# The impact of manufacturing exports on food poverty reduction in South Africa

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**Abstract**

*As South Africa struggles to deal with many of its socio-economic challenges including poverty, this paper was interested to empirically unpack how trade specifically manufacturing exports are contributing towards poverty reduction. The paper was motivated by the decent surge in exports especially in the manufacturing sector whilst on the other side, poverty levels increased. The paper employed time series data spanning 1990-2020 in a Vector Error Correction Model (VECM). The food poverty line index was used as the dependent variable, and it was found that exports from the manufacturing sector were significant in explaining food poverty reduction for South Africa. Further, economic growth and the human development index (HDI) were found to have poverty reducing effects in the long run. Interestingly, we found foreign direct investment increasing food poverty in South Africa in the long-run but reducing it in the short-run. Policy recommendations arising from our results are that South African authorities should consider pursuing more export led growth policies especially in industries that can absorb labour from those with little or no skills. Also, foreign direct investment should be encouraged in sectors that are not labour substitutive so that more inflows can lead to reduced food poverty through job creation in the long run.*

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## 1.0 Introduction

South Africa leads all the regions in the African continent as the most industrialised African country. Further, the Southern African country enjoys a significant stake of total foreign direct investment inflows that comes into the continent (Giroud and Yu 2020). The country also leads the continent as the number one exporter with an estimated value of $85,686,133,000 worth of goods and services that were produced in South Africa reached their final consumption in different parts of the world in 2020 alone (World Bank 2020). Whilst acknowledging the above accolades, the country has struggled to deal with its persistent problems of rising unemployment, high inequality and extreme poverty. The persistent deterioration of the above socio-economic indicators in a country that leads the continent as the number on exporter whilst ranked as a middle-income country is what motivated this study.

The objective of this paper is to empirically examine the impact of trade on food poverty in South Africa. We use the food poverty index as a proxy for poverty which is the dependent variable whilst trade

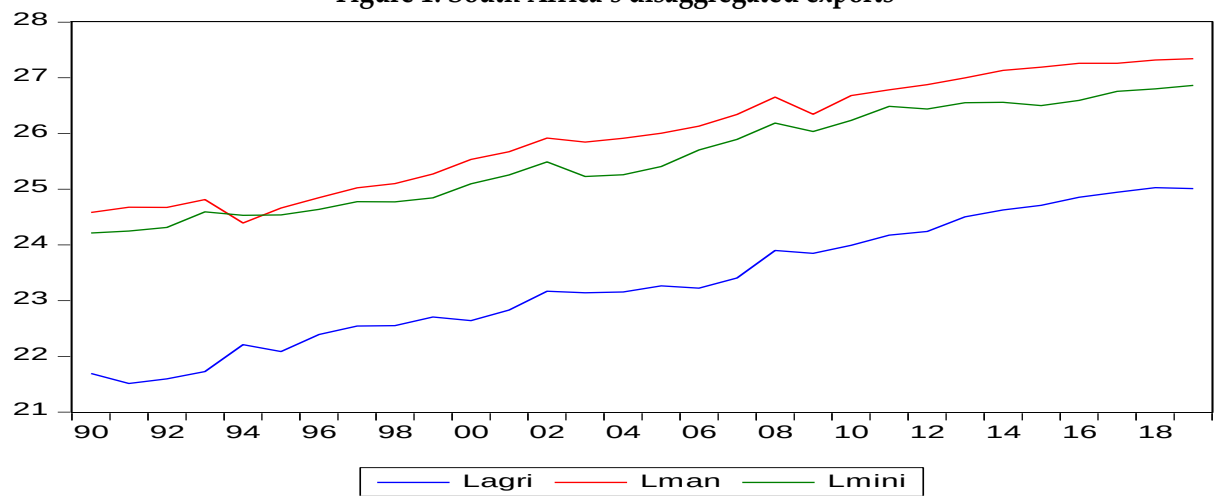
(manufacturing exports), Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Human Development Index (HDI) are independent variables in a Vector Error Correction Mechanism (VECM) model. However, theoretically, the relationship between trade and poverty is very ambiguous (Le Goff and Singh 2014). There is no agreement in literature on the ability of trade to reduce poverty as well as the direction in which trade affects poverty (Anector et al., 2020). In South Africa and Sub-Saharan Africa, the impact of trade on poverty is not clear as other researchers found trade worsening poverty (Onakoya et al., 2019; Fash and Mold 2008; Van de Westhuizen 2007). On the other hand, (Mabugu and Chitiga 2007; Le Goff and Singh 2014; Anetor et al., 2019) identified trade as a poverty reducing variable. The fact that there is no agreement in literature on the impact of trade on poverty open doors for further investigations, hence the relevance of this study. Moreover, to the best of our knowledge, there is no research in South Africa that has looked on the relationship of trade and poverty focusing on food poverty and that is the main contribution of this paper to the trade-poverty debate.

