



GORDON INSTITUTE
OF BUSINESS SCIENCE

University of Pretoria

The Relationship between Export Performance and Global Economic Performance

Submitted by:

Edwin Emmanuel Ukama

11356449

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

Date: 7 November 2012

ABSTRACT

As trade between nations has progressed, some countries have focussed their economic policies on increasing exports. In many cases, these exports have been the most significant driver behind the economic success of these nations and the resultant improvement in the welfare of their citizens. This research is needed in order to understand the extent that a country is dependent on the economic output of its trading partners to drive its export performance. This is of particular interest in the context of the current economic issues being experienced in some of the major markets of the world. The research evaluates the statistical relationship between world GDP and export performance, adjusting for different time periods and different industries. A Granger causality test was also applied in an effort to avoid the shortfalls of simple longitudinal regression tests. The sample included data from 1948 to 2010, across 11 industries in 20 countries.

The research found a strong relationship between world GDP and export performance, although the results of the Granger test show that this is not a causal relationship. The diversity and complexity of a country's industrial structure emerged as a significant theme in the research and was integrated into a model (Figure 5) that can be used by policy makers to assess their own export position according to these variables. The results of this research can assist policy makers in understanding the vulnerabilities of their export performance to global economic cycles as well as in prioritising and evaluating industrial sector development. The research highlights how, in spite of the challenges that may be experienced with regards to global economic performance, there is still a great deal of scope for policy makers to influence their own futures when it comes to export performance.

KEY WORDS

Exports; Trade; Economic Performance

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Name: Edwin Emmanuel Ukama

Signature:

Date: 7 November 2012

ACKNOWLEDGEMENTS

I am truly blessed to have spent so much time researching a topic I am so interested in. This research journey has been personally fulfilling and I would like to acknowledge all those who assisted me in the process.

My research supervisor Professor Adrian Saville: for his insight, rigour and dedication to my work. Thank you for allowing me to explore my own curiosity on a topic that so many people have different and interesting views on. Your passion for South Africa is contagious and I will always believe that where we are today does not have to determine where we will be in the future.

Roulof Hefer and Paul Claasen: for your passion and enthusiasm in delivering a high standard of statistical and econometric output for this paper. You are some of the most talented, hard working and honest students I have ever met and will make great economists one day.

The GIBS faculty who supported us in this journey: Margie Sutherland in her numerous research workshops and all other faculty and staff.

The team at UTi Worldwide: for investing so heavily in my growth and development and providing me with the platform to explore my interests. Especially to Jenny, Paul and Gavin for believing in me.

My friends and family: for supporting me and always encouraging me. Especially to my wife Kudzai and my son Munashe for all the time we could have spent together that you sacrificed in order to allow me to complete this MBA.

Finally, to my Lord and Saviour Jesus Christ, you were the rock that held everything together for the last two years.

Table of Contents

1.	CHAPTER ONE: INTRODUCTION.....	1
1.1	Introduction to the research problem	1
1.2	Defining the research problem	2
1.3	Changes in world trade structures	5
1.4	Motivation for the research.....	6
2.	CHAPTER TWO: LITERATURE	8
2.1	Introduction to the literature review	8
2.2	Why study export performance?	9
2.2.1	Economic vulnerability in the context of exports.....	10
2.2.2	The export-led growth hypothesis.....	12
2.2.3	The fallacy of composition	14
2.2.4	Thirlwall's law	15
2.3	Exogenous factors affecting export performance.....	16
2.3.1	Exports and global economic cycles.....	16
2.3.2	Exports and global value chains.....	18
2.3.3	Trade openness and protectionism	20
2.4	Endogenous factors affecting export performance.....	22
2.4.1	Firm-level factors influencing export performance.....	22
2.4.2	Exports and the composition of industry in an economy.....	24
2.4.3	Export diversity versus export concentration	26
2.5	Literature review conclusion.....	28
3.	CHAPTER THREE: RESEARCH HYPOTHESES	30
3.1	Introduction	30
3.2	Hypothesis One	30
3.3	Hypothesis Two	31
3.4	Hypothesis Three.....	31

4.	CHAPTER FOUR: RESEARCH METHOD	33
4.1	Introduction to the research method	33
4.2	The unit of analysis	33
4.3	Population	33
4.4	Sampling method and size	33
4.5	Data gathering process	34
4.6	Analysis approach.....	35
4.6.1	Regression coefficient	35
4.6.2	Granger causality test.....	36
4.6.2.1	Procedure One: Stationarity test	37
4.6.2.2	Procedure Two: Cointegration test.....	37
4.6.2.3	Procedure Three: Causality test.....	38
4.7	Research limitations.....	38
5.	CHAPTER FIVE: RESULTS	40
5.1	Sample description	40
5.2	Hypothesis One	40
5.3	Hypothesis Two	42
5.3.1	Analysis by product grouping	43
5.3.2	Hypothesis Two - Conclusion	44
5.4	Hypothesis Three.....	45
5.4.1	Procedure One: Stationarity test	45
5.4.2	Procedure Two: Cointegration test	47
5.4.3	Procedure Three: Causality test	48
6.	CHAPTER SIX: DISCUSSION.....	49
6.1	Introduction to the discussion.....	49
6.2	Hypothesis One:	49
6.2.1	Economic vulnerability.....	50

6.2.2	Implications of hypothesis results on exogenous influences	52
6.2.3	Implications of hypothesis results on endogenous influences	53
6.3	Hypothesis Two:	55
6.3.1	Exogenous factors impacting exports by industry.....	55
6.3.2	Endogenous factors impacting export performance by industry ...	57
6.4	Hypothesis Three – A model for classifying the results.....	59
6.4.1	Internal vs. external causality (y axis).....	61
6.4.2	Industry complexity (x axis)	61
6.4.3	Section 1: Exogenous causality and simple industry structure	61
6.4.4	Section 2: Exogenous causality and complex industry structure ..	62
6.4.5	Section 3: Endogenous causality and simple industry structure...	62
6.4.6	Section 4: Endogenous causality and complex industry	62
6.5	Conclusion to the discussion.....	63
7.	CHAPTER SEVEN: CONCLUSION.....	64
7.1	Introduction	64
7.2	Synthesis of the research findings	64
7.3	Balancing industry complexity with export vulnerability.....	66
7.4	Recommendations for policy makers	66
7.5	Recommendations for firms	68
7.6	Recommendations for future research.....	68
7.7	Closing reflections.....	69
8.	REFERENCE LIST	70
9.	Appendices	82
9.1	World Trade Organisation product classifications	82
	Product definitions	82
	Primary products.....	82
	Manufactures:	82

Other products: 84

LISTS OF FIGURES AND TABLES

<u>Figures</u>	<u>Page</u>
Figure 1: Export exposure	3
Figure 2: Determinants of export performance	23
Figure 3: SAS autocorrelation and Dickey-Fuller test sample	46
Figure 4: Cointegration test using SAS	47
Figure 5: Export-GDP-Industry matrix	60
<u>Tables</u>	
Table 1: Example of raw data collation template	36
Table 2: Regressions and p-values over different periods	41
Table 3: Regression by commodity	42
Table 4: Collated regression results by industry and country	85
Table 5: Granger causality results	48
Table 6: Ranked comparisons of GDP and export relationships	51

1. CHAPTER ONE: INTRODUCTION

1.1 Introduction to the research problem

Considerable literature has developed in recent years in an effort to understand the extent to which a country's exports drive that same country's economic growth (Mahadevan, 2007; Awokuse, 2008; Chan & Dang, 2010). This so-called export-led growth (ELG) hypothesis, however, merely assesses the extent to which economic performance is export-led. As such, the results of ELG fail to provide the information policy makers would need when attempting to quantify a nation's vulnerability to changes in the economic output of their trading partners.

In considering changes in the economic output of trading partners, there is little agreement on whether macroeconomic fluctuations are a function of exogenous forces or endogenous forces (Harvey, 2011, p.382). However, the policy implications that follow from this research activity are important because if economic problems largely arise from external shocks and errors in policy, then a hands-off approach to managing the economy is more appropriate (Harvey, 2011, p.382). If this assumption is incorrect, however, then less interference in an economy leaves people at the mercy of an imperfect system suffering under adverse endogenous influences (Harvey, 2011, p.382). If international economic activity or world GDP is exogenous to an economy, then policy intervention to promote export activity is futile because export performance largely depends on factors out of the control of the host country. If the diagnosis is different, and world GDP is endogenous to a home country's performance, then intervention in promoting exports would be important in increasing world demand for a country's exports.

Thus, the research aims to develop empirical tools to quantify the relationship between a country's level of exports and the GDP of the recipient country. This will be done by applying empirical tools to examine the relationship between host country exports and the economic activity of its top trading partners. It will

then be possible to compare the strength of the relationship between a country's exports and the GDP of the recipient country over different time periods, in order to assess how changes in the global environment have impacted it. The conclusions from the above recommendations can be provided to policy makers for how to manage their export programmes.

Hwang and Im (2009) identified five main factors that affect international trade. These were: (i) world demand; (ii) domestic demand; (iii) exchange rate; (iv) credit markets; and (v) protectionism (Hwang & Im, 2009). This research will focus on world GDP, which is consistent with Hwang and Im's (2009) definition of world demand, although as the document progresses it will become apparent that there are other factors besides these that affect international trade.

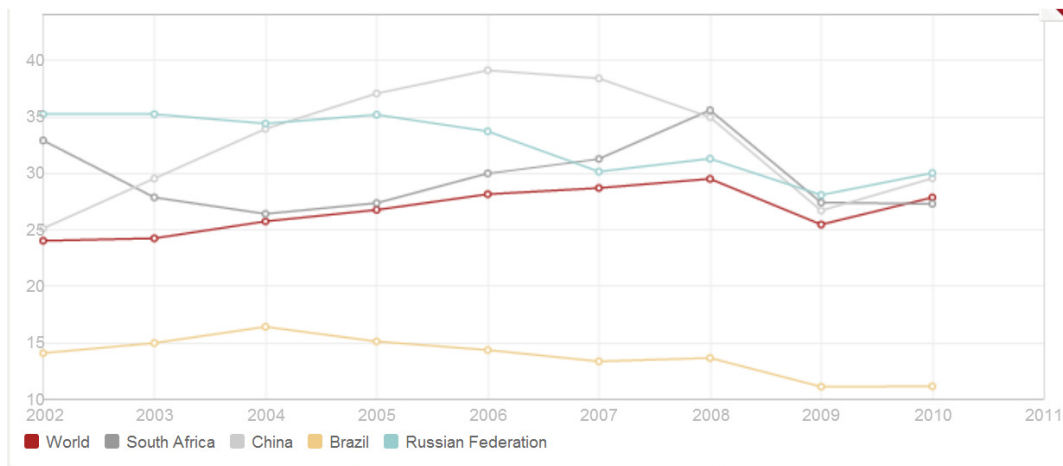
1.2 Defining the research problem

When countries pursue an export-oriented economic strategy they may benefit through productivity gains from economies of scale, specialisation, capital accumulation, employment growth and wage growth (Mahadevan, 2007). Academic interest in export-oriented industrialisation has been sustained for many years. Keasing (1967, p.304) is an example of an earlier author who looked at the benefit to a nation of an outward looking industrial policy focussed on "industrial and trade happenings outside the country". Since then, a substantial literature has developed that concerns the ELG hypothesis, which points towards there being a causal link between a nation's exports and the economic growth of that same nation (Huang & Wang, 2007).

The trended effect of international GDP on a nation's exports, however, is of more academic interest than any short-term fluctuations. Figure 1 below details the export exposure of the world, South Africa, China, Brazil and the Russian Federation (Russia). The graph shows how world export exposure declined briefly in 2008 but then increased in 2009. Interestingly, Chinese export exposure had started to decline in 2006 prior to the 2008 financial crisis, while Brazilian export exposure had been declining steadily since 2004. Importantly, despite the trend of exports contributing less to the Brazilian economy, some

analysts such as de Sainte Croix (2012) still diagnosed that the European economic crisis and the North American recession were the reasons for Brazil's slowdown in economic growth from 7.53% in 2010 to 2.73% in 2011. In other words, the assumption is that Brazil's export performance is a function of global demand (or world GDP).

Figure 1: Export Exposure



Source: World Bank and OECD (2012)

Whilst the world's GDP may explain Brazil's declining export performance, there could be other possible explanations for this result. A study by Muriel and Terra (2009) showed that the sources of comparative advantage for Brazil are the relative abundance of capital, land and unskilled labour. This raises the question of whether declines in export performance have more to do with global economic cycles, as has been surmised by de Sainte Croix (2012), or whether there is something else affecting the export performance of the country in question, namely internal factors. Thus an alternative view suggests that these sources of Brazilian comparative advantage have been deteriorating over time. The merit of this argument could be empirically tested by comparing the various factors of capital, land and unskilled labour, against those of competing export nations. Another approach could be to analyse other GDP components such as consumption, investment and government expenditure as percentages of GDP, to see if any recent variances in the components of GDP can explain this result.

There are many ways to come to a conclusion on this analysis, although it is the author's opinion that a decline in export performance should not be trivially attributed to global GDP and economic cycles. The abundance of literature on the 2008 financial crisis, as well as its exposure in the media, makes it a convenient causal factor for analysts to use to explain export performance (Chongvilaivan, 2010). This is despite the fact that there may not be any significant causal relationship between international GDP growth and that specific country's exports. Santos-Paulino (2010, p.1107) highlighted how there may be country-specific factors unrelated to the economic fortunes of the world economy or business cycles that may explain the export performance of emerging economies, such as "the quality of human capital, the approach to economic factors, government support and political stability", whereas de Saint-Croix (2012) seemed to focus solely on economic cycles.

In the case of Brazil, the poverty headcount ratio and the national poverty line as expressed as a percentage of the population decreased from 34.4% in 2002 to 21.4% in 2010, while at the same time GDP per capita increased from \$5311 in 2002 to \$9175 in 2010 (World Bank, 2012). There is a possibility that the decline in Brazilian exports, expressed as a percentage of GDP, is due to changes in internal consumption patterns and structural changes in the Brazilian economy, indicating that the Brazilian economy is consumption-led and not export-led. However, analysts still defer to global economic growth as an explanation for Brazil's export performance and in turn use this as an explanation for their GDP performance.

In a study of eight East Asian countries, Lee (2011) identified that country-specific factors explained about 50% of the economic output volatility of these economies between 1997 and 2007, the regional factors accounted for 24% of the economic output volatility, and the world factor only explained 7% of the output variation of the median country. While this represents a small sample of eight countries, it may provide some indication that local economic policies and factors may be more relevant in explaining economic performance and variables than global factors. Chongvilaivan (2010), however, expressed how the decoupling of the Asian economies to the fortunes of the international

economy is a myth. This view was particularly due to these economies' level of export exposure (Chongvilaivan, 2010).

Thus two authors studying a similar sample of countries have sharply differing points of view of the overall effect of international demand factors on a country's export performance. This sharp difference of opinions underlies a need to better understand the relationship between the global economy and a country's export performance. It can be inferred depending on the interpretation of results, but uncertainty can be removed by more rigorous analysis with a broader, more representative, sample. This is made more pertinent considering the changes currently being experienced in the global economy where developing economies are experiencing greater economic growth than developed economies, which in turn points to structural shifts in global trade performance.

1.3 Changes in world trade structures

Understanding exogenous factors that influence trade may be helpful in understanding trade structures. This could be important when one looks at how the South African Minister of Trade and Industry, Rob Davies, highlighted in a presentation to the World Export Development Forum that there was a fundamental change being experienced in the world economy as economies such as China, India, Brazil, South–East Asia and Africa showed significant growth (Davies, 2010). Davies (2010, p.16) highlighted the “sluggishness in the developed world” and “diminishing prospects for credit funded consumer growth” as factors constraining developed economies. Trade between developing economies is expected to increase significantly and new trade relationships are expected to emerge in the future (Davies, 2010). These changes taking place in the global economic environment are largely beyond the control of South Africa and other exporting nations.

There is also evidence of the potential effect of global GDP on a nation's export performance in African countries. Between 1999 and 2008, the total value of South African exports increased from \$26.7 billion to \$100.5 billion (Republic of South Africa, Department of Trade and Industry, 2012). In 2009, China became

South Africa's largest trading partner from being the fifth largest partner the year before (Department of Trade and Industry, 2012). During the same period between 1999 and 2008, world GDP increased from \$31.2 trillion to \$61.3 trillion, while China's (GDP) increased from \$1 trillion to \$4.5 trillion (World Bank, 2012). In 2009, due to the impact of the financial crisis and ensuing recession, world GDP fell to \$58 trillion while China's GDP increased to \$4.99 trillion (World Bank, 2012). South African trade with each of its top five trading partners fell dramatically from 2008 to 2009, except for trade with China which increased by over 40% (Republic of South Africa, Department of Trade and Industry, 2012).

It seems that China's trade with the developed nations has also been affected in the short term by the global economy. The Chinese economy grew at 8.1% in the first quarter of 2012 - its slowest pace in nearly three years - which was directly attributed by the Chinese government to falling demand due to the European crisis (Zuo, 2012). China became the biggest trading partner to the European Union (EU) in 2011. However, the USA, Hong Kong, Japan and South Korea all rank higher than any EU countries in terms of export destinations for Chinese goods (Hong Kong Trade Development Council, 2012). Based on these statistics, the inference could be that the decline in the EU's GDP had a significant effect on Chinese exports, although this inference bears no academic weight because a causal relationship has not been tested empirically.

1.4 Motivation for the research

The empirical research will study the relationship between a country's export performance and the GDP of the countries it is exporting to. This empirical research is important for at least three specific reasons. First, as global economic dynamics continue to change, policy makers need to know to what extent they can attribute export performance solely to the global economic environment. They will need empirical evidence to support this point of view using a method that can easily be replicated across economies and geographies. Second, should a strong causal relationship emerge between

exports and the GDP of the recipient country, there may be implications in terms of how a country should engage with its trading partners. One possible extreme policy alternative could be to look at ways of decoupling the country's export performance from certain trading partners during times of economic downturn. Third, evidence of weak causal relationships could be an indication that export policy should rather focus on factors within the nation's direct control.

