A study of South African revealed comparative advantage of exports within the BRICS

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Abstract

There is much debate about the long-term benefit of South Africa's membership to the BRICS partnership. Generally, there has been a perception that all the other BRICS partner countries are growing to the detriment of the South African economy. The focus of this article is to analyse the growth trend of an exclusive group of export goods that were identified to have a high revealed comparative advantage for South Africa within the BRICS bloc in 2012. These were identified to be potential growth area for South Africa within the BRICS trading bloc. This research aims to assess if there is a significant change in the performance of these exclusive exports since they were identified. A non-probability sample of 20 South African export product categories was drawn from the full population of 37 export categories that possess a revealed comparative advantage. Statistical analyses revealed that out of the twenty export categories identified to have a high revealed comparative advantage for South Africa in 2012; eight have grown while five have declined over the period under review. The value for tourism to South Africa and BRICS nations *per se,* is also unpacked to a limited extent since the study has bearing on it. There is clearly much scope to conduct further research to explore the countries that require deeper diplomatic engagement to create access to markets for South African exporters.

Keywords: Revealed Comparative Advantage, International trade theory, trade agreements, BRICS

Introduction

As a developing country, one of South Africa's major economic goals is to reduce the unemployment rate which has remained stubbornly high, above the 20% mark, for decades. To stimulate growth in the domestic economy, one of the strategic levers that the

government employs is the encouragement of exports through targeted and increased trade with global markets by taking advantage of trade agreements. The World Trade Organisation (WTO) broadly defines two types of trade agreements, namely regional trade agreements and preferential trade agreements (World Trade Organisation, 2018). Regional trade agreements comprise of trade agreements between countries considered to be peers, while preferential trade agreements comprise of all trade agreements, including free trade agreements with countries where one country is provided special treatment over other countries and enjoys some sort of exclusive arrangement (World Trade Organisation, 2018) in the engagement of trade. Trade agreements are theoretically aimed at facilitating trade, thereby making it easier and cheaper to do business between different countries or different geographical zones, as well as reducing barriers that would otherwise impede on trade.

Within the context of trade agreements and trading zones, South Africa enjoys membership to the exclusive BRICS economic bloc. BRICS is an economic and political cooperation as well as a trading zone formed by Brazil, Russia, India, China and South Africa. The BRICS economies are all significantly influential and are characterized to be leading developing economies both globally and in their respective regions (IDC, 2014). All five BRICS economies are part of the Group of 20 (G20) member countries. The G20 is an informal group of 19 countries and the European Union, with representatives of the International Monetary Fund and the World Bank, that have a mandate to broaden the dialogue on key economic and financial policy issues among systemically significant economies plus to promote cooperation to achieve stable and sustainable world growth that benefits all (Kirton, 1999). This attests to the BRICS's global influence, as the G20 is an important forum in the global economic agenda. Being part of this forum means that the BRICS are part of key decision-making for the world economies. There is deep cooperation between the BRICS nations providing for peer to peer flow of information, funds and skills (Roland, 2013). Providing a new world order – bilateral relations among BRICS nations are carried out on the basis of non-interference, equality, and mutual benefit (Roland, 2013). Given their significance, it has largely been forecasted that by 2020, the BRICS countries would be responsible for nearly half of all global gross domestic product (GDP) growth contribution (South African Government, 2016).

Value for tourism

Globally the largest service sector is that of Tourism and Travel. It contributes to foreign exchange earnings as well as provides employment at a large scale. Many countries all over the globe are realizing the importance of travel and tourism sector in the growth of their economies. A strong foundation of travel and tourism industry can contribute greatly to the economic growth of countries leading to the overall sustainable development. Many countries are encouraging the travel and tourism industry to seek potential economic benefits, over traditional industries like manufacturing and agriculture. The study undertaken focuses on analyzing the contribution that BRICS (Brazil, Russia, India, China, South Africa) nations have made in the travel and tourism industry. The PwC estimates showed that the BRIC nations spent approximately R3 billion per year.

The BRIC (Brazil, Russia, India, China) nations had a significant impact on the travel and tourism industry of South Africa, leading to greater business, higher employment rates, and rapid economic growth. Since global tourism is rapidly increasing, it is estimated that the economic share of BRICS towards the travel and tourism industry will progress steadily until 2030. In fact, the BRICS nations are being seen as the future powerhouse of travel and tourism industry (Pop, 2014). Since the formation of the BRICS nations, there has been a potential growth in tourism rate, specifically in India and China, owing to the population, demographic factors, and economic growth (Naidoo, 2018).

