A COMPARATIVE ANALYSIS OF THE LEVEL OF COMPETITIVENESS OF THE SOUTH AFRICAN CLOTHING AND TEXTILE INDUSTRY

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Abstract

The aim of the article is to perform a comparative competitor benchmark analysis of the level of competitiveness of the South African clothing and textile industry (CAT industry). The article employs both Revealed Comparative Advantage (RCA) indices and fixed-effect panel data estimates in order to perform an analysis of the level of competitiveness of the South African CAT industry. The study includes export data from 1990-2013 for 18 sample emerging markets. The RCA indices indicate that the South African CAT industry has comparative disadvantages in both the clothing and textile sectors. Asian CAT industries are inclined towards a more dominant comparative advantage when compared to other emerging markets in both the clothing and textile sectors. The indices indicate a large and widening gap between the levels of competitiveness of the South African CAT industry and the CAT industries of sample countries (especially India and China). The fixed-effect panel data estimates suggest that increasing unit labour costs and declining export shares can be viewed as major determinants of the increasing lack of competitiveness of the South African CAT industry. The results of this article point to a mounting crisis in the South African CAT industry, most especially in terms of job losses and declining exports markets. Proper policy responses from the government, industrialist, retailers, labour unions and other stakeholders within the economy (such as banks and development finance institutions) are required.

Keywords

South African clothing and textile industry, emerging markets, low-cost competitors, revealed comparative advantage indices (RCA), fixed-effect panel data estimation, labour unit cost, real effective exchange rate, exports-share

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1. INTRODUCTION

The aim of this article is to perform a comparative competitor benchmark analysis of the level of competitiveness of the South African clothing and textile industry (CAT industry).

The CAT industry plays an important role in the manufacturing sector of the South African economy in the sense that it is labour-intensive and makes job opportunities available to unskilled labour. The CAT industry accounts for close to a fifth of the total manufacturing employment in the South African economy (IDC, 2014). However, due to its vulnerability to the world markets the South African CAT industry has been challenged by stagnating competitiveness and the loss of jobs. According to the IDC (2014), the textile industry employment trend has declined by 7.5%, while clothing and textile imports grew by 21.3% (higher than South African clothing and textile exports, which grew by only 6.9%) during the same period. There is also evidence of a decline in the production volumes and utilisation in the South African CAT industry. The South African CAT industry was structured during a period of political isolation, when domestic production dominated the market (Barnes, 2005). As a result, the South African CAT industry was unable to obtain economies of scale, and, moreover, the industry is characterised by import substitution protection and it is finding it difficult to compete internationally due to a lack of investment capital and an inadequate technology base. Barnes (2005) further observes that in the 1990s, the adoption of trade liberalisation and restructuring in the South African CAT industry led to a rise in unemployment in the industry, whereas productivity increased purely due to cost-minimisation and downsizing, rather than production growth.

This article is significant in the field of economic policy and development since it contributes towards a greater understanding of the current level of the international competitiveness of the South African CAT industry. The article makes an important contribution by providing evidence of the level of international competitiveness of the South African CAT industry. This evidence can be useful for policymakers and other industry stakeholders who are responsible for the implementation of policies that promote development in the South African CAT industry.

2. LITERATURE REVIEW

From the late 1980s and onwards, the South African CAT industry was increasingly exposed to international competition, a process that was accelerated when South Africa joined the World Trade Organisation's (WTO) Agreement on Textiles and Clothing (ATC) in 1994 (Van der Westhuizen, 2006). The South African government then introduced and implemented an economic policy that was aimed at promoting international openness, with the purpose of partially addressing the profitability and productivity problems in the manufacturing industry (Gelb, 2005). The South African CAT industry tariffs were relaxed more quickly than was required by the ATC, which may have resulted in the industry being unprepared for rising imports, most of them coming from China. This also resulted in the South Africa CAT industry being unable to compete with China in the clothing markets of the European Union (EU) and the United States (US) after the Multi-Fiber Arrangement (MFA) was abolished in 2004 (Biacuana, 2009). As a result, the South African CAT industry export potential has remained generally low, and is mainly concentrated in the EU and the US markets. These exports consist mainly of basic product items which are made possible by the preferential trade agreements that are duty and tariff-free. However, this has not improved South Africa's CAT industry competitiveness, as the country's high cost structure makes it difficult to compete with low-cost competitors such as China, India, Turkey, and Pakistan (Barnes, 2005).

As a result, clothing imports increased substantially in South Africa. With the dawn of the MFA in 2004, the South African market experienced additional competitive pressure from the Asian countries. According to Biacuana (2009), "China's share of the total South African imports of clothing and textiles grew from 16.1% in 1996 to 60.7% in 2008", which resulted in substantial job losses in the South African CAT industry.

There are traditionally two measures of comparative advantage: i) domestic resource costs (DRC) and ii) revealed comparative advantage (RCA) (JunNing, PingSun & Hishamunda, 2009). Other common indexes/indicators include, i) the trade specification coefficient (TSC), ii) the index of relative export performance (REF) and iii) the constant market share (CMS) (Irawan & Yushkova, 2013).

The RCA index is based on technological differences across countries, which result in the differences in productivity. These productivity differences are further expanded in modern trade theories. According to Topcu and Kilavuz (2012), the new trade theories cater for increasing returns to scale, product diversity, consumer preference, externalities, and innovation in expressing these productivity differences. It is also emphasised that changes in the domestic and international market forces could trigger changes in the country's comparative advantage over time (Widodo, 2009). The RCA index is a popular measure of comparative advantage used in a number of studies that analyse the level of competitiveness of various sectors and or sub-sectors of different economies. Some of the recent studies include Havrila and Gunawardana (2003), Utkulu and Seymen (2004), Leishman, Menkhaus and Whipple (1999), Topcu et al. (2012), Muendler (2007) and Fertö and Hubbard (2003). These studies were conducted in various sectors and sub-sectors within the agriculture and manufacturing industries.

Researchers in the field of RCA are divided in their interpretations of the measures (Havrila et al., 2003). Some interpret measures as dichotomous, while others interpret measures as ordinal or cardinal. In the dichotomous sense, the RCA index is viewed as a means to conclude whether or not there is a comparative advantage. Cardinal measures entail the numeric magnitude of RCA, and ordinal interpretation ranks countries as having a higher or lower degree of RCA. The cardinal index is preferred, since it provides more detail about the magnitude of the differences in comparative advantage among various industries. However, the problem that is encountered with RCA indices is that real trade patterns are exposed to distortion by government interventions and policies (Utkulu et al., 2004). This may result in the misrepresentation of the underlying comparative advantages. It is emphasised that government protectionist policies such as import restrictions, and to some extent export subsidies, will distort RCA indices. For this reason, Fertö et al. (2003) make use of nominal "assistance coefficients" estimated by the Organisation for Economic Co-operation and Development (OECD) by country and commodity to account for the possible distortions in measuring RCAs. Fertö et al. (2003) suggest the application of a process-based measure of RCA known as "implicit revealed comparative advantage" to eliminate the distortion that may result from post-policy intervention. Similarly, Depperu and Cerrato (2005) describe "competitive advantage as the condition of dominance within a specific industry that a firm has acquired in comparison to its competitors". Industry-level competitiveness is thus indicated by an "industry's ability to design, produce and market products that are superior to those offered by competitors", and dominance in this regard can be assessed from a number of factors, such as inter alia "price, quality, technological advancement" (Depperu et al., 2005). The term 'competitiveness' is also being adopted by the World Economic Forum (WEF) and is defined as "set of institutions, policies, and factors that determine the level of productivity of a country" (WEF, 2013). Therefore, competitiveness can be monitored through changes in productivity and economic welfare, or changes in the living standards of the people within a particular nation.