The contribution of the research, therefore, is a specific contribution to the field of the study of economic cycles and whether in a study of export performance, world demand can be regarded as a significant influencing variable. This will give support towards an argument of whether endogenous or exogenous variables are more important as determinants of export performance. Second, with the foundation of economic success for many developing countries being ELG, the research aims to provide insights into whether this growth can be sustained in the context of the rapidly changing structure of the global economy.

2. CHAPTER TWO: LITERATURE

2.1 Introduction to the literature review

The literature has been organised into two distinct categories - those factors that are endogenous drivers of export performance and those that are exogenous drivers of export performance. If the drivers of export performance are endogenous then they are a direct result of macro-economic policy (Rebucci, 2010). Therefore, any evidence in support of the endogenous factors that influence export performance may support the conventional view that “a stable macro-economic environment is a necessary condition for growth” (Rebucci, 2010, p. 535). Endogenous growth theory (EGT) is the field of study that provides several ways in which economic policy can increase long-term growth rates (Brzezinski & Dzielinski, 2009). If the drivers of a nation’s export performance are exogenous then they are largely determined by external factors outside of the influence of a nation’s macroeconomic policy (Rebucci, 2010).

The initial section of the literature review presents arguments on why this study on export performance is required. This will clarify why export performance is important to a nation and how a country can benefit from improving its understanding of the drivers of exports. This section includes a discussion on the advantages and disadvantages of following an export-led growth strategy, as well as a discussion on exports in the context of economic vulnerability. Included will be some of the major fields of study in current literature on the performance of the export sector.

The study then goes on to discuss the exogenous factors that influence a nation’s export performance. This highlights why changes in economic output in the global economy are important to a county’s exports. Bearing in mind that this paper is dedicated towards understanding the influence of specific exogenous factors (world demand), the alternative endogenous view is discussed in order to provide a balanced argument. This includes some alternative views on export concentration and export diversity in relation to

global economic performance. The structural composition of exports is included as an endogenous factor affecting export growth, although structural composition may also be interpreted as being an exogenous factor.

2.2 Why study export performance?

The globalisation of the world economy and the common view that increasing exports has benefits for society has encouraged research into the field of exports (Liargovas & Skandalis, 2008). Differences in economic growth have created differences in income across countries, which transform into significant differences in living standards and other indicators of the quality of life (Brzezinski & Dzielinski, 2009). Developing and highly advanced countries are becoming aware of the importance of prioritising exports in national planning policies, although export-led growth policies have largely been implemented by developing countries (Liargovas & Skandalis, 2008).

There is a dynamic relationship between exports, domestic demand and economic growth, with exports and domestic demand being important for economic growth (Tsen, 2010). Moreover, economic growth has a positive impact on exports and domestic demand, meaning that successful and sustained economic growth requires growth in exports and growth in domestic demand (Tsen, 2010). The profile of cross-border trade in determining the economic and political fortunes of a nation is now so important that some authors such as Martin, Meyer and Thoenig (2008) even suggested that there is a greater chance of countries going to war if there are not strong bilateral trade ties between them.

Factors not in the control of the country have also not received enough attention in export performance research (Baldauf, Cravens & Wagner, 2000). A better understanding of how these factors influence export performance could assist in clarifying some unanswered empirical questions such as those raised by Blalock and Roy (2007), who looked into reasons why Asian export performance did not improve after the Asian financial crisis of 2007. They were faced with the dilemma that the results of their empirical study were largely

inconclusive. Export performance did not improve despite the fact that terms of trade improved in favour of exports as Asian currencies devalued, the level of entrepreneurial ambition was unchanged and firms that exported behaved in the same way as firms that were not exporting (Blalock & Roy, 2007). This Asian example also highlights the possible effect of export performance on economic vulnerability.

2.2.1 Economic vulnerability in the context of exports

Export instability is by no means the only cause of economic vulnerability, with other important factors being low levels of economic development, low economic growth and high levels of income inequality (Guillaumont, 2010). Briguglio, Cordina, Farrugia and Vella (2009) also included economic openness and reliance on strategic imports as factors contributing to economic vulnerability. However, the larger the share exports of GDP, the larger the impact of an export shortfall (Guillaumont, 2010). The literature (Agosin, Alvarez & Bravo-Ortega, 2012; Athukorala, 2009; Meilak, 2008; Feenstra, 2008) suggested that export concentration can make a nation vulnerable to external changes. Therefore, global output and demand fluctuations affecting a country's export performance may have serious implications on a country's overall economic vulnerability (Guillaumont, 2010). In protecting its economy, China's key challenge now is to rebalance domestic demand toward private consumption, which may be a good example of the effect of exports on economic vulnerability (Bibow, 2012).

A general insight is that open economies and economies with diversified exports seem to be less vulnerable than those economies with a high export concentration (Naude, McGillivray & Rossouw, 2008). However, there is consensus through many studies that export instability has a negative effect on growth (Naude et al., 2008). Guillaumont (2010) suggested that export instability was increasing and was significantly higher in less developed countries (LDCs), while it was decreasing in small island developing states (SIDS). Naude et al. (2008) identified certain characteristics that make the

South African economy vulnerable to external shocks. One of these factors was a dependence on commodity exports and reduced export diversity.

At a local level, the effect of economic vulnerability on the South African economy is further complicated because richer areas in South Africa are generally located closer to an export hub or international port and are exporting more of their gross geographic product (GGP) than poorer magisterial districts (Naude et al., 2008). Despite their affluence, these areas experienced higher volatility in their GDP growth rates than poorer areas, because they were more open for trade and exported on average 16% of GDP compared with only 3% in poorer areas (Naude et al., 2008). Thus the effect of export fluctuations was felt in the heart of the areas within the country where output was concentrated, making the overall effect on the economy more significant (Naude et al., 2008).

The ability of an economy to recover from the effects of adverse shocks and the ability to withstand shocks are, therefore, two key contributors to economic resilience (Briguglio et al., 2009). Should a strong relationship emerge between export performance and international economic growth, then an implication is that a country has to seek alternatives that will mitigate this effect as it impacts the overall economic resilience of the country. This is exacerbated because, as trade and financial linkages increase between countries, external shocks are more likely to be transmitted faster and stronger across borders (Duval & Vogel, 2008). The implications of exports on economic vulnerability are serious if one considers the study by Córdova and Seligson (2010), which provided evidence of economic vulnerability as a threat to political democracy, especially amongst the poor and the youth in Latin America.

Di Giovanni and Levchenko (2009) provided three perspectives on volatility and international trade. Their first observation was that economic sectors that are more open to international trade are more volatile. Second, the authors suggested that trade goes along with increased specialisation. Third, they suggested that “sectors that are more open to trade are less correlated with the rest of the economy, an effect that acts to reduce overall volatility” (di Giovanni & Levchenko, 2009, p.558). The combined effect is that “the relationship

between trade openness and overall volatility is positive and economically significant” (di Giovanni & Levchenko, 2009, p.558).

Three theories will be used to justify the need for this research by highlighting how topical export performance is in the current literature. The three theories of ELG, fallacy of composition and Thirlwall’s law show how the level of a nation’s exports can support or impede its growth potential. More importantly, the literature shows how each theory alone contributes to the argument, but cannot on its own answer the questions concerning the effect of the global economic environment on export performance.

2.2.2 The export-led growth hypothesis

ELG refers to the positive benefits that may accrue to a country when it pursues a strategy of increasing demand to foreign countries (Awokuse, 2008). The interest in a country pursuing export-oriented growth strategies is not new as there may be direct or indirect benefits for pursuing this strategy (Awokuse, 2008). Direct benefits include the resultant increase in output, which can translate into an increase in employment or income. Indirect effects include greater economies of scale in non-export industries and related improvements in technology (Awokuse, 2008). The basic concept of ELG is generally expressed in the same manner in literature, with similar definitions being provided by Chan and Dang (2010), Huang and Wang (2007) and Nain and Ahmad (2010). There is conflict in the literature, in terms of the empirical tests used to prove the ELG in practice. The methods for conducting empirical investigations of this nature are regularly improved and refined and consist of different methods such as bi-variate causality techniques, which include vector auto correction mechanisms (VECM) and Granger causality empirical techniques (Chan & Dang, 2010).

Keasing (1967) discussed outward-oriented growth strategies as a country’s intent to build capability based on the external market demands rather than internal market demands. Of particular interest is Keasing’s (1967, p.320) idea that “outward-looking strategy emphasises the quality and direction rather than

the absolute magnitude of industrial development”. Thus exports in this context are all about the indirect benefits of developing industrial capabilities by focussing externally. Other indirect benefits identified in the literature are by Mahadevan (2007), who included specialisation as one of the benefits of pursuing an export-led growth strategy, and Park, Yang, Shi and Jiang (2010), who showed that increasing exports did improve firm level productivity.

As the literature progressed, the emphasis seems to have changed completely to those factors that directly increase the volume of exports and their direct contribution to economic growth. In past studies on export performance, the emphasis has been on the relationship between export performance and the economic growth of the same country. In these empirical studies the ELG is either disregarded or supported based on the direct impact of exports on economic growth (Giles & Williams, 2000).

The first comprehensive review of the various empirical tests of the ELG was provided by Giles and Williams (2000), who reviewed over 150 articles to test the empirical relationship between exports and local economic growth. The authors identified two primary methods of empirical investigation, namely cross sectional studies and time series causality studies. Singh (2010) collated a survey of empirical studies on whether trade advances economic growth using a smaller sample than Giles and Williams (2000). Singh (2010), however, concluded that trade does not necessarily cause economic growth, open economies do not necessarily grow faster and trade policies have to be looked at in relation to other countries. These authors, however, did not review any empirical studies on the relationship between the economic growth of the world and export performance.

Nain and Ahmad (2010) produced an empirical study on India that failed to support the export-led growth hypothesis, while Kundu (2010) published an empirical study on India in the same year that supported the export-led growth hypothesis. Technically, each of the studies is methodologically sound and it is difficult to quantify the source of differing findings considering that there are so many elements to the Granger non-stationary data method used. Therefore,

further analysis of the ELG in this format will not bring us any closer to understanding the relationship between a country's exports and global economic growth, because the method of ELG does not aim to test this explicitly and also because of the inconsistency of the empirical results. Giles and Williams (2000) urged authors to exercise caution when using time series tests for the ELG, although they did not discredit these tests outright.

Chan and Dang (2010) identified some evidence of reverse causality between export performance and economic growth when they tested the ELG empirically. The Chang and Dang (2010) study is important because the authors aggregated total international export performance and total international economic growth into one model to test the ELG. The reverse causality, therefore, indicated that while exports contribute to international economic growth, there is evidence that international economic growth also contributes towards export performance. Their study, however, is not without its limitations.

Chan and Dang (2010) did not try to explore this reverse causality any further as their sample was only up to the year 2000 prior to the global recession. They also did not give an indication of whether this causal relationship is becoming weaker or stronger over time and did not breakdown the findings by country or by industry sector. Causality tests such as those used in the Chan and Dang (2010) study can be influenced by the omitted variables and while they may provide an indication of the relationship present, the inclusion of different variables could have produced different results (Siliverstovs & Herzer, 2007).

2.2.3 The fallacy of composition

While the ELG provides a positive view of why it is important for a country to boost its exports due to the direct and indirect economic benefits, there are some counter arguments against it. One such counter argument is the theory of the fallacy of composition. Kerr (2009) described the fallacy of composition as the situation where developing nations compete with each other to capture the demand of industrialised nations. Razmi and Blecker (2008) highlighted how, by competing against each other, these countries ended up in a situation where

they were forced to reduce their prices in times of depressed international demand. The gains of trade were transferred to the importing countries and success in the export economy came to one country at the expense of another (Razmi & Blecker, 2008).

The fallacy of composition directly challenges the ELG by providing a scenario where a country that focuses on an ELG strategy may not experience economic growth, but rather experience declining growth. This is because it reduces prices and wages while failing to invest in productive capacity due to declining export earnings (Kerr, 2009). In studies of the fallacy of composition, the catalyst was always constrained international demand (Razmi & Blecker, 2008). Therefore, understanding the relationship between international economic growth and export performance may provide further evidence that mitigates or aggravates the effect of the fallacy of composition.

2.2.4 Thirlwall's law

Thirlwall's law states that if a country's growth rate "results in a rate of import growth exceeding that of exports, the resulting deterioration in the balance of payments impedes the process of economic growth and consequently reduces economic growth" (Ozturk & Acaravci, 2010, p.262). A deficit in the balance of payments may result in an exchange rate depreciation which represents a worsening of the terms of trade (Bajo-Rubio & Díaz-Roldán, 2009). In Ozturk and Acaravci's (2010) study of South Africa, they found empirical evidence to support Thirlwall's law and recommended an economic policy that promotes exports.

The application of Thirlwall's law is significant to this study because it talks to a demand constrained economy rather than a supply constrained economy (Ozturk & Acaravci, 2010). This is consistent with a post Keynesian view rather than a Neo Classical economic view and the balance of payments has become a very important issue for developing countries (Ozturk & Acaravci. 2010).

2.3 Exogenous factors affecting export performance

Hwang and Im (2009) identified five important factors that affected trade. These were (i) the level of world demand; (ii) the level of domestic demand; (iii) the level of exchange rate volatility; (iv) access to credit markets; and (v) the degree of protectionism. Of these factors, world demand emerged as the most influential. This is because of vertical intra-industry trade links as well the effect of import demand on a country's exports (Hwang & Im, 2009). Taking a Keynesian approach to growth, then, it is demand growth that drives the development of an economy (Cardoso & Soukiazis, 2008), while foreign demand is the most important element that can restrict growth (Cardoso & Soukiazis, 2008).

2.3.1 Exports and global economic cycles

In 2010 the IMF forecast a reduction in GDP for the Commonwealth of Independent States due to the declining demand for exports from developed countries and the associated decrease in prices of raw materials (Vlasiuk, 2010). The resultant decline in global demand was so significant that this decline in exports could not be offset by the devaluation of a currency. Vlasiuk (2010) used empirical data from the Ukraine in 2008 and 2009 to show how a devaluation of the currency had a negligible effect on the overall level of exports.

The collapse in world trade during the 2008 financial crisis was also more severe than in previous recessions that had occurred post the Second World War (Levchenko, Lewis & Tesar, 2010) - only the 2001 recession was comparable in severity. The limitation with the Levchenko et al. (2010) study is that it is based on US trade data only. However, the US - as the world's largest economy - should still be able to provide valid insights into global trade movements. An indirect consequence of the 2008 financial crisis was the reduction in the liquidity available to finance international trade. This had the effect of increasing the cost of trade credit for exporters, with developing

country exporters being the hardest hit. Any resultant declines in exports due to lack of liquidity can be considered as exogenous factors (Capling & Higgott, 2009). The reason for classifying this as an exogenous factor is that Capling and Higgott (2009) were careful to mention that these increases in protectionist behaviour did not indicate a failure of the World Trade Organisation (WTO) or other global trade institutions. Rather, this reinforced how crucial they are in encouraging and stimulating international trade (Capling & Higgott, 2009).

Economic downturns are also not only a western or advanced economy phenomenon. Chinese growth has also slowed since 2009 due to the global financial crisis (Guo & N'Diaye, 2009) and this decline is argued to be primarily due to China's dependence on exports to advanced economies as the economy became more market oriented (Guo & N'Diaye, 2009). It is not likely that China can maintain its past growth due to the slow recovery of the current global economy (Guo & N'Diaye, 2009). Japan is the only economy in Asia that has historically managed to grow its market share of the world economy to 10% while achieving similar growth rates, however this was followed by a period of significant decline (Guo & N'Diaye, 2009).

Kaplinsky and Morris (2009) also highlighted how Sub-Saharan Africa (SSA) struggled to compete with Asia on a global scale in terms of exports. Thus, as Asian exports grew, there may have been an indirect decline in SSA due to the region being less competitive in the global market than Asia. Therefore, even if Asia was driving global economic growth and Africa-Asia trade is growing, there may still be other factors that prevent the African countries from capitalising on this improvement in Asia's economic performance. In order to analyse the effect of the global economy over time, it will be important to compare export performance and the GDP performance of the trading partners over different time periods. This will support or oppose Guo and N'Diaye's (2009) and Vlasiuk's (2010) opinions of deteriorating export performance during a recession.

China's biggest African trading partners, which mainly are oil-exporting, tend to cut themselves off from the African market as their exports to China increase

(Montinari & Prodi, 2011). On the contrary, a rise in exports to China from non-oil-exporting countries increased trade between African countries (Montinari & Prodi, 2011). This may be due to the additional wealth created by these exports (Montinari & Prodi, 2011). This empirical study by Montinari and Prodi (2011) showed how trade responded differently to changes in the global economic output of trading partners and how it is in a nation's interests to understand this relationship. Firms choose whether they want to export or not and foreign income volatility has a negative impact on exports (Franke, as cited in Bredin & Cotter, 2008). This may be due to the increased cash flows being required in gearing up for exports and the overall costs of entry in comparison to the expected return.

Rogova (2011) emphasised the dangers of an economy being too export oriented with too great an external dependence. He used the Russian economy as his case study to demonstrate how the country's fiscal and monetary policy is now too dependent on exogenous factors (Rogova, 2011). This has limited the purposeful development of a monetary system that supports the development of economic sectors that will provide the most benefit to society (Rogova, 2011).

