

South Africa's exports to China

Higher quantity or bigger variety?

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ABSTRACT

In general, a country's "fundamentals", namely its endowments of physical and human capital, labour and natural resources along with the quality of its institutions, largely determine what it produces. Any attempt to reshape the production structure beyond the boundaries of these fundamentals is likely to fail and limit potential economic performance. Although fundamentals play an important role, it does not necessarily pin down exactly what a country will produce and export. Export expansion is pivotal in a country's attempt to promote economic growth and can be based on either the intensive margin, involving expansion in the quantity of existing exports or the extensive margin, involving expansion in the variety of products exported. Furthermore, a country also needs to evaluate its domestic production capacity given a specific trading partner. South Africa and China are moving closer to one another as trading partners, presenting ample trade opportunities. South Africa's sectoral exports to China identifies key trade opportunities, while export sectors with potential to export more existing products (intensive margin) or more product varieties (extensive margin) are identified in this article. This analysis could provide valuable insight into the government's trade institutions. The information could assist in providing guidance to exporting firms to ensure increased effectiveness in a very competitive environment.

INTRODUCTION

International trade is perceived as an engine of economic growth according to the orthodox classical view. However, a key concern has been the potential risk that increasing exports will depress the terms of trade and make rapidly growing economies worse off – or at least severely diminish the gains from trade (Pham and Martin 2007). This trade pessimism was widely regarded as a big enough threat to make developing countries focus on import substitution as a growth path. More recently, an export orientated approach is once again perceived as a more promising approach to growth. The effectiveness of export promotion is, however, in the end an empirical issue, as it is difficult to decide for or against an export-led approach as there are conflicting results worldwide. Export growth may represent an increase in demand for a

country's output. An expansion of exports may also promote specialisation in the production of the export products, which in turn may boost the productivity levels and may cause the general level of skills to rise in the export sector. This may then lead to a reallocation of resources from the relatively inefficient non-trade sector to the higher productive export sector.

An outward-oriented approach may provide access to advanced technologies, benefits through learning by doing as well as improved management practices which may enhance further efficiency gains. Increased exports may loosen a foreign exchange constraint which makes it easier to import external capital and intermediate inputs. In addition, exports based on a country's comparative advantage may allow the exploitation of economies of scale, especially in a domestic market that is too small to achieve an optimal scale. An outward-oriented view may also provide opportunities for creative entrepreneurial activity, seeking out risk and opportunities. Although it is accepted that the reliance on exports alone will not necessarily result in sustained long-term economic growth, increased exports generate much needed income for developing economies. Politicians in general are convinced that providing assistance to exporters is a no-lose issue. In its most elementary form, the argument is that exports are good and exporting firms are good firms. Therefore, supporting domestic firms to export is a good policy strategy (Bernard and Jensen 2004).

On 23 December 2010, South Africa was invited to become part of a collective of developing economies consisting of Brazil, Russia, India and China (BRIC). Strategically, the main objective of this was to establish South Africa as the African partner, given its dominance on the continent. The benefits of which would increase higher trade volumes between these countries and the African continent in general. The relatively small size of South Africa's economy compared to the other countries has led to ambiguous reactions to the inclusion of South Africa in the BRICS group of countries. Some of the main reasons for this reaction include whether South Africa would be as formidable a trade partner, or simply provide larger and easier market access to the other developing countries while failing to increase exports in a similar fashion.

Several studies have given due consideration to the determinants of export potential between countries, however in the case of developing countries one would presume the existence of both inhibiting and prohibiting factors. This article identifies South Africa's unexploited export potential, if any, to China. Based on this, an attempt would be made to identify the sectors where an increased quantity of existing exports is possible against sectors that provide opportunity for increased product variety. This study explores exports from South Africa to China from 2001 to 2013 using an augmented gravity model.

The rest of the article is organised as follows: the second section provides a brief overview of the literature on trade amongst developing countries, while the third section briefly deliberates south-south trade between China and South Africa. The fourth section describes the empirical model with the fifth section providing the methodology. The estimation results are provided in the sixth section and the sectoral trade potential in the seventh section. The conclusions are drawn from the analysis and discussed in the last section.