The importance of identifying possible determinants of the level of competitiveness of the different sectors and sub-sectors of an economy is highlighted in the literature. In this regard De Broeck, Guscina and Mehrez (2012) developed an econometric model based on a panel dataset of nine central and eastern European countries and 65 industries between 1994 and 2008, to estimate the determinants of competitiveness in the Slovakian economy. Firstly, the estimation results indicate significant differences in unit labour cost (ULC) across sectors, countries, and the sample period, highlighting challenges in using aggregate measures that fail to capture these differences. Secondly, the authors were able to propose two measures of competitiveness at an industry level. The first measure was a simple construction of the ULC in a given sector and country relative to the sectoral average across countries, and the second one was constructed by estimating the relative ULC on various explanatory variables, such as GDP per capital, the lagged unemployment rate, and the size of the sector in the country's total exports. Application to the Slovakian case study estimation results reveals that it was competitive in most of the manufacturing sectors during 2000 to 2007. This simply implies that the actual ULC was below the sectoral norms, and that in the majority of the sectors, competitiveness improved over time.

Edwards and Golub (2002) also confirm the relevancy of ULC as a key measurement of competitiveness of the South African economy. Their study uses panel data based on selected developing and developed countries for the period 1970 to 1998 to estimate the impact of relative ULC on export performance across various sectors of the South African economy. The results of the estimation model show that relative ULC has an expected negative sign, and that it is significant in explaining the structure of South African exports. It implies that a rise in relative ULC during a particular period will result in a decrease in real exports in the long term, *ceteris paribus*. The implication is that sectors with relatively low wages and high productivity levels tend to export more. Another important finding from this study is that when the absolute estimates of wages and productivity of the South African economy are compared to the selected developed and developing countries, South African labour seems to be competitive in relation to most industrial countries. However, South Africa's ULCs appear to be high relative to most developing countries, most especially in comparison to their major competitors in Asia and Latin America. These results confirm the previous findings from Golub (2000) on an analysis of South Africa's international cost competitiveness. In addition, human capital can also be considered as an important factor in determining high labour productivity and low labour costs. To support this statement, Aggrey (2010) assesses the effect of human capital on labour productivity. Aggrey (2010) employed a generalised least squares method to estimate the human capital model. The results indicate the important impact of average education, training and the proportion of skilled workers on labour productivity, thus improving an industry's competitiveness domestically and internationally.

In terms of the determinants of competitiveness at company level within a particular industry, performance indicators such as return on investment (ROI), return on assets (ROA) and profitability ratios are important (Depperu et al., 2005). Even though this may be true, these measures alone cannot prove the competitiveness of a particular industry. In fact they constitute some of the end results of a competitive industry. However, the real crux for analysis of competitiveness remains to detect those factors that may determine competitiveness, rather than to show its end result (Martin, 2003). Silva (2000) categorises measures of industry competitiveness into, i) trade-orientated measures (import cover rate, import penetration ratio, export orientation ratio, net export orientation ratio, market share measures, and RCA analyses), ii) productivity and cost-orientated measures (ULC, total productivity, the resource cost coefficient, value added, export unit value, and profit measures) and iii) composite/index measures (real exchange measures and constant market share analysis). However, the major

determinants of competitiveness mostly reviewed in the literature include ULC, the real effective exchange rate (REER) and export performance. These are also described as the cost and price competitiveness indicators respectively (Mbaye & Golub, 2002).

REER can be described as a "measure of changes in the competitiveness of different industries in a country by taking into account the changes in the relative prices between the comparable industries in countries involved" (Pelinescu & Ceraiani, 2006). This implies that a growth in the value of REER may result in declining competitiveness. The REER is also considered an important measure of competitiveness. Sorsa and Chobanov (2004) assessed the competitiveness of different industries in Bulgaria using the REER. The study evaluated the medium- and long-term determinants of REER, using components from the natural real exchange rate (NATREX) and the behavioural equilibrium exchange rate (BEER) methodologies. The authors used quarterly time series data from 1997:3 to 2003:1 and the auto-regressive distributed-lags (ARDL) approach to perform the estimations. The results show that all coefficients have expected results, and that productivity, gross savings, world interest rates, and foreign direct investment determine the REER.

Dhasmana (2013) studied the impact of variations in the real exchange rate on the performance of Indian manufacturing companies over the period 2000 to 2012. The study estimated a standard output growth equation augmented with real exchange rate variation integrated with time varying import and export shares of each firm. Dhasmana (2013) used growth in output and sales as dependent variables. Significant as per the economic theory, the results reveal that all coefficients have expected signs. Most importantly, the coefficient of labour growth, ULC, investment, and changes in real exchange rates are confirmed to significantly explain variations in output and sales growth of the companies involved in the study. This confirms the importance of REER and ULC as the determinants of competitiveness and sustainability over a period of time.

Although relative, ULC and REER are the most commonly used measures of competitiveness; they have some limitations in terms of measuring the international competitiveness of industries within countries. For instance, Agbor and Taiwo (2014) indicate that the usual behaviour of REER in many developed and developing countries may not produce expected results in the commodity-exporting countries. In support of this, Pelinescu et al. (2006) estimated the REER by using ULC in Romania, including a panel of 19 countries, for the period 1995 to 2004. The purpose of the study was to determine the dynamics of Romanian economic competitiveness relative to its trade partners. The results reveal that since imported products with low added-value dominate Romanian exports, the dynamics of REER based on ULC are not a true reflection of the level of competitiveness relative to its trading partners. Pelinescu et al. (2006) suggest that the reason for these results is due to the fact that labour cost in the Romanian economy has a significantly lower share in total costs in comparison to that of its trading partners. Thus, this makes REER based on ULC insignificant to Romania as a measure of the level of competitiveness, due to the fact that its total exports include a high share of commodities in the manufacturing industry. Furthermore, Agbor et al. (2014) argue that the impression that an increase in relative ULC results in a loss of competitiveness is rather unconvincing. They support the view that differential changes in non-labour costs will impact on the level of competitiveness, but may not reflect in real ULC. Therefore, the authors emphasise that REER and ULC are appropriate for measuring competitiveness primarily in economies exporting manufactured goods, whereas employing these measures to countries exporting primary products may be insignificant.

Some studies promote an export approach to the determination of the level of competitiveness (Adams, Gangnes & Shachmurove, 2006; Delgado, Farinas, & Ruano, 2002; López & García, 2005;

Edwards et al., 2002; Dosi, Grazzi, & Moschella, 2013). An RCA index greater than one implies that a particular country has a greater share of exports of a specific industry over its competitors. Moreover, this particular country must possess certain characteristics in order to maintain or grow its level of competitiveness. For instance, Adams et al. (2006) indicates that China's export competitiveness is due to several factors such as: "the favourable exchange rate, low wages and available supplies of unskilled labour, the reduced cost of communication and transportation, the flow of foreign direct investment and foreign management and its implications for China's productive abilities, the large scale of the potential Chinese domestic market, the opening of world markets, and the encouragement of Chinese foreign trade policy". It is also indicated in the same study that some of these factors also justify the use of an exports approach, since an industry can be viewed as competitive when it has a greater share of exports (due to relatively lower labour costs and a relatively depreciating currency).