The travel and tourism industry has proven to be an asset for economic growth along with sustainable development, specifically for African countries. The tourists who visit South Africa contribute significantly to its economy via different economic activities generated from businesses like travel agencies, hotels, restaurants, airlines along with other leisure activities and transportation services. This ultimately contributes to the rise in GDP of South Africa.

South African exports opportunities in the BRICS

According to the Industrial Development Corporation (IDC), in 2014 the external trade (being exports and imports) of the BRICS economies accounted for 17% of the world total trade. Combined foreign direct investment (FDI) inflows in the BRICS economies were at an estimated USD322 billion in 2013 (IDC, 2014). Foreign direct investment is direct investment made by a foreign entity to acquire a controlling stake in a local entity (UNCTAD, 2016). Although China was unsurprisingly the leading foreign direct investment recipient in the same period amongst the BRICS economies, South Africa did record the highest rate of growth in foreign direct investment inflows during the same period (IDC, 2014).

Analyses undertaken by the Industrial Development Corporation (IDC) indicated that there was significant potential for the further development of South Africa's export trade with other BRICS countries (IDC, 2014). As part of that analysis a study examining goods produced in South Africa with a potential for growth due to their revealed comparative advantage (RCA) was conducted using data of up to 2012. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static (World Bank, 2016). The findings indicated that out of the 37 product categories that South Africa could potentially export in greater quantities or for the first time to other BRICS markets, the country had a high RCA in 20 instances compared to the leading sources of imports into BRICS economies (IDC, 2014). This means that for these twenty product categories, South Africa was already fully geared to increase export capacity upon an increase in the demand of those products from other BRICS nations.

Problem statement

The general perception is that most of the trade between South Africa and its BRICS partners is not being used to South Africa's full advantage, not least to the point where the South Africa can create and sustain jobs and grow the export sector (Gauteng Provincial Treasury Bulletin, 2013). Critics warn that the BRIC(S) may be developing at the expense of South Africa (Mazenda, 2016). This research therefore aimed to assess and determine if there is growth in the exporting of these 20 product categories in South Africa. Exports traditionally experience challenges due to setbacks such as language barriers and direct market penetration into foreign markets. As a bilateral trade agreement partner, South Africa should in theory have reduced barriers to market entry due to existing bilateral cooperation. This means that as a BRICS partner, South Africa should not be experiencing difficulties in finding buyers in other BRICS countries.

Statement of purpose

The purpose of this quantitative research is to analyse the performance of 20 product categories with a high RCA for South Africa to the BRICS bloc to determine if these product categories have experienced growth since 2012. The dependent variable is the position of trade in value, while the independent variable is the share of trade in volume. In other words, the position of trade in value for South African exports in the BRICS bloc is determined by the share of South African exports in volume within the bloc. A change in the position of trade, given a change in the share of trade indicates whether South African organisations

have indeed been benefiting from the trade agreement or whether these opportunities have not been adopted.

Objectives of the study

The objective of this quantitative research is to analyse the growth trend of 20 export good categories that were identified to have a high revealed comparative advantage for South Africa within the BRICS bloc in the year 2012.

The sub-objectives of this quantitative research are:

1. To analyse if the position of trade in value for the South African export products with a high RCA changed between 2012 and 2016

2. To assess if the position of trade for the South African export products with a high RCA changed significantly between 2012 and 2016

3. To analyse if the South African export products with a high RCA changed in terms of volume between 2012 and 2016

To analyse if there is a significant change in volume in South African export products with a revealed comparative advantage between 2012 and 2016

Literature Review

Various literature and studies can be found about the origination and the formation of the BRICS bloc of economies, and how South Africa came to join the economic bloc that was formerly known as the "BRIC". It is well documented that the term "BRIC" was coined in the paper written in 2001 by former Goldman Sachs economist Jim O'Neil, titled "Building Better Global Economic BRICs". The paper analysed and forecasted the emergence of Brazil, India, China and Russia (BRIC) as the next economic powerhouses, expected to grow and overtake most developed economies to become part of the six largest economies in the world by 2050 (O'Neill, 2001).

South Africa officially joined the BRICS bloc of emerging economies in December 2010 in alignment with the South African government's foreign policy to strengthen South-South relations (South African Government, 2016). South-South cooperation is a broad framework for collaboration among developing countries in the political, economic, social, cultural, environmental and technical domains to meet their development goals through concerted efforts (UNOSSC, 2016). The first official BRICS forum was held in 2011 with the objective of encouraging commercial, political and cultural cooperation amongst the BRICS member countries (Industrial Development Corporation, 2014). Prior to this forum, there were BRIC forums which South Africa was not a part of.

