
Belgium	2011	44	4	8	1619	5	9	1600
	2012	36	4	8	1429	5	8	1600
UK	2011	15	4	7	950	4	6	1045
	2012	13	4	7	950	4	6	1045
US	2011	20	4	6	1050	5	5	1315
	2012	20	4	6	1050	5	5	1315
China	2011	50	7	21	500	5	24	545
	2012	60	8	21	500	5	24	545
India	2011	100	8	17	1055	9	20	1025
	2012	109	8	16	1095	9	20	1070

(*Source:* The World Bank, 2012)

From the above table it can be concluded that South Africa has scored the lowest when compared to its Top 10 export competitors. The consistent performance is rather prominent in all the countries except that of South Africa, where its performance has increased or decreased in large amounts between the year 2011 and 2012 in the categories involved. The time taken to trade in these countries is much shorter than in South Africa, meaning that the total cost attributed to trade is simultaneously also less.

Table 4.12: South Africa's trade facilitation performance as per the Doing Business Report compared to that of the BRIC countries:

Country	Year	Rank/185	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
SA	2011	115	6	16	1620	7	23	1940
	2012	144	8	30	1531	8	32	1795
Brazil	2011	114	8	13	1790	7	17	1730
	2012	121	7	13	2215	8	17	2275
Russia	2011	120	8	36	1850	11	36	1880
	2012	112	8	21	2820	10	36	2920

Country	Year	Rank/185	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
India	2011	100	8	17	1055	9	20	1025
	2012	109	8	16	1095	9	20	1070
China	2011	50	7	21	500	5	24	545
	2012	60	8	21	500	5	24	545

(*Source:* The World Bank, 2012)

From the above table South Africa has scored the lowest in comparison to the other BRIC countries. The time it takes for an export transaction to realise is rather longer in comparison to the rest of the BRIC countries, making the cost to export from South Africa higher. China has performed the best with a much lower cost to import and export a container of goods.

Table 4.13: South Africa's trade facilitation performance as per the Doing Business Report compared to that of the SADC countries:

Country	Year	Rank/185	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
SA	2011	115	6	16	1620	7	23	1940
	2012	144	8	30	1531	8	32	1795
Mauritius	2011	19	5	10	660	6	10	695
	2012	23	5	13	737	6	13	689
Botswana	2011	59	6	27	2945	7	37	3445
	2012	54	6	28	3185	8	41	3420
Namibia	2011	87	9	25	1800	7	20	1905
	2012	78	9	29	1800	7	24	1905
Tanzania	2011	109	5	24	1262	7	31	1475
	2012	92	6	18	1255	6	24	1430
Madagascar	2011	142	4	21	1197	9	24	1555
	2012	137	4	21	1197	9	24	1555
Malawi	2011	157	10	34	2175	9	43	2870

Country	Year	Rank/185	Docs to export	Time to export	Cost to export (US$)	Docs to import	Time to import	Cost to import (US$)
	2012	145	10	41	1675	9	51	2570
Zimbabwe	2011	172	8	53	3280	8	73	5200
	2012	171	8	53	3280	9	73	5101

(*Source:* The World Bank, 2012)

In the table above South Africa has scored fifth place out of the eight relevant SADC countries. Mauritius scored very well, which can be as a result of it geographic position, especially when compared to the landlocked countries such as Botswana and Zimbabwe where the cost of importing and exporting a container is very high. It can also be assumed that a country is more attractive in doing business with if its geographical position is more accessible through a port for example, as transport costs increase as the distance increases.

4.7 SOUTH AFRICA'S TRADE FACILITATION PERFORMANCE ACCORDING TO THE GLOBAL COMPETITIVENESS REPORT INDEX

As mentioned in Section 3.3.4, the Global Competitiveness Report measures the competitiveness of countries at various levels, inclusive of but not limited to trade. For the purpose of this study, however, the infrastructural pillar was used to compare the competitiveness of the quality of infrastructure among countries, as this level of performance directly affects the movement of goods in a country.

Table 4.14: South Africa's logistical performance according to the Global Competitiveness Report Index:

Infrastructure	2011	2012
Quality of overall infrastructure	56	58
Quality of roads	43	42
Quality of railroad infrastructure	47	46
Quality of port infrastructure	49	52
Quality of air transport infrastructure	18	15
Available airline seat kilometres/week	24	24
Quality of electricity supply	94	94
Mobile telephone subscriptions/100 pop	98	35

Infrastructure	2011	2012
Fixed telephone lines/100 pop	73	99

(*Source:* World Economic Forum, 2012)

This table shows the increase and decrease in South Africa's infrastructural arena from 2011 to 2012 and how it has ranked on a global scale.

Although South Africa has been ranked 52nd in 2012 in the Global Competitive Report, it is evident from Table 4.14 that, although the overall quality of infrastructure might have improved slightly, the quality of road, railroad and air infrastructure has declined. Mobile telephone subscriptions have also declined from 98 mobile subscriptions per 100 persons in 2011 to 35 mobile subscriptions per 100 persons in 2012.

Table 4.15: South Africa's logistical performance according to the Global Competitiveness Report Index compared to that of its Top 10 export competitors:

Country	**South Africa**		**Singapore**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	56	58	3	2
Quality of roads	43	42	1	3
Quality of railroad infrastructure	47	46	6	5
Quality of port infrastructure	49	52	2	2
Quality of air transport infrastructure	18	15	2	1
Available airline seat kilometres/week	24	24	17	16
Quality of electricity supply	94	94	9	6
Mobile telephone subscriptions/100 pop	98	35	28	14
Fixed telephone lines/100 pop	73	99	17	30
Country	**Netherlands**		**Germany**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	17	10	9	9
Quality of roads	27	11	5	10
Quality of railroad infrastructure	9	9	5	7
Quality of port infrastructure	3	1	5	9
Quality of air transport infrastructure	8	4	3	7

Country	**Netherlands**		**Germany**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Available airline seat kilometres/week	19	22	5	5
Quality of electricity supply	11	1	6	19
Mobile telephone subscriptions/100 pop	21	53	5	27
Fixed telephone lines/100 pop	27	21	26	2
Country	**Switzerland**		**Japan**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	1	1	15	16
Quality of roads	3	6	22	14
Quality of railroad infrastructure	1	1	3	2
Quality of port infrastructure	35	37	37	31
Quality of air transport infrastructure	5	5	54	46
Available airline seat kilometres/week	27	28	4	4
Quality of electricity supply	7	4	5	36
Mobile telephone subscriptions/100 pop	3	29	34	82
Fixed telephone lines/100 pop	33	5	75	12
Country	**Belgium**		**UK**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	20	17	33	24
Quality of roads	24	26	35	24
Quality of railroad infrastructure	11	13	19	16
Quality of port infrastructure	4	6	23	12
Quality of air transport infrastructure	14	14	34	22
Available airline seat kilometres/week	35	35	3	3
Quality of electricity supply	13	13	15	8
Mobile telephone subscriptions/100 pop	25	51	11	28
Fixed telephone lines/100 pop	41	22	24	10
Country	**US**		**China**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	23	25	72	69
Quality of roads	19	20	53	54
Quality of railroad infrastructure	18	18	27	22

Country	US		China	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of port infrastructure	22	19	67	59
Quality of air transport infrastructure	32	30	79	70
Available airline seat kilometres/week	1	1	2	2
Quality of electricity supply	23	33	52	59
Mobile telephone subscriptions/100 pop	16	15	57	58
Fixed telephone lines/100 pop	71	72	111	114
Country	**India**			
Infrastructure	**2011**	**2012**		
Quality of overall infrastructure	91	87		
Quality of roads	90	86		
Quality of railroad infrastructure	23	27		
Quality of port infrastructure	83	80		
Quality of air transport infrastructure	71	68		
Available airline seat kilometres/week	12	13		
Quality of electricity supply	110	110		
Mobile telephone subscriptions/100 pop	110	116		
Fixed telephone lines/100 pop	118	118		

(*Source:* World Economic Forum, 2012)

In general it cannot be denied that South Africa is far behind when it comes to its infrastructural performance when compared to its Top 10 export competitors. South Africa`s road, railroad and port infrastructure is definitely not on par with these countries. It should however be kept in mind that most of the countries in the table above are developed countries, which means that their economic development is far better than that of South Africa, which is an emerging economy.

Table 4.16: South Africa's logistical performance according to the Global Competitiveness Report Index compared to that of the BRIC countries:

Country	SA		Brazil	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	56	58	84	107

Country	**SA**		**Brazil**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of roads	43	42	105	123
Quality of railroad infrastructure	47	46	87	100
Quality of port infrastructure	49	52	123	135
Quality of air transport infrastructure	18	15	93	134
Available airline seat kilometres/week	24	24	9	7
Quality of electricity supply	94	94	63	68
Mobile telephone subscriptions/100 pop	98	35	62	41
Fixed telephone lines/100 pop	73	99	76	55
Country	**Russia**		**India**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	94	101	91	87
Quality of roads	125	136	90	86
Quality of railroad infrastructure	31	30	23	27
Quality of port infrastructure	93	93	83	80
Quality of air transport infrastructure	104	104	71	68
Available airline seat kilometres/week	13	12	12	13
Quality of electricity supply	80	84	110	110
Mobile telephone subscriptions/100 pop	8	41	110	116
Fixed telephone lines/100 pop	39	5	118	118
Country	**China**			
Infrastructure	**2011**	**2012**		
Quality of overall infrastructure	72	69		
Quality of roads	53	54		
Quality of railroad infrastructure	27	22		
Quality of port infrastructure	67	59		
Quality of air transport infrastructure	79	70		
Available airline seat kilometres/week	2	2		
Quality of electricity supply	52	59		
Mobile telephone subscriptions/100 pop	57	114		
Fixed telephone lines/100 pop	111	58		

(*Source:* World Economic Forum, 2012)

Overall, South Africa has ranked third among the BRIC countries in the Global Competitiveness Report of 2012, but considering the performance of the report`s infrastructural pillar as compared above, South Africa was ranked first.

According to Schwab (2012), the general results of the Global Competitiveness Report show that South Africa is growing at a slower rate when compared with other emerging economies as in the table above. Schwab (2012) explains that unemployment and poverty, two general concerns are encouraging the slowdown in the growth and competitiveness of the country and now even more than ever, the infrastructure of the country, which can be seen in the table above. Although South Africa has scored the highest among the BRIC countries, concern surrounding the improvement in the infrastructural areas of the country should be raised.