The rest of the paper is organised as follows, the following section displays poverty and trade trends for South Africa before the empirical literature review. Next after the empirical literature review will be the methodology section where data issues and estimation technique issues are presented and discussed. That will then be followed by a section dedicated to the presentation, discussion and analysis of the findings and lastly the paper will present its conclusion and policy recommendations.

### 1.1 Trade and poverty trends in South Africa

This section focuses on displaying trade and poverty levels in South Africa overtime using publications from Statistics South Africa (Stats SA). Figure 1 below displays disaggregated exports from South Africa's most tradeable sectors' namely Agriculture (LAgri), Manufacturing (LMan) and Mining (LMini)}. The figure shows that from 1990 to 2018, South African exports experienced a steady increase especially in manufacturing and mining. Although agriculture lagged behind in terms of its percentage of exports in relation to total exports, its growth was significant.

**Figure 1: South Africa's disaggregated exports**



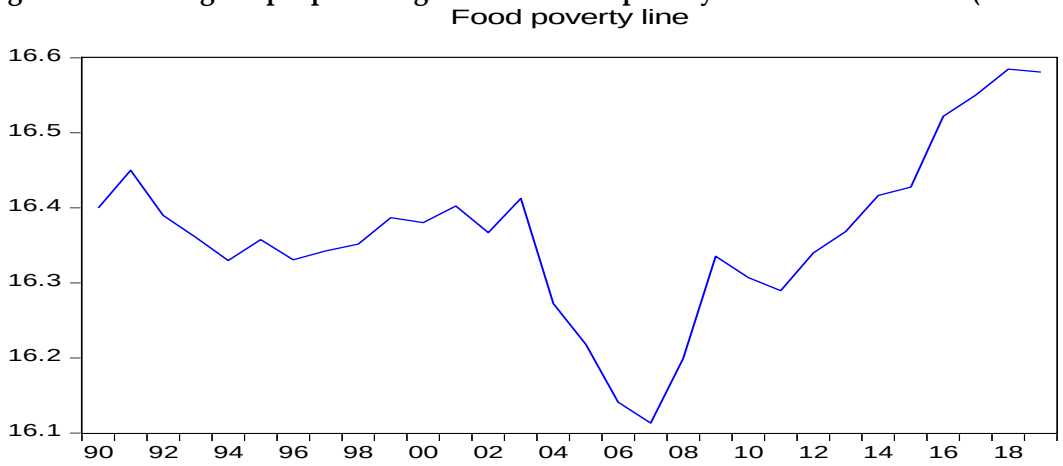

*Source: Statistics South Africa*

Globally, the number of people living in extreme poverty fell by more than 1 billion during the period 1990-2015 from 1.9 billion to 0.73 billion respectively, thanks to so much economic progress mainly in China (World Bank 2016). However, Sub-Saharan Africa has not seen much change since extreme poverty

is increasingly concentrated in the region and it is estimated that about 40% of the region's people live on less than $1.90 a day (World Bank 2020). Poverty rates in South Africa remain unacceptably high for a middle-income country. The National Income Dynamics Study (NIDS) survey showed that 20% of households in South Africa experienced hunger in the last quarter of 2020 (NIDS 2021). It went further to highlight that 14 out of approximately 59.3 million South Africans are living in extreme poverty meaning they suffer from food security.