Delgado et al. (2002) also justify the link between the export approach, ULC, and REER. In their research the authors used a sample of manufacturing companies over the period 1990 – 1996 to analyse total factor productivity differences between exporting and non-exporting companies. A non-parametric approach was employed in order to test the market selection and learning hypothesis, which are supposed to explain the greater productivity of exporting companies. The estimation results indicate that higher levels of productivity are found in exporting companies rather than non-exporting companies. However, with regard to justification of the market selection and learning hypothesis, evidence of supporting the self-selection or more productive companies in the export market was found, whereas evidence in favour of learning-by-exporting was found to be rather weak and limited to younger exporters. In addition, companies that are innovative and that adopt the latest technologies are found to be more likely to be competitive in the export market than those that do not (López et al., 2005).

Edwards et al. (2002) did a panel data estimation, including a sample of 24 industries for the period 1970-1998, to provide evidence of an existing relationship between ULC, REER, and export performance. Real ULC was compared across a wide range of countries, and it was found that South Africa is cost competitive in comparison to developed economies, but less competitive against other developing economies. Furthermore, it was acknowledged that labour cost competitiveness has improved during the 1990s, but much of this has been as a result of a significant depreciation of the currency. It was also found that real ULC has a significant impact on export performance in the long run, meaning that a 1% increase in real ULC reduces real exports by between 1.64% and 2.32% in the long run. In addition, improvement in relative productivity is found to positively enhance exports, while rising relative wages reduce exports.

In another study, Dosi et al. (2013) evaluated the determinants of international competitiveness at company level in a sample of 15 member countries of the OECD and for a single country, Italy, for the period 1989-2006. The study included data from 11 manufacturing sub-divisions for each country studied. The results obtained from a pooled ordinary least squares (OLS) estimation show that technology variables have greater explanatory power than cost-related variables as far as international competitiveness is concerned. When inter-company data is estimated, technology variables still dominate in terms of explaining the level of competitiveness. However, the cost-related variables present mixed outcomes. For instance, wage levels appear not to impede export share; instead they are positively related to exports, even in labour-intensive sectors like textile and wearing apparel. However, it is also noted that this outcome corresponds to the empirical work on selection into export markets, which suggests that exporting companies pay higher wages than non-exporting companies. In addition, the coefficient of changes in relative ULC produces

an expected sign (negative) only in three sectors, but most importantly in the textile, wearing apparel, and leather sectors, where cost-related competitiveness is thought to be more relevant.

3. RESEARCH METHODOLOGY

The article employs the RCA indices and a fixed-effect panel data econometric model in order to perform a comparative analysis of the level of competitiveness of the South African CAT industry. In this section the following are highlighted, namely:

- the provision of a research approach and its justification for this research;
- the identification of the major instruments and the type of data that are used to perform a comparative analysis;
- the provision of an explanation for the selection of the comparable countries that are used in this research, and;
- the presentation of an econometric model that is employed to obtain the results of the determinants of the level of competitiveness.

3.1 Research approach, estimation process and data

The quantitative approach in the research is applied in two forms, namely i) as indices that measure and analyse the performance of the South African CAT industry in comparison to a sample of selected emerging markets (approach one), and ii) as a fixed-effect panel data estimation model in order to determine and analyse the determinants of the level of competitiveness of the South African CAT industry (approach two).

In terms of the first approach RCA indices are selected due to the ease and availability of data and also due to the ability to reveal the extent to which the South African CAT industry has a comparative (dis)advantage with respect to the CAT industries of other countries (Fertö et al., 2003).

$$RCA_{ijt} = \left\{ \frac{Xijt}{\sum Xjt} \middle| \frac{\sum Xiut}{\sum Xut} \right\} \quad \textbf{(1)}$$

where:

RCA_{ijt} = RCA Index value for *i* industry in country *j* in period *t*.

X_{ijt} = Exports of industry *i* of country *j* in period *t*.

ΣX_{jt} =Sum of exports of country *j* in period *t*.

ΣX_{iut} = Sum of world exports of industry *i* of country j in period *t*.

Equation (1) implies that sub-sectors of the South African CAT industry can be regarded as being comparative when the value of the index is greater than unity and less comparative when the value of the index is below unity. Moreover, the more products of the sub-sectors from the CAT industry South Africa exports, the larger its proportion will be, and the more comparative advantage it will gain, *ceteris paribus*.

The data required to conduct a comparative analysis in this research is exports of the total South African CAT industry and the selected sub-sectors within the South African CAT industry. Export data is sourced from United Nation Trade statistics, WTO's Trade Statistics Database, and Quantec Research based on South African Revenue Services (SARS) at a 3-digit and 4-digit Standard

International Trade Classification (SITC) over the period 2000-2014. The exports values are presented in US$ terms. The SITC classifications of 3-digit and 4-digit levels of aggregation are silk, cotton, vegetable textile fibres (not spun, waste thereof), synthetic fibres suitable for spinning, other man-made fibres suitable for spinning, wool, animal hair, horsehair yarn, and fabric thereof, worn clothing and other worn textile articles, textile yarn, cotton fabrics, woven, fabrics, woven, of man-made fabrics, other textile fabrics (woven), knitted or crocheted fabrics (not elsewhere stated), tulles, trimmings, lace, ribbons, and small wares, special yarn, special textile fabrics and related items, made-up articles of textile materials, floor coverings, women's clothing of textile fabrics, men's or boys clothing of textile, knitted, crocheted, women's clothing of textile, knitted or crocheted, articles of apparel (of textile fabrics), clothing accessories (of textile fabrics) and articles of apparel, clothing accessories (excluding textiles).

To assess the comparative level of competitiveness of the different sub-sectors of the South African CAT industry, it was considered imperative for the South African CAT industry to be measured against the CAT industries of some of the top emerging markets in the world. These emerging markets include: Brazil, Russia, India, and China (BRICS countries), Bangladesh, Egypt, Indonesia, Madagascar, Mauritius, Mexico, Morocco, Pakistan, Poland, Taiwan, Thailand, Turkey, and Vietnam. The selection of these countries is based on their trade relationship with South Africa and also on the availability of data.

Various economic and industrial-based variables are included in order to apply a fixed-effect panel data econometric estimation that would determine the factors that may be influencing the level of competitiveness of the South African CAT industry over the time period 1990 to 2013. The equations to be estimated include ULC, REER, and export performance. These approaches are chosen to determine which measures best explain the level of competitiveness of the South African CAT industry relative to its competitors. South Africa is compared to countries such as China, India, Indonesia, Mauritius, Poland, Taiwan, Thailand, and Turkey. The selection of these countries was based mainly on sectoral trends data provided by the IDC (IDC, 2014), which shows that these countries are the leading source of imports and exports for the South African CAT industry, and also based on the availability of data.

- ULC is estimated as:

$$ULC_{ij} = {LC_{ij}}/{LP_{ij}} \quad \textbf{(2)}$$

where:

ULCij represent ULC of industry *i* in country *j*

LCij represent labour cost of industry *i* in country *j*

LPij represent labour productivity of industry *i* in country *j*

The smaller the ULC coefficient, the greater the level of competitiveness (indicating a negative relationship). The basic argument is that if the South African CAT industry wants to gain a competitive advantage against its competitors it needs to maintain its labour productivity higher than labour cost, and its ULC must be relatively lower than its competitors.