Table 4.17: South Africa's logistical performance according to the Global Competitiveness Report Index compared to that of the SADC countries:

Country	**SA**		**Mauritius**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	56	58	57	53
Quality of roads	43	42	58	58
Quality of railroad infrastructure	47	46	0	0
Quality of port infrastructure	49	52	56	48
Quality of air transport infrastructure	18	15	56	49
Available airline seat kilometres/week	24	24	66	68
Quality of electricity supply	94	94	64	66
Mobile telephone subscriptions/100 pop	98	99	44	43
Fixed telephone lines/100 pop	73	35	83	86
Country	**Botswana**		**Namibia**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	54	64	25	40
Quality of roads	47	55	15	35
Quality of railroad infrastructure	44	55	30	39
Quality of port infrastructure	86	97	16	27
Quality of air transport infrastructure	94	96	55	59
Available airline seat kilometres/week	136	141	106	105
Quality of electricity supply	88	104	41	52

Country	**Botswana**		**Namibia**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Mobile telephone subscriptions/100 pop	65	101	109	75
Fixed telephone lines/100 pop	101	19	104	105
Country	**Tanzania**		**Madagascar**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	124	124	112	125
Quality of roads	104	94	106	130
Quality of railroad infrastructure	72	82	96	98
Quality of port infrastructure	119	117	108	123
Quality of air transport infrastructure	118	117	106	114
Available airline seat kilometres/week	93	83	103	95
Quality of electricity supply	122	132	121	127
Mobile telephone subscriptions/100 pop	133	126	127	138
Fixed telephone lines/100 pop	120	139	128	132
Country	**Malawi**		**Zimbabwe**	
Infrastructure	**2011**	**2012**	**2011**	**2012**
Quality of overall infrastructure	106	116	116	123
Quality of roads	76	89	94	95
Quality of railroad infrastructure	78	84	61	76
Quality of port infrastructure	99	94	61	61
Quality of air transport infrastructure	119	133	99	122
Available airline seat kilometres/week	131	140	114	126
Quality of electricity supply	129	128	130	137
Mobile telephone subscriptions/100 pop	136	126	134	115
Fixed telephone lines/100 pop	123	142	111	114

(*Source:* World Economic Forum, 2012)

In the above table South Africa, Mauritius, Botswana and Namibia has scored very similar results in their overall infrastructure score. The Trans-Kalahari corridor network that runs from Namibia through Botswana to South Africa is a very important trade route that has made trade between these countries much easier. The Walvis Bay port in Namibia also had result that Namibia`s quality of infrastructure increased. What is important however is that the other

SADC countries should also aim to improve their overall infrastructure as this will allow regional trade to expand, which may improve economic growth (Schwab, 2012).

Schwab (2012) also explains that poor performance in only one or two areas of a country`s infrastructure, may have a very strong implication on a country's overall logistical and trade performance. This proves that infrastructure, as a pillar of a country's competitiveness score, is one of the problematic factors when it comes to doing business, being one of the key components of trade. The difficulty of exchanging information, additional to the increased amount of information such as documentation, combined with the decrease in the quality of logistics, raises the concern for South Africa's future logistical and trade state.

The various elements as such highlight many areas of concern for South Africa. In Chapter 5 the various trade elements are combined into an integrated TFI in order to compare South Africa's state of trade facilitation and the individual variables with other countries.

4.8 CONCLUSION

In this chapter, trade facilitation in South Africa was analysed whereby it was evident that despite the trade initiatives that South Africa has implemented in order to promote trade, the general performance of South Africa's trade industry has failed to improve overall.

In Section 4.3, South Africa's performance in the various elements of trade facilitation of the years 2010, 2011 and 2012 were discussed. The performance in the LPI, the ETI, the Doing Business Report and the Global Competitiveness Report was discussed. In addition to recent empirical studies and the various indexes discussed above, all prove that transportation, infrastructure and communication are the most problematic areas in the economy. Transportation costs have increased considerably due to a lack of competition and poor quality infrastructure. Currently, the ability to satisfy customer demands through both South Africa's "hard" and "soft" infrastructural elements and the competence of logistics service providers, poses as a great challenge that needs to be addressed (Doherty *et al.*, 2012).

Compared to other countries, especially more developed countries, the reliability of South Africa's trading system and its supply chains remains a concern as it directly effects the time and costs associated with a trade transaction. South Africa remains far behind its competitors when it comes to the state of trade facilitation reform. Furthermore, trade expansion and trade diversification are hampered as a result of many services not being liberalised. As mentioned in Section 2.3.1, a trade transaction consists of various functions, where each function acts as a business service separately. Not liberalising these trade services, increases the costs and time incurred during a trade transaction, hence the reason why trade facilitation needs to be

implemented. Apart from market access, which often poses as a threat to traders, it is often the transportation of goods that causes serious concern. This is evident in South Africa's LPI performance. As time and costs are the main concerns when it comes to transit of a trade transaction, investors, traders and businessmen have identified the pace and quality of a country's transit process as the main indicator when it comes to defining and assessing a country's trade performance.

Chapter 5

CONSTRUCTING A TRADE FACILITATION INDEX

5.1 INTRODUCTION

As explained in Section 4.2, Havenga (2012) emphasizes the need to improve the efficiency of each element in a trade transaction, whereby trade facilitation reform is applied to a country`s trade based growth factors in order to improve the efficient flow of goods. The importance of applying a trade facilitation initiative according to Davies (2012), has however been recognised, but implementing such an initiative and being able to measure its effect, remains a challenge.

For the purpose of this chapter it is vital to understand that the benefits and the importance of trade facilitation in the international trade arena, as highlighted in Chapter 3.2, are as a result of good trade facilitation reform application. The benefits therefore serve as an output of improved trade facilitation (Davies, 2012). Improving the input elements of a trade transaction, such as the soft and hard infrastructural elements, is what an effective trade facilitation initiative will have to entail. Being able to measure the trade facilitation state in a country remains challenging as no single measurement index exists. The construction of such an integrated index will therefore serve as the aim of this chapter.

Measuring the state of trade facilitation through an integrated index, compiled from the trade indexes as described in Chapter 3.4, this index will serve as a benchmark to compare the state of trade facilitation in South Africa with that of other countries. In the following chapter, a Trade Facilitation Index (TFI) will be constructed by applying a Principle Component Analysis procedure. In Section 5.2 the methodology of the study will be explained, followed by the Trade Facilitation Index results in Section 5.3 and the conclusion thereafter.

5.2 METHODOLOGY

The different indexes discussed in Sections 4.4, 4.5, 4.6 and 4.7 showed that, in order for South Africa to improve its trade performance with regard to lower trade costs and to improve its general trade performance state, a trade facilitation reform initiative would need to be implemented. Although all the above indexes overlap in terms of trade and logistical states to some extent, an integrated index is necessary to represent the four pillars of trade facilitation (physical infrastructure, information and communication technology, border and transport

efficiency, and business and regulatory environment), represented by the hard and soft infrastructural elements as explained in Section 2.3.1.

Individual variables were therefore drawn from each index, as described in Section 3.4, and may be combined into one composite trade facilitation index, which will represent all areas of trade in a country and lay the foundation as to where trade facilitation should be applied. These variables as described in Section 3.5 are highlighted again in the paragraphs below.

For the purpose of this study, it was decided to include “Infrastructure” as a variable from the LPI, representing many internal elements as described by Figure 2.1, and to also include “quality of roads, ports, railroads, air and electrical supply” which forms part of the Competitiveness Report Index, which represents the physical quality of the “hard” infrastructure.

The factors from the different indexes and reports that could be used effectively to measure trade facilitation or compile a trade facilitation measurement tool are shown in the table below:

Table 5.1: Trade Facilitation Index Factors:

Factors	**Measurement**
1. Customs	Score out of 5
2. Infrastructure	Score out of 5
3. International shipments	Score out of 5
4. Logistics competence	Score out of 5
5. Tracking	Score out of 5
6. Timeliness	Score out of 5
7. Documents to export	Amount of documents
8. Time to export	Number of days
9. Cost to export	US$
10. Market access	Score out of 7
11. Border administration	Score out of 7
12. Transport and communications	Score out of 7
13. Business environment	Score out of 7

14. Quality of roads	Score out of 139
15. Quality of railroad infrastructure	Score out of 139
16. Quality of port infrastructure	Score out of 139
17. Quality of air transport infrastructure	Score out of 139
18. Quality of electricity supply	Score out of 139

These 18 variables were used to construct a Trade Facilitation Index. The index was constructed using a principle components analysis, which is a statistical procedure that makes use of an orthogonal transformation process in order to convert a set of observations that are possibly correlated into linearly uncorrelated variables that are known as principle components (Jaggi, 2012).

The first step in the composition of the composite index (Trade Facilitation Index) was to convert the data set of the 18 selected variables to the same scale where a z-score, the empirical standard deviation vector, was created from the square root of each element. This new standard set of data then represented the linear combination of the original data. The formula used to standardise the different variables are as follows:

$$z = \frac{X - \dot{X}}{S}$$

Where z is the standard score

S = standard deviation of a sample

X = each value in the data set

$\dot{X}$ = mean of all values in the data set

(*Source:* Salkind, 2007)

In order to compute a z-score, the mean ($\dot{X}$) is eliminated by subtracting it from the value (X) in the sample and then dividing the score deviation by the standard deviation (S), (Salkind,

2007). The formula above therefore relates to the difference between a specific country and the average of all the countries taken into consideration, divided by the standard deviation of the variable in regard. This formula is then applied to all 18 factors. By calculating a z-score for each factor, the data set is being standardized, thus for each factor you can then make assumptions on SA's position in the world for each individual factor.

After standardising the dataset, it was necessary to indicate the correlation between the different variables in order to establish whether all the different variables correlate with each other sufficiently. The following table shows the correlations between each of the variables selected. A correlation of 0.3 and larger is seen as medium, and a correlation of 0.5 and larger is seen as substantial (Cohen, 1988). From Table 5.2 below, it can be seen that there is a medium to large correlation between all of the variables.

Table 5.2 Correlation among variables

		Customs	Infrastructure	International_Shipments	Logistics_competence	Tracking	Timeliness	Docs_to_export	Time_to_export	Cost_to_export
Customs	Pearson Correlation	1	.939**	.865**	.942**	.901**	.841**	-.644**	-.476**	-.330**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Infrastructure	Pearson Correlation	.939**	1	.891**	.952**	.935**	.861**	-.633**	-.525**	-.348**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
International_Shipments	Pearson Correlation	.865**	.891**	1	.907**	.884**	.837**	-.615**	-.537**	-.402**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Logistics_competence	Pearson Correlation	.942**	.952**	.907**	1	.941**	.868**	-.629**	-.517**	-.335**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Tracking	Pearson Correlation	.901**	.935**	.884**	.941**	1	.880**	-.644**	-.504**	-.355**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Timeliness	Pearson Correlation	.841**	.861**	.837**	.868**	.880**	1	-.605**	-.490**	-.313**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Docs_to_export	Pearson Correlation	-.644**	-.633**	-.615**	-.629**	-.644**	-.605**	1	.610**	.469**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000
	N	132	132	132	132	132	132	132	132	132
Time_to_export	Pearson Correlation	-.476**	-.525**	-.537**	-.517**	-.504**	-.490**	.610**	1	.815**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000
	N	132	132	132	132	132	132	132	132	132
Cost_to_export	Pearson Correlation	-.330**	-.348**	-.402**	-.335**	-.355**	-.313**	.469**	.815**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
	N	132	132	132	132	132	132	132	132	132
Market_access	Pearson Correlation	.158	.143	.110	.098	.134	.084	-.205*	-.255**	-.218*
	Sig. (2-tailed)	.071	.103	.208	.264	.126	.337	.018	.003	.012
	N	132	132	132	132	132	132	132	132	132

(Source: Author's own calculations using SPSS, 2014)