LITERATURE REVIEW

In recent years the global environment has made it imperative for countries to explore foreign market opportunities in order to gain and sustain a competitive advantage. Globalisation



provides new markets, investment and sourcing opportunities for countries engaged in international trade. Developing economies are a growing presence in an integrated global economy. It is, however, essential that to produce for the world market, a country has to be able to compete and this necessitate the existence of productive attributes. Based on the success of Asian countries, developing countries are moving away from inward-oriented import substitution policies toward outward-oriented export-led growth (Aulakh and Teegen 2000). The success of these countries is mainly accomplished through manufacturing at home and exporting these products to foreign markets. According to the neoclassical view, export expansion can thus be a catalyst for output growth both directly, as a component of aggregate output, as well as indirectly through efficient resource allocation, greater capacity utilisation, exploitation of economies of scale and stimulation of technological improvement due to foreign market competition. In turn, exports provide foreign exchange that allows for increasing levels of imports of capital and intermediate products that in turn raise the growth of capital formation and stimulate output growth (Awokuse 2003). China as a country is a prime example that openness to trade is a mechanism for achieving more rapid and efficient growth including a better distribution of domestic resources. Bernard and Jensen (2004) conclude that exporting firms, in general, have more workers, proportionately more white collar workers, higher wages, higher productivity, greater capital intensity, higher technology intensity and are more likely to be part of a multi-plant firm. Although the advantages of export expansion are well known, different ways exist in which developing countries can address this demanding and challenging process.

Hummels and Klenow, (2002) provide a framework for dividing trade expansion into an intensive margin, involving expansion in the quantity of each export and an extensive margin, involving expansion in the number of products exported. This framework provides important implications for developing countries engaged in exports. In the same vein, Shepherd (2010) concludes that there are four ways in which a developing country can expand its levels of trade, which include:

- more trade in goods that existing trading partners already exchange (*the intensive margin*);
- introduction of new product varieties (*the product extensive margin*);
- an increase in the unit values of traded goods (*the quality margin*); and
- creation of trading relationships between new partners (*the geographical extensive margin*).

According to Lee and Kim (2012) trade expansion at the extensive margin through improved trade facilitation, implies a wider range of goods are exported. Here, export diversification in terms of product variety is leading economic growth. However, if trade grows at the intensive margin, it is suggestive of larger market share in the destined import markets due to increased volumes of existing exported products. This may be evidence of an upgrade in a country's development process to a more advanced level. Extensive and intensive margins can also be broken down into primary and manufactured products trade, since trade infrastructure may have a different impact depending on whether the export category is a primary or manufactured product. Models based on differentiation focuses on the intensive margin where a country with more resources will trade more, but will not trade a large number of products. Felbermayr and Kohler, (2006) add an additional motivation at the

extensive margin which is related to welfare. If trade is based on product differentiation, the expansion of world trade on the extensive margin seems particularly important from a welfare perspective, since it increases the degree of product differentiation. Other models based on monopolistic competition concentrate on the extensive margin for exports where countries which is bigger in size will trade more products. Another way of distinguishing the evolution of trade expansion is between trade in final and intermediate products as discussed by Yi (2003). According to this approach, the intensive margin is related to changes in trade volumes, based on a given pattern of vertical specialisation. The extensive margin, addresses the question of whether a particular input is traded internationally or not. In all of these cases, trade costs play an important role. Bernard, Jensen, and Schott (2006) underline the argument that reductions in trade costs may boost industry productivity.

Many recent studies emphasised the importance of extensive versus intensive margins in explaining the evolution of international trade volumes. Trade expansion can be decomposed in several ways. A distinction can be made between changes in the number of active bilateral trade relationships or extensive margin and the growth of trade volumes in existing trade relationships or intensive margin (Felbermayr and Kohler 2006). A firm-level distinction was made by Bernard, Jensen, and Schott (2006) which decomposes exports into entry and exit, indicating firms entering and exiting the export scene (extensive margin) and changes in foreign sales that exporting firms achieve (intensive margin). Hummels and Klenow (2005) distinguish between the variety dimension of trade growth (extensive margin), the quality (price) and the quantity dimension (intensive margin). The literature on the role of intensive and extensive margins and its contribution towards trade expansion has revealed two opposing conclusions. A large body of work have found the extensive margin to be more important compared to a number of studies which found the intensive margin to be more influential. However, the conceptual differences in terms of the definition used for the intensive and extensive margins, partly explain the difference in results (Besedeš and Prusa 2011).