According to Figure 2, the number of people suffering from food poverty has increased overtime, a situation that is so unexpected for a middle-income country (see figure 2 below).

**Figure 2: Percentage of people living under the food poverty line in South Africa (1990 to 2018)**




*Source: Statistics South Africa*

To eliminate extreme poverty, South African authorities since independence (1994) have affected several pro-poor policies and working documents targeted at eradicating poverty. However, looking at the country's poverty statistics, it is difficult to clear that the socio-economic position of the general populace has not significantly improved. Whilst acknowledging population growth overtime, the percentage of people living under extreme poverty has increased. In 2006, South Africa had 13.4 million people living under extreme poverty and in 2015, that number increased to 13.8 million. In percentages those statistics paints an improving picture (28.4% in 2006 and 25.5% in 2015) but looking at the number of people living under such extreme conditions, it is very clear that effected policies failed to move a significant number of people out of poverty.

**Table 1: Poverty trends in South Africa (2006-2015)**

| Poverty headcounts | 2006 | 2009 | 2011 | 2015 |
|---|---|---|---|---|
| Percentage of the population that is UBPL poor | 66,6% | 62,1% | 53,2% | 55,5% |
| Number of UBPL poor persons (in millions) | 31,6 | 30,9 | 27,3 | 30,4 |
| Percentage of the population that is LBPL poor | 51,0% | 47,6% | 36,4% | 40,0% |
| Number of LBPL poor persons (in millions) | 24,2 | 23,7 | 18,7 | 21,9 |
| Percentage of the population living in extreme poverty (below FPL) | 28,4% | 33,5% | 21,4% | 25,2% |
| Number of extremely poor persons (in millions) | 13,4 | 16,7 | 11,0 | 13,8 |

*Source: Statistics South Africa*

Further, in response to the large number of vulnerable citizens, South African authorities have overtime invested so much into the social wage. The social wage has played a phenomenal role to safeguard millions of lives in the republic. Looking at the figures, budget allocations towards safety nets such as the old people's grants, free education and social grands has increased tremendously, and it currently commands an estimated 60% of government spending (Statistics South Africa 2019). The social wage programme has seen access to services increasing for previously disadvantaged communities in the country. Access to tapped water, electricity and flashing toilets increased tremendously in the 1996-2015 period as reported by Statistics South Africa (see table below).

**Table 2: Percentage number of people with access to basic services in South Africa**

| Year | Electricity | Piped water | Flush toilet |
|---|---|---|---|
| 1996 | 58,2 | 60,8 | - |
| 2001 | 69,7 | 62,3 | 49,1 |
| 2007 | 80,1 | 69,4 | 55,0 |
| 2011 | 84,7 | 73,4 | 57,0 |
| 2016 | 90,3 | 83,5 | 60,6 |

Source: Statistics South Africa (2017)

The picture painted by above statistics points to improved living standards in South Africa but when one looks at the cost of living, the story takes a different dimension. This is so especially when we look at the cost of living from the perspective of poverty lines that are used to measure different dimensions of poverty in the country. All the poverty lines (food datum line, lower bound and upper bound poverty line) have more than doubled if not tripled in a space period a single decade. In 2006 the food datum line was 219 South African Rand and in 2016 it was 531 Rand. As for the lower and upper bound, they both increased from 370 Rand to 758 Rand and 575 Rand to 1138 Rand, respectively. The short of it simply means that, cost of living has more than doubled in South Africa in the past decade. Looking at the poverty data, rising cost of living affects mostly the lower bracket of the population than it does to high income earners.

## 2.0 Empirical literature review

This section is dedicated to review some literature on the relationship between trade, unemployment and poverty. The discussion will help this research to understand the dynamics of the relationship both in developing and developed country but mostly for countries in the same group with South Africa (middle income countries). In an effort to understand poverty dynamics in South Africa, Edwards and Jenkins (2015), explored the relationship between trade, employment and technological change in South Africa using correlation analysis. Their findings indicated that manufacturing trade flows have been biased against labour-intensive sectors. Also, the net effect of trade on employment was found close to zero. Also on South Africa, Mabugu and Chitiga (2007), investigated the short- and long-term effects of trade liberalization using a dynamic microsimulation computable general equilibrium approach. Their findings concluded that, complete tariff removal on imports has negative welfare and poverty reduction impacts in the short run which turns positive in the long term due to the accumulation effects. They went on to state that, the mining sector is the biggest winner after liberalisation whilst sectors like textile and manufacturing suffer huge losses.