		Customs	Infrastructure	pments	competence	Tracking	Timeliness	Docs_to_export	Time_to_export	Cost_to_export
Border_administration	Pearson Correlation	.847**	.812**	.740**	.791**	.785**	.712**	-.729**	-.635**	-.469**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Tranport_and_ Communiactions	Pearson Correlation	.857**	.869**	.797**	.833**	.853**	.782**	-.693**	-.499**	-.318**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Business_Environment	Pearson Correlation	.732**	.689**	.587**	.655**	.652**	.600**	-.567**	-.452**	-.308**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Quality_of_Roads	Pearson Correlation	.733**	.707**	.687**	.691**	.674**	.648**	-.501**	-.453**	-.335**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Quality_of_railroad_infrastr uctu	Pearson Correlation	.579**	.573**	.526**	.577**	.539**	.492**	-.349**	-.144	-.056
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.098	.524
	N	132	132	132	132	132	132	132	132	132
Quality_of_port_infrastruct ure	Pearson Correlation	.322**	.307**	.240**	.309**	.277**	.244**	-.118	-.222*	-.122
	Sig. (2-tailed)	.000	.000	.006	.000	.001	.005	.178	.011	.165
	N	131	131	131	131	131	131	131	131	131
Quality_of_air_transport_in frast	Pearson Correlation	.671**	.678**	.652**	.652**	.652**	.616**	-.526**	-.474**	-.386**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	132	132	132	132	132	132	132	132	132
Quality_of_electricity_suppl y	Pearson Correlation	.700**	.689**	.604**	.650**	.680**	.648**	-.502**	-.357**	-.194*
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.026
	N	132	132	132	132	132	132	132	132	132

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

(*Source*: Author's own calculations using SPSS, 2014)

	Market_access	Border_ administration	Tranport_and_ Communiactions	Business_ Environment	Quality_of_Roads	Quality_of_railroad infrastructure	Quality_of_port infrastructure	Quality_of_air_ transport infrastructure	Quality_of_ electricity_ supply
Customs	.158	.847**	.857**	.732**	.733**	.579**	.322**	.671**	.700**
	.071	.000	.000	.000	.000	.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
Infrastructure	.143	.812**	.869**	.689**	.707**	.573**	.307**	.678**	.689**
	.103	.000	.000	.000	.000	.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
International_Shipments	.110	.740**	.797**	.587**	.687**	.526**	.240**	.652**	.604**
	.208	.000	.000	.000	.000	.000	.006	.000	.000
	132	132	132	132	132	132	131	132	132
Logistics_competence	.098	.791**	.833**	.655**	.691**	.577**	.309**	.652**	.650**
	.264	.000	.000	.000	.000	.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
Tracking	.134	.785**	.853**	.652**	.674**	.539**	.277**	.652**	.680**
	.126	.000	.000	.000	.000	.000	.001	.000	.000
	132	132	132	132	132	132	131	132	132
Timeliness	.084	.712**	.782**	.600**	.648**	.492**	.244**	.616**	.648**
	.337	.000	.000	.000	.000	.000	.005	.000	.000
	132	132	132	132	132	132	131	132	132
Docs_to_export	-.205*	-.729**	-.693**	-.567**	-.501**	-.349**	-.118	-.526**	-.502**
	.018	.000	.000	.000	.000	.000	.178	.000	.000
	132	132	132	132	132	132	131	132	132
Time_to_export	-.255**	-.635**	-.499**	-.452**	-.453**	-.144	-.222*	-.474**	-.357**
	.003	.000	.000	.000	.000	.098	.011	.000	.000
	132	132	132	132	132	132	131	132	132
Cost_to_export	-.218*	-.469**	-.318**	-.308**	-.335**	-.056	-.122	-.386**	-.194*
	.012	.000	.000	.000	.000	.524	.165	.000	.026
	132	132	132	132	132	132	131	132	132
Market_access	1	.286**	.169	.111	.071	.005	.121	.114	.098
		.001	.053	.206	.420	.950	.169	.192	.265
	132	132	132	132	132	132	131	132	132

(*Source*: Author's own calculations using SPSS, 2014)

	Market_access	administration	Communiactions	Environment	Quality_of_Roads	infrastructure	infrastructure	transport	electricity_
Border_administration	.286**	1	.873**	.825**	.700**	.456**	.332**	.698**	.668**
	.001		.000	.000	.000	.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
Tranport_and_ Communiactions	.169	.873**	1	.760**	.724**	.572**	.341**	.711**	.727**
	.053	.000		.000	.000	.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
Business_Environment	.111	.825**	.760**	1	.665**	.386**	.307**	.566**	.646**
	.206	.000	.000		.000	.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
Quality_of_Roads	.071	.700**	.724**	.665**	1	.458**	.368**	.756**	.703**
	.420	.000	.000	.000		.000	.000	.000	.000
	132	132	132	132	132	132	131	132	132
Quality_of_railroad_infrastr uctu	.005	.456**	.572**	.386**	.458**	1	.130	.369**	.442**
	.950	.000	.000	.000	.000		.140	.000	.000
	132	132	132	132	132	132	131	132	132
Quality_of_port_infrastruct ure	.121	.332**	.341**	.307**	.368**	.130	1	.375**	.315**
	.169	.000	.000	.000	.000	.140		.000	.000
	131	131	131	131	131	131	131	131	131
Quality_of_air_transport_in frast	.114	.698**	.711**	.566**	.756**	.369**	.375**	1	.638**
	.192	.000	.000	.000	.000	.000	.000		.000
	132	132	132	132	132	132	131	132	132
Quality_of_electricity_suppl y	.098	.668**	.727**	.646**	.703**	.442**	.315**	.638**	1
	.265	.000	.000	.000	.000	.000	.000	.000	
	132	132	132	132	132	132	131	132	132

(*Source*: Author's own calculations using SPSS, 2014)

Furthermore it was necessary to test the data to indicate whether a principle component analysis is appropriate to construct the trade facilitation index. This was done by performing two tests, namely the Kaiser-Meyer-Olkin measure of sampling adequacy and the Bartlett's test of sphericity.

- The Kaiser-Meyer Olkin measure: A statistic that indicates the proportion of variance in your variables that might be caused by common underlying factors. This measure is normally between the value of 0 or 1, where higher values, closer to 1, generally indicates that factor analysis may be useful (Michael *et al*, 2004).
- Bartlett`s test of sphericity: Test the hypothesis that the correlation matrix is an identity matrix, meaning that the variables are unrelated and not suitable for structure detection. The associated p-value should therefore be <0.001, where a valid factor analysis can then be done (Michael *et al*, 2004).

The following table shows the results from the two tests.

Table 5.3: Kaiser-Meyer-Olkin measure and Bartlett's test of spherity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.933
Bartlett's Test of Sphericity	Approx. Chi-Square	2716.391
	df	153
	Sig.	0.000

(*Source*: Author's own calculations using SPSS, 2014)

The Kaiser-Meyer-Olkin test indicates a value of 0.933, which is very close to 1 and therefore indicates that the data is acceptable to perform a principle component analysis. The Bartlett's test has a value smaller than 0.001, which also indicates there is enough correlation between the variables, meaning that a factors analysis can be done.

In order to apply the principle component analysis the data also had to be normally distributed, graphs plotted from the data of the 18 variables (see appendix A) showed that all variables were normally distributed and were therefore significant to use. The descriptive statistics also depicted the mean, median, minimum, maximum and standard deviation of each variable (see appendix B).

The following table indicates the communality coefficients, which shows how much variance in a measured variable is reproduced by the underlying constructs in a model and how much of

the variance of an observed variable is useful in delineating the composite variables in the model (Thompson, 2003).

Table 5.4: Communality coefficients

Communalities

	Initial	Extraction
Customs	1.000	.910
Infrastructure	1.000	.916
International_Shipments	1.000	.840
Logistics_competence	1.000	.907
Tracking	1.000	.892
Timeliness	1.000	.803
Docs_to_export	1.000	.663
Time_to_export	1.000	.848
Cost_to_export	1.000	.802
Market_access	1.000	.312
Border_administration	1.000	.854
Tranport_and_Communiactions	1.000	.866
Business_Environment	1.000	.638
Quality_of_Roads	1.000	.710
Quality of railroad infrastructure	1.000	.533
Quality_of_port_infrastructure	1.000	.760
Quality of air transport infrastructure	1.000	.662
Quality_of_electricity_supply	1.000	.665

(Source: Author's own calculations using SPSS, 2014)

All of the variables in Table 5.4 above is higher than 0.3. The lowest was 0.312 for the variable market access, but all other variables had a good level of communality coefficient of between 0.533 and 0.916.

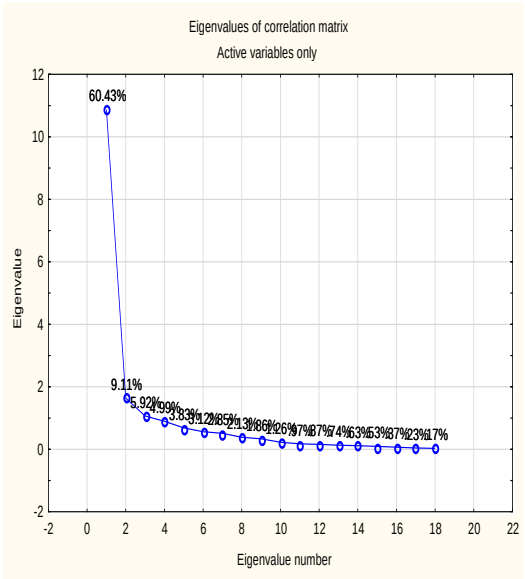
Table 5.5: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	10.877	60.430	60.430	10.877	60.430	60.430	10.581

(Source: Author's own calculations using SPSS, 2014)

Table 5.5 above shows the total variance. The results indicated that one factor declared 60.43% of the variance. This is also indicated in the scree plot below. The scree plot is a graphical display of the total variance of each component in the dataset and determines how many components should be retained in the final calculation of the index. The total variance and scree plot indicate that one factor is sufficient. Therefore it was also not necessary to compile a rotated component matrix.

Table 5.6: Scree plot



(Source: Author's own calculations using SPSS, 2014)

Therefore it was accepted that all 18 variables could be combined into a single index due to the results indicated above. In order to construct the final trade facilitation index, the final step in the principle component analysis was to compile the component score coefficient matrix. This matrix indicates the percentage value contribution by each of the 18 variables that were used to compile the final composite index or trade facilitation index. Table 5.7 indicates the component score coefficient matrix.

Table 5.7: Component Score Coefficient Matrix

	Component
	1
Customs	.087
Infrastructure	.087
International_Shipments	.082
Logistics_competence	.086
Tracking	.085
Timeliness	.080
Docs_to_export	-.068
Time_to_export	-.058
Cost_to_export	-.043
Market_access	.017
Border_administration	.084
Tranport_and_Communiactions	.085
Business_Environment	.072
Quality_of_Roads	.074
Quality of railroad infrastructure	.053
Quality_of_port_infrastructure	.034
Quality of air transport infrastructure	.072
Quality_of_electricity_supply	.071

(Source: Author's own calculations using SPSS, 2014)

Therefore in order to construct the trade facilitation index for each country in the world, the component scores in Table 5.7 were applied as per the following formula:

$$TFI_i = [(Customs_{z,i} \times 0.087) + (Infrastructure_{z,i} \times 0.087) + (InternationalShipments_{z,i} \times 0.082) + (LogisticsCompetence_{z,i} \times 0.086) + (Tracking_{z,i} \times 0.085) + (Timeliness_{z,i} \times 0.080) + (DocsToExport_{z,i} \times 0.068) + (TimeToExport_{z,i} \times 0.058) + (CostToExport_{z,i} \times 0.043) + (MarketAccess_{z,i} \times 0.017) + (BorderAdministration_{z,i} \times 0.084) + (Transport\&Communication_{z,i} \times 0.085) + (BusinessEnvironment_{z,i} \times 0.072) + (QualityOfRoads_{z,i} \times 0.074) + (QualityOfRailroad_{z,i} \times 0.053) + (QualityOfPortInfrastructure_{z,i} \times 0.034) + (QualityOfAirTransport_{z,i} \times 0.072) + (QualityOfElectricitySupply_{z,i} \times 0.071)]$$

with:

z = standardised value

i = country

The final composite index or Trade Facilitation Index (TFI) could therefore be calculated for each country in the world, based on the above distribution between the different variables. The final TFI for all countries in the world is shown in Appendix C.