2.3.2 Exports and global value chains

Developing economies are becoming increasingly export oriented, creating what are known as global value chains. Milberg and Winkler (2010, p.4) defined global value chains as "the expansion of global production networks". Grossman and Rossi-Hansberg (2008) referred to this as the "trade in tasks" which Milberg and Winkler (2010) distinguished from the trade in final goods. Stiglitz (as cited in Milberg & Winkler (2010)) emphasised how the recent downturn was spread by the way that global financial markets are connected. Developing countries that are dependent on exports were the main casualties because of their participation in global value chains (Milberg & Winkler, 2010).

An alternative view on export linkages suggested by Athukorala (2009) could be that there has been a natural progression in terms of how world trade has

developed. Since 1970, the progression in world trade has been that of classical food products being replaced by processed food products (Athukorala, 2009). Certain factors have contributed towards this, which include the internationalisation of food, international migration, the revolution in communication and the increase in international tourism (Athukorala, 2009). The next phase of international trade was the early entry of global production sharing, where activities involved in the production of goods or services were separated across two or more countries (Athukorala, 2009).

This is consistent with the global value chains as described by Milberg and Winkler (2010) and with Grossman and Rossi-Hansberg's (2008) trade in tasks. Athukorala (2009), however, distinguished between two stages of this development. The first stage occurred when small portions of outputs were outsourced to low-cost locations and later re-imported back to the host country for assembly and incorporation into the final product. As time has progressed, however, many countries could be involved in the assembly procedures at parts of the value chain, which represents the second phase in value chain development (Athukorala, 2009). Thus, given the nature of global value chains, international economic demand and growth can have significant impacts on a country's export performance. An extension to this concept which is also an exogenous factor is that the more other nations are exposed to a country's media, the more likely they are to buy its products (Quinn, 2009).

Thus far, the literature review has focused on the effect of economic growth in the importing country in terms of how it influences demand for another country's exports. This is based on Hwang and Im's (2009) view of world demand and its direct effect on export performance. There are, however, other indirect effects that a depressed global economic output may have on another country's exports. This is to do with the level of a country's trade openness and the effect of protectionism.

2.3.3 Trade openness and protectionism

Bussière, Perez-Barreiro Straub and Taglioni (2011) provided evidence of why there is an increasing trend towards protectionism. First they cited the slow progress in the Doha Round of WTO trade negotiations and how it has taken many years to get resolution on global trade liberalisation for agriculture and services (Bussière et al., 2011). Second, there has also been an increase in anti-dumping sentiment and policy, although not all of the increase in anti-dumping activity since 2008 should be attributed to the economic crisis (Bussière et al., 2011). There is still a reasonable expectation of an increase in anti-dumping activity in the future due to the fact that there is political and societal sentiment that is cautious regarding the effect of free trade on local employment and local welfare (Bussière et al., 2011). This is especially applicable where global trade has been perceived to contribute to the widening wage inequality in developing countries. There is evidence in academic research that trade globalisation does not increase inequality, although the perception is difficult to change because the issue is complex and empirical studies have been made using different methods and data sets (Bussière et al., 2011).

Cipollina and Salvatici (2008) painstakingly made the distinction between trade openness and protectionism. Trade openness was taken as the propensity of a nation to be involved in trade with other countries and depended on a variety of variables, which included natural endowments, the size of the economy and the available technology (Cipollina & Salvatici, 2008). Therefore, an economy could have a low level of trade openness, with this having little to do with the policy setting or the regulatory environment.

Two countries can have different levels of trade openness with similar trade policies, or might even have the same level of openness despite implementing different trade barriers (Cipollina & Salvatici, 2008). Thus, even if demand for a specific product is present within the importing country, protectionist measures could deter that item from being imported and result in a decline in exports to that country (Cipollina & Salvatici, 2008). Therefore, the constraint to a nation's

exports could be institutional as a result of protectionism, rather than due to a direct decrease in volume demand.

This raises the question of the influence that a trade policy regime has on a nation's export performance and there are a variety of views provided in the literature. Capling and Higgott (2009) provided a view in the context of the 2008 financial crisis. The authors highlighted how, since the start of the 2008 financial crisis, governments responded with more trade restrictive policies and were more active in monitoring and taking action via anti-dumping legislation than they were in the years prior to the financial crisis. This protectionism was a reaction to a decline in economic output within an economy. Sometimes protectionist intervention was not done openly, as was the case in some of the financial bailouts to automotive manufacturers, where terms were included that favoured local supply and were essentially covert trade barriers to counteract imports (Capling & Higgott, 2009). Another example of covert protectionism was capital controls which favoured domestic lending over foreign lending (Bussière et al., 2011).

Lehmann and O'Rourke (2008) questioned the wisdom of looking for correlations between average measures of trade protection and economic growth. This was because in their view, the nature of the industry being protected was more important than the average level of protection across all industries. Therefore, without understanding the relationship between global economic performance and export performance, it is very difficult to quantify the effect of declines in demand that are due to protectionist measures. Di Giovanni and Levchenko (2009) suggested that openness to trade has a strong correlation with sectoral and aggregate volatility. They quantified this relationship as being five times stronger in developing countries than developed ones.

The focus on demand driving exports is, however, not universally accepted. Santos-Paulino (2010) found that amongst other factors, export productivity is determined by a country's fundamental endowments, which include real

income, human capital endowment, institutional features and relative prices. These are some of the endogenous factors that will now be discussed.

2.4 Endogenous factors affecting export performance

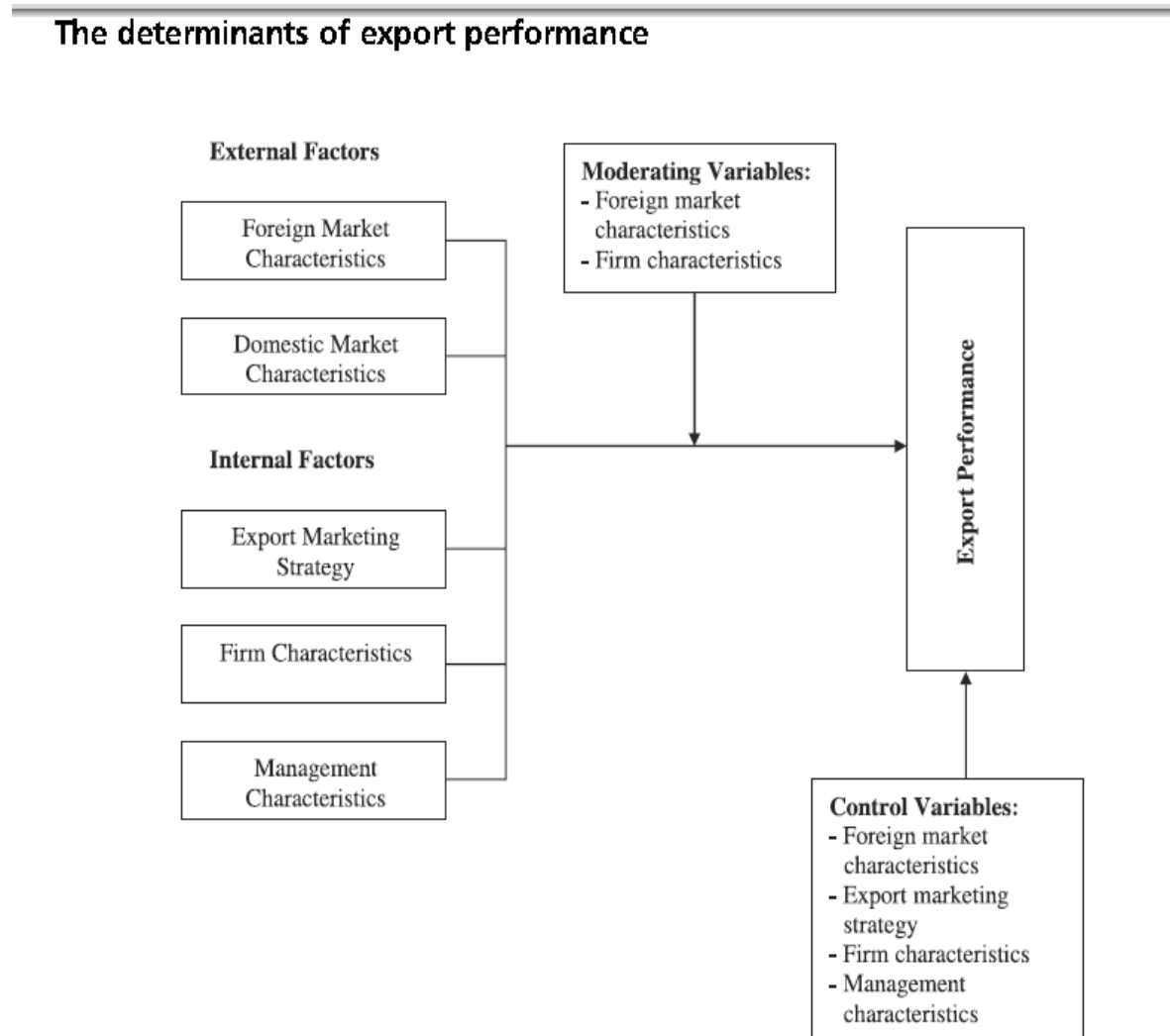
Given the definition provided by Rebucci (2010), endogenous factors will be discussed as those factors that are within a nation's control as part of macroeconomic policy or are within a firm's direct control. Endogenous factors affecting export performance are, therefore, taken in this paper to be those factors falling within the macroeconomic policy regime. Campos, Hsiao and Nugent (2010) found that political crises are more important determinants of structural reforms than economic crises, which places them firmly as endogenous factors. Defective institutions damage a country's capacity to export manufactured goods and an improvement in institutional quality would result in an increase of manufactured exports (Méon & Sekkat, 2008). Improving a country's institutional framework may be instrumental in improving that country's integration into international trade, although some institutional factors are more important than others (Méon & Sekkat, 2008). Liargovas and Skandalis (2008) identified the top barriers for exporters as being bureaucracy and access to the distribution system in the importing country, whereas the biggest motivations to export were the potential market size available as well as potential market growth available.

2.4.1 Firm-level factors influencing export performance

The range of recommendations to exporters from literature indicates that there is no one single factor that can capture the entirety of what is required for a firm to boost exports. Higgins and Mordhorst (2008) emphasised the role of branding in improving export performance, while Brouthers, Nakos, Hadjimarcou and Brouthers (2009) emphasised the need for firms to target fewer markets to improve export performance. Their empirical study also showed how better performing small firms were those firms that targeted markets that were geographically distant from them through the use of strong distribution networks.

Sousa, Martínez-López and Coelho (2008, p. 343) provided a useful summary of themes emerging from firm level research into export performance. These are shown in Figure 2 below.

Figure 2: Determinants of export performance



Source: Sousa et al. (2008)

Using the definition by Sharma (in Sousa et al., 2008, p.263), “A moderator is defined as a variable which systematically modifies the form and/or strength of the relationship between a predictor and criterion variable”. In Sousa et al.’s (2008) model, foreign market characteristics are expressed as external factors and moderating factors.

2.4.2 Exports and the composition of industry in an economy

Government intervention in the form of incentives, if large enough, can encourage firms which are already exporting to compete on the international stage. However, there is sparse evidence that these same grants encourage non-exporters to start exporting (Görg, Henry & Strobl, 2008). A policy choice available, however, may be the selection of the specific industry to support. Knowledge of how the various industries are affected by international demand could assist in making this policy choice.

Structural change also affects the overall constraint to growth as identified by Thirlwall (1979), in terms of the composition of the various sectors that are being imported and exported (Gouvea & Lima, 2010). Amiti and Freund (2010) argued that diversification may be desirable to an exporting country in promoting export growth because it can alleviate some of the inherent risks that arise from demand shocks to certain industrial sectors. The attraction of new markets is an important incentive for exporting, which is possibly the reason why the sectoral composition of exports will continue to change over time (Liargovas & Skandalis, 2008). Looking at a recent study by Levchenko et al. (2010) on trade during the 2008/2009 financial crisis, there were different trade declines experienced by different industrial sectors during the global recession and not all industries reacted in the same way to changes in global demand. Specialisation in products allowed for quality improvement, which is why specialisation may lead to higher economic growth (Minondo, 2010). However, the fact that South Africa's productive capabilities are highly specialised has meant that they cannot be easily re-deployed to other activities (Hausmann & Klinger, 2008). This has slowed down the structural transformation of the economy (Hausmann & Klinger, 2008).

In the case of the Ukraine during the 2008 financial crisis, food and agriculture did not show as significant a decline as other industries, and the metals industry went from contributing 45% of the country's exports in 2008 to 34% of exports in 2009 (Vlasiuk, 2010). Vlasiuk (2010) even suggested that grain exports were

now the key to economic recovery for the Ukraine, rather than the metals that had been the country's leading export commodity for decades. Again, this opens up the discussion into whether the relationship between exports and the GDP of the receiving country is affected by the same sectoral variables.

The sectoral composition of a country's economy is also particularly important in determining the effect of the fallacy of composition. Evidence of this was Razmi and Blecker's (2008) comparison of the export results of high technology countries and low technology companies. They used the World Bank's (2003) definition for high technology where "High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments and electrical machinery" and provided their own definition of low technology referring to "unskilled, labour-intensive manufactures" (Razmi & Blecker, 2008, p.22). They found that countries that pursued an export-led strategy while competing against other low technology countries could experience competitive devaluations and decreases in wages when demand was constrained. LDC exports, however, diversify away from the dominant export commodity over time (Kellman & Shachmurove, 2011).

Complementary findings by Liargovas and Skandalis (2008) emphasised that manufacturing exports respond to variables in the ELG differently to primary exports. High technology exports do significantly contribute to economic output (Yoo, 2008). Mah (2007) argued that manufacturing exports were not essential for a country to achieve ELG, although this was contradicted by Siliverstovs and Herzer (2007), who believed that manufactured goods were a key to improving exports. There is also evidence that higher technology manufactured exports enhance productivity while primary resource based exports limit productivity (Santos-Paulino, 2010). By developing countries becoming more sophisticated, their exports pose "a potential competitive threat to high-income industrialised economies, beyond traditional labour-intensive sectors" (Santos-Paulino, 2010, p.1107). Therefore, there is academic interest in testing whether the relationship between exports and the GDP of the receiving country is affected by the industrial composition of exports.

In analysing the interaction between Chinese economic growth and Latin American export growth through the use of Granger analysis, China's export growth accounts for a positive and significant amount of the increase in Latin American exports (Gallagher & Porzecanski, 2008). This may be because of China's growing demand for primary commodities. However, as discussed by Gallagher and Porzecanski (2008), China is highlighting Latin America's dependence on primary commodities. In addition, because imports from China are manufactured goods, this may contribute to Latin America's persistent trade deficits (Gallagher & Porzecanski, 2008). Thus commodity dependence may not be a positive position for the region to be in (Gallagher & Porzecanski, 2008).

Raynolds (2008) emphasised quality standards as being important to export performance. A further expansion of the export diversity discussion is that there are two types of variety, namely related variety and unrelated variety (Saviotti & Frenken, 2008). Related variety is product variety within economic sectors while unrelated variety is the variety between sectors. This distinction is important because "related variety stimulates growth instantaneously, while unrelated variety only promotes growth with a considerable time lag" (Saviotti & Frenken, 2008, p.201).

All of these authors' findings are supported by empirical evidence, however all are country specific. While country specific studies may increase difficulty in generalising the results, Geda and Meskel (2008) suggested that understanding trade is best done at a country level.

2.4.3 Export diversity versus export concentration

Related to the literature on industry structure is that of export diversification. Using Agosin et al (2012) definition, export diversity refers to a situation where a country is not dominated by one industrial sector in terms of its exports. Export concentration is the inverse of this, where a nation is completely dependent on one commodity or commodity type for its exports (Agosin et al, 2012). Meilak (2008) suggested that developing nations have a higher propensity for export concentration compared to developed nations.

Agosin et al (2012) went as far as to say that export diversification is the key to economic growth and presented evidence that export diversification is associated with higher economic growth. Agosin et al (2012) suggested that the portfolio effect reduces volatility that arises from the global economic environment, in that different industries respond differently to economic cycles (Agosin et al, 2012). There is a danger that dependence on export revenues on a few products can therefore create excessive short-run volatility in national income. This situation is exacerbated if these commodities are primary commodities (Dennis & Shepherd, 2011). In analysing the results from their empirical study, Naude et al. (2008) noted how the South African magisterial districts that had the highest export growth between 1996 and 2001 were those that were more specialised in their exports. In this case, diversification of the product base being exported did not lead to improved export performance.

However, the literature is not unanimous in its support of export diversification. Meilak (2008) presented the view that specialisation is positive or negative depending on what the country specifically needs. Therefore, if the country can achieve higher growth through specialisation then it must not pursue export diversity at all costs, but rather specialise (Meilak, 2008). This is a pragmatic view of export diversity which Meilak (2008) based on the insight that comparative advantage is not static and even though a nation has certain factor endowments, it does not necessarily mean that these cannot change over time. Meilak (2008) specifically referred to how a nation can improve its aptitude to produce different skills through a learning process over time.

If there are potential advantages of a country diversifying its exports, then one could expect that rational economies would move towards export diversification. This is not the case in many developing economies however, as there are some factors that limit a country's ability to diversify its exports (Dennis & Shepherd, 2011). Odularu (2009) used the Economic Community of West African States (ECOWAS) as an example of a trade block whose potential has been limited by low export diversification because the leadership in the trade block is mainly concerned with the economic and political risks associated with its dependence

on commodity exports. This obsession with primary exports has reduced the focus on boosting the competitiveness of other industries (Odularu, 2009).

Dennis and Shepherd (2011) identified certain costs which limit a nation's ability to diversify its exports. These are export costs, market entry costs and international transport costs (Dennis & Shepherd, 2011). Benedictis, Gallegati and Tamberi (2009) provided two additional explanations on why a nation may fail to diversify its exports. The first is that the size of the country seems to have some bearing on a nation's ability to diversify its exports. According to Benedictis et al. (2009), manufacturing export specialisation has been known to increase as the size of the country decreases. Smaller nations are, therefore, more likely to be more specialised (Benedictis et al., 2009). Further, there is evidence that countries located geographically far from major economic markets have manufacturing exports that are more concentrated (Benedictis et al., 2009). Therefore, using the thinking of Benedictis et al. (2009), the extent of export concentration is largely determined by physical or natural factors of a country that are difficult to change. Acceptance of Benedictis et al.'s (2008) conclusions, however, would make industry structure exogenous to exports rather than endogenous.