The BRICS countries were deemed to have a lot in common in terms of population, GDP and unemployment (Gauteng Provincial Treasury Bulletin, 2013). Lumumba-Kasongo (2015) states that the BRICS are similar in their country composition characteristics in that a large portion of their population is politically disabled, meaning they are poor, unemployed and cannot participate meaningfully in the political process of the country. South Africa was invited to join the economic bloc as the then biggest economy in Africa and the then preferred gateway to the rest of the continent (Gauteng Provincial Treasury Bulletin, 2013). In joining the BRICS, South Africa not only represented the resource-rich African continent on BRICS, but at the same time had the potential to gain much from its membership (IDC, 2014). South Africa was expected to progressively reap the benefits of its economic and political relationships with fellow BRICS countries, especially if the BRICS counterparts

increasingly opened up their economies, while domestically South Africa addressed the structural problems that constrain competitiveness, including improvements in productivity, infrastructure logistics, as well as skills development (IDC, 2014).

According to the Gauteng Provincial Treasury Bulletin of March 2013, there was much debate about the suitability of South Africa being part of the BRICS due to its size – in terms of its economy, population and even GDP; because at the time of joining, South Africa was a much smaller economy than any of the other BRIC countries. This gave the impression that South Africa was invited to join the bloc for political reasons rather than economic reasons (Gauteng Provincial Treasury Bulletin, 2013).

In joining the BRICS, South Africa viewed the move as a step closer to re-integrating with the world in international affairs and relations after the long isolation experienced prior to 1994 (President Jacob Zuma, 2013). Through various bilateral agreements with other African nations, South Africa maintained its commitment to the consolidation of the African agenda and aimed to use its BRICS membership to increase strategic cooperation among emerging market economies of the South in support of this African agenda (South African Government, 2016). As a direct result of joining the BRICS, South Africa has enjoyed support for issues affecting Africa such as peace, security and development issues (President Jacob Zuma, 2013).

General -Influence on global governance

The BRICS have been able to demand a stronger political voice in international governance structures corresponding to their economic status (Singh, 2016). Onyekwena, Taiwo and Unenze (2014), discuss the emergence of the BRICS as an alternative world order in terms of global governance and affairs. There is general consensus that as a collective, they have increased multipolarity in international relations, challenging the bias of Western leadership in global affairs and thus creating a shift of power away from the North (Onyekwena, Taiwo and Unenze, 2014). In international relations, multipolarity is a concept broadly defined as the balance of power amongst four or more countries that possess an almost equal amount of regional or world influence regarding military, culture and economics (Oszu, 2013). This perspective implies the coexistence of several, but equally respected spaces of power with similar value systems (Lumumba-Kasongo, 2015). It is based on laws of ecology and promotes social development (Lumumba-Kasongo, 2015). A multipolar approach underlines the decentralisation of world resources and their better management, as well as their fair distribution (Lumumba-Kasongo, 2015).

Prior to the 2008 era, global governance was the domain of the North, with profound influence on the Bretton Woods institutions such as the World Bank, UN, IMF (Onyekwena, Taiwo & Unenze, 2014). Countries of the South were largely excluded from global leadership and the conduct of global affairs (Onyekwena, Taiwo & Unenze, 2014). Attesting to the recognition of the contribution made by developing countries in global affairs, South Africa was invited to be a non-permanent member of the United Nations Security Council.

Lumumba-Kasongo (2015), states that the BRICS present a new global political paradigm that articulates that the Western policies based on capitalism are exploitative and are a directly responsible for the global meltdown experienced in 2008. The failure of global politics in that era and the subsequent devastating social and environmental effects were thought to be the result of failed old Western ways of conducting business (Lumumba-Kasongo, 2015). Lumumba-Kasongo (2015) asserts that going forward, along with the European Union and the United States, the BRICS are projected to become great powers of the world.

The BRICS countries are increasingly recognised as championing the change in international development co-operation architecture (Singh, 2016). In addition, the BRICS

have increasingly gained importance as donors in the international financial architecture (Singh, 2016).

The BRICS have been taking their governance role seriously, continually committing to the course of anti-corruption in their member states, as well as taking active steps to deal with the issue, including formulating a working group and having regular meetings, as well as re-iterating their full commitment during each annual summit. Because of the global prominence now afforded to the BRICS bloc, in particular regarding issues of governance, corruption and anti-corruption, efforts from the bloc are also increasingly under the microscope (Kurakin & Sukharenko, 2018). South Africa has been ranked the highest in the group according to the Transparency International Corruption Perceptions Index (Kurakin & Sukharenko, 2018). Brazil and Russia are lowly ranked on the index (Kurakin & Sukharenko, 2018). Other countries such as China and India follow closely to South Adrica or their rankings (Kurakin & Sukharenko, 2018).