The limitations of this principle component analysis were the fact that the data for the 18 variables were not available for the same period of time in each instance or for all the countries made use of. The variables extracted from the LPI index was only available for years 2007, 2010 and 2012, where the data from the Enabling Trade Index was only available for years 2010 and 2012. With regards to the Doing Business Report and the Competitiveness Report, the years 2011 and 2012 were fully available. Therefore the index was built using only one year's data for 2012 as this was the only year in which all data sets were available. However, a principle component analysis is primarily used as a tool in composing a predictive model. Therefore using data for one year is more accurate, as the variance between different time series wants to be eliminated in order to reduce the chance of outliers and thus make the model more robust.

Table 5.8 below indicates the correlation between the TFI for all countries and the exports of goods and services (as a % of GDP), as well as GDP (current US$). The correlation shows

that there is a good correlation between this index and exports of goods and services, as well as GDP. Therefore it proves that the TFI is a useful index and correlates well with exports, as well as economic growth figures.

Table 5.8: Correlation

		Exports of goods and services (% of GDP)	GDP__current_US$_
REGR factor score 1 for analysis 1	Pearson Correlation	.452**	.346**
	Sig. (2-tailed)	.000	.000
	N	77	124

**. Correlation is significant at the 0.01 level (2-tailed).

(Source: Author's own calculations using SPSS, 2014)

The following section focus on the results from this TFI to show the value and contribution it makes to our understanding of South Africa's performance in trade facilitation elements.

5.3 TRADE FACILITATION INDEX RESULTS

In this section, the results of the Trade Facilitation Index for South Africa will be discussed in comparison with that of other countries in the world. The purpose is to show how South Africa compares in the total trade facilitation process with its top 10 competitors, as well as other countries with similar economic conditions. From the results, South African policy makers can identify areas that need reformation in order to improve the general trade facilitation performance of the country and simultaneously identify challenges and opportunities in an international trade context. From tables 4.7, 4.8 and 4.9 below, one could conclude that the higher the rating of the Trade Facilitation Index, the better the state of that country's trade facilitation.

The first comparison is between South Africa and its top 10 export competitors. The BRIC countries were then compared, as these emerging economies have shown significant growth and have similar economic conditions to that of South Africa. A comparison between South Africa and the available SADC countries follows then, as South Africa also had to be compared to its trade member countries, considering that these member countries were all part of the same trade bloc union, with similar economic conditions.

The TFI gave each country a score based on the principle component analysis. The higher the score, the better the performance of the country within the index. In general, South Africa fared

well, although not quite as well in comparison to South Africa`s top 10 export competitors. This can be attributed to the increase in trade costs and the time taken to complete a trade transaction as a result of an insufficient infrastructure that hinders the effective movement of goods across borders. This is primarily why South Africa's competitors perform better in the TFI.

The Trade Facilitation Index of South Africa compared to its top 10 export competitors as shown in Table 5.9.

Table 5.9: Trade Facilitation Index - SA compared with top 10 export competitors

Country	**Trade Facilitation Index**
Singapore	2.32937
Netherlands	2.03076
Germany	1.92832
Switzerland	1.78414
Japan	1.75218
Belgium	1.74636
United Kingdom	1.74623
United States	1.61589
South Africa	0.76772
China	0.61863
India	-0.16602

(*Source:* Author's own calculations using SPSS, 2014).

From Table 4.7, it is clear that South Africa's trade facilitation performance was much lower in comparison to the other top competitors. Compared to the performance of Singapore, which scored highest at 2.32937 index points, South Africa scored 1.56165 index points lower. Considering that Singapore and most of the countries in Table 4.7 above are developed countries with well-established trade development policies, it was clear that South Africa needed to implement trade facilitation reform initiatives to be able to compete with these countries in an international market. Compared to South Africa's top 10 export competitors it was clear that South Africa was far behind when it comes to its trade facilitation performance.

The country scored much lower than its competitors, except when compared to China and India, which were the only countries that South Africa out-rated in this index.

Trade facilitation should therefore be applied to the variables present in the index as they have a positive relationship with trade. In other words, if the state of the variables is improved through policy, the general trade facilitation of South Africa could improve and the country could thus be more competitive.

Table 5.10 shows how the Trade Facilitation Index of South Africa compared to that of the BRIC countries.

Table 5.10: Trade Facilitation Index - SA compared with BRIC countries

Country	**Trade Facilitation Index**
South Africa	0.76772
China	0.61863
India	-0.16602
Brazil	-0.23532
Russia	-0.98127

(*Source:* Author's own calculations using SPSS, 2014)

According to Table 5.10, South Africa rated first among the BRIC countries, which is more on a similar economic par as all of them are classified as emerging economic countries. It may be concluded that, although South Africa performs equally well when compared to the other BRIC countries, which might have similar infrastructural issues, the country is most definitely far behind when wanting to compete with the top export competitors as South Africa cannot produce the amount of export volumes at the ease and pace as its competitors.

Table 5.11 shows how the Trade Facilitation Index of South Africa compared to that of SADC countries.

Table 5.11: Trade Facilitation Index - SA compared with SADC members

Country	Trade Facilitation Index
South Africa	0.76772
Mauritius	-0.01678
Botswana	-0.39044
Namibia	-0.39997
Tanzania	-0.77926
Madagascar	-0.78010
Malawi	-0.87344
Zimbabwe	-0.93471

(*Source*: Author's own calculations using SPSS, 2014).

Table 5.11 clearly shows that South Africa is most definitely the leader when it comes to trade facilitation in the SADC region. South Africa has by far out-performed the other SADC countries, although as previously stated by Perez and Wilson (2008), African trade has declined considerably as a result of an increase in costs and time delays. These member countries are also evidently not on a par with other world countries and will therefore struggle to compete in international markets, hence the importance of improving their TFI scores.

In general, South Africa is therefore unable to compete with most of these countries when it comes to trade and the ease with which these countries can conduct trade. Keeping in mind that these countries are also mostly first-world or developed countries where trade development initiatives such as trade facilitation reform practices have been implemented successfully, the urgency of applying trade facilitation reform is evident. This index can then also serve as a tool that can be used to keep score of the improvement in a country's trade facilitation reform efforts and can then be revised through policy development when necessary.

With regard to the South African government, we can conclude that although various trade agreements and transit regulations have been implemented by Government and various authorities, a wider-reaching incentive needs to be applied over the entire trade procedure as crucial trade, infrastructure and transport elements needs to be focused on and consequently enforced. The potential benefits for the South African government and the business community such as that of enhanced trade tax collection, resource distribution and transparent delivery of public services will certainly accompany the positive effects of an improved trading

environment and increasing trade volumes. The adoption of the simplification, harmonisation and standardisation principles of trade facilitation will mean that governments adopt an international supply chain perspective, whereby all the activities within a trade transaction necessary for goods to be produced, transported and delivered to the final consumer are improved. This reference model is thus represented by the Trade Facilitation Index, making it possible for South African policy makers to apply reform initiatives to the areas of concern.

Considering that world economies are at different development stages, have different individual national priorities, and function in different administration and legal environments, it is necessary for countries to determine their own individual reform needs, which is possible through the measurement of the Trade Facilitation Index. Trade facilitation once again stands firmly at the top of all trade development programmes as it improves the reliability, timeliness and cost-effectiveness of trade as a whole, which is ultimately what South Africa should strive for as it cannot compete with developed countries.

5.4 CONCLUSION

In this chapter, the methodology of the study was discussed in Section 5.2, where the main aim was to build a measurement tool in order to measure the state of trade facilitation in a country. The methodology contained the presentation of the 18 variables selected in the construction of the Trade Facilitation Index, as they are also representing the model of what trade facilitation defines as shown by Figure 2.1 in Section 2.3.

In order to construct the Trade Facilitation Index, a principle component analyses was used, whereby the data from the 18 variables were transformed into z-scores. The standardised data was then used to conduct a Kaiser-Meyer-Olkin measure and a Bartlett`s test of spherity, which indicated that the principle component analyses is an appropriate method to build the index. The total variance shown in Table 5.4 and the scree plot as in Table 5.5 also indicated that one factor is sufficient.

Section 5.3 explains that the Trade Facilitation Index will serve as a benchmark in order to compare the trade facilitation performance against that of other countries. Using this tool, policy makers can make decisions on improving the factors that is used to build the index, which then allows the analysing of its performance over a period of time.

The results of the TFI were used to compare South Africa to its top 10 export competitors, the BRIC countries and that of relevant SADC countries. Results revealed that, although South Africa performed relatively well among the BRIC countries, the country can most definitely not be compared to the performance of the top 10 export competitors. Referring to the TFI, South

Africa scored 1.56165 index points lower than Singapore, which scored highest of all among the top 10 export competitors. Using this index as a benchmark proves that South Africa needs to focus on trade facilitation reform in order for the country to be able to compete in the international trade arena and truly benefit from the advantages of trade facilitation reform as South Africa has scored much lower than its competitors.

Additionally, the correlation or positive relationship between the TFI of a country, its GDP and its exports, prove that the TFI is valuable and may be a useful resource for policy makers when allocating resources and identifying areas to develop and to invest in.

Chapter 6

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

International trade has evolved and expanded as a result of various improvements in various trade initiatives and as a result of an increase in competition and multilateral trade negotiations. Trade policies specifically those of a trade development nature applied by various developed countries, proved to be successful in lowering trade costs and increasing exports. Trade facilitation as trade incentive has proved to be beneficial in addressing various aspects of economic development.

The successful ability of a country to export and improve its global trade performance is directly related to that country's ability to provide low-cost trade services and moving freight effectively from the producer to the consumer. Trade facilitation therefore addresses all-important aspects of trade such as improving the general infrastructure of trade, customs administration, regulatory barriers and information technology.

The increase in global supply chains have made the aim of reducing trade costs a major concern, as the process between a producer and a consumer has become more lengthy, repetitive and therefore complicated. The successful integration of a facilitated trade incentive within an international market depends on minimising the series of costs realised within this process by applying regulated trade facilitation measures to each individual infrastructural element.

Furthermore, effective trade practises form part of the economic building blocks of a country, while adding to the ability of that country becoming more interdependent and inter-connected on a global scale. However, the ability to become connected and being able to compete will surface as goods move faster and more efficiently across borders at lower costs, which is why trade facilitation should be such an important priority in every economic decision (Anon, 2010b).

A country's ability to trade internationally depends on the efficiency of its trade facilitation reform to improve the access to logistics networks and various domestic features. Better trade facilitation performance through effective reform strategies will ensure an expansion in trade

and overall attractiveness through export diversification and increased foreign direct investment opportunities (Arvis *et al*., 2012).

Regarding the competitive world, the quality of trade facilitation reform will directly affect the decisions of a firm when it comes to investment as well as possible supplier and consumer markets.

As a conclusion to this study, the various chapter findings will be highlighted in the next section in order to provide the necessary means to prove the importance of trade facilitation, its measurement and its contribution to improving trade and thus economic growth.