2.5 Literature review conclusion

The literature has provided two opposing schools of thought to the argument of export performance. These are whether exogenous or endogenous factors are largely responsible for a nation's export performance (Harvey, 2011). Exogenous factors identified include global economic cycles (Levchenko et al., 2010), global value chains (Grossman & Rossi-Hansberg, 2008) and trade openness and protectionism (Bussière et al., 2011). The exogenous school of thought suggests that factors affecting the level of exports are largely out of the control of the policy makers, even though a nation's export performance is dependent on them (Harvey, 2011). The endogenous point of view suggests that export performance is largely driven by factors within the control of policy makers or firms within an economy (Harvey, 2011). Endogenous factors identified include firm level decisions (Sousa et al., 2008), policy driven choices

such as the choice of industry to participate in (Gouvea & Lima, 2010) and the choice of the number of different industries in which to participate (Agosin et al, 2012).

The dominant tendency in export research, however, has to been to focus on testing export performance and its influence on a country's economic growth by using the various methodologies such as ELG (Awokuse, 2008), Thirlwall's law (Ozturk & Acaravci, 2010) and fallacy of composition (Kerr, 2009). Given the popularity of these studies in the literature, this trend seems likely to continue unabated. This may be because methodologies such as the ELG can be replicated easily, while there is no one overarching method that tests for the comparative effect of endogenous and exogenous variables on export performance. Unfortunately the availability of a large number of ELG studies in the literature does not necessarily provide conclusive evidence of any trends, as the studies are country specific and the core method has been amended or improved over time. Hence, one of the advantages of ELG theory being accessible and easy to replicate may end up being one of its major downfalls.

Chapter 3 will present the research hypotheses driven by the problems defined in the literature. These hypotheses represent empirical ways to test for the validity of some of the themes discussed in Chapter 2.

3. CHAPTER THREE: RESEARCH HYPOTHESES

3.1 Introduction

The hypotheses presented are all based on the themes found in the literature. The first hypothesis refers to the relationship between the exports of a country and the world's GDP. This has an impact on a country's economic vulnerability and is impacted by global economic cycles. The second hypothesis analyses this relationship by industry. The third hypothesis is an improvement on the first hypothesis by testing the causality between world GDP and export performance. Each hypothesis is presented individually below.

3.2 Hypothesis One

The first research objective seeks to determine whether the relationship between the exports of a country and the GDP of the countries it is exporting to is becoming weaker or stronger over time. This hypothesis references literature from Milberg and Winkler (2010), Cardoso and Soukiazis (2008) and Kaplinsky and Morris (2009).

The null hypothesis states that the relationship between the exports of a country and the GDP of the country it is exporting to is not becoming stronger over time. The alternative hypothesis, therefore, states that the relationship between the exports of a country and the GDP of the country it is exporting to is becoming stronger over time.

$$H_0: \beta_{t-1} = \beta_{t-2} = \beta_{\dots n};$$

$$H_1: \beta_{t-1} > \beta_{t-2} > \beta_{\dots n}$$

Where β refers to the regression coefficient of the country's exports and GDP of the country it is exporting to.

3.3 Hypothesis Two

The second research objective is to determine whether the relationship between a country's exports and the GDP of the country it is exporting to differs by commodity type. This references literature by Amity and Freund (2010) and Vlasiuk (2010).

The null hypothesis states that the relationship between the exports of a country and the GDP of the countries it is exporting to varies significantly by industry or commodity type. The alternative hypothesis states that the relationship between the exports of a country and the GDP of the countries does not vary significantly by industry or commodity type.

$$H_0: \beta_1 = \beta_{...i};$$

$$H_1: \beta_1 \neq \beta_{...i}$$

Where β_i refers to the regression coefficient between the country's exports and the GDP of the importing country of the i th industry or commodity.

3.4 Hypothesis Three

The third research objective is to determine the causal relationship between the exports of a country and the GDP of the countries it is exporting to. This hypothesis references literature from Chang and Dang (2010), Ozturk and Acaravci (2010) and Kerr (2009).

The null hypothesis states that there is no significant causal relationship between the GDP of the countries it is exporting to and a country's exports. The alternative hypothesis, therefore, states that there is a significant causal relationship between the GDP of the countries it is exporting to and a country's export performance.

$$H_0: \text{Exports}_t = \sum_{i=1}^p \alpha_i \text{Exports}_{t-i}$$

Where $i = 1 \dots n$, across all time.

$$H_1: \text{Exports}_t = \sum_{i=1}^p \alpha_i \text{Exports}_{t-i} + \sum_{i=1}^p \beta_i \text{GDP}_{t-i}$$

Where $i = 1 \dots n$, across all time.

4. CHAPTER FOUR: RESEARCH METHOD

4.1 Introduction to the research method

The research aimed to produce evidence for or against the existence of relationships between a country's export performance and the GDP of the country to which it is exporting. Saunders and Lewis (2012) suggested that when examining relationships using statistics, one of the key areas of analysis should be any cause and effect relationship. Quantitative research was conducted using secondary data. As stated by Saunders and Lewis (2012), two advantages for using secondary data of this nature are that it is already in the public domain and is also available in software compatible formats. Each these advantages were relevant to this study as all the data were from the public domain and all of it was analysed using software.

4.2 The unit of analysis

The unit of analysis was a single country's export performance.

4.3 Population

The population available was all the countries in the world that exported a product to another country.

4.4 Sampling method and size

The relevant sampling frame was all the countries listed on the United Nations Conference on Trade and Development (UNCTAD) database. There were two samples that were required. The first was export data required for the analysis, while the second was the GDP for the countries being exported to. For the two samples a non-probability convenience sample technique was used. The research focussed on the exports of a single country, namely South Africa. This

sampling technique was selected based on the ease of obtaining the data for the sample (Saunders & Lewis, 2012).

4.5 Data gathering process

The data used were longitudinal time series data from public sources. Longitudinal studies are appropriate if one wishes to study changes over time (Saunders & Lewis, 2012) therefore this method was appropriate in testing all three hypotheses.

The first stage of the data gathering process was to collate historical export data on the exporting country (South Africa) at a total level and by commodity. Only countries falling within the 80% contribution to South African exports according to the Republic of South Africa Department of Trade and Industry (2012) were included in the study. The data were collected from the UNCTAD (2012) database. (Please see Appendix 1 for the product definitions used in the UNCTAD (2012) database.)

The export data found were for South Africa for a period of 53 years. Some 31 years of data were found at a commodity level from 1980 to 2010. All data were then collated into a Microsoft Excel table on a spreadsheet. The use of a spreadsheet assisted in that data could be presented in a way that aided the research using tables and graphs (Saunders & Lewis, 2012). This was particularly relevant considering that the data required the representation of different countries, time periods and commodities on one sheet.

The second stage of the data gathering process was to include the GDPs of the countries that were being analysed onto the same spreadsheet. These data were available from the publicly available UNCTAD (2012) database. Again, 53 years' worth of country GDP data were used for the period between 1948 and 2010.

4.6 Analysis approach

Two data analysis approaches were used in the study. These were the regression coefficient and the Granger causality method. SAS software was used for all statistical analysis and the results were summarised onto a Microsoft Excel spreadsheet for further analysis.

4.6.1 Regression coefficient

One of the objectives of the research was to examine the relationship between a country's exports and the GDP performance of its export partners. This could be achieved using a regression coefficient (R^2), which showed how strong a relationship was between a dependent variable and one or more independent variables (Saunders & Lewis, 2012). The dependent variable in this study was the export performance, with the independent variable being the GDP performance of the recipient country. This was consistent with Saunders and Lewis (2012) in that the independent variable explained the dependent variable. The regression coefficient was also compared and analysed across different time periods.

Every regression coefficient for each period was then captured in a table by trading partner and commodity. In addition, it was important to prove that any relationship did not occur because of chance (Saunders & Lewis, 2012). The statistical "p-value" was tested at a 95% confidence level. Where p was greater than 0.05, then that relationship was taken as occurring due to chance (Saunders & Lewis, 2012).

The year 1994 is commonly used in economic studies by some authors, such as Coulibaly and Logan (2009), Rodrik (2008) and Rogerson (2010), as a significant point in time for South Africa due to it being the year of South Africa's democratic transition. Three time periods were therefore compared that aligned with this date as per the below.

1980-2010: This represented the full period that the commodity export data for South Africa was available.

1980-1993: Looked at industry or commodity export data for South Africa for the years prior to South Africa’s democratic transition.

1994-2010: Looked at industry or commodity export data for South Africa for the years after South Africa’s first democratic elections.

Please see table 1 below for an example of how the results were collated for analysis.

Table 1: Example of raw data collation template

		1980-2010		1980-1993		1994-2010	
Country 1	Total	R^2	ρ	R^2	ρ	R^2	ρ
	Industry 1	R^2	ρ	R^2	ρ	R^2	ρ
	Industry 2	R^2	ρ	R^2	ρ	R^2	ρ
	Industry 3	R^2	ρ	R^2	ρ	R^2	ρ
Country 2	Total	R^2	ρ	R^2	ρ	R^2	ρ
	Industry 1	R^2	ρ	R^2	ρ	R^2	ρ
	Industry 2	R^2	ρ	R^2	ρ	R^2	ρ
	Industry 3	R^2	ρ	R^2	ρ	R^2	ρ

4.6.2 Granger causality test

The second part of the research design entailed testing the time series using the Granger causality test. A weakness of the regression coefficient (R^2) above is that it is exposed to the non-stationarity of the data. When there is non-stationarity in data it means the statistical distribution may change over time (Andreas, Geiger, Trevino & Claffey, 2008). Thus its mean and standard deviation may change over time (Andreas et al., 2008). When data are non-stationary the resultant findings may be misleading, with incorrect relationships being assigned between variables (Granger & Newbold, 1974). The Granger causality test is a common technique in ELG time series tests because of its ability to reduce the effect of non-stationarity in time series analysis (Cheng & Lai, 1997). The basic principle of the Granger causality test is that a variable x is said to Granger-cause y if the prediction of the current value of y is improved

by using past values of x (Cheng & Lai, 1997). Thus in this research model, the test was whether the recipient country's GDP was said to Granger cause exports.

The design method was an adapted model from that used by Jordaan and Eita (2007). The Jordaan and Eita (2007) study tested whether exports Granger-caused GDP. A key difference between the Jordaan and Eita (2007) study and this piece of research was that domestic GDP was replaced with the GDP of the importing country. Therefore, the test was whether recipient country GDP Granger causes exports in one direction and whether exports cause recipient country GDP in the other direction. Thus, different variables were used although the method was kept consistent.

In ELG analysis and general econometric analysis the Granger causality test is very popular and has been used in Jin (2002), Mah (2007), Awokuse (2008), Kundu (2010) and Nain and Ahmad (2010). The Granger test as expressed by Jordaan and Eita (2007) has three basic procedures:

4.6.2.1 Procedure One: Stationarity test

The first procedure of the Granger test was to test for stationarity using the Augmented Dickey-Fuller (ADF) root test (Jordaan & Eita, 2007, p.543). At a 95% significance level a p-value greater than 0.05 indicates that the data are non-stationary (Mohamed, 2009).

4.6.2.2 Procedure Two: Cointegration test

The second procedure was to test for cointegration using VECM (Jordaan & Eita, 2007, p.543). The basic procedure in this test is that each variable is "regressed on the lagged values of itself" and all the other variables in the equation (Jordaan & Eita, 2007, p.543). Cointegration shows evidence of a long-run relationship between the variables and makes it appropriate to proceed with the causality test (Jordaan & Eita, 2007, p.544). If there is no cointegration

then the Granger causality test becomes an “inappropriate test” for causality (Jordaan & Eita, 2007, p.544).

4.6.2.3 Procedure Three: Causality test

The third procedure was to test the “direction” of the causality (Jordaan & Eita, 2007, p.545). The nature of the Granger test used was that it tested causality in both directions. Therefore, for some countries the GDP of the importing country may have Granger caused South African exports, in some countries South African exports may have Granger caused the GDP of the importing countries, and in some countries there could have been bi-directional causality. For the purpose of answering the hypotheses presented in this study, only causality referring to the GDP of the importing country affecting South African exports was included in the results, although tests in both directions were performed.

Because the Granger model is based on identifying a causal relationship from the entire time series, it was not tested in this research for different periods. What it showed, however, was the nature of any causal relationship between export performance and the GDP of the recipient countries for the entire period from 1948 to 2010.

4.7 Research limitations

The export information used was based on only one economy’s exports and will need to be replicated across the world in more countries in order to be widely accepted. The time period selected by the author was largely arbitrary and based on available data. Different start and end periods in the correlation analysis may give differing results and this is exacerbated when there is incomplete data in some time series. As highlighted by de Piñeres (2006), the source of the data can change the result of a Granger causality test. De Piñeres (2006) was able to demonstrate how different sources of data, for the same country and over the same period, gave completely conflicting results when testing the ELG empirically. This same pattern even persisted when tested

across a variety of cross sectional and time series methodologies (de Piñeres, 2006). This is especially applicable in that the sample used was a convenience sample. Causality analysis such as the Granger causality can often produce contradictory results when there are changes to the method. The study also deliberately ignored any detailed explanation of any relationships that emerged that could arise from firm specific, country specific or any other factors that were not GDP.

5. CHAPTER FIVE: RESULTS

The purpose of this chapter is to present the results of the research. The results are presented according to the three hypotheses from Chapter 3. Section 5.1 below provides a brief description of the final samples used.

5.1 Sample description

The data were collected from the UNCTAD (2012) database for 20 countries. The countries were China, United States of America, Japan, Germany, United Kingdom, India, Netherlands, Switzerland, Korea Republic, Mozambique, Belgium, Zimbabwe, Italy, Zambia, Spain, Taiwan, Hong Kong, Malaysia, United Arab Emirates and France. These countries represented destinations for 80% of South African exports.

5.2 Hypothesis One

H₀: The relationship between the exports of a country and the GDP of the country it is exporting to is not becoming stronger over time.

H₁: The relationship between the exports of a country and the GDP of the country it is exporting to is becoming stronger over time.

To test hypothesis one, simple linear regressions were run for the dataset by country for different periods. The coefficient of determination or R^2 shows the variability in the dependent variable (the GDP of a country), which can be explained by the variability in the independent variable. The p-value associated with this test was used to test whether the results were statistically significant. The results of the above test were then compared for the periods 1980-1993, 1994-2010 and 1980-2010. The results are shown in table 2 below.

Table 2: Regressions and p-values over different periods

Country	1980-1993		1994-2010		1980-2010	
	R ²	p-value	R ²	p-value	R ²	p-value
Netherlands	0.59	<.0001	0.78	<.0001	0.83	<.0001
UK	0.57	<.0001	0.72	<.0001	0.81	<.0001
UAE	0.52	<.0001	0.79	<.0001	0.81	<.0001
Malaysia	0.60	<.0001	0.75	<.0001	0.80	<.0001
Belgium	0.61	<.0001	0.76	<.0001	0.80	<.0001
USA	0.62	<.0001	0.76	<.0001	0.80	<.0001
Spain	0.64	<.0001	0.77	<.0001	0.80	<.0001
France	0.63	<.0001	0.77	<.0001	0.80	<.0001
Korea Republic	0.61	<.0001	0.72	<.0001	0.79	<.0001
Mozambique	0.36	<.0001	0.76	<.0001	0.79	<.0001
Italy	0.55	<.0001	0.78	<.0001	0.78	<.0001
Taiwan	0.71	<.0001	0.74	<.0001	0.76	<.0001
Switzerland	0.61	<.0001	0.71	<.0001	0.75	<.0001
India	0.27	<.0001	0.72	<.0001	0.75	<.0001
Germany	0.60	<.0001	0.70	<.0001	0.73	<.0001
China	0.61	<.0001	0.69	<.0001	0.73	<.0001
Hong Kong	0.60	<.0001	0.71	<.0001	0.71	<.0001
Zambia	0.34	<.0001	0.75	<.0001	0.69	<.0001
Japan	0.59	<.0001	0.21	<.0001	0.38	<.0001
Zimbabwe	0.14	<.0001	0.32	<.0001	0.31	<.0001

The first field in the table shows the country whose GDP was used as the independent variable. The last two fields on the table represent the R² and p-value for the entire period from 1980-2010. The results have been ranked according to the R² of the entire period. All the countries in the sample had results that were statistically significant in that the p-value was less than 0.05, therefore the results are statistically significant at the 95% confidence interval. The three time periods in the sample show the different time periods for which the regression coefficient was tested and the relevant R² and p-value. For 19 of the 20 countries in the sample, the relationship between South African exports and the GDP of the importing country was stronger in the second period than it was in the first period. The only country that this relationship strength was not true for was for Japan, where the R² was 0.59 in the first period (1980 to 1994) and 0.21 in the second period (1995-2010).

The null hypothesis is therefore rejected because for the majority of the countries in the sample, the relationship between South African exports and the GDP of the country it is exporting to is becoming stronger over time.

5.3 Hypothesis Two

H₀: The null hypothesis stated that the relationship between the exports of a country and the GDP of the countries it is exporting to varied significantly by industry or commodity type.

H₁: The alternative hypothesis stated that the relationship between the exports of a country and the GDP of the countries it is exporting to, did not vary significantly by industry or commodity type.

To test hypothesis two, simple linear regressions were run for the dataset by country for different industries. The coefficient of determination or R² shows the variability in the dependent variable (South African exports) which can be explained by the variability in the independent variable (the importing country's GDP). The p-value associated with this test was used to test whether the results were statistically significant. The results of the above test were then compared for the different industry types. The results are shown in Table 3 below. The results are shown to two decimal places for ease of presentation.