The main theoretical framework in which countries have to bring down their own prices relative to other countries as the only way to expand their exports, unfortunately simultaneously create serious terms of trade deterioration for countries increasing their exports. The intensive margin growth is characterised by expansion of exports of the same products to existing markets and smaller developing countries face significantly more challenges in this regard. One way in which developing countries can prevent the trade pessimism is if growth in exports does not only occur through an expansion in the quantities of the same good. If export growth, therefore, is diversified by increasing the number of the products range, the outcome may be more positive. This approach would cause an increase in the variety of exported products. This extensive margin growth may help to offset the deterioration in the terms of trade associated with the conventional, intensive margin growth. Another way of preventing the trade pessimism is improving the quality of products exported (Pham and Martin 2007). However, smaller developing countries face bigger challenges to achieve this. According to Hummels and Klenow (2005), adverse terms of trade effects are much less likely if a country's trade grows at the extensive margin where the emphasis is on the range of products traded rather than the volume within a given range. Given an adequate preference for variety, expansion at the extensive margin may cause an increase in their demand, outperforming the price-depressing impact of higher export volumes.

All theories of international trade predict that larger economies generally trade more than smaller economies. According to Kehoe and Ruhl (2002) the extensive margin is important in explaining why big countries trade more than small countries, simply because big countries trade more products in general than small countries. The extensive margins of trade can account for a large share of the variation in imports and exports across countries. However, to the extent that larger economies export more on extensive margins or export higher quality products, adverse terms of trade effects are no longer a necessary consequence. These larger economies may now export more varieties to more countries or export higher quality products at higher rather than lower prices. In general, geographic diversification seems more important than product diversification at the extensive margin, especially for developing countries. Numerous studies have found the extensive margin to be a more important aspect in explaining trade expansion.

In the study of Hummels and Klenow (2005) it is shown that the extensive margin accounts for 60% of exports in larger economies. Evenett and Venables (2002) find that 33% of the growth in exports from developing countries between 1970 and 1997 is based on the extensive margin. A study by Kang (2004) on two Asian countries, Taiwan and South Korea, revealed that the extensive margin is more important in explaining export growth than the intensive margin. Felbermayr and Kohler (2006) also found evidence that the extensive margin were dominant in world trade growth during the 1950 to 1970 period as well as during the mid-1990s. This finding is echoed by the study of Helpman, Melitz and Rubinstein (2008). Given the extensive margin approach, these demand-side benefits could substantially increase the welfare gains both to countries expanding their exports and to the countries that trade with them.

However, a study by Amiti and Freund (2007) finds that in the case of China, the intensive margin played a more important role in export expansion than the extensive margin between 1992 and 2005. The results of Besedeš and Prusa (2011), which analysed 46 mostly developing countries, show that the majority of the growth in trade is attributed to the intensive margin rather than the extensive margin. Amurgo-Pacheco and Pierola (2008) also find that exports at the intensive margin account for the most important share of overall trade growth. Besedeš and Prusa (2011) show that the relative performance of developing countries is particularly poor on the extensive margin as they are unable to maintain and deepen their export relationships. It seems that developing countries perform better on the intensive margin as the variation in trade across one-year intervals is dominated by the intensive margin (Bernard, Jensen, Redding and Schott 2009). Besedeš and Prusa (2011) continue to decompose export expansion into three different parts, namely establishing new partners and markets; having relationships survive or persist; and deepening existing relationships. The first aspect of new export relationships is the extensive margin while the two remaining are aspects of the intensive margin. Hausman and Rodrik (2003) show that despite many efforts to establish new relationships, only a handful of products dominate many developing countries' exports. It seems that the reason for so few products originating from developing countries is that new products almost always fail. High failure rates are common in developing countries and have a detrimental effect on export growth.