6.2 SUMMARY OF THE STUDY

It is important to understand what the aim of each chapter was and what the results revealed. The general objective of this study as set out in Chapter one, was to investigate the current state and impact of trade facilitation in South Africa. Specific objectives of the research aim was to develop a measurement to compare the state of the South African trade facilitation performance with that of other countries in the world.

The purpose of this study was to analyse and present the importance of implementing a trade facilitation programme as a trade development initiative whereby the need to measure trade facilitation performance is of an urgent matter. The need to eliminate trade barriers such as increased trade costs and the time taken to complete a trade transaction was emphasised as it poses a threat to efficient trade facilitation reform.

Throughout the study, it became clear that the aim of this study was to suggest a reformation plan that would improve the trade facilitation in South Africa and a means of measuring this improvement as a whole that would have contributed to the overall general objective as mentioned above. The need to develop an effective trade facilitation programme is of high importance in South Africa in order to increase exports and realise the additional benefits that trade facilitation reform presents.

In Chapter 2, the benefits of international trade and the role of trade facilitation were identified through various economic theories (see section 2.2). It was found that effective trade practices form part of the economic building blocks of a country, thus adding to the ability of the country becoming more interdependent and inter-connected on a global scale.

The benefits of trade facilitation, however, include the ability to become connected and being able to compete, resulting in goods moving faster and more efficiently across borders at lower

costs. This is why trade facilitation should be such an important priority in every economic decision (Anon, 2010a).

The main benefits of international trade that were identified in Section 2.2 included the following:

- the stabilisation of fluctuations in exchange rates and market values;
- the reduction of dependency on existing markets;
- the gain of global market share;
- business expansion opportunities;
- the potential to extend domestic sales;
- an increase in profits as sales increase; and
- enhancing of domestic competitiveness.

Trade facilitation was described as an element of trade in Section 2.3. Trade facilitation was defined as a procedure that harmonises and simplifies trade activities such as the movement of goods, the administration and management thereof, as well as issues with infrastructure and the general business and regulatory environment. Trade facilitation therefore comprises a complex structure that was depicted in Figure 2.1.

The differentiation between the "hard" and "soft" infrastructural variables that consist of the physical infrastructure, information and communication technology, border and transport efficiency and the business and regulatory environment was highlighted in Section 2.3.1 Alternatively, all the processes that enable a trade transaction to take place are directly associated with one of the four sub-groups (see figure 2.1) and this is where the focus for trade facilitation reform should be aimed in order for export volumes and the competitiveness of a country to increase.

The specific objective set out in Section 1.3.2, to define and establish the role that trade facilitation plays in an international trade environment, was evidently reached.

Chapter 3 dealt with the measurement of the effect caused by trade facilitation reform, and the challenge to truly measure the trade facilitation state of a country was highlighted. What is important, however, is identifying the impact and effectiveness of trade facilitation reform.

Section 3.2 considered previous studies that have investigated various means to measure the effect of trade facilitation. These studies proved that the improvement in trade facilitation reform measures would entail the following advantages:

- lower trade costs;
- mitigation of the aftershocks of economic crises;
- increases in trade volumes;
- increases in economic development;
- increased investment in trade infrastructure;
- magnified trade sectors; and
- increases in productivity of exporters.

Although the advantages of trade facilitation reform have long been recognised, studies on the measurement of trade facilitation are however very scarce. Similar studies make use of a gravity model or a Computable General Equilibrium (CGE) model in order to quantify the effects of trade facilitation reform. However, due to indirect costs, statistical errors, incorrect proxies and other unrecognised variables, no exact index exists to measure the trade facilitation performance of world countries.

There are, however, four very relevant trade performance indexes as explained in Section 3.4, which are mostly associated with measuring variables present in either the "hard or soft" infrastructure of a country. These indexes, namely the Logistics Performance Index (LPI), the Doing Business Report (DBR), the Enabling Trade Index (ETI) and the Global Competitiveness Report Index (GCRI) were each separately discussed. In the process, 18 relevant variables were chosen from these indexes, and these were effectively used to construct the TFI.

The specific objective set out in Section 1.3.2, to define trade facilitation and its effect on economic growth, including the impact and effect of trade facilitation reform on an economy, was evidently reached.

In Chapter 4, the trade facilitation performance of South Africa was evaluated through the analysis of current trade performance indexes in comparison to the performance of South Africa`s top 10 export competitors, the BRIC countries and that of the SADC countries.

It was found that the ability of countries to move goods successfully from manufacturers to consumers in both international and domestic markets has improved considerably in the last few years. Certain countries however, such as Africa and most developing countries, still need to show improvement in their trade performance areas in order for an economy to truly benefit from the increase in trade as the process of moving goods becomes more efficient and effective (Anon, 2010b).

Trade facilitation in South Africa has not seen much progress recently and the urgent need to invest in trade facilitation reform has been highlighted. Although South Africa is currently a high-profile African country, the country will not be able to defend itself against other more powerful trade markets if trade costs and the time taken to trade continue to increase.

The specific objective set out in Section 1.3.2, to examine and establish the measurement of trade facilitation through existing trade performance indexes, was evidently reached.

In Chapter 5, the need to measure the performance of a country's trade facilitation was emphasised, as the reform of such performance could be indexed and then compared with the performance of other world countries.

In Section 5.2, an integrated index, namely the TFI, was developed by making use of a principle component analysis. The 18 variables extracted from the trade performance indexes, were transformed into z-scores and thereafter a Keiser-Meyer-Olkin measure and a Bartlett`s test of spherity was done in order to test whether a factor analysis can be done. Results proved that enough correlation between the variables are present and thus the component scores of the variables were calculated.

In Section 5.3, the results of the TFI were used to compare South Africa to its top 10 export competitors, the BRIC countries and that of the SADC countries. Results revealed that, although South Africa performed relatively well among the BRIC countries, the country can most definitely not be compared to the performance of the top 10 export competitors. Referring to the TFI, South Africa scored 1.56165 index points lower than Singapore, which scored highest of all among the top 10 export competitors. Using this index as a benchmark proves that South Africa needs to focus on trade facilitation reform in order for the country to be able to compete in the international trade arena and truly benefit from the advantages of trade facilitation reform as South Africa has scored much lower than its competitors.

Additionally, the correlation or positive relationship between the TFI of a country, its GDP and its exports, proves that the TFI is valuable and may be a useful resource for policy makers when allocating resources and identifying areas to develop and to invest in.

The specific objective set out in Section 1.3.2, to compare South Africa`s trade facilitation performance with that of other countries and to analyse the relationship between trade facilitation in South Africa and the effect on its economic growth and exports, were evidently reached.

6.3 RECOMMENDATIONS

Based on the study and its general findings, one cannot ignore the fact that trade facilitation as a trade development initiative should without a doubt be the focus point of every trade policy of a country.

Regarding South Africa, the efficiency, timeliness and quality of both the "hard" and "soft" infrastructures are the areas that South Africa should focus on investing in for the long-term. It is quite obvious that a lower quality of infrastructure and efficiency process will increase the timeliness of a transaction, thus enabling shorter lead times in product movement activities. An increase in the delay of a transaction means a simultaneous increase in the costs of the transaction and thus a lower profit. As a solution, it can be suggested that considering the current limitations to the TFI, further study should aim at developing and perfecting the TFI as its validity cannot be ignored. This will have result that professionals and policy makers could then use the TFI as a tool to measure annual trade facilitation performance for a country, enabling them to analyse its reform policies and thus focus on key areas, represented by the variables used to construct the TFI. Improving variables such as the market access of South Africa, will directly affect its exports and GDP. By this means it is also possible to measure the improvement or decrease in South Africa`s performance from year to the next and whether trade facilitation reform policies are actually applied correctly.

The South African government and stakeholders will need to adopt comprehensive approach in the reformation of trade facilitation which is crucial when it comes to trade development. Innovative solutions are essential as the trade industry - and specifically infrastructure – which have been described as "unfriendly" and that there are many lessons to be learned by policy makers (Havenga, 2010).

Based on the findings of this study, South Africa will have to focus on adapting a technological approach when it comes to the reformation of policies, whereby the reduction in transport costs and customs modernisation should be a priority. In order for South Africa to be able to compete successfully in the international trade arena, it certainly needs to focus on allowing a paradigmatic shift within its trade procedures. Considering the involvement of third-party, private companies, will also have affect that companies within the country will have the

opportunity to invest in the development of the infrastructure, which will in return be utilised again to increase trade activities, increase export volumes and help build a growth platform for the country.

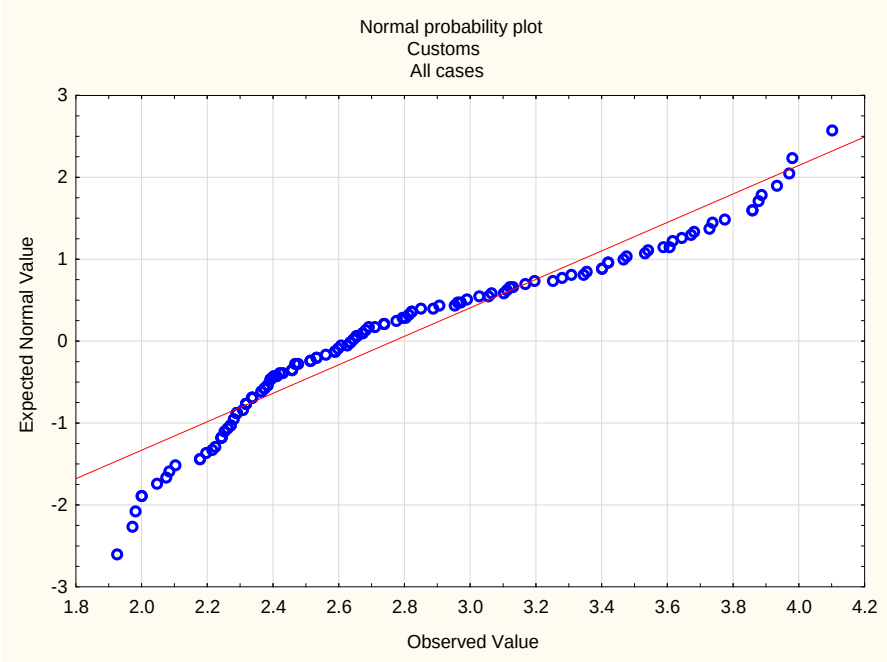
Additionally, this study contributes to the diagnostic assessment of trade constraints, highlighting the potential gains that can be realised through trade facilitation reform along the variables comprised by the constructed index. Although various policies are aimed at diminishing trade costs, trade facilitation reform as a trade development policy needs to be adopted and measured annually in order to track and trace a country's efforts in improving its exports and competitiveness.

A network-based service needs to be innovated so that the service can integrate different infrastructural networks in order for supply chains to be connected more efficiently and thus serve as a knowledge platform for traders. The spillover effects of trade facilitation reform from a micro- to a macro-economic perspective, whereby a cost-benefit analysis can be conducted to identify more accurate constraints to trade expansion efforts can be considered as topic of further study. This can then be of good use in improving the measurement of the effect that trade facilitation has on a country. The design and implementation of such a platform are unfortunately outside the scope of this study, but would most certainly serve as a further topic of study that may be pursued in future studies.