Using trade in the motor industry as a case study, Flatters and Netshitomboni (2006), argued that large subsidies have created quite a few new manufacturing jobs than as expected. Also, those trade

subsidies have acted as a blockade to the development of new jobs in vehicle sales, service and maintenance, many of which would be much more relevant to the poor. In agreement to the narrative of to Mabugu and Chitiga found, Flatter and Netshitomboni argue that trade liberalisation has not benefitted the poor across the sectors, but the benefits have been sectoring specific. On the other hand, Thurlow (2008), looked at the impact of trade liberalisation in South Africa and found that liberalising trade has not contributed to poverty increases in South Africa. However, the benefits were enjoyed by high income earners and mostly white households. The author further argued that high levels of unemployment and lack of highly skilled human capital meant that poor households are disconnected from most of the benefits of liberalization.

Further, Le Goff and Singh (2014) looked at poverty from an African viewpoint trying to understand how the trade variable would interact with poverty. The main assumption of their study was that more trade openness should lead to higher labour prices and decrease in poverty in the process if opening the country for trade absorbs abundant resources of the poor which is mainly labour. Their analysis used a panel of African countries spanning the period 1981-2010 and testing for non-linearities in the trade-poverty relationship. Their main finding was that trade has poverty reducing effects in countries with stronger financial sectors, high education levels and stronger governance institutions. The implication of their findings is that trade alone will have less impact on poverty if the local environment is not supportive in offering capital and skilled labour. That then means that if the majority of the people in poverty lack skills or are uneducated, they may be left behind when others are enjoying the benefits of trade (Thurlow 2008).

When Van de Westhuizen (2007), looked at the impact of trade in the clothing industry on poverty in South Africa, the impact of trade on poverty continued to look farfetched. The author concluded that, exposure of previously protected domestic industries to international competition caused losses in both income and employment. The study argued that opening the clothing industry to trade led to job losses in South Africa and as a result contributed to poverty. On the other hand, Anetor et al., (2020), focused on Sub-Saharan Africa to understand the impact of foreign direct investment (FDI), trade, and foreign aid on poverty reduction in a single model using the Feasible Generalized Least Square (FGLS) technique. Their study revealed that, FDI and foreign aid had a negative effect on poverty reduction in the countries the study covered. To make sense of the results, the authors highlighted that, for FDI and foreign aid to reduce poverty, Sub-Saharan countries need to attract more FDI whilst channelling aid properly. Interestedly, they found trade significantly reducing poverty especially in low-income countries.

On the contrary to the findings of Anetor et al., (2020), also looking at the same region (Sub-Saharan Africa), Onakoya et al., (2019) found a negative relationship between trade and poverty in the period investigated. In short Onakoya et al., implied that poverty in SSA was actually worsened by trade. Looking at the review of literature above, we observed that the relationship between poverty and trade in South Africa and Africa at large is mixed and inconclusive. We seek to make a contribution into that debate using manufacturing exports as a proxy to trade. Looking at the exports data for South Africa, there is evidence that it has been increasing from 1990 to the current period considered by the current study and it will be interesting to see how trade interacted with poverty overtime.