Besedeš and Prusa (2011) conclude that almost all activity at the extensive margin has only a short run impact on exports and little or no impact on long term export growth. The low survival rates during the start-up years generally prevent deepening. Secondly, if survival

rates increase, it would cause higher export growth even if deepening is absent. Lastly, the very high failure rates make the connection between the extensive margin and long-term export growth very fragile. Although their final results confirm that the intensive margin is the dominant force in trade growth, it does not mean that the extensive margin cannot play an important role. Successful developing countries differ significantly from less successful ones on the intensive margin. Differences on the extensive margin are present, although much smaller and in favour of less successful developing countries. These conclusions indicate that developing countries are able to form new export relationships, but are much less successful in maintaining those relationships.

It seems that even opponents of the export-oriented approach to economic development agree that export growth has been imminent since World War II. Rodrik (2006) noted that no country has successfully grown without trade expansion. Irrespective of whether export growth is the cause or the consequence, it remains an important element for growth.

SOUTH-SOUTH TRADE

In general, a country's *fundamentals*, namely its endowments of physical and human capital, labour and natural resources along with the quality of its institutions determine what it produces. These fundamentals determine the relative costs and patterns of specialisation in a country. Any attempt to reshape the production structure beyond the boundaries of these fundamentals is likely to fail and limit potential economic performance. Although fundamentals play an important role, it does not necessarily pin down exactly what a country will produce and export. Another important aspect is the number of entrepreneurs that are willing and able to engage in production and export. The larger this number, the closer the economy can get to its productivity frontier (Hausmann, Hwang and Rodrik 2006). According to these authors, countries that can latch on to higher productivity products will perform better.

To the extent that market size influences productivity, large countries can *afford* to be closed, while small countries face stronger incentives to remain open (Alesina and Wacziarg 1998). Findings by Shepherd, which are in line with the broader literature on the topic, suggest that the market size and developmental level, international trade costs, and export costs applicable to the exporting country, all have a critical impact on the potential of trade growth (Shepherd 2010). Research conducted on East Asian markets and their determinants of trade flow suggest that the technological gap between two countries also plays a significant role in their ability and capacity to trade with one another (Filippini and Molini 2003).

South-south trade is playing an increasingly important role in international trade and its share in overall trade has increased dramatically. The spectacular rise and current significance of China in the global economy is much debated in recent years. The emerging importance is in part due to its active engagement with the world through international trade, investment and finance. The rise of this potential Asian giant could mark the beginning of a change in the global balance of economic and political power. However, the impact of its increased presence on the African continent presents immense economic possibilities and challenges to these countries in general and South Africa in particular.

It is clear that an array of determinants exist for trade flow between developing countries, of which some are external and some internal to the exporting country. It is, therefore, important



to understand these factors and the potential role they play in export determination between trading partners. China's expanding engagement in Africa has captured world attention. China has a broader diplomatic effort to portray itself as a peacefully rising power interested in a *win-win* solution. China is the largest developing country in the world while Africa is the continent where the largest number of developing countries is located (Guijin 2005). China's pursuit to become a global role player and emergence as an economic power has seen its influence expand in Africa, reshaping political and economic relationships on the continent. This poses both challenges and opportunities that will require complex and sensitive diplomatic efforts to ensure that the interests of China and African countries are all protected. In the process, one would like to witness the creation of a regional and global environment that promotes stability and where economic growth is fostered. As China's domestic economy grows, it is expanding and deepening its political and economic relations in Africa, primarily to secure access to African markets and raw materials. As a strategic partner, China is attractive to many African countries. China's self-proclaimed respect for sovereignty and non-interference in internal affairs is appealing to many African leaders (Thompson 2005). The underlying motive is the expressed need to build strong south-south ties.

From a South African perspective, several export opportunities exist in the BRIC's grouping in general, in particular China. In the process of trade, income is generated and employment levels in general expand. International trade is a complex activity where countries need to identify potential exchange partners, assessing their reliability, trustworthiness, timeliness and capabilities (Martincus, Carballo and Gallo 2010). South Africa's main export products include a variety of primary products such as mineral resources (chromium, platinum, manganese, and iron ores), motor vehicles and car parts, machinery and mechanical appliances. Its main export partners are China, the United States, Japan, Botswana and Germany. The challenge to South Africa is whether it will follow the extensive margin, developing and exporting new products or remain exporting its current stock of products, although higher volumes according to the intensive margin. China poses a significant opportunity for South Africa in terms of either following an extensive or intensive margin approach, exploring China's massive demand for its products and channelling exports to satisfy this unsaturated potential demand.