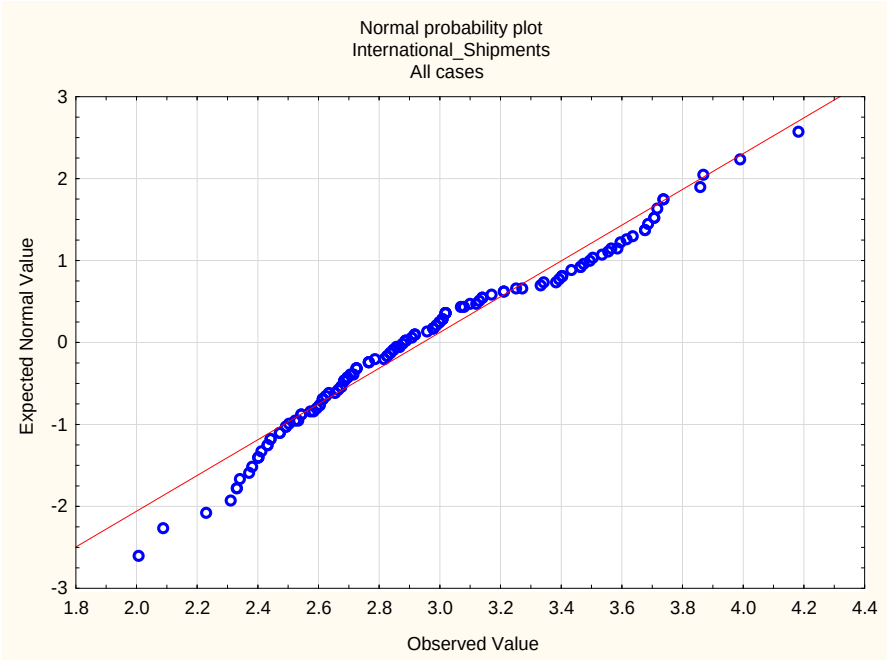
APPENDIX A

APPLYING THE PRINCIPLE COMPONENT ANALYSIS-NORMALITY

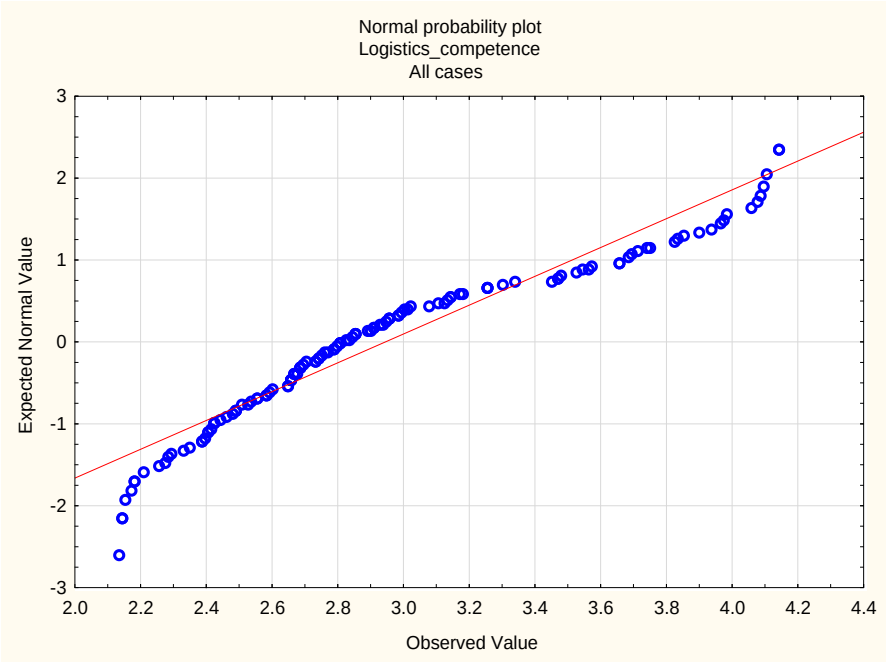
Graph A.1: Customs



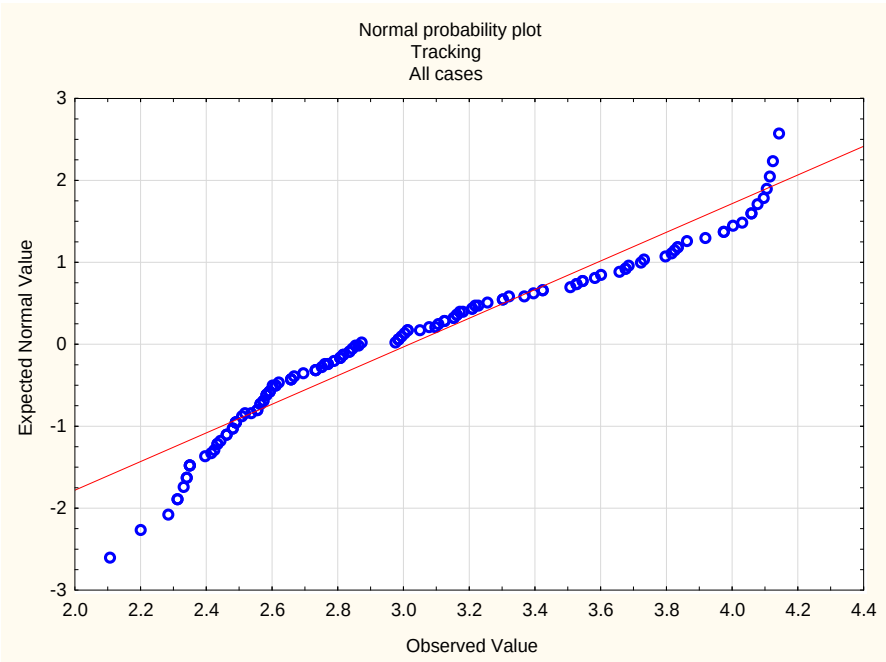
Graph A.2: International shipments



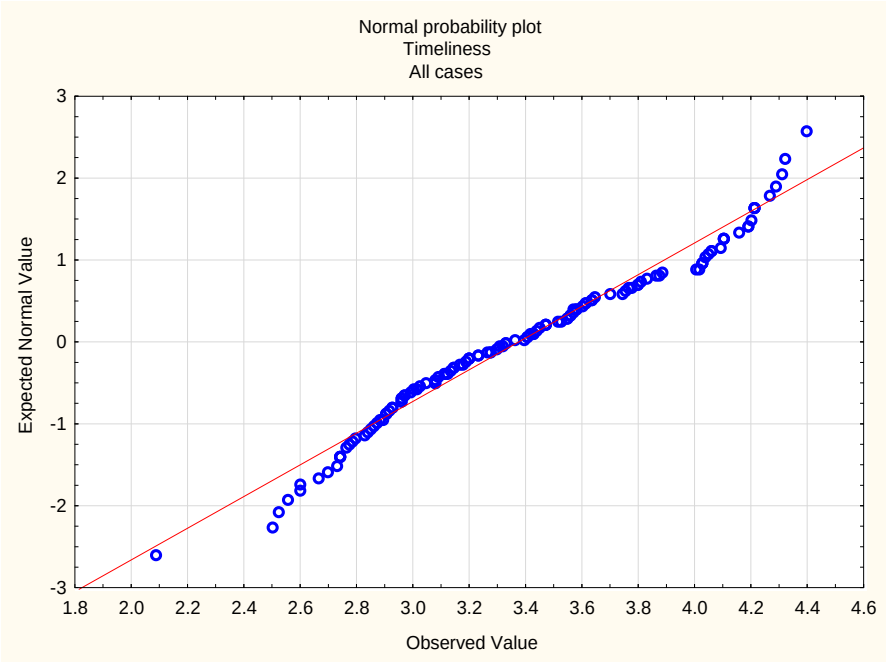
Graph A.3: Logistics competence



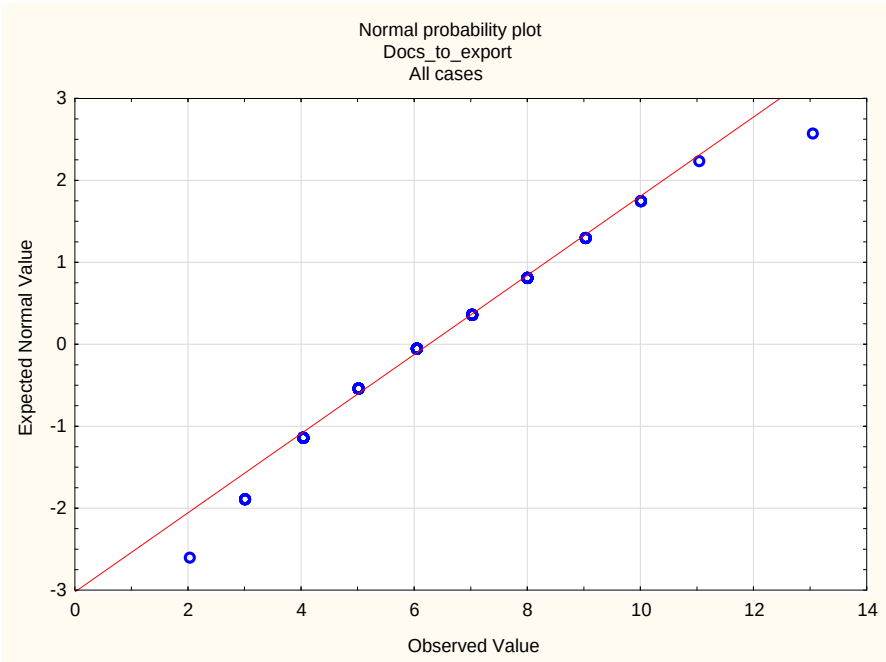
Graph A.4: Tracking



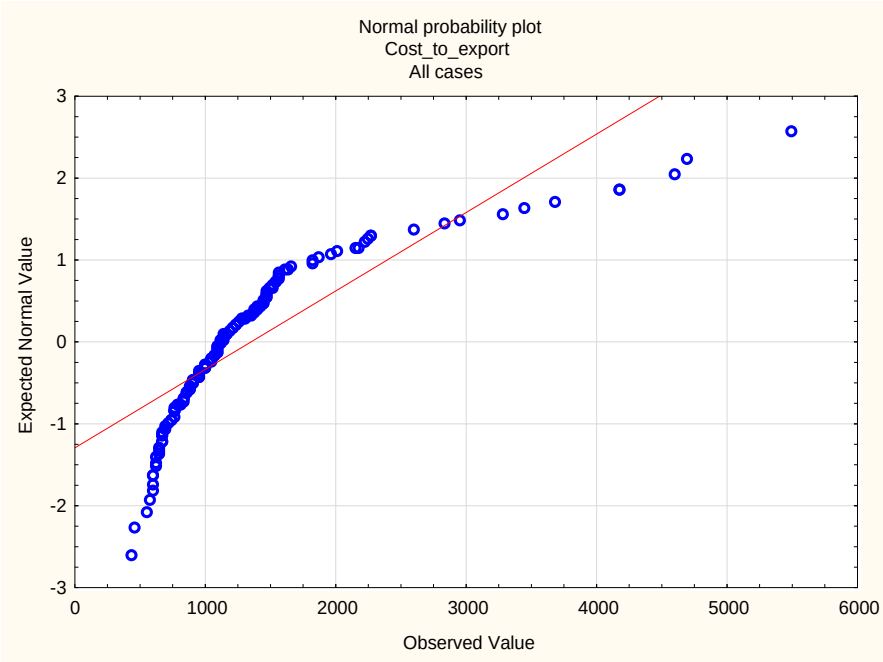