Table 3: Regression by commodity

1980-2010			
Rank	Product Grouping	R ²	p-value
1	Chemical	0.83	<.0001
2	Food	0.82	<.0001
3	Manufactures	0.80	<.0001
4	Office and Telecom Equipment	0.80	<.0001
5	Automotive	0.79	<.0001
6	Iron and Steel	0.78	<.0001
7	Agricultural	0.75	<.0001
8	Fuels and Mining	0.75	<.0001
9	Telecommunications	0.66	<.0001
10	Textiles	0.58	<.0001
11	Clothing	0.20	<.0001

The results are ranked according to the R^2 value. All of the results showed a p-value of less than 0.05. This means that the results are significant at a 95% confidence level. Chemical products had the highest R^2 value, with clothing products having the lowest R^2 value. Telecommunications, textiles and clothing represent the largest differences in R^2 value compared to the other industries. Each industry is further broken down to show how the R^2 value differed by country in the sample.

5.3.1 Analysis by product grouping

Table 4 in the appendix shows all collated regression results by country and commodity. All results were statistically significant at a 95% confidence level and are therefore not random. Chemical products were the highest ranked product category by R^2 value with a value of 0.83. Malaysia, Netherlands and the UAE had the highest R^2 values between South African chemical exports and their GDP, while Hong Kong, Zimbabwe and Japan had the lowest.

Food was the second highest ranked product category by R^2 value with an overall value of 0.82. China, India and UAE had the highest R^2 values between South African food exports and their GDP, while Hong Kong, Japan and Zimbabwe had the lowest. Manufactures were the third highest ranked product category by R^2 value with a value of 0.80. Netherlands, the UK and Belgium had the highest R^2 values between South African manufactures exports and their GDP, while Mozambique, Japan and Zimbabwe had the lowest. Office and telecom equipment were the fourth highest ranked product category by R^2 value with a value of 0.80. The UK, USA and Spain had the highest R^2 values between South African office and telecom exports and their GDP, while Germany, Zimbabwe and Japan had the lowest. Automotive products had the fifth highest R^2 values across all the product groups with a value of 0.79. The UAE, USA and Spain had the highest R^2 value between South African automotive exports and their GDP, while Germany, Zimbabwe and Japan had the lowest.

Iron and steel products were the sixth highest ranked product category by R^2 value with a value of 0.78. Spain, Netherlands and Belgium had the highest R^2 values between South African iron and steel exports and their GDP, while Hong Kong, Zimbabwe and Japan had the lowest. Agricultural products were ranked seventh out of the 11 industries included in the sample with an R^2 value of 0.75. The UAE had the highest R^2 value of South African agricultural exports and its GDP, followed by China and India. Hong Kong, Japan and Zimbabwe had the lowest R^2 values in the sample.

Fuels and mining products were the eighth highest ranked product category by R^2 value with a value of 0.75. The UAE, Zambia and Malaysia had the highest R^2 values between South African fuels and mining exports and their GDP, while the UK, Zimbabwe and Japan had the lowest. Telecommunications equipment was the ninth highest ranked product category by R^2 value with a value of 0.66. The UK, USA and Spain had the highest R^2 values between South African telecommunications exports and their GDP, while China, Switzerland and Japan had the lowest.

Textiles were the tenth highest ranked product category by R^2 value with a value of 0.58. The UK, Hong Kong and Korea had the highest R^2 values between South African textile exports and their GDP, while Mozambique, Zambia and Zimbabwe had the lowest. Clothing was the lowest ranked product category by R^2 value with a value of 0.20. Mozambique, Japan and Hong Kong had the highest R^2 values between South African clothing exports and their GDP, while China, India and Zambia had the lowest.

5.3.2 Hypothesis Two - Conclusion

The null hypothesis was not rejected because there is a significant difference between the R^2 levels across different industries. The null hypothesis stated that the relationship between the exports of a country and the GDP of the countries it is exporting to varies significantly by industry or commodity type, which is consistent with the results shown above.

5.4 Hypothesis Three

H₀: The null hypothesis stated that there is no significant causal relationship between the GDP of the countries it is exporting to and a country's exports.

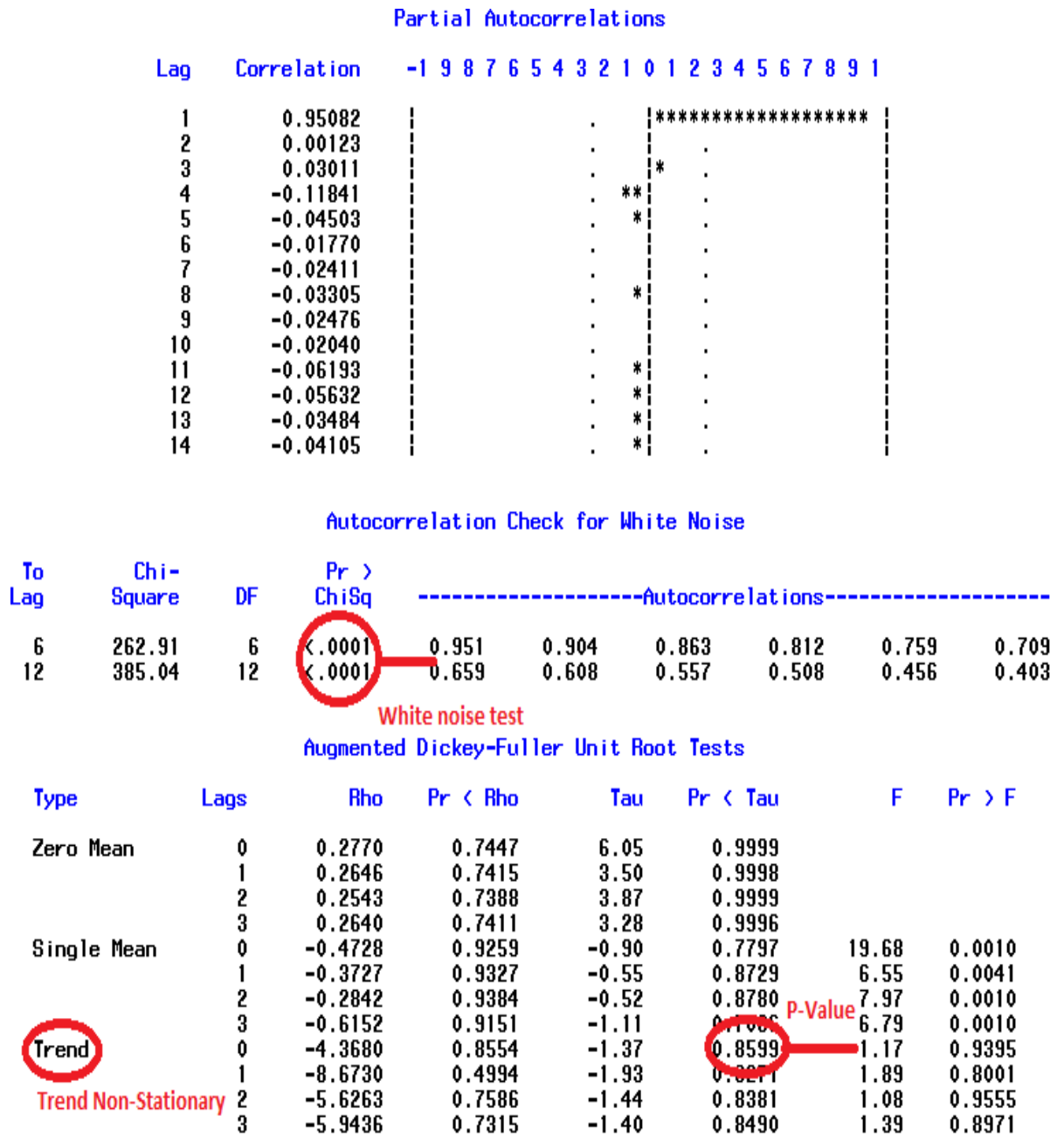
H₁: The alternative hypothesis stated that there is a significant causal relationship between the GDP of the countries it is exporting to and a country's export performance.

This hypothesis was tested using the Granger causality test as used by Jordaan and Eita (2007).

5.4.1 Procedure One: Stationarity test

The first procedure to test for stationarity used the ADF root test. At a 95% significance level a p-value less than 0.05 indicates that the data is stationary. The below output from the statistical programme SAS shows that the data are not random white noise and are non-stationary, based on a p-value of 0.8599.

Figure 3: SAS autocorrelation and Dickey-Fuller test sample

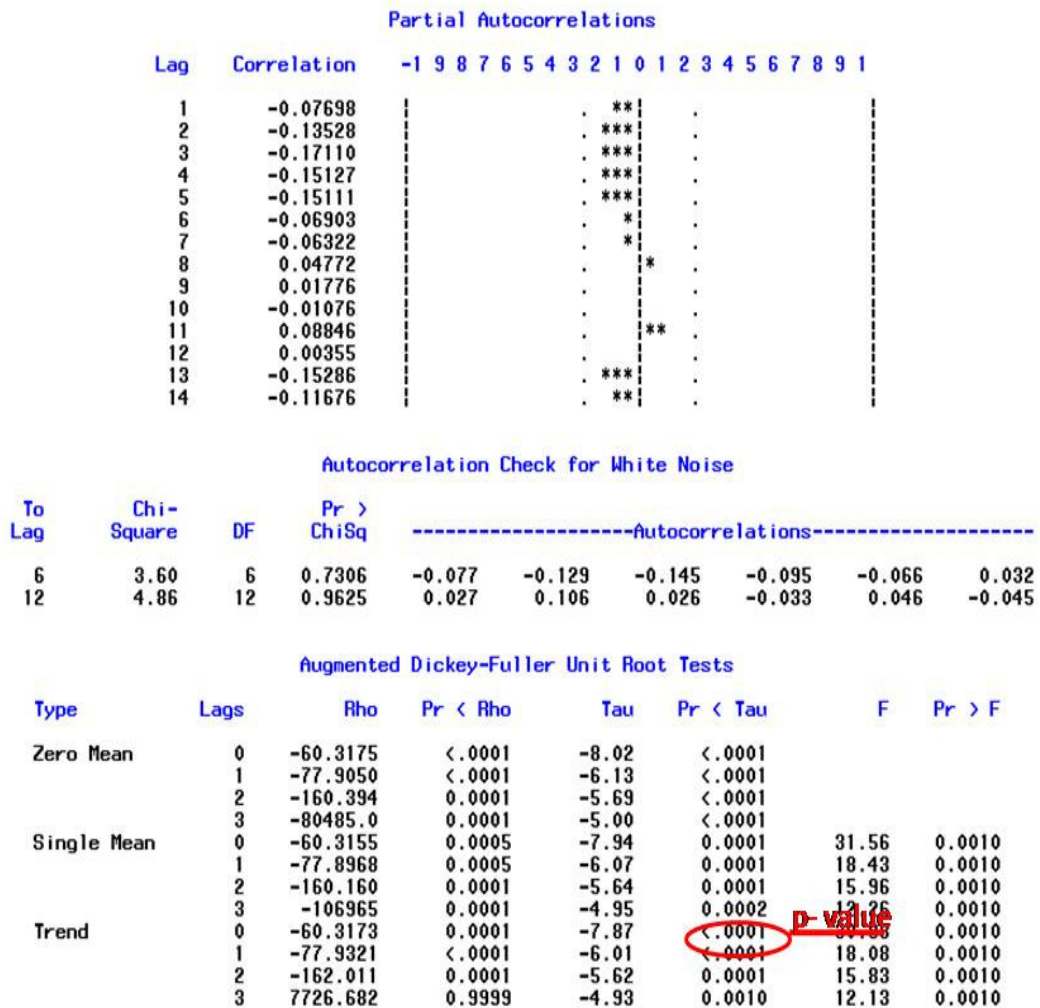


The p-values from the ADF tests for all the countries in the sample were higher than 0.05, indicating that the data were non-stationary. As the data were non-stationary it was possible to proceed with the second procedure to test for cointegration.

5.4.2 Procedure Two: Cointegration test

The cointegration of the data used was then tested using the VECM. At the 95% significance level, if the data were cointegrated then its p-value would be less than 0.05. The result of the procedure showed a p-value less than 0.05 for all the countries in the sample. This confirmed that the data were cointegrated and could be used to conduct the causality tests. The output below from the programme SAS shows how the p-value is less than 0.05; this indicates the data are cointegrated.

Figure 4: Cointegration test using SAS



5.4.3 Procedure Three: Causality test

The third procedure was to test for causality using the Granger method. Where the p-value was less than 0.05, this indicated causality in that the independent variable Granger caused the dependent variable.

The results are summarised in Table 5 below.

Table 5: Granger causality results of international GDP causing exports

Country	Causality	P- Value
*Zambia	GDP Causes Exports	0.030
Netherlands	GDP Causes Exports	0.084
Korea Republic	GDP Causes Exports	0.085
United States	GDP Causes Exports	0.197
India	GDP Causes Exports	0.212
United Kingdom	GDP Causes Exports	0.228
Switzerland	GDP Causes Exports	0.353
Germany	GDP Causes Exports	0.419
Japan	GDP Causes Exports	0.505
China	GDP Causes Exports	0.598
Belgium	GDP Causes Exports	0.623
Mozambique	GDP Causes Exports	0.676
Spain	GDP Causes Exports	0.686
France	GDP Causes Exports	0.777
Malaysia	GDP Causes Exports	0.941
Zimbabwe	GDP Causes Exports	0.959
Italy	GDP Causes Exports	0.979

Three of the countries in the sample could not be analysed due to incomplete or inconsistent data over the period. These were Hong Kong, Taiwan and the United Arab Emirates. Of the 17 countries finally analysed, only Zambia had a p-value less than 0.05. Therefore the null hypothesis is not rejected as there is no significant causal relationship between the GDP of South Africa's top trading partners and South African exports. The GDP of South Africa's top trading partners does not Granger cause South African export performance when reviewing data from 1948 to 2010.

6. CHAPTER SIX: DISCUSSION

6.1 Introduction to the discussion

There is a common view that increasing exports has benefits for society (Liargovas & Skandalis, 2008) and the aim of this research was to better understand the relationship between a country's exports and the GDP of the countries that it is exporting to. This was done in the context of there being exogenous forces present which are out of the control of a nation, or endogenous factors which are largely within the control of the policy framework (Harvey, 2011). In discussing the results it was important to separate the relationship as tested using the regression coefficient R^2 in hypothesis one and hypothesis two from any causality emerging as a result of the Granger test in hypothesis three. This was in order to avoid spurious causality or "nonsense regressions" as defined by Granger and Newbold (1974, p.112). It is, therefore, emphasised that a strong relationship indicated by the R^2 does not automatically indicate causality. Where causality is incorrectly assigned to an exogenous or endogenous factor this could result in very incorrect policy assumptions. While all hypotheses were tested at an aggregate level for country or industry, this chapter also includes cross-referencing of country and industry results where this enhances the discussion.

6.2 Hypothesis One:

H₀: The relationship between the exports of a country and the GDP of the country it is exporting to is not becoming stronger over time.

H₁: The relationship between the exports of a country and the GDP of the country it is exporting to is becoming stronger over time.

Of the 20 countries included in the test, 19 countries showed a stronger relationship between exports and recipient country GDP over time, leading to the rejection of the null hypothesis. The R^2 values for the second period (1995

to 2010) were greater than 0.69 for all the countries in the sample except for two and this showed that this relationship between South African export performance and global GDP is very strong. This has implications with regards to economic vulnerability as well as interpretations when using an exogenous and endogenous analytical framework.

6.2.1 Economic vulnerability

The larger the share that exports have on GDP, the larger the impact of an export shortfall and the greater the economic vulnerability (Guillaumont, 2010). Figure 1 in Chapter 1 showed how South Africa's export exposure is 27.12% of GDP, implying that this proportion of the economy is vulnerable to negative shifts in the global economy. This is further exacerbated because as trade and financial linkages increase between countries, external shocks are more likely to be transmitted faster and stronger across borders (Duval & Vogel, 2008). In the case of South Africa and the increased relationship between the country's exports and the GDP of its top trading partners this trend is likely to continue into the future. This view is further justified if increasing trade ties remains a priority for the South African government. Auta (2012), however, questioned the relevance of pursuing the ELG model for SSA countries as it has made SSA countries dependent on developed countries.

Using the overall R^2 for the entire period from 1980 to 2010, the countries with the strongest relationship between South African exports and their GDP are Netherlands, UK, UAE, Malaysia and Belgium, while the countries that experienced the greatest increase in this relationship are India, Zambia, Mozambique, the UAE and Italy. The countries with the weakest relationship between South African export performance and their GDP are China, Hong Kong, Zambia, Japan and Zimbabwe while South Korea, Switzerland, China, Taiwan and Japan experienced the smallest increase in this relationship.

Table 6 below, shows South Africa's top export destinations ranked by value. The colours denote different continents. What is evident is that three of the top

five export destinations had some of the smallest changes in R^2 from period one to period two. The same three countries, namely, China, Japan and Germany, had a low overall R^2 between 1980 and 2010 meaning that in the sample of countries they showed some of the weaker relationships between South African export value and their GDP.