EMPIRICAL MODEL

A gravity model is an important instrument to determine the export potential and is used to analyse the relationship between volume and direction of bilateral international trade. Tinbergen (1962) and Pöyhönen (1963) pioneered the idea of explaining bilateral trade flows using Newton's law of gravity. The economic capability of a country, generally measured by gross domestic product (GDP) acts as the attraction factor between two countries. However, the attraction would partially be offset by the distance between the countries, which serves as a resistance factor. In theory, one would thus expect that countries with a stronger GDP and which are in close proximity to one another would experience higher volumes of bilateral trade. Conversely, the smaller the GDP and the further away the countries from one another the less trade would occur. Anderson (1979) and Bergstrand (1985, 1989) emphasise that the gravity model is a good representation irrespective of the structure of product

markets. Several studies augmented the basic gravity model with a number of variables such as population size (Bergstrand 1985 & 1989), a measure of the price variable (Oguledo and Macphee 1994) and exchange rate (Mátyás 1997; and Tri Do 2006). A study conducted by Jafari, Ismail and Kouhestani (2011) suggest the main determinants of trade flows between the countries are GDP, exchange rate and population size.

The basic gravity equation explains the extent of exports between country i and country j by three factors. These factors are the total supply of the exporting country (i), the potential demand of the importing country (j), and the various factors representing the resistance to trade flow between countries. In its basic form, exports from country i to country j are determined by the economic sizes (GDP), population, geographical distances and a set of dummies which represent some institutional aspects. The gravity model used in this article is specified in line with (Martinez-Zarzoso and Nowak-Lehmann 2003; Jakab, Kovacs and Oszlay 2001; Breusch and Egger 1999):

$$\ln X_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln POP_i + \beta_4 \ln POP_j + \beta_5 \ln ER_{ij} + u_{ij} \quad (1)$$

where X_{ij} is exports of goods from country i to country j , and Y_i and Y_j are the GDP of the exporter and importer countries, POP_i and POP_j are the populations of the exporter and importer, ER_{ij} is the real exchange rate (rand/US\$) between countries i and j and u_{ij} is the error term.

A high level of GDP in the exporting country indicates a higher level of production potential and implies increased volumes of export availability. Similarly, a higher importer's GDP represents increased potential demand for imports. The coefficients are therefore expected to have positive signs. According to Martinez-Zarzoso and Nowak-Lehmann (2003) and Armstrong (2007), there is no clear *a priori* relationship between exports and the populations of both the exporting and importing countries. The estimated coefficient of the exporter's population could either be positive or negative. A large population indicates a large domestic market with high levels of consumption (absorption effect) and thus lower quantities to export (Nilsson 2000). Large populations may also encourage division of labour (economies of scale) and this means higher production levels and thus opportunities to export more. In the same vein, the estimated coefficient of the trading partner's population could either be positive or negative. Thus, the effects of population for both the exporting and importing countries cannot be assigned *a priori*. It is thus expected that and to have ambiguous signs (Oguledo and MacPhee 1994). A higher rate of exchange (depreciation of the rand) generally leads to an increase in exports, while a lower rate of exchange (appreciation) leads to a decrease in exports. It is therefore expected that the coefficient should be positive when the real exchange rate depreciate and negative when the real exchange rate appreciate.

METHODOLOGY

A panel data approach is used to estimate the gravity model of bilateral trade as many advantages such as the role of the business cycle and the interactions between variables over a long period of time can be captured (Egger 2000; Egger and Pfaffermayr 2003; Martinez-Zarzoso and Nowak-Lehman 2003). In addition, the risk of getting biased estimates



is lowered and country-specific effects that do not change over time can be analysed. Panel data involves different models that can be estimated such as pooled, fixed and random effects. The pooled model assumes that countries are homogeneous, while fixed and random effects introduce heterogeneity in the estimation. The pooled model is restricted and assumes a single intercept.