Empirical studies on theories of economic growth

International trade has long been understood to have an imperative role in reducing poverty and stimulating economic development which can increase employment opportunities. International trade has continued to play an essential role in the development and in the reduction of poverty in world economies, especially in developing countries (International Monetary Fund, World Trade Organisation and World Bank, 2017:8). This growth was supported by other initiatives such as massive reductions in trade costs (International Monetary Fund, World Trade Organisation and World Bank, 2017:8). The majority of global economies are linked through financial agreements and trade (Mhaka & Jeke, 2018).

Neoclassical trade theory explains international trade on the basis of comparative advantages (Costinot, 2009). Neoclassical trade theory uses comparative advantage to determine the direction and pattern of trade between two countries (Yenokyan, Seater & Arabshahi, 2014). Comparative advantage is mainly driven by technology or factor endowment (Costinot, 2009). Using a modified Ricardian model of trade, in which factors of production are produced as opposed to endowed; Yenokyan, Seater and Arabshahi (2014) were able to show that trade can raise growth through comparative advantage. Using the techniques of the mathematics of complementarity, Costinot (2009), found that factor productivity and factor supply could be utilised to predict patterns of specialisation in a multifactor generalisation of the Ricardian model of neoclassical trade (Costinot, 2009). These results offer insights into the joint effects of technology and factor endowments on specialisation (Costinot, 2009).

According to Yenokyan, Seater and Arabshahi (2014) the literature surrounding the debate as to whether international trade promotes economic growth suggests that through international trade, economic growth is indeed promoted in two ways; through an aggregate scale effect and technology transfer. In their report, they purport that economists have generally been able to use the endogenous growth theory as a proper framework in which to analyse the economic growth effects of trade (Yenokyan, Seater & Arabshahi, 2014). The aggregate scale effect promotes trade by opening new markets for firms that then enable the firms to increase production capacity and hence sales (Yenokyan, Seater & Arabshahi, 2014).

The technology transfer factor increases trade as it facilitates knowledge spill-overs when communication channels develop between domestic firms and their partners in new markets (Yenokyan, Seater and Arabshahi, 2014). By increasing market size, trade enables the firms to increase activities that increase economic growth as profitability rises at firm level (Yenokyan, Seater & Arabshahi, 2014). The general two-sector model describes the growth part of the model, in which there are two goods produced in two sectors and both goods

can be used as factors of production, necessary for production in both sectors (Yenokyan, Seater & Arabshahi, 2014). According to Yenokyan, Seater and Arabshahi (2014); allowing the factors of production to be traded generates growth effects of trade. The results of their study were that in general trade does generally increase the growth rate of an economy, while trade in itself need not increase a country's growth rate or lead to spill-over effects (Yenokyan, Seater & Arabshahi, 2014). This is dependent on the type of goods that the country imports, with an increase in factors of production importing leading to an increased level of economic growth (Yenokyan, Seater & Arabshahi, 2014).

There has been research on heterogenous firms that emphasises the relative growth of high-productivity industries, but these do not take into account the effects of comparative advantage because they consider only a single factor or industry (Bernard, Redding, Schott, 2007). "Neoclassical trade theory, with its focus on comparative advantages, stresses the reallocation of resources across industries and as well as changes in relative factor rewards but provides no role for firm dynamics" (Bernard, Redding & Schott, 2007). As countries liberalise and engage in international trade, the reallocation of resources is the main concern of neoclassical economic theory of comparative advantages (Bernard, Redding, Schott, 2007). This theory does not take into account the role of a firm in the reallocation, but rather that of the trading nation and industries (Bernard, Redding & Schott, 2007). Bernard, Redding and Schott (2007), modified the neoclassical model to include the heterogeneous firm as trade costs fall; they found evidence that with the inclusion of the heterogeneous firm to the model, trade generates aggregate welfare gains as well as distribution of income in the economy.

The cost of trading goods tends to be higher for emerging and developing economies than for advanced economies (International Monetary Fund, World Trade Organisation and World Bank, 2017:11). Trade costs are explained as the costs of doing business between two countries, and the higher the trade costs, the lower the trade flows are expected to be (Arvis, Shepherd, Duval & Utoktham, 2013). The actual costs of trading can be quite profound, and can "reflect factors as diverse as the exchange rate, distance, investment climates, language, logistics, and transport, as well as trade policies" (International Monetary Fund, World Trade Organisation and World Bank, 2017:11).