Graph A.5: Timeliness



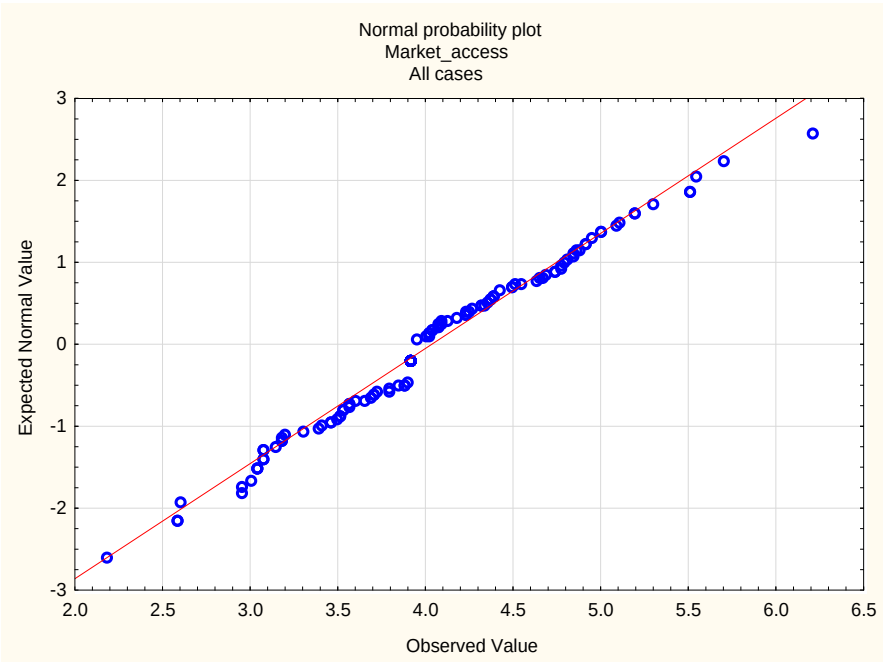
Graph A.6: Documents to export



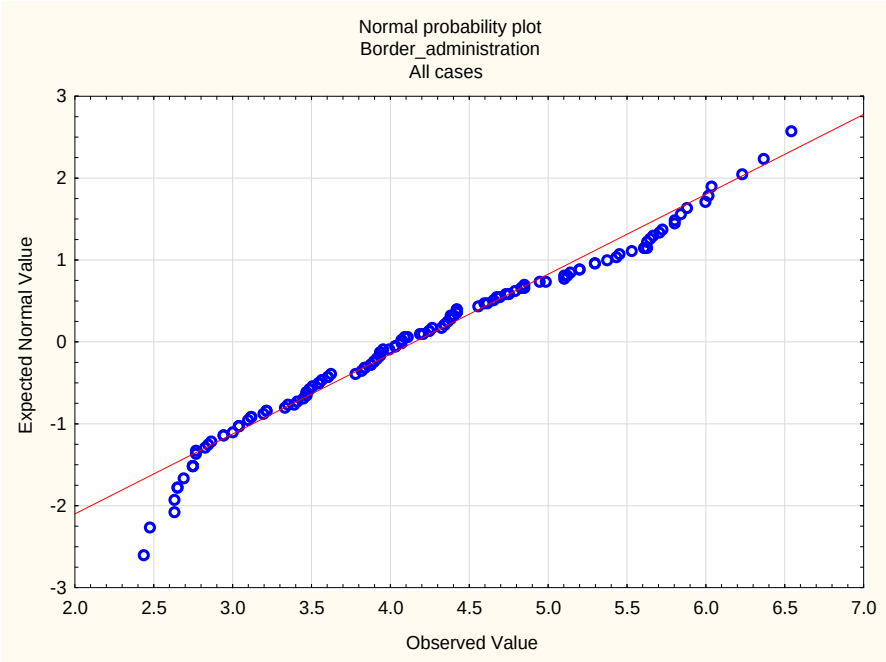
Graph A.7: Cost to export



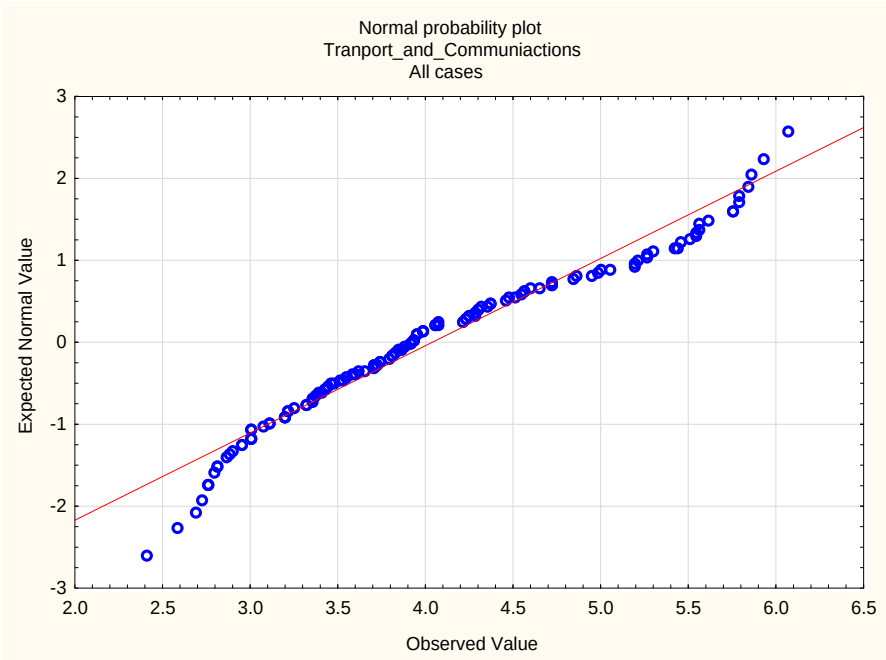
Graph A.8: Market access



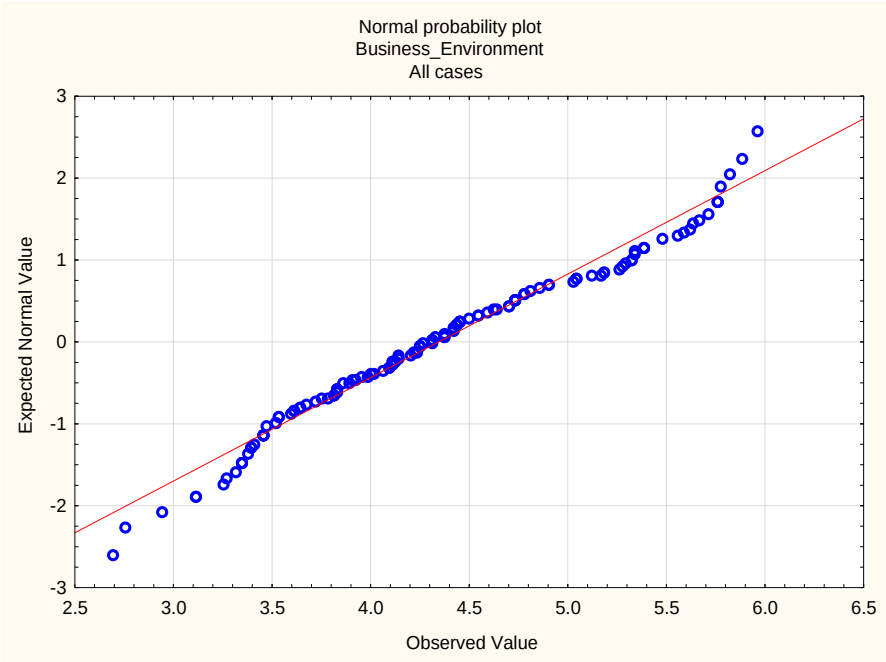
Graph A.9: Border administration



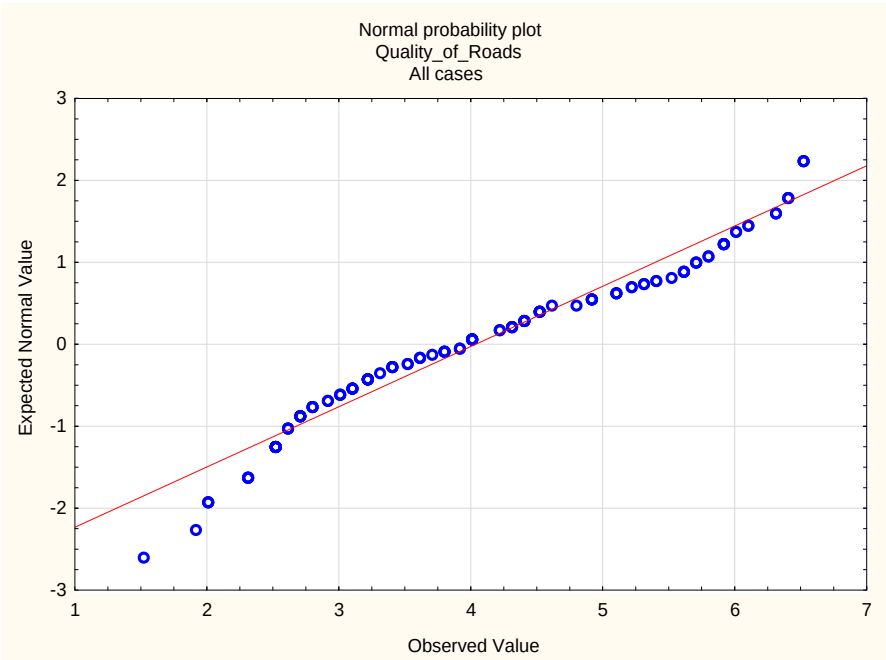
Graph A.10: Transport and communications