The same parameters over time and across countries and country specific effects are not estimated. However, the unrestricted models (fixed or random effects models) allow the intercept and other parameters to differ across countries. As countries do differ from one another, a decision should thus be made whether to use a random or fixed effect model since the regressions include individual country effects. When estimating the trade flows between a randomly drawn sample of factors from a large population, a random effects model is more appropriate. The fixed effects model is again more appropriate when estimating the flow of trade between an ex ante pre-determined selection of factors (Egger 2000; Martinez-Zarzoso and Nowak-Lehmann 2003). This article analyses the trade between South Africa and China and a pre-selection of 28 export sectors and therefore the fixed effects will be the preferred model.

Before the estimation of Equation (1) the univariate characteristics of the variables are first analysed using panel unit root tests. This is done to establish whether there is a potentially co-integrated relationship between the variables. If all variables are stationary, then the traditional ordinary least square (OLS) estimation can be used to estimate the relationship between the variables. If variables contain a unit root or are non-stationary, a co-integration test should be performed. This study applies two different types of panel unit root tests, namely that of Levin, Lin and Chu (2002) as well as Im, Pesaran and Shin (IPS) (2003). The LLC reject the null of a unit root for all variables. A rejection of unit roots by at least one test assumes a verdict of stationarity. That implies that a co-integration test is not required and Equation (1) can be estimated using the OLS method. The detailed data source and description are provided in the Appendix.

ESTIMATION RESULTS

Table 1 presents the results for the fixed effects model which estimates country specific effects and introduces heterogeneity. To check the poolability of the data, the F-test is performed and the results show that the null hypothesis of equality of the individual effects or homogeneity for all countries is rejected. This confirms that a model with individual country effects (fixed effects) is the preferred model. The Hausman test is also executed within the random effects model in order to detect misspecification or to ensure that the X-regressors and individual effects are not correlated. The results show that the Hausman specification test [0.000 (1.000)] accepts the null hypothesis of no misspecification. This result therefore indicates exogeneity of the X-regressors and thus no correlation between the individual effects and the X-regressors.

The results of the fixed effects model as shown in Table 1 indicate that the coefficient of South Africa's GDP has a positive and statistically significant sign and this is consistent with the theory. As South Africa's GDP increases, exports to China are stimulated. An increase in China's GDP causes a decrease in the exports of South Africa's products and this is in

contrast with the theoretical expectation. However, the coefficient is statistically significant which might imply that as China's GDP increases, it results in a higher level of domestic production of products and therefore causes lower imports from South Africa.