Table 6: Ranked comparisons of GDP and export relationships

Country	Ranking by SA Export Value *	Ranking by GDP Growth (1980-2010)**	Ranking by Relationship Change Period 1 vs. Period 2 ***	Ranking by Relationship (1980-2010) ****
China Total	1	2	18	16
USA Total	2	10	11	6
Japan Total	3	11	20	19
Germany Total	4	1	15	15
UK Total	5	15	8	2
India Total	6	6	1	14
Switzerland Total	7	12	17	13
Netherlands Total	8	14	6	1
Korea Republic Total	9	3	16	9
Mozambique Total	10	19	3	10
Belgium Total	11	17	9	5
Zimbabwe Total	12	20	7	20
Italy Total	13	13	5	11
Zambia Total	14	16	2	18
Spain Total	15	9	13	7
Taiwan Total	16	4	19	12
Hong Kong Total	17	7	14	17
Malaysia Total	18	5	10	4
UAE Total	19	8	4	3
France Total	20	18	12	8
	Colour Key			
Asia	Americas	Africa	Europe	

*This is the ranking of where this country features as a South African export destination

**This is the ranking of the GDP growth of these countries comparing between 2010 and 1980 (2010-1980)

***This is ranking of the change in R^2 between period one (1980-1994) and period two (1995-2010)

****This is the ranking by R^2 for the entire period from 1980 to 2010

The implications of this are that the effect of fluctuations in the economic output of these countries should be smaller than for most of the other countries in the sample. Japan is the only economy where the R^2 declined in the second period compared to the first. Japan has experienced economic stagnation for a prolonged period (Guo & N'Diaye, 2009) and in the context of economic vulnerability, this works in South Africa's favour by reducing the effect that Japanese economic stagnation could have on South African exports.

The African countries in the sample all showed stronger increases in the relationships between their GDP and South African exports in period two compared to period one. Without assigning any causality, the observation is that as the GDP of these African countries increases, South African exports to them also increase. In contrast, the countries that experienced the smallest change in R^2 from period one to period two were China, Taiwan and Japan. Considering that Asian countries have experienced significant growth (Davies, 2010), this could imply that South African exports to these countries have not grown at the same rates as the GDP of these countries.

Therefore, summarising the discussion regarding economic vulnerability related to hypothesis one, the South African economy is becoming more vulnerable to global economic fluctuations. African export destinations are becoming more important to South African exports although European export destinations continue to be relevant when reviewing economic vulnerability. Finally, although China and Japan are significant export destinations for South African goods, the value of South African exports to these countries is becoming less related to the GDP of these countries over time.

6.2.2 Implications of hypothesis results on exogenous influences

Vlasiuk (2010) highlighted the negative effect that decreases in global demand can have on a country's export performance. Given the results of hypothesis one and the economic vulnerability highlighted above, economic cycles stand out as relevant exogenous factors when analysing export performance. Where

an economic downturn results in a decrease in demand for an exported product, South Africa will definitely be affected. However, the area of controversy will always be the country level analysis. It would be incorrect to assign the same level of this exogenous variable to all countries equally during an economic downturn. South African exports to Asian economies should theoretically be less affected over time than exports to African countries because the relationship between export performance and GDP is getting stronger over time for African countries compared to Asian countries.

The second exogenous factor of relevance to these results is that of economic openness and protectionism. Bussière et al. (2011) highlighted that there was an increase in protectionism in terms of global trade and this raises two conflicting issues. First, an increase in protectionism seems intuitively in conflict with the relationship between export performance and the GDP of the recipient country becoming stronger over time. Possibly, the relationship has become stronger despite the protectionism and could be even stronger were there less protectionism. Second, this does not explain the varied change in relationship between South African exports and European countries or Southern African Development Community (SADC) countries, considering that they would negotiate the terms of trade as a unified block.

These results seem to vindicate Lehmann and O'Rourke (2008) who cautioned against using regressions based on aggregate measures of protectionism and economic growth. Thus their argument of focussing on industry level protectionism as a better measure of the effect of protectionism is enhanced by the argument that country level aggregate measures of protectionism also do not place sufficient emphasis on the effect of regional trade blocks.

6.2.3 Implications of hypothesis results on endogenous influences

Taking Méon and Sekkat's (2008) view, defective institutions hurt a country's capacity to export manufactured goods and an improvement in institutional quality would result in an increase of manufactured exports. With the

relationship between a country's exports and the GDP of the recipient country becoming stronger over time, there are some serious considerations with regards to a country's institutions. The first point is whether the country's institutions can react to the various economic cycles described by Vlasiuk (2010). For example, if a country needs to invest in productive capacity to make itself more competitive in a particular sector to take advantage of GDP growth in a country where the relationship between South African export performance and importing country GDP is particularly strong. The alternative view is that in periods of economic downturn, the country needs institutions to protect its exports against practices such as illegal dumping and the enforcement of protectionism. There are some countries such as Japan where the relationship between South African exports and Japanese GDP is not becoming stronger over time. For these countries, fluctuations in economic activity should not affect strategic decisions when deciding how the country can position itself to increase its exports. Two of these major strategic decisions are how many industries to focus on and which industries to focus on. Making these decisions is particularly difficult considering that economic policy incentives in the form of grants do not necessarily result in an increase in export activity (Görg et al., 2008).

The results of the research, therefore, seem to fit well within the Sousa et al. (2008) model of foreign market conditions being moderating factors that modify the potential of a country's exports. Therefore, for a firm looking to increase its exports it can focus on endogenous factors such as branding, management and marketing. However, its success will be moderated by the strength of the relationship between that country's exports and the GDP of the country it is exporting to. This, however, leaves the question open in terms of why, if foreign demand conditions are out of the control of the exporting firm, they should not simply be reclassified as exogenous factors. Sousa et al.'s (2008) solution was to classify these factors in the export model as external and moderating factors. Considering that the relationship between South African export performance and the GDP of the countries it is exporting to is becoming stronger over time, these foreign demand conditions can probably be justified as external and exogenous factors only.

6.3 Hypothesis Two:

H₀: The null hypothesis stated that the relationship between the exports of a country and the GDP of the countries it is exporting to varied significantly by industry or commodity type.

H₁: The alternative hypothesis stated that the relationship between the exports of a country and the GDP of the countries it is exporting to did not vary significantly by industry or commodity type.

The null hypothesis was not rejected because there is a significant difference between the R^2 levels between South African exports and across different industries. Again the discussion will be in the context of comparing exogenous explanations of this result from endogenous ones.

6.3.1 Exogenous factors impacting exports by industry

When broken down to industry level, national economic cycles become more complex and complicated as their effect varies across different industries (Vlasiuk, 2010). Not all industries respond the same way to changes in global demand and from this study the industry with the strongest relationship between South African exports and global GDP was the chemicals industry. However, there were significant differences in the R^2 by industry and the results in the telecommunications, textiles and clothing industries are significantly different to those of the chemicals industry in that these industries had a significantly lower R^2 value. Taking a positive view, this would mean that South African exports to the telecommunications, textiles and clothing industries are less affected by global economic demand, and therefore, should be able to fair well in times of depressed demand. Accepting this view would encourage a policy maker to focus on these industries in times of global economic depression.

However, taking a negative view of this result could suggest that exports of South African telecommunications, textiles and clothing products are insignificant in terms of their impact on the global marketplace. Kaplinsky and Morris (2009) suggested that the success of the export performance of the Asian economies could be at the expense of the African economies and this may explain why these three industries had the weakest relationships between global GDP and South African exports. Alternatively, this may all be to do with the stage in the value chain that the exported product contributes to. This aligns with Grossman and Rossi-Hansberg's (2008) trade in tasks where different parts of a value chain occur in different countries.

The strong relationship between South African exports of chemicals products and global GDP could indicate that they are essential inputs at the start of the value chain. If this is the case then one argument for this relationship being so strong is that any decline in demand for any product further down the chain that uses chemicals as inputs, could impact South African chemical exports. This idea can be adapted once more in the food sector which had the second strongest relationship between South African exports and global GDP. Using Athukorala's (2009) findings of the internationalisation of the food value chain suggests that South African food exports are at the start of the food value chain. By accepting this view, policy makers wishing to protect their export industry from fluctuations in global demand would decide where in the value chain they wish to position their exports. Being at the start of the value chain could indicate that any demand fluctuation from any downstream activity will affect you, whereas the further downstream the activity then only demand from the next processes in the value chain will affect you.

Based on the empirical findings of this paper, the suggestion above regarding the value chain would be inappropriate because the industry sectors with the third and fourth strongest relationships between South African exports and global GDP are manufacturers and office and telecom equipment. By definition these industries are not at the start of the value chain and neither are telecommunications, textiles and clothing. Thus the argument that global value

chain is an exogenous factor that affects the strength of the relationship between export performance and global GDP does not hold in the case of South Africa.

Having ruled out the effect of the value chain positioning, another explanation for the difference in industry R^2 between the global economy and export performance could be trade openness and protectionism. Lehmann and O'Rourke (2008) suggested that protectionism is best understood at an industry level, although it is beyond the scope of this paper to review industry protectionism for every country that South Africa exports to. The implication of this study for policy makers, however, is to highlight the importance of protectionism to industrial and export policy in the light of exogenous macroeconomic events. Where protectionism is covert (Capling & Higgott, 2009; Bussière et al., 2011) this may prove to be extremely difficult. Therefore, while it is important to be aware of the exogenous factors affecting an industry, such as demand fluctuations, the structure of the value chain and the nature of trade openness and protectionism within that specific industry, it may be more practical for a government to focus on the endogenous factors within their control.

6.3.2 Endogenous factors impacting export performance by industry

For a manager of a South African firm, the results of this study show a strong relationship between global GDP and export performance within most industries. While there is some variance in the findings by industry, the Sousa et al. (2008) model of export performance will be relevant to any of the industries. An industry with a strong relationship between its exports and global GDP may require greater focus on some of the other factors of the Sousa et al. (2008) model, such as management characteristics and export strategy.

Where there is a strong relationship between South African export performance and global GDP, as is the case in the chemicals industry, then the management should focus on implementing a competitive strategy because as demand

increases in the industry, exports should increase accordingly. Should a situation arise where global GDP is increasing and exports for a firm within the chemicals sector are not increasing, this may point to a weakness in other endogenous factors related to competitiveness. Examples of these include the role of branding (Higgins & Mordhorst, 2008) and the need to target fewer markets (Brouthers et al., 2009). For a firm within the South African clothing industry, however, the international demand only explains 20% of the export performance and firms within this sector need to look internally rather than externally if they wish to improve export performance. Any recent declines in the performance of the telecommunications, textiles and clothing industries cannot be blamed on adverse external demand conditions only. A possible credible explanation of this performance, however, may be found by reviewing the policy environment.

Görg et al. (2008) highlighted how there is sparse evidence that government grants encourage firms to start exporting. In the event that a government was to pursue incentives by industry, the policy choice would be whether to focus on industries with strong ties to the global economy (chemicals, food, manufactures) or industries with a low relationship between global demand and their performance. A possible solution would be to focus on both and pursue export diversification as per Amiti and Freund (2010). Therefore, while some industries will be highly correlated with global demand, some will not. In times of increasing global demand the country exports more in the industries with a high R^2 , and in times of depressed demand the country can be buffered by sectors not so tied to the effects of global demand. However, this is different to Vlasiuk's (2010) recommendation with regards to the complete realignment of the Ukrainian export focus in the wake of the global financial crisis. The Vlasiuk (2010) approach was less about diversification and more about refocusing by abandoning some industries altogether in favour of others.

Razmi and Blecker's (2008) recommendation of how to implement the above would be to move from low technology to high technology exports. In the case of South Africa, high technology exports have a varied relationship with global GDP. Office and telecom equipment has an R^2 of 0.80 while

telecommunications has an R^2 of 0.66. Thus a recommended move towards high technology exports would provide sufficient diversity in terms of the interaction between global demand and export volume. However, there was little agreement in the literature between Mah (2007) and Siliverstovs and Herzer (2007) on the role of manufactured exports in export policy. Looking at the high R^2 value in this study, manufactures are very important for South Africa as an export sector because as global demand increases, there is a strong relationship with exports and therefore, exports should also increase.

The move to increase manufactured products can also be enhanced by looking at increasing the related variety of products within the industry as related variety increases economic growth (Saviotti & Frenken, 2008). The advantage of having related variety within the industry is that diversification of products will have different relationships with global demand. This could potentially insulate the country's exports from economic downturns and align with Odularu's (2009) premise that export diversity is required and is a positive development for an economy.

6.4 Hypothesis Three – A model for classifying the results

H₀: The null hypothesis stated that there is no significant causal relationship between the GDP of the countries it is exporting to and the country's exports.

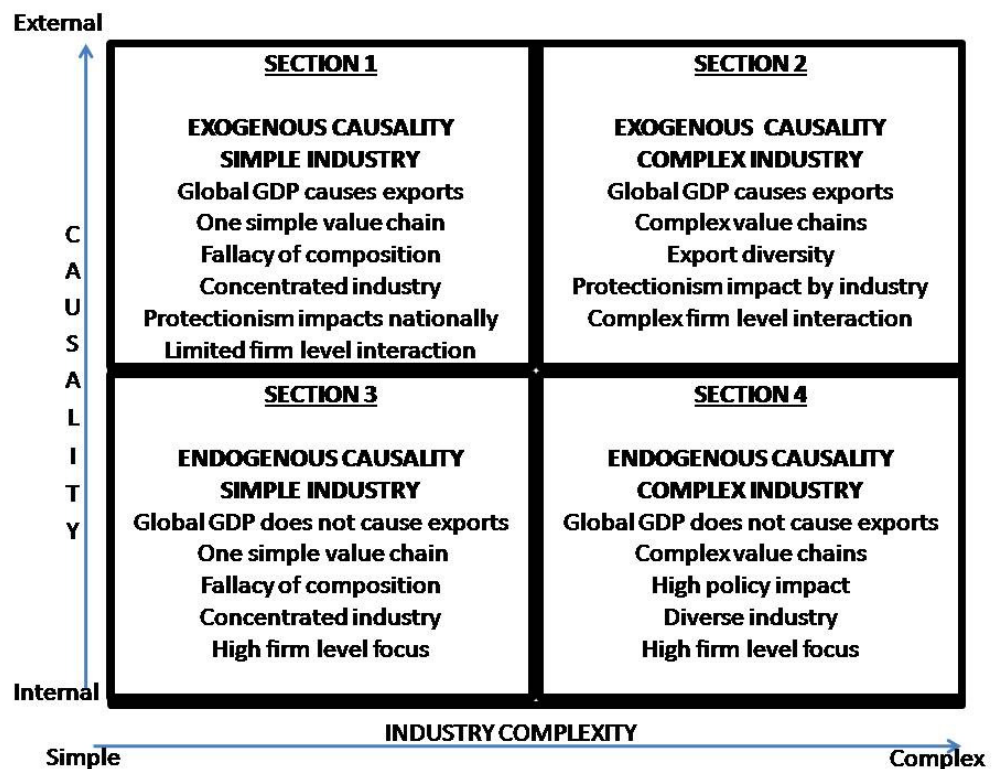
H₁: The alternative hypothesis stated that there is a significant causal relationship between the GDP of the countries it is exporting to and a country's export performance.

The null hypothesis was upheld because using the Granger causality approach there was no significant causal relationship between the GDP of South Africa's top trading partners and South African exports. This was a significant result because the regression results from the first two hypotheses showed there is a strong relationship between global GDP and South African exports. However, the result of this third hypothesis confirms that the strong relationship is not causal. By confirming that the relationship between international demand and

South African exports is not causal, this places a significant amount of weight on endogenous factors being more important for export policy.

In order to explain how these results could be practically applied they have been developed into the matrix model (figure 5) below, which plots the level of endogenous and exogenous factors against the level of complexity of the industries in the economy. This is based upon three assumptions coming out of the research results. First, the relationship between export performance and global GDP is becoming stronger over time. Second, the relationship between export performance and global GDP varies by industry. Third, global GDP does not cause export performance despite this relationship becoming stronger over time.

Figure 5: Export-GDP-Industry matrix



6.4.1 Internal vs. external causality (y axis)

The y axis represents the level of exogenous or endogenous causality regarding the country's export performance. The more external the causality the more exogenous it is, and the more internal the causality the more endogenous it is. The Sousa et al.'s (2008) model has internal and external factors contributing to export performance. Rather than use the internal and external distinction this paper persists with the exogenous and endogenous classification used consistently in the literature review. Based on the results from hypothesis three, where the Granger test found no causality between the GDP of South Africa's largest trading partners and South African export performance, this will be taken as evidence of endogenous causality.

6.4.2 Industry complexity (x axis)

The x axis represents the industry complexity. Export diversity (Amiti & Freund, 2010), the move to high technology exports (Razmi & Blecker, 2008) and product variety (Saviotti & Frenken, 2008) have been all taken to contribute to the complexity of a country's export industries. Where industry is concentrated and consists of low technology exports this has been taken as representing less complexity.

6.4.3 Section 1: Exogenous causality and simple industry structure

Countries classified in this section have GDP causing their exports and a simple industry structure. They have a simple value chain as their industries are very concentrated (Milberg & Winkler, 2010). They are susceptible to the fallacy of composition, especially if their single export is a low technology export (Razmi & Blecker, 2008). Any protectionism in the global trade environment will impact them nationally, with this effect being exacerbated if they have high export exposure (Capling & Higgott, 2009). At a firm level, there is little a company can do to change the outcome of its export performance (Sousa et al., 2008).

6.4.4 Section 2: Exogenous causality and complex industry structure

Countries classified in this section have global GDP causing export performance. They have diversified and complex industries and therefore complex value chains (Milberg & Winkler, 2010). Their exports are diversified and protectionism impacts them by industry (Lehmann & O'Rourke, 2008). The firm level interaction is complex in that the firms have to focus on external and internal variables (Sousa et al., 2008). While not all the variables are in their control, there are actions that firms can take to export more.

6.4.5 Section 3: Endogenous causality and simple industry structure

Global GDP does not cause export performance and the industry lacks diversity. There is one simple value chain and the economy is potentially susceptible to the fallacy of composition (Razmi & Blecker, 2008). Industry is concentrated and there is high firm level focus and interaction because since global GDP does not cause exports, success in the export market depends more on the firm's own capability and the institutional framework (Méon & Sekkat, 2008).