- The REER is estimated as:

$$REER_t = \frac{NEERt \times CPIt}{CPIt^*} \quad \textbf{(3)}$$

where:

$REER_t$ represents the REER of a domestic country at period t against a basket of currencies of trading partners

$CPIt$ and $CPIt^*$ represent consumer prices index of a domestic country and foreign country respectively

$NEERt = \prod_{i=1}^{N} S(i)^{w}_{t}(i)$, which represents nominal effective exchange rate calculated by applying weighted average of S(i)t to the bilateral exchange rate between domestic country and all the foreign countries ($\prod_{i=t}^{N}$) that are included as competitors

The basic argument is that a growth in the level of REER means an appreciation in the currency in real terms, resulting in a loss of competitiveness.

- Export share approach

For the purpose of this research, exports are described as total exports of the South African CAT industry as defined under 3- and 4-digit SITC in the countries under study. In this research, the export share of the South African CAT sector is employed as a measure of competitiveness. It is expected that variables of ULC and REER will display negative coefficients. The export share variable is expected to have a positive sign, meaning that increasing exports for the South African CAT industry relative to its competitors may demonstrate increased competitiveness, *ceteris paribus*.

There are various explanatory variables in the literature that are used in order to explain variations in ULC, REER, or export share performance. Fagerberg (1988) discussed a few of these variables, including per capital GDP and technological variables. Cheng (2010) and De Broeck et al. (2012) also add variables such as the unemployment rate, wages, size of industry, output, tariff, quality of institutions, per capita GDP. The motivation for the explanatory variables is adopted from some of these studies. However, it is taken into consideration that this research is dealing with a labour-intensive South African CAT industry. Therefore, caution must be taken in selecting the explanatory variables. With this in mind, and also taking into consideration of Morris and Einhorn's (2008) view that China possesses cost competitiveness over many of the emerging markets competitors, this research presents the following variables:

- Wages and salaries: this includes labour compensation per employee converted into US$ at a nominal exchange rate. The sign of the coefficient of wages and salaries is expected to be negative. This implies that countries with lower labour costs are likely to have a competitive advantage, and the opposite is also possible. For the purpose of this research, the notification used to identify wages and salaries in the equation is Wage.
- Labour productivity: it can be described as output per hour of labour input and it can also be viewed as a measure of how efficient labour is (Bureau of Labor Statistics, 2013) and can also represent the effect of process innovation (Dosi et al., 2013). The literature suggests that a company that improves its productivity increases its probability of being more competitive than its competitors. Hence the sign of the coefficient is expected to be positive. The notation used to identify labour productivity in the equation is Prod.
- Real Gross Domestic Product per capita in US$ (Real GDP per capita): De Broeck et al. (2012) suggest that countries with a higher level of GDP per capita usually have higher ULC. Moreover, the authors state that per capita income would usually represent differences in "institutions, product quality, technology and the stock of human and physical capital". More importantly, higher ULCs in this regard may not necessarily imply lack of

competitiveness. For the purpose of this research the notation of Real GDP per capita is represented by GDP_pc and the sign of the coefficient is expected to be positive.

- Technology is represented by the total number of patent applications per country and it is used as a proxy for technological advancement. Dosi et al. (2013) use two variables to proxy technology: investment intensity, which is determined by calculating the ratio between industry expenditures on gross fixed capital formation and value added at current prices, and patenting activity intensity, which is represented by the share of national industry patents granted over the sum of the industry's patents granted to the total countries investigated. The authors find that patents are more significant to industries such as chemical, electrical, and non-electrical, whereas they produce insignificant results in industries that are more labour-intensive, such as the textile and apparel sectors. Due to the lack of gross capital formation data in some of the countries investigated in this research, patents as a proxy for technology are used. Therefore, a notification for patents in this research is shown as tech, and its coefficient is expected to have a positive sign, meaning that countries with high technologies are likely to be more competitive.
- MFA: This was introduced as a means to ratifying countries' rights to impose quotas on textiles and apparel imports (Morris, Barnes & Esselaar, 2004). In addition, the purpose of MFA was to enable developed countries to restructure their textiles and clothing industries before opening up to competition from developing countries. However, this agreement was abolished in 2004, which allowed countries such as China and India to increase their dominance in this industry. Therefore, the purpose of adding MFA as an independent variable is to account for the impact of the abolishment of MFA in the regression. MFA is treated as a dummy variable, taking the value of 1 for periods before 2004 and 0 for periods after 2004. Tengstam (2009) also used MFA as a dummy to show a country being under the risk of MFA quotas and that it was the best available alternative for this purpose. However, Tengstam (2009) also warns that this dummy is quite uneven, and there might be a risk of endogeneity. Nevertheless, it is still adopted in this research. The sign of the coefficient is expected to be negative.
- Inflation rate (Inf): "Inflation as measured by the consumer price index (CPI) reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly" (IMF, 2014).

A fixed-effect panel data econometric estimation based on the panel data of nine countries, as described in the above section, for the period 1990-2013 is performed. The fixed-effect panel data estimation is adopted in order to draw a comparative analysis between countries in terms of ULCs, REER, and export share. For this purpose, the following fixed-effect panel data estimation is applied.

$$\gamma_{it} = \alpha + \beta_1 D_{it} + f_i + \varepsilon_{it} \qquad \textbf{(4)}$$

where:

$\boldsymbol{Y_{it}}$ is a $m \times 1$ vector of the dependent variable and it is observable in a random sample of the population

α is a scalar

$\boldsymbol{\beta}$ is $m \times m$ matrix of coefficient

$\boldsymbol{D_{it}}$ represents $n \times 1$ vector of dummy variables

fi is individual-specific effects which represent the differences that exist between countries

ε_1 is the idiosyncratic error, which changes across t as well as across i.

The fixed-effect panel data estimation is used in order to account for possible heterogeneity between the CAT industries of the sample countries. This means that the differences that may exist between various CAT industries can be accounted for by using the sample countries themselves as dummies. Failure to account for differences that may exist between the sample countries may lead to bias coefficients.

The estimation of equation 4 takes into consideration equation by equation (Kabundi, Schaling & Some, 2014). This means that since there are nine countries, one country is used as a reference category. Therefore the equation of country I is the intercept plus the slope coefficient. For the purpose of this research, China was used as a reference category due to its large GDP per capita as compared to the other emerging countries in this research.

4. ESTIMATION RESULTS

4.1 RCA results for the textile and clothing sectors of South Africa

In order to determine the actual performance of the South African CAT industry relative to other emerging markets and trade partners, RCA indices are calculated according to Revision 3 of the SITC. The RCA indices are calculated for aggregate (at SITC 3-digit level) and for selected sub-sectors (at SITC 3-digit level) of the South African CAT industry for the period 1990-2013. The results are presented in TABLES 1 and 2.

TABLE 1 presents the RCA indices of the South Africa's textile sector relative to other selected countries. This table indicates that the textile sector of the South African CAT industry has always had an RCA index far below 1, with the highest index of 0.3598 in 2003 and lowest of 0.1477 in 2012. Moreover, the index started to show an increase in the 1995-2003 period, but in the post-2004 period it started to decline. The RCA indices imply a loss of competitiveness of the South African textile sector relative to the selected sample countries. The pre-2004 period was a period during which South Africa had just started adjusting to international competition and a time that was characterised by a relative lack of technology and high labour cost (Morris, 2008). Moreover, the policies (Duty Credit Certificate Scheme) implemented by the government to promote exports appear to have favoured fewer and larger companies. It may have also encouraged specialisation prematurely, as this might be viewed as risky when challenging countries like China and India with relatively lower labour cost and easier access to raw materials in the same market.