According to Hornok and Koren (2015), global exporters and importers are subjected to many administrative barriers in their trade which may include compliance to complex regulatory requirements, inspections and even customs clearance. Hornok and Koren (2015) stated that countries with high administrative barriers to importing receive fewer and larger shipments. This may discourage an exporter in that country, resulting in less trade with that particular country, as the exporter focuses instead on other markets that are more competitive and profitable (Hornok & Koren, 2015). Khosa, Botha & Pretorius (2015), found that in the presence of exchange rate volatility, exporters in emerging markets tend to avoid or reduce their exposure to uncertainty and risk by adjusting trade activities. Their study asserted that exchange rate volatility creates uncertainty and affects planning which discourages local suppliers from expanding into international markets because of fears of profit variability (Khosa, Botha & Pretorius, 2015).

Key to the reduction of trade costs, has been an increasing number of regional trade agreements (International Monetary Fund, World Trade Organisation and World Bank, 2017:11), that have facilitated a larger degree of international trade openness in those economies. According to Mhaka and Jeke, (2018) trade agreements enable countries to offset the effects of unilateral self-serving interests and bind the countries to reduce trade restrictions. Ngepah and Udeagha (2018) investigated the effects of regional trade agreements in Africa. Assessing trade creation and trade diversification effects through the use of the gravity model, they found that regional trade agreements may enhance trade

(Ngepah & Udeagha, 2018). Trade gains of regional trade agreements were not to the detriment of non-member countries (Ngepah & Udeagha, 2018).

According to the WTO trade openness, which is the value of trade as a percentage of GDP per capita, has been the key driver to improved living standards in both developed and developing economies, driven mainly by increased productivity and manufacturing exports which are attributed directly to the reduction in trade costs (International Monetary Fund, World Trade Organisation and World Bank, 2017). There is a general consensus in literature and empirically that trade openness leads to the promotion of economic growth. The extent to which trade openness impacts a country is dependent on the characteristics as well as supporting policies of the economy (International Monetary Fund, World Trade Organisation and World Bank, 2017). In other words, the structure of the economy has a direct bearing on the extent to which trade openness can improve productivity, manufacturing export performance as well as the standard of living. Greater trade openness can also be linked to a higher income per capita, while trade reform can be linked to increased productivity, increased economic growth and ultimately the reduction of poverty levels (International Monetary Fund, World Trade Organisation and World Bank, 2017).

Naude, Szirmai and Lavopa, (2013) conducted a study analysing the effects of structural changes and technological advances on industrialisation in the BRICS economies. Industrialisation and manufacturing, given endogenous growth theory is important for economic growth; while technological progress is a necessary factor for industrialisation (Naude, Szirmai & Lavopa, 2013). Higher per capita and higher productivity growth can be directly linked to structural changes and development in the economy, that is attributed to industrialisation (Naude, Szirmai & Lavopa, 2013). In their study, Naude, Szirmai and Lavopa, (2013) found that developing countries can access international knowledge and technology transfer through domestic investment and foreign direct investment. Foreign direct investment (FDI) is direct investment made by a foreign entity to acquire a controlling stake in a local entity (UNCTAD, 2016). Uduak, Akpan, Salisu, Isihaka, Simplice, and Asongu, (2014) in their study found that the benefits of FDI do not necessarily directly translate to economic growth and technology transfer, but are rather dependent on the capacity of the human capital in the host country to sustainably absorb the knowledge brought about by FDI. Alemu and Lee (2015), asserted that by introducing both capital and technology to the recipient country, foreign direct investment promotes economic growth. They furthermore attribute foreign direct investment for the flow and distribution of technology, management skills and modern business practices across different economies (Alemu and Lee, 2015). Together with the implicit benefits to production, such as employee training, improved production capabilities and networks, improved access to markets foreign direct investment can bring about structural change to the economy and sustainability (Alemu and Lee, 2015). In their study; Naude, Szirmai and Lavopa (2013), also emphasise that foreign direct investment is the main channel through which emerging economies may access international knowledge.