6.4.6 Section 4: Endogenous causality and complex industry

This is the section in which the author would place South Africa. Based on the findings from hypothesis three, global GDP does not cause exports. Based on the findings from hypothesis two, South Africa's industry is diverse and reacts differently to changes in the GDP of its largest trading partners. Each industry represents complex value chains that may potentially have significant trade in tasks (Milberg & Winkler, 2010). Policy and institutions have a significant impact in that they can improve or degrade export performance (Méon & Sekkat, 2008). Firms in this section of the model would also have to focus on external

and internal variables while not all the variables are in their control (Sousa et al., 2008).

6.5 Conclusion to the discussion

Each hypothesis was tested and discussed independently of each other, although the model in figure 5 managed to highlight the linkages between the results. The two critical elements in reviewing the results are the ability to isolate the relationship between the GDP of the importing country and South Africa's exports from any causality, and the ability to scrutinise the effect of the industry on this relationship. One significant advantage of the research approach was that it looked at relationships between variables and was therefore not biased by the value of the exports or GDPs analysed. This is advantageous because it offers a means to evaluate the export performance of various industries and trading partners using a metric that is not biased by size.

Opportunities have also been identified where South Africa could benefit from exploring certain trade relationships. For example, the relationship between Zambia's economy and South African export performance is rapidly becoming stronger, with Zambia being the only country in the sample where the p-value in hypothesis three indicated that GDP does cause export performance. In terms of numerical value, Zambia is only South Africa's 15th largest trading partner and might not have been subject to this level of analysis in a study where the size of the value of the trade is very important.

7. CHAPTER SEVEN: CONCLUSION

7.1 Introduction

In this chapter a synthesis of the research findings is presented with a linkage back to the research problem identified in Chapter 1 and the relevant literature. Recommendations are also provided for policy makers and firms on how they can improve their export performance. Finally, the paper discusses some ideas for future research into the field of exports that may complement or enhance the findings presented.

7.2 Synthesis of the research findings

Chapter 1 discussed the importance of ELG strategies to developing countries such as South Africa. A key question posed was how important the GDP of trading partners was to a country's export performance. With GDP being an exogenous factor out of the control of the exporting country (Harvey, 2011), it was unclear how important this relationship between the GDP of the importing country was to a country's export performance. This was extremely pertinent given that the distribution of global economic output has changed significantly in recent years (Davies 2010).

The findings from the research reveal that the relationship between global output and export performance is becoming stronger for South Africa, although there is significant variation of the strength of this relationship by industry. These findings pose a challenge to firms and policy makers because such factors are beyond their control. However, the significant finding from hypothesis three shows that despite the strength and nature of this relationship, it is certainly not a causal relationship. Therefore, a country or firm's destiny in terms of export performance can still be influenced significantly by factors within its control, even if there is a strong relationship between its exports and the GDP of the country it is exporting to.

The research was based on prior literature that referred to exogenous and endogenous variables that may explain the strength of the relationship between export performance and global GDP. Regarding the exogenous factors, the findings show strong links with the literature pertaining to changes in global trade structures and the shift from developed to developing markets. However, when it comes to applying global value chains to the findings, the results become varied by industry and are difficult to generalise. High technology exports do not necessarily behave differently to low technology exports when looking at the relationship between export performance and the GDP of the importing country.

When protectionism and trade openness are included as exogenous factors, again there is insufficient evidence to suggest that this is a significant variable when one considers that the literature suggests that protectionism is increasing, while at the same time the relationship between exports and GDP from hypothesis one is getting stronger. The author would expect this to be the opposite case, considering that protectionism is a deterrent to trade. The failure of the Granger test to support the causal relationship between export performance and the GDP of the importing country shows even less evidence to support the importance of exogenous factors in boosting exports. The endogenous factors from the literature, however, are more plausible in reviewing the research results.

The findings in favour of endogenous factors being more important are the major significant contributions of this research. The first contribution is how the policy and institutional framework within a country is a significant endogenous factor that can contribute to export success. Choosing which industries to focus on, as well as which countries to trade with, are significant public policy choices. The second contribution was to highlight how managers at the firm level do have some control of their own destiny when attempting to enhance export performance. The full set of recommendations for policy makers and firm management are expanded upon later in the paper.

7.3 Balancing industry complexity with export vulnerability

While every country has certain factor endowments and historical trade linkages, no country is permanently stuck in a particular trade and industry paradigm. This is consistent with Meilak's (2008) view that a country's comparative advantage is not static. For countries that show a strong relationship between their exports and the GDP of their top trading partners, the opportunity to diversify industry in order to minimise this impact exists immediately. For these countries that already possess diverse industries, it may be a question of choosing which industry sectors to focus on. The worst position to be in is where a nation is dependent on exogenous support for its growth, which is also based on the success of a single or few industries.

Where a country's exports are not affected by the economic growth of its largest trading partners, then any policy that makes the country more competitive on the global stage will have a significant impact. This research has shown for South Africa that endogenous factors are more important in boosting exports than exogenous factors. South African policy makers have decided where they would prefer to position the country's economy according to the New Growth Path (Republic of South Africa Department of Economic Development, 2010), although the next phase is to implement the required policy changes with a view to increasing industry complexity or reducing the dependency on a few key trading partners. Thus the third contribution of the research is that it provides a set of empirical tools that can be replicated for any country and also an analytical framework that can be used for strategic purposes.

7.4 Recommendations for policy makers

The first recommendation for South African policy makers is to pursue export diversity aggressively. Each industry reacts differently to changes in the global economy. Export diversity is one way in which to avoid the fallacy of composition and also spread the effect of changes in global economic cycles

and distribution. Dennis and Shepherd (2011) identified that overcoming barriers to export diversity includes reducing export costs caused by inefficiency and poor policy, reducing market entry costs by removing trade barriers and reducing international transport costs by improving the logistics infrastructure. Achieving these objectives would have a significant impact on increasing export diversity.

Second, policy makers must avoid the tendency to only attribute export performance to exogenous causal factors. While the global economy and the relationship with exports are dynamic, there may be merit in challenging some generally accepted assumptions by conducting proper empirical analysis. For time series data this should use an approach such as the Granger test, which is rigorous enough to highlight spurious regressions.

In South Africa's case, there was the interesting finding that South African export performance has a weaker relationship with the GDP of some of its largest trading partners than some of the smaller ones. Japan was a case in point in that it remains a very significant trading partner for South African exports, although exports to that country seem to be becoming less related to the fortunes of the Japanese economy. Zambia had the opposite trend in that there is a very strong relationship between Zambian GDP and South African exports to Zambia. While these relationships are interesting, policy makers would be unwise to base their export policy decisions solely on this outcome. However, they should also make sure that they pick up on trends that may signal the need to refocus their export effort. The findings have to be practically applied and not merely implemented at face value without consideration of other factors.

As expressed in the literature by Tsen (2010), the dynamic interaction between export performance and domestic demand reveals that both factors are important for economic growth. ELG analysis and Thirlwall's law are other complementary tools that can be used to evaluate the export effort. Using only one of these techniques is not sufficient to understand the full export situation

within a country, while focussing only on export performance and ignoring domestic demand is not a holistic approach to understanding economic growth.

7.5 Recommendations for firms

For firms there is a significant amount of research that has been conducted in the literature regarding how they can boost their export performance. Most of the research, such as Sousa et al. (2008), remains relevant for firms regardless of the relationship their industry faces with the GDP of the countries they are exporting to. Despite this, being aware of the strength of this relationship is still important as it can have strategic consequences in terms of how they compete. For example, a South African firm that manufactures chemicals for export should expect to be affected adversely in times of depressed economic output and already be starting to develop strategies to mitigate this effect. Branding (Higgins & Mordhorst, 2008) and the need to focus the export effort by targeting fewer markets (Brouthers et al., 2009) are two strategies suggested from the literature that can also assist firms in their export efforts. These findings illustrate that a South African firm is not completely at the mercy of the global economy when it comes to boosting exports, as the global economy does not cause South African export performance.

7.6 Recommendations for future research

The research identified that global GDP does not cause South African export performance, but did not quantify the effect of each of the endogenous or exogenous factors that do. Three ideas of further research related to this are stated below.

First, further research could be conducted using a multivariate Granger analysis of several endogenous and exogenous variables, including GDP, in order to identify which specific one has the strongest effect on export performance. Other variables in the model could include exchange rates, economic freedom,

education, export diversity, infrastructure and distance to markets. Second, the research was based on South Africa and further research could replicate this study for more countries in order to classify where they sit in the export-GDP-industry matrix. There may or may not be a trend in that most countries in the world can be classified according to a certain segment. Third, while the research was conducted for the data available between 1948 and 2010, further analysis could be conducted on the strength of the relationship between exports and the GDP of the country being exported to for more time periods. For example in 10-year increments from 1950 to 2010 if the data are available.

7.7 Closing reflections

The study has attempted to contribute to the body of research related to export performance by providing a framework that can be used to understand the extent that policy makers and firms can control their export performance. The research findings have presented a research method where the strength of the relationship between a country's export performance and the GDP of the countries it is exporting to can be tested for causality. The results of this empirical test are able to inform policy makers of the extent to which they are in control of their own destinies regarding export performance.

The research method developed in the paper presented a set of empirical tools that can be replicated easily, as well as a model which can be used to analyse the results and develop export or industry policy. The empirical tools and the model presented are complementary to many of the other export analysis methods currently available. These include the ELG, fallacy of composition and Thirlwall's law. One of the key issues raised in Chapter 1 was the extent that ELG is a sustainable source of economic growth for developing nations in the context of the rapidly changing structure of the global economy. The simple answer to this question is that it ELG will remain sustainable so long as policy focuses on identifying the influence of exogenous and endogenous factors and planning accordingly to leverage or mitigate their impact.

8. REFERENCE LIST

- Agosin, M. R., Alvarez, R., & Bravo-Ortega, C. (2012). Determinants of export diversification around the world: 1962-2000. *World Economy*, 35(3), 295-315. doi: 10.1111/j.1467-9701.2011.01395.x
- Amiti, M., & Freund, C. (2010). The Anatomy of China's Export Growth. In C. R. Feenstra, & S-J. Wei. *China's Growing Role in World Trade* (pp.35-56). Chicago: University of Chicago Press.
- Andreas, E., Geiger, C., Trevino, G., & Claffey, K. (2008). Identifying Nonstationarity in Turbulence Series. *Boundary-Layer Meteorology*, 127(1), 37-56.
- Athukorala, P. (2009). Economic transition and export performance in Vietnam. *ASEAN Economic Bulletin*, 26(1), 96-114.
- Auta, .E.M. (2012). Infrastructure, export-led growth and economic development in sub-Saharan Africa: An empirical analysis. *IUP Journal of Managerial Economics* 10(1), 46-78.
- Awokuse, T. O. (2008). Trade openness and economic growth: Is growth export-led or import-led? *Applied Economics*, 40(2), 161-173.
- Bajo-Rubio, O., & Díaz-Roldán, C. (2009). Does the balance of payments constrain economic growth? Some evidence for the new EU members. *Post-Communist Economies*, 21(1), 41-46. doi:10.1080/14631370802663612
- Baldauf, A., Cravens, D. W., & Wagner, U. (2000). Examining determinants of export performance in small open economies. *Journal of World Business*, 35(1), 61.

- Benedictis, L. D., Gallegati, M., & Tamberi, M. (2009). Overall trade specialization and economic development: Countries diversify. *Review of World Economics*, 145(1), 37-55.
- Bibow, J. (2012). How to sustain the Chinese economic miracle. *Chinese Economy*, 45(1), 46-73.
- Blalock, G., & Roy, S. (2007). A firm-level examination of the exports puzzle: Why East Asian exports didn't increase after the 1997–1998 financial crisis. *World Economy*, 30(1), 39-59.doi:10.1111/j.1467-9701.2007.00871.x
- Bredin, D., & Cotter, J. (2008). Volatility and Irish exports. *Economic Inquiry*, 46(4), 540-560.doi: 10.1111/j.1465-7295.2007.00101.x
- Briguglio, L., Cordina, G., Farrugia, N., & Vella, S. (2009). Economic vulnerability and resilience: Concepts and measurements. *Oxford Development Studies*, 37(3), 229-247.
- Brouthers, L. E., Nakos, G., Hadjimarcou, J., & Brouthers, K. D. (2009). Key factors for successful export performance for small firms. *Journal of International Marketing*, 17(3), 21-38.doi:10.1509/jimk.17.3.21
- Brzezinski, M., & Dzielinski, M. (2009). Is endogenous growth theory degenerating? Another look at lakatosian appraisal of growth theories. *Journal of Economic Methodology*, 16(3), 243-263.doi: 10.1080/13501780903121675
- Bussière, M., Pérez-Barreiro, E., Straub, R., & Taglioni, D. (2011). Protectionist responses to the crisis: Global trends and implications. *World Economy*, 34(5), 826-852.
- Campos, N. F., Hsiao, C., & Nugent, J. B. (2010). Crises, what crises? New evidence on the relative roles of political and economic crises in

begetting reforms. *Journal of Development Studies*, 46(10), 1670-1691. doi: 10.1080/00220388.2010.492865

Capling, A., & Higgott, R. (2009). Introduction: The future of the multilateral trade system--what role for the World Trade Organization? *Journal of East Asian Studies*, 9(3), 313-325.

Cardoso, C., & Soukiazis, E. (2008). Explaining the uneven economic performance of the EU cohesion countries: An export-led growth approach. *International Trade Journal*, 22(2), 156-187. doi:10.1080/08853900801970551

Chan, K. S., & Dang, V. Q. T. (2010). Multilateral trade and export-led growth in the world economy: Some post-war evidence. *Empirical Economics*, 38(3), 689-703. doi:10.1007/s00181-009-0285-7

Cheng, B.S., & Lai, T. W. (1997). An investigation of co-integration and causality between energy consumption and economic activity in Taiwan. *Energy Economics*, 19(1), 435-444.

Chongvilaivan, A. (2010). Undoing a myth of the global financial crisis and growth prospects: Evidence from selected Asia-Pacific economies. *Regional Outlook*, 8(1) 79-86.

Cipollina, M., & Salvatici, L. (2008). Measuring protection: Mission impossible? *Journal of Economic Surveys*, 22(3), 577-616. doi: 10.1111/j.1467-6419.2007.00543.x

Córdova, A., & Seligson, M. A. (2010). Economic shocks and democratic vulnerabilities in Latin America and the Caribbean. *Latin American Politics & Society*, 52(2), 1-35.

- Coulibaly, B., & Logan, T. D. (2009). South Africa's post-apartheid two-step: Social demands versus macro stability. *American Economic Review*, 99(2), 275-281. doi: 10.1257/aer.99.2.275
- Davies, R. (2010). New forces of Economic Growth. *International Trade Forum*, 21(4), 16-16.
- de Piñeres, S., A G. (2006). What a difference a source makes! An analysis of export data. *Applied Economics Letters*, 13(1), 35-39. doi:10.1080/13504850500378122
- de Sainte Croix, S. (2012, March 20). Industry Struggles as Brazil Economy Slows. *The Rio Times*, Retrieved from <http://riotimesonline.com/brazil-news/rio-business/industry-struggles-as-brazil-economy-slows/>
- Dennis, A., & Shepherd, B. (2011). Trade facilitation and export diversification. *World Economy*, 34(1), 101-122. doi: 10.1111/j.1467-9701.2010.01303.x
- di Giovanni, J., & Levchenko, A. A. (2009). Trade openness and volatility. *Review of Economics & Statistics*, 91(3), 558-585.
- Duval, R., & Vogel, L. (2008). Economic resilience to shocks: The role of structural policies. *OECD Journal: Economic Studies*, 2008(44), 201-238.
- Gallagher, K. P., & Porzecanski, R. (2008). China Matters. China's economic impact in Latin America. *Latin American Research Review*, 43(1), 185.
- Geda, A., & Meskel, A. G. (2008). China and India's growth surge: Is it a curse or blessing for Africa? The case of manufactured exports. *African Development Review*, 20(2), 247-272. doi: 10.1111/j.1467-8268.2008.00184.x

- Giles, J. A., & Williams, C. L. (2000). Export-led growth: A survey of the empirical literature and some non-causality results. Part 1. *Journal of International Trade & Economic Development*, 9(3), 261-337. doi:10.1080/09638190050086177
- Görg, H., Henry, M., & Strobl, E. (2008). Grant support and exporting activity. *Review of Economics & Statistics*, 90(1), 168-174.
- Gouvea, R. R., & Lima, G. T. (2010). Structural change, balance-of-payments constraint, and economic growth: Evidence from the multisectoral Thirlwall's law. *Journal of Post Keynesian Economics*, 33(1), 169-204.
- Granger, C. W. J., & Newbold, P. (1974). Spurious regressions in econometrics. *Journal of Econometrics*, 2(2), 111-120.
- Grossman, G. M., & Rossi-Hansberg, E. (2008). Trading tasks: A simple theory of offshoring. *American Economic Review*, 98(5), 1978-1997. doi:10.1257/aer.98.5.1978
- Guillaumont, P. (2010). Assessing the economic vulnerability of small island developing states and the least developed countries. *Journal of Development Studies*, 46(5), 828-854.
- Guo, K., & N'Diaye, P. (2009). Is China's Export-Oriented Growth Sustainable?. *International Monetary Fund Working Paper*. Retrieved from <http://media.rtl.nl/media/financien/rtlz/2009/chinaimf0814.pdf>
- Harvey, J. T. (2011). United States business cycles from 1971 through 2010: A post Keynesian explanation. *Journal of Economic Issues (M.E. Sharpe Inc.)*, 45(2), 381-390. doi: 10.2753/JEI0021-3624450215
- Hausmann, R., & Klinger, B. (2008). South Africa's export predicament. *Economics of Transition*, 16(4), 609-637. doi: 10.1111/j.1468-0351.2008.00337.x