In comparison to other African countries such as Egypt, Madagascar, Mauritius, and Morocco, South Africa's textile sector appears to be performing the worst. The textile RCA index has averaged 4.4 for Madagascar, 3.3 for Egypt, 1.8 for Mauritius, 1.0 for Morocco, and 0.26 for South Africa in the period 1990-2013. Madagascar had the best-performing African textile sector and it never lost its competitive advantage in the period under review. Egypt had the best-performing textile sector in the early 1990s, but it deteriorated until it lost its comparative advantage in 2006 and 2007. The Mauritian RCA index was below 1 between 1990 and 1992, but accelerated to above 1 in the post-1992 period, showing a significant competitive gain in the textile market. Lastly, considering the trend in Morocco, comparative advantage was lost between 1994 and 2005, but it was regained in the post-2006 period.

TABLE 1: The RCA index, Textile Sector (SITC division 65), 1990-2013

The Balassa Revealed Comparative Advantage Index, Textiles Industry, 1990 to 2013

Year	Bangla-desh	Brazil	China	Egypt	India	Indone-sia	Mada-gascar	Mauri-tius	Mexico	Morocco	Pakistan	Poland	Russia	South Africa	Taiwan	Thailand	Turkey	Vietnam
1990	6,8645	0,8193	3,8880	7,1914	4,0496	1,6153	3,7096	0,9944	0,5877	1,5972	15,9294	0,6642	0,0000	0,2377	3,0498	1,3434	3,7057	0,0000
1991	5,8090	0,8624	3,5916	4,4180	4,6067	1,9437	3,5753	0,9981	0,6057	1,3981	15,7900	0,5137	0,0000	0,2254	3,0896	1,2779	3,3861	0,0000
1992	4,9706	0,9104	3,2608	4,1823	4,8242	2,6918	3,7602	0,9458	0,6008	1,4475	15,8200	0,6562	0,0000	0,2471	2,9713	1,2565	3,5516	0,0000
1993	4,3718	0,8058	3,1691	4,2667	4,5111	2,3937	4,2212	1,0878	0,5624	1,4610	17,5118	0,7487	0,0000	0,2177	3,1809	1,2367	3,4766	0,0000
1994	3,7825	0,7455	3,2119	5,8629	5,0361	2,0485	3,9509	1,3170	0,5070	0,8974	17,7809	0,7590	0,3010	0,2136	3,5794	1,1959	3,9868	0,0000
1995	4,1913	0,7291	3,1705	5,6446	4,8337	2,0286	5,1549	1,6971	0,5473	0,8749	18,0797	0,7589	0,1541	0,2895	3,5628	1,1659	3,9702	0,0000
1996	3,7068	0,7479	2,8410	4,2517	5,2818	2,0157	6,1235	1,7316	0,5709	0,8119	18,6940	0,8158	0,2101	0,3093	3,6398	1,2023	4,1561	0,0000
1997	3,4523	0,6920	2,7122	4,8710	5,3766	1,4375	5,5649	1,8060	0,6198	0,6879	18,9663	0,9238	0,1970	0,3161	3,7206	1,2634	4,5748	0,5620
1998	3,1061	0,6400	2,5571	5,1661	5,0091	1,7183	5,3902	1,7575	0,6337	0,6561	18,6022	0,9802	0,2072	0,3198	3,6456	1,1853	4,8250	0,6121
1999	2,9368	0,6681	2,6159	3,9079	5,5723	2,3060	5,3956	2,0329	0,6607	0,6840	19,7769	1,0377	0,1992	0,3449	3,4262	1,2177	5,1134	1,2578
2000	2,5667	0,6780	2,7044	3,2467	5,5055	2,2368	4,0941	2,1625	0,6438	0,6898	20,9467	1,0793	0,1920	0,3302	3,2865	1,1825	5,5130	0,8594
2001	3,2209	0,6151	2,6592	2,5178	5,3497	2,3452	4,3020	2,4493	0,5560	0,8442	20,5896	1,0067	0,1859	0,3311	3,3022	1,2189	5,2957	0,9876
2002	3,4067	0,5890	2,6647	1,9027	4,9817	2,0761	5,8891	1,5901	0,5805	0,7475	20,4209	0,9775	0,1917	0,3503	2,9826	1,1893	4,9668	1,0714
2003	2,6019	0,6664	2,7024	1,6560	4,7991	2,0051	3,9373	1,7739	0,5576	0,6485	21,4876	0,9852	0,1755	0,3598	2,7291	1,1844	4,8948	1,0346
2004	3,4051	0,6122	2,6740	1,3331	4,5859	1,9837	3,9861	1,9871	0,5233	0,6991	21,6806	0,8993	0,1610	0,3099	2,6162	1,2639	4,8249	1,1467
2005	3,9230	0,5786	2,7869	1,0896	4,3273	1,9937	4,5160	1,8043	0,5167	0,8736	22,7731	0,9081	0,1040	0,3124	2,5360	1,2883	4,9800	1,1583
2006	7,0097	0,5475	2,7806	0,8158	4,0288	1,9234	4,3894	1,8556	0,4841	1,0492	24,4612	0,8501	0,0965	0,2875	2,4167	1,2231	4,9102	1,4714
2007	4,1465	0,5229	2,6924	0,8654	3,7583	1,9023	4,1516	2,2982	0,4741	1,2449	24,2765	0,9246	0,0826	0,2790	2,3096	1,1854	4,8991	1,5939
2008	4,5932	0,4459	2,9654	1,8755	3,4507	1,7027	3,9577	2,1784	0,4427	1,0511	22,9655	0,8537	0,0646	0,2415	2,3448	1,1704	4,6195	1,6168
2009	3,5008	0,3718	2,9755	2,6412	3,2955	1,5957	3,8883	2,1045	0,4185	1,3002	22,2015	0,7178	0,0802	0,2182	2,3088	1,1790	4,5196	2,0997
2010	3,9863	0,3282	2,9486	2,9625	3,4414	1,5896	3,8784	1,9735	0,3928	1,1514	22,2244	0,7199	0,0896	0,1537	2,1420	1,1811	4,7652	2,5692
2011	4,8379	0,2693	3,0909	3,0992	3,1493	1,4827	4,4452	2,7502	0,3811	1,1872	22,2419	0,7255	0,0804	0,1340	2,2248	1,1358	4,9636	2,4199
2012	4,2145	0,2653	3,0150	2,9973	3,3301	1,5641	4,1519	2,3815	0,3933	1,0725	22,9128	0,7292	0,0713	0,1477	2,2142	0,9956	4,7092	2,1928
2013	3,9976	0,2411	2,9639	3,2129	3,7125	1,5557	3,6746	2,4327	0,3959	1,0164	22,7820	0,6822	0,0700	0,2723	2,0646	1,0396	4,9154	2,2283
Average	**4,1084**	**0,5980**	**2,9434**	**3,3324**	**4,4507**	**1,9232**	**4,4212**	**1,8379**	**0,5277**	**1,0038**	**20,3715**	**0,8299**	**0,1214**	**0,2687**	**2,8893**	**1,1993**	**4,5635**	**1,0367**

Source: WTO Statistical Data, 2014; Authors' analysis

Among other reasons, it is felt that the lack of competitiveness of the South African textile sector against fellow African countries can also be attributed to the adoption of trade liberalisation and restructuring in the sector in the 1990s, which led to a rise in unemployment and closure of some companies (Barnes, 2005). South Africa's textile sector appears to lag far behind the selected Asian countries (Bangladesh, China, India, Indonesia, Pakistan, Taiwan, Thailand and Vietnam). All these countries appear to have a comparative advantage in the textile sector relative to South Africa. In addition, Pakistan shows a high advantage followed by India and Bangladesh, relative to other selected Asian countries. These countries dominate the South African textile market, with textile imports from China averaging about 38% of total textile imports in the first quarter of 2014. Again, South Africa lags behind in terms of technology, easy access to raw materials, and cost competitiveness, relative to these Asian countries.