Ncube and Cheteni (2015), conducted a study to examine the impact of the BRICS alliance on South Africa's economic growth. Their study used the vector error correlation model (VECM), and the results indicated that South Africa had gained from the international trade between the BRICS bloc (Ncube & Cheteni, 2015). Ncube and Cheteni (2015) explained that South Africa's economy gains from the BRICS alliance through an improved human capital factor. In their study, Ncube and Cheteni (2015) asserted that in terms of trade openness, all the BRICS countries had improved since the alliance formed, even though all the BRICS economies are mainly export-oriented economies. The surprising result, however, was that the study also found that given the trade practices of some other trade partners, South Africa's openness will in the long run impact the economy negatively (Ncube & Cheteni, 2015). Even though there are political gains, in the long run South Africa should still work to reduce its trade openness to the BRICS alliance in the long run (Ncube & Cheteni, 2015). This would be effective if domestic industries are stimulated, and domestic

prices are competitive and the infant industries are protected through policies against the multinational companies who benefit from lower production costs, economies of scale and economies of scope (Ncube & Cheteni, 2015).

Shayanewako (2018), also conducted a study to assess the relationship between trade openness and economic growth for the BRICS economies. The study used panel data and assumed cross-sectional homogeneity in order to analyse the relationship between trade openness and economic growth in the BRICS countries (Shayanewako, 2018). The results of the study confirmed the presence of a long run relationship between trade openness and economic growth in the BRICS countries (Shayanewako, 2018). Shayanewako (2018) concluded that there is bidirectional causality from trade openness to economic growth in just about all the BRICS alliance members. This implies that there is cooperation in facilitating trade within the alliance (Shayanewako, 2018). Ulasan (2012), also investigated the relationship between trade openness and economic growth and found that there is a positive relationship between the two variables.

Research Methodology

Creswell (2014) defines a research design as a type of inquiry within qualitative, quantitative or mixed method approaches that provides a specific direction for the procedures in a research design, providing a clear strategy of inquiry. It is a process of collecting and interpreting data with a clear objective (Rahi, 2017:2). Qualitative designs employ a variety of inquiries including case studies and interviews. Typically, qualitative designs explore the meaning attached to social problems involving an inductive form of inquiry (Creswell, 2014). Mixed research methods involve qualitative and quantitative forms of inquiry, often using the themes derived from the qualitative portion of the research to explain the results of the quantitative section of the research (Creswell, 2014). Quantitative research designs reflect a postpositivist philosophy, where the research identifies and assesses specific causes that influence outcomes (Creswell, 2014).

Research Population

A population is defined as the complete group that is to be studied that possess at least one common characteristic (Singaravelu, 2017). A population can comprise of cases, people or objects (Etikan, Musa & Alkassim, 2015:1). The population for this research comprises of all the South African exports that were calculated to have a revealed comparative advantage within the BRICS bloc in 2012 (IDC, 2014).

Sampling Design

The sampling design is a definite plan for obtaining a sample within a population (Singaravelu, 2017). Sampling is also defined as the process of selecting a portion of the population for investigation (Rahi, 2017:3). "The aim of all quantitative sampling approaches is to draw a representative sample from the population, so that the results of studying the sample can then be generalized back to the population" (Marshall, 1996). Research may follow one of two types of sampling, either probability sampling or non-probability sampling (Etikan, Musa & Alkassim, 2015:1). Probability sampling employs random procedures to select a sample from the population, and all elements of the population have an equal chance of selection (Etikan, Musa & Alkassim, 2015:1). The usefulness of probability sampling is in its ability to extrapolate the results of the random sample to the entire population, as well as the reduction in bias of selection (Etikan, Musa & Alkassim, 2015:1). Probability sampling is useful for large populations. There are various types of probability sampling methods such as cluster sampling, systematic sampling, cluster random sampling and stratified random sampling (Marshall, 1996).

Sampling Frame and Sampling Size

The sampling frame is a complete list of all items within the population which may be sampled (Singaravelu, 2017). The population for the research comprised of the 37 product categories with a revealed comparative advantage for South Africa, that the country could potentially export in greater quantities, or for the first time, to other BRICS markets (IDC, 2014). The sampling frame therefore comprised of all the product categories that had a revealed comparative advantage which is much higher than that of the leading import sources in the BRICS bloc for South Africa. There are twenty export product categories that fulfil the sampling frame requirement, and since this was a sample of convenience all twenty products were selected into the sample. The sample size for this research was therefore 20 product categories.

Data Collection Techniques

In collecting the data for this research, the following secondary and primary sources of data were explored:

- Previous studies and documents on the subject from various online sources, and university databases.
- Official documents, from official economics and statistics offices of the BRICS organisations as well as reliable sources such as Statistics SA, The World Trade Organisation and The World Bank.
- Archived research data and studies of a similar nature, sourced from library journals and database sources of Economic societies, JSTOR and the university library.