- Higgins, D. M., & Mordhorst, M. (2008). Reputation and export performance: Danish butter exports and the British market, c.1880-c.1914. *Business History*, 50(2), 185-204. doi: 10.1080/00076790701868601
- Hong Kong Trade Development Council. (2012). *China Statistics*. [Data file]. Retrieved from <http://www.hktdc.com/info/mi/ccs/en/China-Statistics.htm>
- Huang, T.H., & Wang, M.H., (2007). A test for the export-led growth hypothesis in possibly integrated vector autoregressions. *Applied Economics Letters*, 14(13), 999-1003.
- Hwang, S., & Im, H. (2009). Implications of the global financial crisis on Korea's trade. *Asian Economic Papers*, 8(3), 46-81.
- Jin, J. C. (2002). Exports and growth: Is the export-led growth hypothesis valid for provincial economies? *Applied Economics*, 34(1), 63-76. doi:10.1080/00036840010025632
- Jordaan, A. C., & Eita, J. H. (2007). Export and economic growth in Namibia: A granger causality analysis. *South African Journal of Economics*, 75(3), 540-547. doi:10.1111/j.1813-6982.2007.00132.x
- Kaplinsky, R., & Morris, M. (2009). The Asian drivers and SSA: Is there a future for export-oriented African industrialisation? *World Economy*, 32(11), 1638-1655. doi:10.1111/j.1467-9701.2009.01253.x
- Keesing, D. B. (1967). Outward-looking policies and economic development. *Economic Journal*, 77(306), 303-320.
- Kellman, M., & Shachmurove, Y. (2011). Diversification and specialization paradox in developing country trade. *Review of Development Economics*, 15(2), 212-222. doi: 10.1111/j.1467-9361.2011.00603.x

- Kerr, W. A. (2009). Recession, international trade and the fallacies of composition. *Estey Centre Journal of International Law & Trade Policy*, 10(1), 1-11.
- Kundu, A. (2010). Export and economic growth in the economy of India: An econometric study (1971-2005). *IUP Journal of Applied Economics*, 9(4), 35-58.
- Lee, G. H. Y. (2011). Aggregate shocks decomposition for eight East Asian countries. *Journal of the Asia Pacific Economy*, 16(2), 215-232. doi: 10.1080/13547860.2011.564754
- Lehmann, S. H., & O'Rourke, K. H. (2008). The structure of protection and growth in the late 19th century. *Review of Economics & Statistics*, 93(2), 606-616.
- Levchenko, A. A., Lewis, L. T., & Tesar, L. L. (2010). The collapse of international trade during the 2008-09 crisis: In search of the smoking gun. *IMF Economic Review*, 58(2), 214-253. doi:10.1057/imfer.2010.11
- Liargovas, P. G., & Skandalis, K. S. (2008). Motivations and barriers of export performance: Greek exports to the Balkans. *Journal of Southern Europe & the Balkans*, 10(3), 377-392. doi:10.1080/14613190802493840
- Mah, J. S. (2007). Economic growth, exports and export composition in China. *Applied Economics Letters*, 14(10), 749-752. doi:10.1080/13504850600592572
- Mahadevan, R. (2007). New evidence on the export-led growth nexus: A case study of Malaysia. *World Economy*, 30(7), 1069-1083. doi:10.1111/j.1467-9701.2007.01030.x
- Martin, P., Mayer, T., & Thoenig, M. (2008). Make trade not war? *Review of Economic Studies*, 75(3), 865-900.

- Meilak, C. (2008). Measuring Export Concentration: The Implications for Small States. *Bank of Valetta Review*, 37(1), 35-48.
- Méon, P., & Sekkat, K. (2008). Institutional quality and trade: Which institutions? Which trade? *Economic Inquiry*, 46(2), 227-240.
- Milberg, W., & Winkler, D. (2010). Trade Crisis and Recovery Restructuring of Global Value Chains. *World Bank Policy Research Working Papers*, Retrieved from <http://www.felixpena.com.ar/contenido/negociaciones/anexos/2010-10-restructuring-global-value-chains.pdf>
- Minondo, A. (2010). Exports' quality-adjusted productivity and economic growth. *Journal of International Trade & Economic Development*, 19(2), 257-287. doi: 10.1080/09638190802573071
- Mohamed, I. E., (2009). 204-2009: Simulating Time Series Analysis: Examining the Long-Run Relationships (Cointegration) – Part II. *SAS Global Forum 2009*. Retrieved from <http://support.sas.com/resources/papers/proceedings09/204-2009.pdf>
- Montinari, L., & Prodi, G. (2011). China's impact on intra-African trade. *Chinese Economy*, 44(4), 75-91.
- Muriel, B., & Terra, C. (2009). Sources of comparative advantages in Brazil. *Review of Development Economics*, 13(1), 15-27. doi: 10.1111/j.1467-9361.2008.00493.x
- Nain, M. Z., & Ahmad, W. (2010). Export-led growth hypothesis in India: Some further evidences. *IUP Journal of Monetary Economics*, 8(3), 69-82.

- Naude, W., McGillivray, M., & Rossouw, S. (2009). Measuring the vulnerability of subnational regions in South Africa. *Oxford Development Studies*, 37(3), 249-276.
- Ozturk, I. & Acaravci, A. (2010). An application of Thirlwall's law to the South African economy: Evidence from ARDL bounds testing approach. *African Journal of Business Management*, 4(2), 262-266.
- Park, A., Yang, D., Shi, X., & Jiang, Y. (2010). Exporting and firm performance: Chinese exporters and the Asian financial crisis. *Review of Economics & Statistics*, 92(4), 822-842.
- Quinn, M. A. (2009). Movies and the mystery of the missing trade: Is Hollywood good for U.S. exporters? *International Trade Journal*, 23(2), 231-254. doi: 10.1080/08853900802388019
- Raynolds, L. T. (2008). The organic agro-export boom in the Dominican Republic. *Latin American Research Review*, 43(1), 161.
- Razmi, A., & Blecker, R. A. (2008). Developing country exports of manufactures: Moving up the ladder to escape the fallacy of composition? *Journal of Development Studies*, 44(1), 21-48.
- Rebucci, A. (2010). Is growth exogenous? Evidence from the 1970s and 1980s. *Applied Economics*, 42(5), 535-543. doi: 10.1080/00036840701704410
- Republic of South Africa, Economic Development Department. (2010) The New Growth Path: The Framework. Presented to the Parliamentary Portfolio Committee by Minister Ebrahim Patel on 23rd November 2010. Available online at www.info.gov.za/speech/DynamicAction?pageid=461&sid=14787&tid=24857

- Republic of South Africa Department of Trade and Industry (2012).
Statistics. [Data File]. Retrieved from
<http://apps.thedti.gov.za/econdb/raportt/Wtorev.html>
- Rodrik, D. (2008). Understanding South Africa's economic puzzles. *Economics of Transition*, 16(4), 769-797.
- Rogerson, C. M. (2010). Local economic development in South Africa: Strategic challenges. *Development Southern Africa*, 27(4), 481-495.
- Rogova, O. (2011). Type of balance of payments as a sign of economic backwardness. *Problems of Economic Transition*, 54(7), 85-95.
- Santos-Paulino, A. (2010). Export productivity and specialisation: A disaggregated analysis. *World Economy*, 33(9), 1095-1116.doi: 10.1111/j.1467-9701.2010.01276.x
- Saunders, M., & Lewis, P. (2012). *Doing Research in Business and Management. An Essential Guide to Planning Your Project*. Edinburgh Gate: Pearson.
- Saviotti, P., & Frenken, K. (2008). Export variety and the economic performance of countries. *Journal of Evolutionary Economics*, 18(2), 201-218.doi: 10.1007/s00191-007-0081-5
- Siliverstovs, B., & Herzer, D. (2007). Manufacturing exports, mining exports and growth: Cointegration and causality analysis for Chile (1960–2001). *Applied Economics*, 39(2), 153-167.doi:10.1080/00036840500427965
- Singh, T. (2010). Does international trade cause economic growth? A survey. *World Economy*, 33(11), 1517-1564.

- Sousa, C. M. P., Martínez-López, F. J., & Coelho, F. (2008). The determinants of export performance: A review of the research in the literature between 1998 and 2005. *International Journal of Management Reviews*, 10(4), 343-374.
- Thirlwall, A.P. (1979). The Balance of Payments Constraint as an Explanation of International Growth Rate Differences. *Banca Nazionale del Lavoro Quarterly Review*, 128(1), 45–53.
- Tsen, W. H. (2010). Exports, domestic demand, and economic growth in china: Granger causality analysis. *Review of Development Economics*, 14(3), 625-639.doi: 10.1111/j.1467-9361.2010.00578.x
- United Nations Conference on Trade and Development [UNCTAD] (2012) *UNCTADSTAT*. [Data File]. Retrieved from http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx?sRF_ActivePath=P,15912,15913&sRF_Expanded=P,15912,15913
- Vlasiuk, A. (2010). The world financial crisis and principles of anti-crisis regulation in Ukraine. *Problems of Economic Transition*, 53(4), 35-59.doi:10.2753/PET1061-1991530203
- World Bank (2003) *World Development Indicators*. Retrieved from http://econ.worldbank.org/external/default/main?pagePK=64165259&theSitePK=469372&piPK=64165421&menuPK=64166093&entityID=000094946_03051504051563
- World Bank. (2012). *Indicators*. [Data File]. Retrieved from <http://data.worldbank.org/indicator>
- Yoo, S.H. (2008). High-technology exports and economic output: An empirical investigation. *Applied Economics Letters*, 15(7), 523-525.doi: 10.1080/13504850600721882

Zuo, P. (2012, April 12). China's Q1 growth slowest in nearly three years.*AFP*.

Retrieved From

<http://www.google.com/hostednews/afp/article/ALeqM5jEN846IGuIDEBlTwbuz-D9a-H7Qg?docId=CNG.2c6ef609240094d85e2c7f264f6543fb.1d1>

9. Appendices

9.1 World Trade Organisation product classifications

Product definitions

All product groups are defined according to Revision 3 of the Standard International Trade Classification (SITC).

Primary products

(i) Agricultural products (SITC sections 0, 1, 2, 4 minus 27 and 28)

- *Food*: food and live animals, beverages and tobacco, animal and vegetable oils, fats and waxes, oilseeds and oleaginous fruit (SITC sections 0, 1, 4 and division 22), of which:

-- *Fish* (SITC division 03), and

-- *Other food products and live animals, beverages and tobacco, animal and vegetable oils, fats and waxes, oilseeds and oleaginous fruit* (SITC sections 0, 1, 4 and division 22 less division 03).

- *Raw materials*: hides, skins and furskins, raw, crude rubber (including synthetic and reclaimed), cork and wood, pulp and waste paper, textile fibres and their wastes, crude animal and vegetable materials, n.e.s. (SITC divisions 21, 23, 24, 25, 26, 29).

(ii) Fuels and mining products

- *Ores and other minerals*: crude fertilizers (other than those classified in chemicals) and crude minerals, metalliferous ores and metal scrap (SITC divisions 27, 28).

- *Fuels*: (SITC section 3).

- *Non-ferrous metals*: (SITC division 68).

Manufactures: (SITC sections 5, 6, 7, 8 minus division 68 and group 891)

(i) Iron and steel: (SITC division 67).

(ii) Chemicals: (SITC section 5), of which:

- *Pharmaceuticals* (SITC division 54), and

- *Other chemicals*: organic chemicals (SITC division 51), plastics (SITC divisions 57, 58), inorganic chemicals (SITC division 52), other chemicals n.e.s. (SITC divisions 53, 55, 56, 59).

(iii) *Other semi-manufactures*: leather, leather manufactures, n.e.s., and dressed furskins, rubber manufactures, n.e.s., cork and wood manufactures (excluding furniture), paper, paperboard and articles of paper pulp, of paper or of paperboard, non-metallic mineral manufactures, n.e.s., manufactures of metals, n.e.s. (SITC divisions 61, 62, 63, 64, 66, 69).

(iv) *Machinery and transport equipment*: (SITC section 7), of which:

- *Office and telecommunications equipment*: office machines and automatic data processing machines, telecommunications and sound recording and reproducing apparatus and equipment, thermionic, cold cathode or photo-cathode valves and tubes (SITC divisions 75, 76 and group 776), of which:

-- *Electronic data processing and office equipment* (SITC division 75),

-- *Telecommunications equipment* (SITC division 76), and

-- *Integrated circuits, and electronic components* (SITC group 776).

- *Transport equipment* (SITC group 713, sub-group 7783, groups 78 and 79), of which:

-- *Automotive products*: motor cars and other motor vehicles principally designed for the transport of persons (other than public transport type vehicles) including station wagons and racing cars, motor vehicles for the transport of goods and special purpose motor vehicles, road motor vehicles, n.e.s., parts and accessories of motor vehicles and tractors, internal combustion piston engines for vehicles listed above, electrical equipment, n.e.s., for internal combustion engines and vehicles, and parts thereof (SITC groups 781, 782, 783, 784, and subgroups 7132, 7783), and

-- *Other transport equipment*: railway vehicles, aircraft, spacecraft, ships and boats, and associated parts and equipment, motorcycles and cycles, motorized and non-motorized, trailers and semi-trailers, other vehicles (not mechanically propelled), and specially designed and equipped transport containers, internal combustion piston engines for aircraft, and parts thereof, n.e.s., internal combustion piston engines, marine propulsion, internal combustion piston engines, n.e.s., parts, n.e.s., for internal combustion piston engines listed above (SITC division 79, groups 713, 785, 786 minus sub-group 7132).

- *Other machinery* (SITC divisions 71, 72, 73, 74, 77 minus groups 713, 776 and minus sub-group 7783), of which:

-- *Power generating machinery*: power generating machinery and equipment minus internal combustion piston engines and parts thereof, n.e.s. (SITC division 71 minus group 713),

-- *Non-electrical machinery*: machinery specialized for particular industries, metalworking machinery, general industrial machinery and equipment, n.e.s., and machine parts, n.e.s. (SITC divisions 72, 73, 74), and

-- *Electrical machinery*: electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof, minus thermionic, cold cathode or photo-cathode valves and tubes, minus electrical equipment, n.e.s., for internal combustion piston engines and parts thereof, n.e.s. (SITC division 77 minus group 776 and subgroup 7783).

(v) Textiles: (SITC division 65).

(vi) Clothing: (SITC division 84).

(vii) Other manufactures: (SITC divisions 81, 82, 83, 85, 87, 88, 89 excluding group 891), of which:

- *Personal and household goods*: furniture (SITC division 82), travel goods (SITC division 83) and footwear (SITC division 85),

- *Scientific and controlling instruments* (SITC division 87), and

- *Miscellaneous manufactures*: instruments and apparatus, photography, optical goods, watches and clocks, toys and games, and other manufactured articles, n.e.s. (SITC divisions 81, 88, 89 minus group 891).

Other products: commodities and transactions not classified elsewhere (including gold), arms and ammunition (SITC section 9 and group 891).

It should be noted that other food products and live animals, beverages and tobacco, animal and vegetable oils, fats and waxes, oilseeds and oleaginous fruit are referred to as other food products, electronic data processing and office equipment is referred to as EDP and office equipment, and integrated circuits and electronic components is referred to as integrated circuits.

Table 4: Collated regression results by industry and country

	Agriculture	Automotive	Chemical	Clothing	Food	Fuels and Mining	Iron and steel	Manufactures	Office and telecom equipment	Telecommunications	Textiles
Total	0.75	0.79	0.83	0.20	0.82	0.75	0.78	0.80	0.80	0.66	0.58
Belgium	0.80	0.89	0.94	0.17	0.91	0.81	0.90	0.93	0.89	0.69	0.70
China	0.94	0.88	0.86	0.03	0.95	0.93	0.78	0.78	0.78	0.59	0.38
France	0.79	0.88	0.93	0.17	0.89	0.80	0.90	0.92	0.89	0.70	0.70
Germany	0.66	0.76	0.90	0.24	0.87	0.67	0.81	0.88	0.81	0.57	0.74
Hong Kong	0.58	0.61	0.77	0.39	0.75	0.54	0.54	0.84	0.80	0.71	0.80
India	0.93	0.88	0.86	0.03	0.93	0.95	0.82	0.80	0.81	0.65	0.41
Italy	0.74	0.86	0.89	0.19	0.85	0.77	0.88	0.90	0.89	0.74	0.69
Japan	0.33	0.02	0.39	0.42	0.64	0.31	0.25	0.58	0.49	0.04	0.61
Korea Republic	0.77	0.84	0.91	0.24	0.81	0.78	0.83	0.91	0.92	0.76	0.78
Malaysia	0.90	0.91	0.96	0.12	0.93	0.90	0.87	0.92	0.89	0.65	0.60
Mozambique	0.86	0.91	0.90	0.75	0.88	0.85	0.81	0.67	0.75	0.79	0.33
Netherlands	0.85	0.93	0.96	0.17	0.90	0.85	0.91	0.94	0.93	0.78	0.71
Spain	0.85	0.93	N/A	0.13	0.90	0.88	0.92	0.92	0.92	0.76	0.64
Switzerland	0.77	0.83	0.91	0.17	0.91	0.78	N/A	0.88	0.84	0.57	0.64
Taiwan	0.85	0.93	0.92	0.13	0.90	0.71	0.70	0.92	N/A	0.76	0.64
UAE	0.95	0.97	0.95	0.04	0.93	0.97	0.90	0.86	0.89	0.75	0.49
UK	0.76	0.87	0.86	0.25	0.76	0.76	0.86	0.93	0.96	0.94	0.80
USA	0.79	0.86	0.88	0.29	0.79	0.75	0.75	N/A	0.95	0.90	0.75
Zambia	0.88	0.86	0.86	0.00	0.88	0.95	0.83	0.72	0.68	0.57	0.27
Zimbabwe	0.27	0.44	0.41	0.07	0.28	0.26	0.88	0.24	0.39	0.46	0.18

Data labelled N/A refers to data that was unavailable at a country level. The aggregate totals, therefore, did not include these countries when running the regression analysis.