Another important comparison that is essential to highlight is between the BRICS member countries. China and India have a comparative advantage in the textile sector in comparison to the other member countries. Of the other three member countries, Brazil and South Africa appear to have comparative advantage relative to Russia, with averages of 0.59 for Brazil, 0.26 for South Africa, and 0.12 for Russia. With South Africa being the newer member of BRICS, it will be interesting to see the direction that the Chinese dominance in the South African textile market takes, if any. Whether it will be beneficial or detrimental will only be seen in time.

Lastly, looking at the other emerging markets in the sample, Mexico has a comparative disadvantage in the textile sector. Poland also appears to lack competitiveness, with the exception of the period 1999-2001. Turkey has always had a comparative advantage in the textile sector, and the trend as shown in TABLE 1 has increased in the same time period.

TABLE 2 indicates the RCA indices of South Africa's clothing sector relative to other selected emerging countries. Once again, South Africa appears to have a comparative disadvantage relative to other African countries in terms of the clothing sector. As indicated in TABLE 2, the RCA indices of South Africa's clothing sector averaged 0.16 in the 1990-2013 period, whereas Egypt, Madagascar, Mauritius, and Morocco averaged 1.68, 10.11, 15.72, and 7.57 respectively for the same periods. Reasons for the lack of competitiveness in the South African clothing sector are similar to those discussed under the textile sector, namely that the sector is characterised by high labour cost and a lack of technology relative to other emerging markets.

All the Asian countries appear to have a significant comparative advantage in the clothing sector relative to their peers, with the exception of Taiwan, which averaged an index of 0.67 for 1990-2013. Countries like Bangladesh and Pakistan have RCA indices averaging 24.26 and 7.25 during 1990-2013 respectively, which are higher than other Asian countries.

China and India are dominant among the BRICS countries in terms of the RCA indices for the clothing sector, with indices averaging 4.44 and 3.55 respectively for 1990-2013. These countries combined have a population of over 2 billion and the capacity to manufacture large volumes for both domestic and international markets in terms of their clothing sectors. The South African clothing sector (index of 0.16) appears to be relatively more competitive than Brazil (0.14) and Russia (0.06). It can be deduced that these three countries are in relative terms not competitive in both the production and overall export of the clothing products in comparison to the other sample emerging markets. Plausible reasons for this state of affairs are that the South African, Brazilian and Russian clothing sectors, i) do not have a strong base for their clothing sectors relative to other emerging markets, ii) that there is a relatively high labour cost related to clothing output and, iii) the lack of technology.

TABLE 2: The RCA Index, Clothing sector (SITC division 84), 1990-2013

The Balassa Revealed Comparative Advantage Index, Clothing Industry, 1990 to 2013

Year	Bangla-desh	Brazil	China	Egypt	India	Indone-sia	Mada-gascar	Mauri-tius	Mexico	Morocco	Pakistan	Poland	Russia	South Africa	Taiwan	Thailand	Turkey	Vietnam
1990	12,4265	0,2535	5,0255	1,8000	4,5361	2,0678	1,1083	16,4652	0,4659	5,4704	5,8520	0,8667	0,0000	0,1162	1,9152	3,9357	8,2694	0,0000
1991	14,9062	0,2707	5,1021	1,4348	4,2772	2,3318	1,4843	15,1995	0,5432	5,4202	5,5477	1,0269	0,0000	0,1710	1,7532	3,8746	7,6621	0,0000
1992	14,2014	0,2782	5,6296	1,5298	4,5238	2,6629	2,0610	14,6724	0,5994	5,8094	5,6403	1,4109	0,0000	0,2110	1,4362	3,3162	8,1347	0,0000
1993	15,0914	0,3107	5,9180	1,7126	4,0457	2,8004	4,5352	16,1071	0,6738	6,0414	6,8542	3,3706	0,0000	0,2513	1,2786	3,3239	8,3463	0,0000
1994	15,5188	0,2695	6,0333	2,0483	4,5539	2,4592	6,3264	16,6342	0,8575	4,0846	6,5856	3,3034	0,0685	0,1519	1,1251	3,0613	7,7868	0,0000
1995	18,3620	0,2095	5,2695	2,4103	4,3854	2,4281	7,0350	17,1299	1,1231	3,7900	6,5828	3,2848	0,0951	0,1837	0,9376	2,8992	9,2485	0,0000
1996	16,9938	0,1695	5,4007	2,2037	4,1503	2,3493	10,0507	16,6315	1,2731	3,6896	6,5444	3,1694	0,1089	0,1830	0,8912	2,1808	8,5187	0,0000
1997	17,5243	0,1251	5,4695	2,0744	3,9050	1,6231	11,6678	17,5177	1,6039	3,2333	6,5341	2,7337	0,0985	0,1716	0,8709	2,0209	8,0143	4,7392
1998	21,8812	0,1071	4,8299	3,1459	4,2348	1,5435	12,6557	16,4190	1,6615	10,5001	6,4091	2,5035	0,1109	0,1692	0,8406	1,9211	7,7309	4,1138
1999	21,7740	0,1120	4,7798	2,4151	4,4732	2,3343	14,5021	18,3953	1,7614	10,0963	6,7949	2,4892	0,1439	0,2081	0,7136	1,8324	7,5909	4,3708
2000	25,9051	0,1670	4,7351	1,9356	4,5981	2,3660	12,2410	19,8545	1,6924	10,5359	7,7615	1,9741	0,1368	0,2377	0,6527	1,7781	7,6814	4,1054
2001	25,0124	0,1550	4,3944	1,5766	4,0327	2,5173	12,2106	16,8350	1,6146	10,4680	7,3741	1,7588	0,1545	0,2587	0,6258	1,7539	6,7874	3,9686
2002	24,9589	0,1182	4,0394	1,1893	3,7719	2,0870	7,4259	16,8110	1,5368	9,9051	7,1698	1,5020	0,1530	0,2746	0,5164	1,6109	7,1157	5,0263
2003	26,3190	0,1349	3,8681	1,0246	3,4832	2,0573	7,5872	16,7789	1,4417	10,5759	7,4116	1,2930	0,1516	0,2764	0,4560	1,4643	6,8539	5,6095
2004	26,8857	0,1328	3,7006	0,8589	3,2076	2,1474	14,5923	16,7474	1,4130	10,7903	8,0106	1,0630	0,0960	0,1983	0,3804	1,4694	6,2832	5,6894
2005	27,9764	0,1154	3,6725	0,5382	3,3108	2,1508	15,2089	13,1279	1,2889	9,6198	8,4459	0,9375	0,0384	0,1267	0,2975	1,3888	6,0750	5,4512
2006	27,6140	0,0864	3,8463	0,3360	3,0635	2,1642	12,7658	12,9428	0,9869	9,9236	9,0336	0,7971	0,0280	0,0955	0,2460	1,2767	5,5082	5,4777
2007	28,5955	0,0703	3,8163	0,3757	2,6681	2,0049	16,1379	15,9589	0,7600	9,2579	8,6186	0,7254	0,0172	0,0685	0,2080	1,0660	5,2306	6,1371
2008	33,6585	0,0567	3,7487	1,3119	2,5041	1,9986	18,0389	15,8118	0,7503	7,4814	8,5665	0,8906	0,0139	0,0657	0,2077	1,0607	4,5839	6,1949
2009	31,2470	0,0450	3,5595	2,2823	2,8973	1,9629	15,2993	15,0756	0,7134	8,7666	7,6400	0,9045	0,0146	0,0648	0,1764	0,9758	4,5115	5,9555
2010	33,4944	0,0332	3,5571	2,0985	2,1511	1,8687	13,0904	12,6042	0,6335	7,3414	7,9507	0,9169	0,0146	0,0480	0,1541	0,9644	4,8457	6,2297
2011	34,5513	0,0330	3,5456	2,2229	2,1213	1,7535	9,6487	15,2262	0,5811	6,6113	7,8470	0,8965	0,0195	0,0480	0,1414	0,8961	4,5262	5,9447
2012	34,3354	0,0299	3,3903	1,8644	2,0280	1,7426	8,7092	13,4907	0,5223	6,5312	7,4588	0,8479	0,0254	0,0544	0,1405	0,8128	4,0935	5,4685
2013	33,0149	0,0275	3,2794	1,9508	2,1979	1,7170	8,1918	10,8344	0,4870	5,8434	7,3732	0,7959	0,0316	0,2142	0,1189	0,7314	4,1405	5,3316
Average	**24,2603**	**0,1380**	**4,4421**	**1,6809**	**3,5467**	**2,1308**	**10,1073**	**15,7196**	**1,0410**	**7,5745**	**7,2503**	**1,6443**	**0,0634**	**0,1603**	**0,6702**	**1,9006**	**6,6475**	**3,7423**