Data Analysis Techniques

After the data is collected, the first step in the analysis is to the calculate the descriptive statistics for the data which represents the characteristic features of the data, and thereafter present the descriptive statistics in table or graph format (Larson, 2006). Comparative designs are used to compare past and present or different parallel situations that may involve macro conditions that the researcher has no control over (Walliman, 2011). The primary analysis of the data takes the form of a comparative analysis. Various forms of display, such as tables and graphs were used to display the data and analyse it further.

The South African export data was sorted and categorised by type, destination and volumes between 2012 and 2016. The rationale for analysing this data was to assess the performance of the exports under investigation. This also fulfilled the first and third research questions. The dependent variable is the position of trade, while the independent variable is the share of trade. In other words, the position of trade for South African exports in the BRICS bloc was determined by the share of South African exports within the bloc.

Inferential statistics test the significance and strength of the relationships and associations between research variables under investigation (Creswell, 2014:225). The research also employed inferential statistics to test the strength and significance of the performance of the exports under investigation. The aim of this exercise was to fulfil the second and fourth research questions.

Research Analysis

The correlation coefficient is presented in graph format to display the relationship between the variables, proving association and reliability. Thereafter, each category is individually analysed for growth in terms of value and volumes since 2012. The results are then tested

for statistical significance through the hypotheses. The results are then consolidated per country and then for the BRICS bloc as a whole.

Correlation Findings
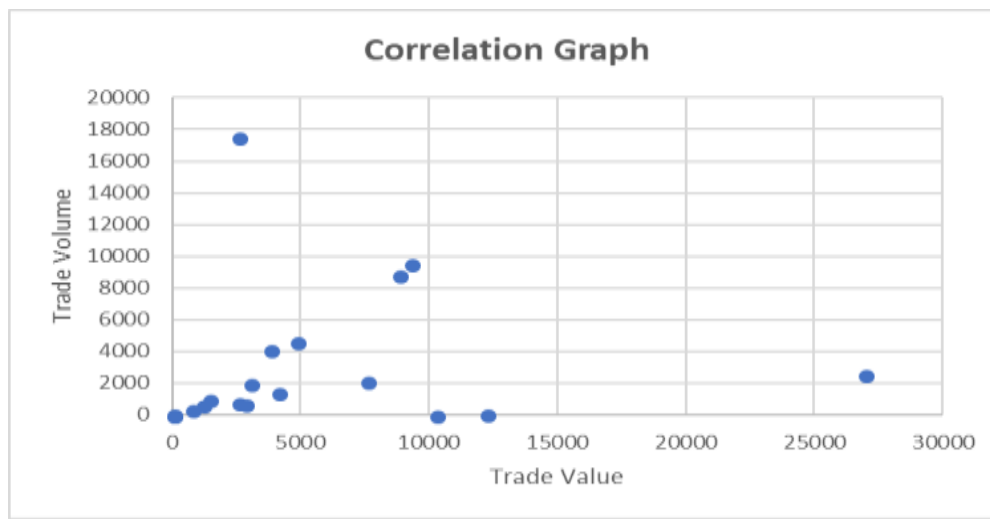
Figure 1. Correlation Results: Independent vs Dependent Variables Association. Source - Own. Compiled from International Trade Centre (TradeMap) Data.

Correlation determines if there is a relationship between variables and the strength of that relationship (Campbell & Campbell, 2008). From the above graph, there is evidence that an association between the dependent and the independent variables exists. Using 2012 data as the base values for this research, the graph shows that trade volumes can be reliably used to explain trade value. The two variables are positively correlated, with a calculated correlation co-efficient of 0,996 which is almost perfectly correlated. the relationship between trade value and trade volume clearly exists, and the strength is proven by the closeness of the correlation coefficient to the value of 1.

Analysis Findings

Each category was analysed to answer the four research questions which were posed. The first part of the findings represents the descriptive analysis, presented in bar graph format. The second part presents the results of the hypotheses analysis and provides the response to the statistical significance of findings which links back to the main research objective per category. The final section presents the findings at the aggregated level of the BRICS bloc, and follows the same structure as the individual category findings.

The main research objective for is briefly restated below:

The objective of this quantitative research is to analyse the growth trend of 20 export good categories that were identified to have a high revealed comparative advantage for South Africa within the BRICS bloc in the year 2012.