**Hypothesis Testing**

*Null*: Trade activities reduce poverty in South Africa.
*Alternative*: Trade activities do not reduce poverty in South Africa

## 3.0 Methodology

### 3.1 Model specification

This section gives a description of the economic model adopted to make the analysis of the link hypothesised by the paper whilst also unpack the variables included in the paper. Our paper follows specifications from earlier studies by Fauzel (2020) and Butt et al., (2007). In its simplest form, the model to be specified by this paper is as follows.

$$Food\ Poverty\ Line = f(LMAN, FDI, GDP, HDI) \quad (1)$$

In reference to equation 1 above, Food poverty is the dependent variable, and it represents the proportion of those people that are below the food datum line or people that are not able to afford the amount of nutrition that is deemed basic by international standards. The population that lives below the food poverty line have to give up certain quantity of food in order for them to afford non-food essentials. Hence, they form part of the most vulnerable percentage of the South African population and that is why they are an important group worth to be examined. The food poverty line index is the responsibility of Statistics South Africa through various household surveys contacted including household weekly consumption diaries. The weekly household diary contacted by the Statistics South Africa is important to understand the dynamic consumption patterns of households especially those that are from low-income households. Considering the given background about the index and what it covers, this paper shall use food poverty line index as a proxy for poverty in South Africa and the paper focuses only on the monetary measure of poverty. Data for this index was obtained from Quantec (Easy data).

### 3.2 Explanatory variables of the study

**3.2.1 Trade (LMAN)-** Trade is the variable of interest for this paper and it is measured by the total manufacturing exports (LMAN) as per Santos-Paulino (2017). The size of a country's manufacturing exports indicates the strength of industrialisation in that specific country, hence the labour absorbing capacity by firms and that can lead to reduced poverty through job creation. The jobs that are created by the manufacturing sector includes those with low or no skills (Mazorodze 2019), hence it should be able to influence food poverty in South Africa given also the size of the manufacturing sector in the country. A negative coefficient is expected for this variable since we assume that increased trade will create employment opportunities that will provide the economic muscle to reduce poverty.

**3.2.2 FDI-** This variable was included in the analysis as a control variable and a negative coefficient is expected as well. Increase in foreign direct investment expands industrialisation through capital infow and innovation (Li and Liu 2005). Increase in capital for local firms improves firm growth chances and also employment growth. Also, investments from abroad can contribute to international trade integration, boost government revenue through taxes and all that have poverty reducing effects (Santos-Paulino 2017).

**3.2.3 GDP**- It is well acknowledged in economics literature that economic growth is one of the most powerful instruments that any economy can use to halve poverty. This has been proven to be true because economic growth creates opportunities of both private firms and government. Private firms can have their incomes grow whilst on the other side government's tax base expanding. Those two situations have got a positive impact on poverty through increase in wages, creation of new employment opportunities and also creation social programmes by the government, all that can reduce poverty in a country. For our analysis, we have included real GDP as an economic growth proxy, and we are expecting again a negative coefficient based on the assumption that increase in economic output has a poverty reduction impact (see Loko and Diouf 2009 and Santos-Paulino 2017).

**3.2.4 HDI-** The human development index is also included in the model controlling for the socio-economic development of South Africa. The index includes the health status of population, their level of literacy and their overall standard of living. Hence, an increasing human development index represents a much-improved society able to take advantage of economic opportunities when they arise or creating economic opportunities themselves (Arief and Prastiwi 2017). The researchers are expecting a negative coefficient under the assumption that increase in HDI has a poverty reduction impact (See also Fauzel et al., 2015).

**3.3 Data properties and Estimation technique.**

When dealing with time series data, before running a regression, it is of importance to understand data properties. The first step we took was to do unit root testing so as to know if the variables were stationary in their level form or after differencing. Using the Augmented Dickey Fuller (ADF) and Schwarz Info Criteria (SIC), we found stationarity results displayed in the table below.

**Table 4: Stationarity results**

| Variable | P-Vale (levels) | P-Value (First difference) | Decision |
|---|---|---|---|
| **FPL** | 0.9484 | 0.0009 | I(1) |
| **LMAN** | 0.1517 | 0.0000 | I(1) |
| **GDP** | 0.9992 | 0.0522 | I(1) |
| **HDI** | 0.6980 | 0.0817 | I(1) |
| **FDI** | 0.3792 | 0.0079 | I(1) |

*Source: Own calculation*

The conclusion was that all the variables involved are non-stationary in their level form and they become stationary after first differencing. When dealing with non-stationary data, it is important to know if they are cointegrated so as to decide which estimation technique to follow. We tested if there was cointegration amongst the variables using the Johansen cointegration test. The cointegration results indicated that there were two (2) cointegrating equations at 5% level of significance (see appendix).