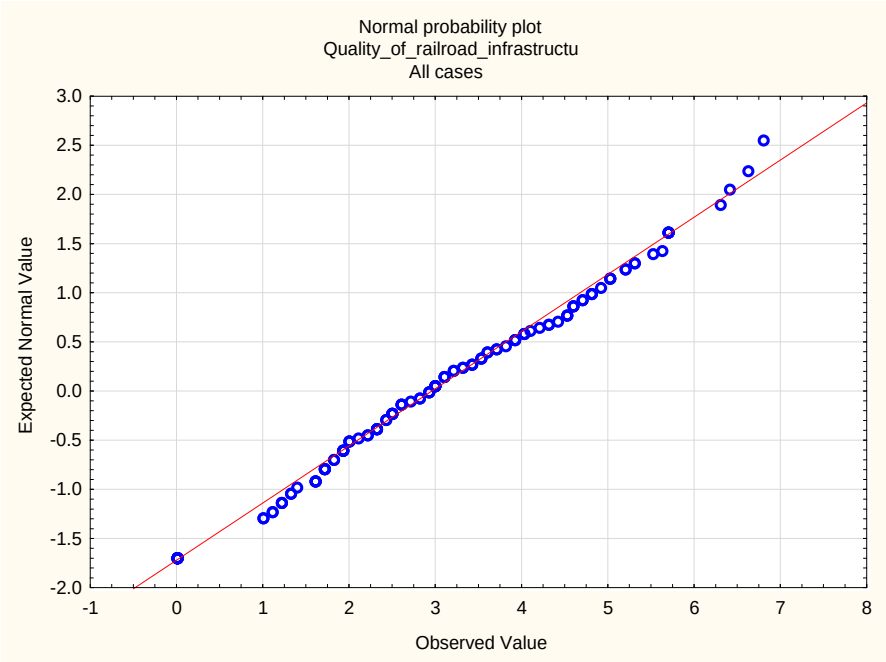
Graph A.11: Business environment



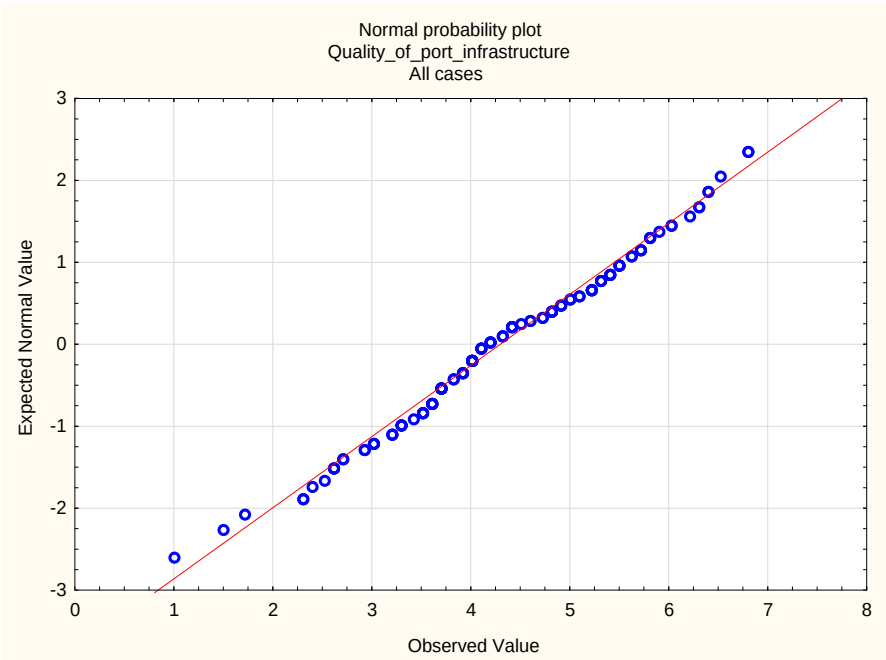
Graph A.12: Quality of roads



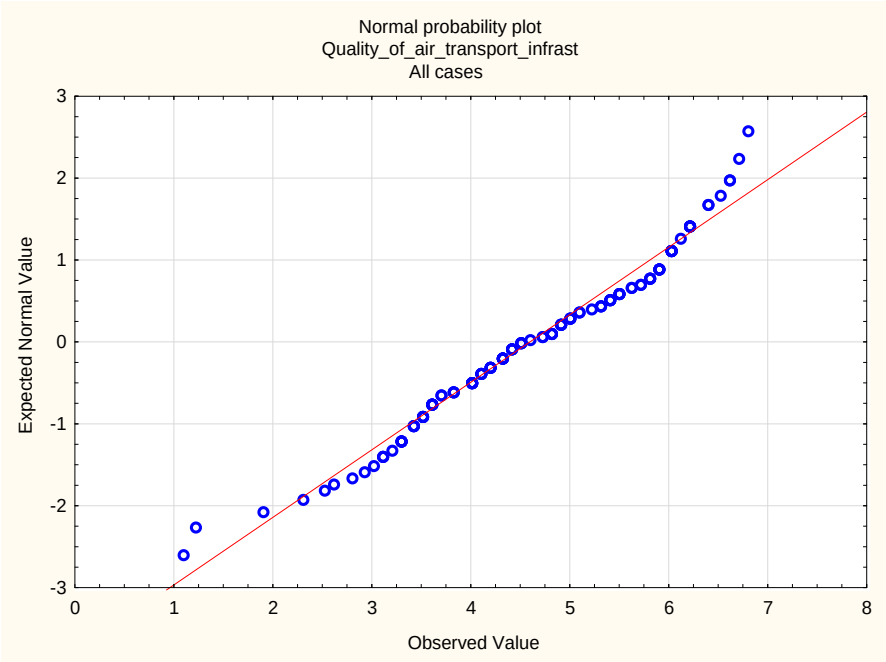
Graph A.13: Quality of railroad infrastructure



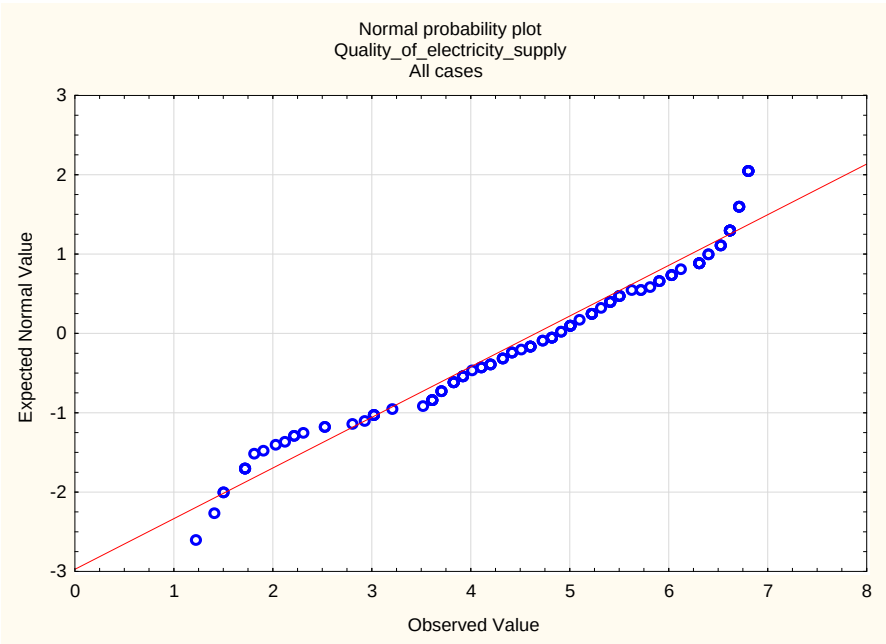
Graph A.14: Quality of port infrastructure



Graph A.15: Quality of air transport infrastructure



Graph A.16: Quality of electricity supply



APPENDIX B

DESCRIPTIVE STATISTICS

	Descriptive Statistics (Trade Facilitation Performance indexes_LaoPR					
Variable	Valid N	Mean	Median	Minimum	Maximum	Std. Dev.
Customs	132	2.766	2.630	1.9200	4.100	0.5480
Infrastructure	132	2.900	2.725	1.9000	4.260	0.6230
International_Shipments	132	2.944	2.865	2.0000	4.180	0.4457
Logistics_competence	132	2.945	2.800	2.1300	4.140	0.5429
Tracking	132	3.018	2.855	2.1000	4.140	0.5471
Timeliness	132	3.376	3.325	2.0800	4.390	0.5044
Docs_to_export	132	6.265	6.000	2.0000	13.000	1.9803
Time_to_export	132	19.068	16.000	5.0000	81.000	13.6545
Cost_to_export	132	1350.386	1099.000	435.0000	5491.000	883.3796
Market_access	132	4.037	3.900	2.1700	6.200	0.6971
Border_administration	132	4.152	4.040	2.4200	6.530	1.0010
Tranport_and_Communiactions	132	4.038	3.905	2.4100	6.060	0.9105
Business_Environment	132	4.345	4.280	2.6800	5.960	0.7744
Quality_of_Roads	132	4.036	3.950	1.5000	6.500	1.3109
Quality_of_railroad_infrastructu	132	2.973	2.900	0.0000	6.800	1.6588
Quality_of_port_infrastructure	132	4.298	4.100	1.0000	6.800	1.1317
Quality_of_air_transport_infrasl	132	4.598	4.500	1.1000	6.800	1.1841
Quality_of_electricity_supply	132	4.653	4.800	1.2000	6.800	1.5070

APPENDIX C

TRADE FACILITATION INDEX

Country	COMPOSITE INDEX (according to principle component weightings)
Singapore	2.32937
Hong Kong	2.23571
Finland	2.03249
Netherlands	2.03076
Denmark	1.96614
Germany	1.92832
France	1.80645
Sweden	1.80138
Switzerland	1.78414
Japan	1.75218
Belgium	1.74636
United Kingdom	1.74623
Austria	1.73144
Canada	1.67186
Luxembourg	1.63421
United States	1.61589
United Arab Emirates	1.54675
Korea	1.43183
Spain	1.37709
Australia	1.35623
Taiwan	1.34288
Norway	1.33918
Ireland	1.21516
Malaysia	1.16462
Iceland	0.95558
Portugal	0.91353
Italy	0.90724
Poland	0.86714
Qatar	0.81378
New Zealand	0.76835
South Africa	0.76772
Slovenia	0.67050
Chile	0.63351
Cyprus	0.62793
China	0.61863
Thailand	0.59673
Turkey	0.58683
Czech Republic	0.55580

Country	COMPOSITE INDEX (according to principle component weightings)
Bahrain	0.53505
Tunisia	0.45116
Estonia	0.40264
Panama	0.39004
Saudi Arabia	0.34593
Hungary	0.33689
Oman	0.31903
Lithuania	0.31826
Croatia	0.29127
Morocco	0.21542
Slovak Republic	0.16533
Mexico	0.08449
Uruguay	0.06995
Georgia	0.06723
Latvia	0.03096
Bulgaria	-0.00567
Mauritius	-0.01678
Indonesia	-0.06446
Greece	-0.06910
Vietnam	-0.08135
Sri-Lanka	-0.11847
Peru	-0.14034
Egypt	-0.15898
India	-0.16602
Malta	-0.17017
Bahamas	-0.20247
Albania	-0.21714
Kuwait	-0.22545
Brazil	-0.23532
Romania	-0.23777
Philippines	-0.26045
Costa Rica	-0.29227
Jordan	-0.34072
Argentina	-0.34942
Bosnia & Herzegovina	-0.38380
Botswana	-0.39044
Namibia	-0.39997
Bhutan	-0.40227
Dominican Republic	-0.40287
Colombia	-0.42391
Ukraine	-0.43905
Montenegro	-0.45509

Country	COMPOSITE INDEX (according to principle component weightings)
Guatemala	-0.48923
Serbia	-0.49087
Ecuador	-0.51670
Togo	-0.52561
Pakistan	-0.52899
Syrian Arab Republic	-0.54764
Lebanon	-0.55521
Gambia	-0.64885
Lao PDR	-0.65312
Armenia	-0.65851
Jamaica	-0.67242
Benin	-0.68777
Guinea-Bissau	-0.69208
Belarus	-0.70027
Senegal	-0.76582
Iran, Islamic Rep	-0.77669
Tanzania	-0.77926
Madagascar	-0.78010
Azerbaijan	-0.78388
Cambodia	-0.79663
Ghana	-0.81167
Bolivia	-0.81981
Macedonia	-0.82049
Solomon Islands	-0.83766
Yemen	-0.85563
Malawi	-0.87344
Honduras	-0.88789
Maldives	-0.91111
Cote d'Ivoire	-0.91529
Zimbabwe	-0.93471
Russian	-0.98127
Kenya	-0.98543
Liberia	-1.04037
Algeria	-1.04429
Gabon	-1.05409
Kazakhstan	-1.06094
El Salvador	-1.06854
Sao Tome & Principe	-1.08442
Cameroon	-1.12923
Niger	-1.18549
Moldova	-1.19100
Fiji	-1.19884

Country	COMPOSITE INDEX (according to principle component weightings)
Mauritania	-1.20039
Paraguay	-1.21922
Guinea	-1.25904
Nigeria	-1.26357
Papua New Guinea	-1.26759
Central African Republic	-1.38051
Kyrgyz Republic	-1.41520
Venezuela, RB	-1.46873
Uzbekistan	-1.49898
Myanmar	-1.52932

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