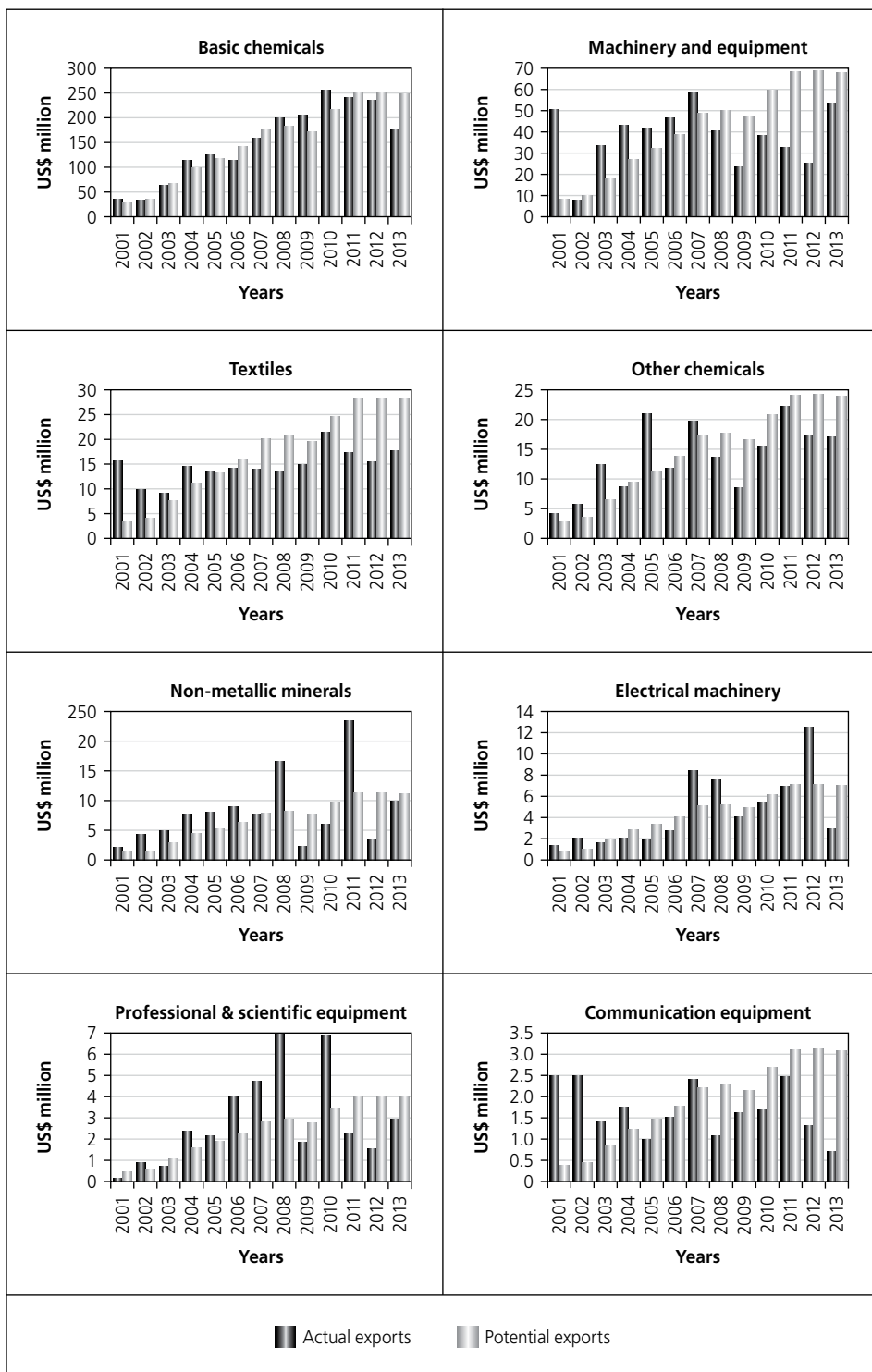
Table 1. Estimation results

Variables	Fixed effects model
Constant	-555.474 (-3.212)***
South Africa's GDP	11.906 (3.678)***
China's GDP	-4.047 (-2.293)***
South Africa's population	21.490 (2.236)***
Exchange rate	-1.507 (-5.575)***
Adjusted R-squared	0.947
F-test	205.13 (0.000)***
Notes: ***/**/* significant at 1%/5%/10% level. The t-statistics of all variables are in parentheses	

The South African population has a positive and statistically significant coefficient which means that South Africa exports more products in general when its population grows. A growing South African population therefore seems to encourage the division of labour (economies of scale) and this means higher production levels and thus opportunities to export more. The effect of China's population was also tested but was found to have a positive but statistically insignificant effect on the exports of South Africa and was therefore discarded from the analysis. An increase in the importer's population implies that the importer's market is growing, resulting in a higher degree of demand for South African products in China. The coefficient of the exchange rate is negative which indicates a decrease in exports from South Africa as the exchange rate depreciated. This is not in line with theoretical expectations, although the exchange rate is statistically significant. It may be that China is not overly sensitive to exchange rate fluctuations and therefore does not follow conventional expectations. The dataset comprises 364 observations, including 13 annual observations for 28 sectors for the period 2001 to 2013 using annual data and the adjusted R-square is 0.947.

Country specific effects estimates from the estimation are presented in Table A1 of the Appendix. The country or cross-section specific effects show the effect of factors that are unique to each sector but not included in the estimation of the model. It shows that exports between South Africa and China differ from sector to sector, given the unique feature of each sector. Table A1 shows that there are features in some sectors that promote exports from South Africa to China (positive signs) in the mining, iron, base metals, basic chemicals, agriculture, paper, machinery, motor industry, food, textiles, other chemicals, petroleum and non-metallic minerals. However, it is also shown that there are unobservable sectoral characteristics that discourage South Africa's exports (negative signs) of footwear, glass, printing, rubber, transport, furniture, apparel, plastic, wood, communications, equipment, beverages, electric, metals, and leather. It is important from a policy perspective to analyse these export inhibiting factors which discourage exports from South Africa to China.