Source: WTO Statistical Data, 2014; Authors' analysis

Other emerging markets such as Mexico, Poland, and Turkey all show RCA indices above 1, implying that they all have a comparative advantage in their clothing sectors in comparison to South Africa. From the estimated RCA indices in TABLES 1 and 2, it can be concluded that, i) South Africa, Brazil, Mexico, Poland, and Russia have a relative comparative disadvantage in the textile sector in comparison to the other countries and, ii) that South Africa, Brazil, Russia, and Taiwan have a relatively comparative disadvantage in the clothing sector. An important aspect to note in terms of South Africa is that the disadvantage in the textile sector is relatively lower than in the clothing sector. This can also be interpreted as the South African textile sector performing better than the clothing sector during the period 1990-2013, *ceteris paribus*.

4.2 Fixed-effect panel data estimates for the determinant of the level of competitiveness of the sub-sectors of the South African CAT industry

Three measures of the determinants of the level of competitiveness are used: ULC, REER and export share. Fixed-effect panel data estimations are performed in order to conduct a competitive analysis between the South Africa CAT industry and the CAT industries of sample countries in terms of ULC, REER, and export share. The sample countries include nine countries (China, India, Indonesia, Mauritius, Poland, South Africa, Taiwan, Thailand, and Turkey) trading in the CAT industry, yielding a balanced panel database with 21 variables and 216 observations per industry for the period 1990-2013. The countries themselves were used as independent variables in order to account for possible heterogeneity that may exist between the countries.

- ULC estimates

TABLE 3: Fixed-effect panel data ULC estimates (China as the benchmark)

	Textile		*Clothing*	
Countries	*Estimate*	*P>(t)*	*Estimate*	*P>(t)*
India	55.82	0.33(c)	-11.69	0.83(c)
Indonesia	20.53	0.72(c)	72.92	0.18(c)
Mauritius	48.59	0.39(c)	61.71	0.25(c)
Poland	12.15	0.83(c)	-2.04	0.97(c)
South Africa	33.18	0.56(c)	46.35	0.40(c)
Taiwan	28.22	0.62(c)	0.45	0.99(c)
Thailand	67.45	0.24(a)	-9.3	0.86(a)
Turkey	592.07	0.00(c)	566.71	0.00(c)
Observations	216		216	
Adjusted R^2	0.44		0.36	

Source: Authors' analysis

*Data range 1990-2013
**Significant at: (a) $p < .01$, (b) $p < .05$, (c) $p < .10$

The textile ULC estimates (TABLE 3) for the sample countries are all greater than zero, which indicates that the ULCs of all the sample countries are higher than the ULC of the benchmark country, China. The textile ULC results confirm the theoretical and empirical proposition that China is likely to be more competitive in terms of ULC relative to other emerging markets, *ceteris paribus*. This is generally expected of China, as it is characterised by faster growth in labour productivity (Chen et al., 2010). Moreover, it is generally well known that China has a significant competitive edge in the CAT sector, which includes low labour cost and economies of scale in the domestic market (James, Ray & Minor, 2003). The ULC estimates indicate that only Poland, Taiwan, and Indonesia are not too far removed from China. Turkey appears to have a huge competitive disadvantage as far as textile ULC is concerned, relative to other countries. These findings can be related to the study of Aysan and Dincsoy (2007), which notes a rising textile ULC for Turkey in comparison to that of Poland, Hungary, the Czech Republic, and Slovakia. As far as South Africa is concerned, textile ULC competitiveness appears to only be relatively better than those of India and Mauritius in the sample. In support of this, India has the second-largest textile sector after China, but it was observed to have high production cost and low productivity (Shetty, 2001). Moreover, its textile production included low value added and low quality products. As expected, South Africa's textile ULC estimate of 33.18 implies that, all other things being constant, it is less competitive than China as far as textile ULC is concerned. These results are expected, as textile trade between these countries has been negative in favour of China, as observed by Wolmarans (2011) and the IDC (2013).

In terms of the clothing ULC estimates, China as the reference category appears to be relatively more competitive than the majority of the sample countries. The exceptions are India, Poland and Thailand (negative clothing ULC estimates when benchmarked against China). The positive clothing ULC estimates of Indonesia, Mauritius, South Africa, and Turkey appear to be significantly higher than the reference category, implying that the clothing sectors of these countries would be relatively less competitive than China. The South African clothing sector appears to be only more relatively competitive than Indonesia and Mauritius. According to Ancharaz (2009), the high ULC of producing garments in Mauritius is mainly due to a combination of low productivity and high labour cost. The same applies to the South African clothing sector, which was viewed as comparatively inefficient (Morris et al., 2008). The sector was observed to be characterised by a lack of skilled labour and high labour costs in relation to output. Thus it is not surprising that the South African clothing sector is struggling to compete against most of the Asian countries.

- REER estimates

Economic theory suggests that countries with a significantly positive and strong REER relative to their competitors are likely to have a competitive disadvantage. Evidence presented in TABLE 4 appears to be consistent with the theory. REER coefficients that are positive are indicative of stronger REERs compared to the REER of the benchmark country (China), and REER coefficients that are negative are indicative of weaker REERs compared to the REER of the benchmark country (China). The textile REER estimates of Mauritius and Thailand are significantly stronger than China's and other sample countries. Mauritius and Thailand are likely to be less competitive than the rest of the sample countries in terms of the textile REER.