The research questions and hypotheses are briefly restated below:

1. *What is the trade position in value of South African revealed comparative exports with other BRICS nations from 2012 to 2016?*

2. *Was there a significant change in the trade position of South African revealed comparative advantage exports within BRICS from 2012 to 2016?*

3. *What are the export volumes of South African revealed comparative advantage exports within the BRICS trade bloc from 2012 to 2016?*

4. *Was there a significant change to the volume of South African revealed comparative advantage exports to other BRICS nations from 2012 to 2016?*

Given the above research questions, the following hypotheses could be tested:

H0: There was no change in the trade position of South African exports within BRICS from 2012 to 2016

H1: There was a change in the trade position of South African exports within BRICS between 2012 and 2016

And,

H3: The South African volume of exports to other BRICS nations did not change from 2012 to 2016

H4: The South African volume of exports to other BRICS nations changed between 2012 and 2016

To understand the significance of this increase in trade, the following results were found:

Table 1. Hypothesis Test Results – Consolidated BRICS Grouping

No.	Region/Partner	Trade Value T Test Results	Trade Volume T Test Results
1	Brazil	0,685543	0,985488
2	Russia	0,37717	0,14671
3	India	0,910581	0,19448
4	China	0,000755	0,024658
5	**BRICS Grouping**	**0,001911**	**0,008623**

Source: Own. Compiled from International Trade Centre (TradeMap) Data.

As a grouping, the p value results for trade value were 0.001911 which is below the 5% level of significance. This infers that the null hypothesis can be rejected. There is overwhelming evidence of a change in the position of trade in terms of value with the BRICS partners since 2012 for the consolidated group of exports under review. The two-sided t-test has a probability of 0.008623 for trade volumes, therefore that null hypothesis is rejected as well. There is evidence of a change in the volume of exports with a high RCA exported by South Africa to its BRICS partners since 2012. Interestingly, at country level, there is not enough evidence of a statistically significant change in trade value or trade volume for all the BRICS partners except China.

Recommendations from research findings

Revisiting the purpose of this research, the following section discusses the research findings in relation to the research problem, research objectives and the current literature available on the subject. The purpose of the research is briefly revisited below:

The purpose of this quantitative research was to analyse the performance of 20 product categories with a high RCA for South Africa to the BRICS bloc to determine if these product categories have experienced growth since 2012.

To address this purpose, the findings have been classified into two parts, each covering three sections. The part discusses the findings at country levels according to three sections, the first section addresses the export categories that were found to have grown, with or without statistical significance. The second section addresses the export categories that were found to have declined with or without statistical significance. The third section addresses those categories that either had no growth movement in either direction (upward or downward); or had conflicting findings between trade values and trade volumes. The final part addresses the research findings for the aggregated BRICS grouping.

Limitations to the study

This research focused only on trade between South Africa and the other BRICS countries thus the results of the study cannot be adapted for other bilateral agreements or economic trading zones. The study also only focused on South African exports opportunities within BRICS economies, not the imports into South Africa from other BRICS economies. The results of this study are therefore not meant to be inferred for the import market.

It was assumed that the information regarding the commodities traded by South Africa and its trade partners was complete and accurate when published. The sampling method had limitations, and a tendency towards bias and thus the situation was considered to be ideal.

Conclusion

The objective of this study was to analyse the growth trend of 20 export good categories that were identified to have a revealed comparative advantage for South Africa within the BRICS bloc through the study conducted by the South African Industrial Development Corporation (IDC) that was published in 2014. This IDC research used data in the periods of years, up to the year 2012.

In summary, eight out of the twenty export product categories show significant change in an upward direction since the IDC research was conducted. These categories are citrus fruit, fresh or dried, apples, pears and quinces, fresh, iron ore and concentrates including roasted iron pyrites, petroleum jelly, mineral waxes and similar products, ferro-alloys; preserved fruits not elsewhere specified (nes), titanium ore and concentrates. For these categories the South African exporters have been able to take advantage of the bilateral trade relations between South Africa and BRICS.

Five out of the twenty export product categories show significant change in a downward direction since the IDC research was conducted. These are fruit and vegetable juices, unfermented, aluminium plates, sheets and strips, of a thickness exceeding 0.2mm, machinery for sorting/ screening/washing, agglomerating/shaping mineral products, trucks, motor vehicles for the transportation of goods, ketones and quinones & their derivatives. For these categories the South African exporters have not been able to take advantage of the bilateral trade relations between South Africa and BRICS. It is recommended that policy makers further enhance relations with the BRICS countries in order to create access to markets for the South African organisations.

In conclusion, South Africa is doing well in terms of trade with China and to some extent India, as the literature on the subject suggested (Onyekwena, Taiwo and Unenze, 2014). As literature proposed, trade with Russia and Brazil requires further intervention. South Africa has good relations on trade with the group as a whole though and tourism growth between the nations is on the increase as well.

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