Figure 1: Actual and potential sectoral exports of South Africa to China (US\$)



TRADE POTENTIAL

To determine the potential exports from South Africa to China, the estimated fixed effects are simulated. The estimated export potential is then compared to actual exports in order to see if there is unexploited trade potential among the respective sectors. The results show that the sectors indicating the biggest export potential are presented in Figure 1 and include basic chemicals, machinery and equipment, textiles, other chemicals, non-metallic minerals, electrical machinery, professional and scientific equipment; and communication equipment. Other sectors indicating a small potential include apparel, furniture, rubber, printing and glass. For all these sectors, potential exports exceed actual exports. It is important to promote exports of these sectors from a South African perspective in order to benefit from this unexploited trade potential. However, a further analysis of all these sectors is important in order to determine and identify possible factors that may inhibit the promotion of actual exports, given the unexploited potential.

Another point of interest is that actual exports exceed potential exports in some sectors, including the agriculture, beverages, food, footwear, iron and steel, leather, metal products, mining, motor industry, paper, petroleum, plastic, other transport equipment and wood sectors. A further analysis of these sectors would provide important information as to why actual exports are much higher than potential exports.

CONCLUSION

In developing countries, investors contemplating entry into new, non-traditional activities face considerable uncertainty about the costs of operation. These costs will not only depend on factor endowments, but also whether entrepreneurs can adopt technology and master technology adaptation, the policy environment and the number of other investors making similar investment choices. If participants are successful they will reap the benefits, if they fail, they will bear the full cost of their failure.

To minimise the potential costs, the question is whether South Africa's exports to China are exerting an intensive or extensive margin approach in general? It seems as if those sectors where the actual exports are exceeding the potential exports are in line with the differentiation model which focuses on the intensive margin. These sectors include, amongst other the agricultural, beverages, food, footwear, iron and steel, leather, metal products, mining, motor industry, plastic and wood sectors. Those sectors where the potential exports exceed the actual exports seem to be more in line with the monopolistic competitive models where the emphasis is more on the extensive margin. These sectors include, amongst other the basic chemicals, machinery, professional and scientific equipment; and communication equipment. The sectors where the intensive margin approach seems possible need to increase the existing quantities already exported. The extensive margin approach poses a greater challenge to South African exporting firms as the development of a wider product range would be required. This information is deemed valuable to any public institution related to international trade and exports specifically.

A number of general factors are important for export growth which including external factors such as foreign direct investment as well as domestic factors such as GDP growth,



savings, industrialisation and a well-educated labour force. Being able to export higher quantities of exports (intensive margin), South Africa should focus on economies of scale, improved productivity and cost of production. Although this is a challenge in itself, it is possible and South Africa can reap the benefits as it has established existing exporting firms in these sectors. However, in expanding the number or variety of exporting products (extensive margin), a relatively much bigger effort from South Africa is envisaged. Although capacity constraints, technical knowledge and financing, amongst other, would pose significant challenges over the short term, the long term advantages of higher levels of economic growth and the concomitant generation of much needed jobs would by far exceed the effort.

APPENDIX

Table A1: Sectors used in the estimation and their specific or fixed effects

Positive fixed effects:		Negative fixed effects:	
Mining	5.720	Footwear	-6.098
Iron	4.579	Glass	-3.877
Base metals	3.695	Printing	-3.760
Basic chemicals	3.331	Rubber	-3.425
Agriculture	2.389	Transport	-2.732
Paper	2.377	Furniture	-2.732
Machinery	2.037	Apparel	-1.958
Motor industry	1.734	Plastic	-1.632
Food	1.490	Wood	-1.202
Textiles	1.152	Communications	-1.055
Other chemicals	0.994	Equipment	-0.798
Petroleum	0.265	Beverages	-0.299
Non-metallic minerals	0.231	Electric	-0.224
		Metals	-0.115
		Leather	-0.086

Data Description and Sources

The study covers the period 2001 to 2013 using annual data. Twenty eight South African export sectors to China were included in the estimation. The data for GDP, populations and exchange rate were obtained from the World Bank and export data originate from the Quantec website: www.quantec.co.za. The data on distance was obtained from <http://www.timeanddate.com>, and they are computed as distance in kilometers between capital cities.

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