India and Indonesia are not far removed from each other, with negative textile REER estimates of -4.28 and -6.82 respectively. The coefficients of Poland and Taiwan appear to be negative at -19.21 and -20.75 respectively, implying a depreciating exchange rate and a relatively more competitive textile sector.

TABLE 4: Fixed-effect panel data REER estimates (China as the benchmark)

	Textile		*Clothing*	
Countries	*Estimate*	*P>(t)*	*Estimate*	*P>(t)*
India	-4.28	0.29(c)	-5.69	0.24(c)
Indonesia	-6.82	0.09(c)	-7.22	0.10(c)
Mauritius	9.69	0.02(b)	5.51	0.05(b)
Poland	-19.21	0.00(a)	-12.34	0.01(a)
South Africa	-2.72	0.51(c)	-4.15	0.44(c)
Taiwan	-20.75	0.00(a)	- 15.35	0.01(a)
Thailand	14.24	0.00(a)	9.35	0.01(a)
Turkey	-1.58	0.70(c)	-2.73	0.62(c)
Observations	216		216	
Adjusted R^2	0.36		0.36	

Source: Authors' analysis

*Data range 1990-2013
**Significant at: (a) $p < .01$, (b) $p < .05$, (c) $p < .10$

Finally, South Africa's textile REER estimate is also negative at -2.72, which implies that on average the exchange rate is depreciating and that there is a chance of the textile sector being more competitive. When comparing the South African textile sector with the textile sectors of the rest of the sampled countries, it was found that the South African textile sector is only relatively more competitive than Mauritius, Thailand and Turkey in terms of the REER. Although undervalued REER may be good for competitiveness in terms of exports, it may not favour those countries that import machinery and raw materials like yarn and fabric. Conversely, maintaining an undervalued exchange rate works for countries like China in terms of increasing demand for exports, and thus achieving higher economic growth (Pettinger, 2009). However, maintaining the undervalued exchange rate also holds the risk of stoking inflationary pressures in the economy, which may lead to an increased cost of living generally.

The clothing REER estimates of India, Indonesia, Poland, South Africa, Taiwan, and Turkey are all negative, meaning that the depreciating real exchange rates of these countries are resulting in a relative higher level of competitiveness when benchmarked against China. The clothing REER estimates of Mauritius and Thailand are positive, indicating weaker level of competitiveness when benchmarked against China. It was found that China's main competitive edge stems from the fact that the government maintains an undervalued currency (Pettinger, 2009).

- Export share estimates

TABLE 5: Fixed-effect panel data export share estimates (China as the benchmark)

	Textile		*Clothing*	
Countries	*Estimate*	*P>(t)*	*Estimate*	*P>(t)*
India	-6.98	0.01(a)	-6.69	0.02(a)
Indonesia	-14.96	0.02(a)	-15.02	0.02(a)
Mauritius	-16.67	0.01(a)	-15.91	0.01(a)
Poland	-16.14	0.01(a)	-15.24	0.01(a)
South Africa	-16.57	0.02(a)	-15.65	0.02(a)
Taiwan	-15.50	0.02(a)	- 15.85	0.01(a)
Thailand	-15.46	0.01(a)	-15.01	0.01(a)
Turkey	-14.01	0.01(a)	-13.99	0.02(a)
Observations	216		216	
Adjusted R^2	0.36		0.36	

Source: Authors' analysis

*Data range 1990-2013
**Significant at: (a) $p < .01$, (b) $p < .05$, (c) $p < .10$

As discussed before, countries with a relatively larger percentage of exports compared to their competitors in a certain industry are thought to be more competitive than others. Negative export share estimates are indicative of a weaker competitive position when compared to the benchmark country (China), while positive export share estimates are indicative of a stronger competitive position when compared to the benchmark country (China). In TABLE 5, all the sample countries presented negative textile export share estimates when benchmarked against China. China appears to have a larger portion of total textile in relation to the sample countries. These results are expected, as China dominates both the production and export in the textile sector (Qiu, 2005). Only the textile export share estimate coefficient of India (-6.98) is closer to that of the benchmark country, implying that India has the second-largest textile export share. Again, these results for India are expected, as it has been the second-largest producer of textile products (Shetty, 2001). Other countries in the sample are expected to lag far behind China and India, due to reasons such as costs related to production and economies of scale. It is especially prevalent for the South African textile sector, which appears in the estimation to be only more competitive than Mauritius in terms of the textile export share. The results are expected for the South Africa textile sector, as data indicates that textile imports have been increasing faster than exports (WTO, 2013). At the same time textile imports from China to Africa as a whole have been increasing (Morris & Reed, 2008). These are deemed to be relatively cheap textile imports, which countries like South Africa are struggling to compete against.

The estimated clothing export share estimates of all sample countries are negative when benchmarked against China. Once again, the Chinese clothing sector appears to be far more

competitive than the rest of the sample countries. India has the second most competitive clothing sector behind China as far as export share is concerned. China and India are the biggest players in the clothing sector of the CAT industry in terms of possessing large economies of scale, access to modern technology, and cheap labour, to name a but few factors (Jin, Swinney, Cao, Muske, Nam & Kang., 2011). Wolmarans (2011) concludes that China has become the largest apparel producer, with a global share of exports of 51%. The clothing sectors of the other sample countries appear to be far removed from both China and India, but not very different from each other in terms of competitiveness in clothing export share.

The South African clothing sector appears to be only relatively more competitive than Mauritius and Taiwan when the export share of clothing is considered. In addition to the factors that are believed to cause a lack of competitiveness and declining exports, it is felt that the export promotion policy initiated by the Department of Trade and Industry (DTI) might have also added to the South African clothing sector's lack of international competitiveness. The policy framework, named the Duty Credit Certificate Scheme (DCCS), was meant to promote and encourage exports in the South African CAT sectors. Although the DCCS policy might have worked in terms of increasing exports by South African companies, the system can be viewed as a failure due to the fact that it lacked the ability to sustain exports as a result of the lack of capacity to create economies of scale. In addition to this, the system might have exaggerated the promotion of specialisation, while ignoring the fact that although diversifying production may not always be the best policy for a business, it is also not the worst. For instance, when a business diverts from producing and trading in various products to trading in specific products, it will lose out more than if it remained diversified if that particular firm is outwitted in the international market for whatever reason. This view is supported by a consistent closure of companies and the dramatic decline in employment in the South African CAT companies as observed from the early 1990s onwards.

5. CONCLUSION

The aim of the article was to perform a comparative competitor benchmark analysis of the level of competitiveness of the South African CAT industry.

The results confirm the expectation that South Africa has a strong comparative disadvantage in the CAT industry relative to other emerging markets. Moreover, empirical evidence presented by the RCA indices shows that there is a large and widening gap between the level of competitiveness of the South African CAT industry and the CAT industries of sample countries (especially India and China). The fixed-effect panel data estimates suggest that increasing unit labour costs and declining export shares can be viewed as major determinants of the increasing lack of competitiveness of the South African CAT industry.

This research found that there is a mounting crisis in the South African CAT industry, most especially in terms of job losses and declining exports markets. Therefore, this state of affairs requires proper policy response from the government, industrialists, retailers, labour unions and other stakeholders within the economy (such as banks and development finance institutions.

Further expansion of this research involves a comparative analysis of the level of competitiveness of individual product lines in the sub-sectors of the South African CAT industry.

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