**3.4 Estimation technique**

After testing the variables for unit roots, we observed that all the variables became stationary after first difference meaning that all of them, we integrated of order one or I (1). Also, the variables were cointegrated with two cointegrating equations. Having known that our variables were all stationary after first difference and they are cointegrated, the most efficient estimation with data of such properties would be a Vector Error Correction Model (VECM).

A VECM does not impose an a priori restriction on the dynamic relations among the different variables in a model. Also, it is a simultaneous equation modelling in which all variables are treated as endogenous. And finally, a VECM was preferred over a standard VAR because of the cointegration that exists among the variables. A standard VAR can only estimate short-run models hence the variables are not supposed to be cointegrated (MacCathy 2000).

Following a specification by Khadaroo and Seetanah (2007), the VECM in this paper was specified as follows.

$\Delta FPL_t = \alpha_0$

$+$

$$\sum_{j=1}^{n} \propto_1 \Delta lnMAN_{t-j}$$

$$+ \sum_{j=1}^{n} \propto_1 \Delta lnGDP_{t-j} + \sum_{j=1}^{n} \propto_1 \Delta lnFDI_{t-j} + \sum_{j=1}^{n} \propto_1 \Delta lnHDI_{t-j} + ECT_{t-1} + \varepsilon_t \quad (2)$$

Where $\Delta FPL_t = FPL_t - FPL_{t-1}, j$ is the tile lag, $\varepsilon_t$ is the error term and $\propto$ being the regression coefficient for the explanatory variables. Moreover, the error correction term was included to capture the speed of adjustment the variables will take to revert back to the steady state overtime.

**4.0 Results Presentations, discussion and analysis**

This section was devoted to analysing the data and also output from the VECM estimation that was done motivated by data properties explained in the section above.

**Table 5: Descriptive statistics**

| | FDI | GDP | FPL | LMAN | HDI |
|---|---|---|---|---|---|
| **Mean** | 27.64515 | 2042.917 | 26.89915 | 25.97484 | 0.610470 |
| **Median** | 27.90851 | 1560.871 | 27.27696 | 25.95996 | 0.624500 |
| **Maximum** | 28.77329 | 5058.589 | 32.34127 | 27.34382 | 0.692300 |
| **Minimum** | 25.88769 | 299.5339 | 20.27373 | 24.39143 | 0.524600 |
| **Std. Dev.** | 0.890856 | 1534.320 | 3.490018 | 0.986455 | 0.056891 |
| **Skewness** | -0.670172 | 0.595117 | -0.143558 | -0.096851 | -0.187543 |
| **Kurtosis** | 2.146181 | 2.002453 | 1.929455 | 1.611593 | 1.508450 |
| **Jarque-Bera** | 3.156913 | 3.014696 | 1.535627 | 2.456494 | 2.956763 |
| **Probability** | 0.206293 | 0.221497 | 0.464026 | 0.292805 | 0.228006 |
| **Sum** | 829.3543 | 61287.52 | 806.9746 | 779.2453 | 18.31410 |
| **Sum Sq. Dev.** | 23.01512 | 68269964 | 353.2265 | 28.21971 | 0.093862 |
| **Observations** | 30 | 30 | 30 | 30 | 30 |

*Source: Own calculations*

Looking at the descriptive statistics table above, the Jarque–Bera test which is a goodness of fit (GOF) test of whether sample data have the skewness and kurtosis matching a normal distribution indicates that the data follows a normal distribution.

**4.1 Short-run results**

According to the Schwarz information criteria (SIC), optimal lag was chosen as well as two cointegrating equations as was suggested by the johansen cointegration test. The results obtained from the estimated VECM are presented in the table below.

**Table 6: VECM Shot-run results**

| Variable | Coefficient | Standard Err | P-Value |
|---|---|---|---|
| LMAN (Trade) | -0.0444 | -1.6016 | 0.0171 |
| LFDI | 0.0869 | 2.9740 | 0.0109 |
| LGDP | -0.0229 | -1.0164 | 0.0230 |
| HDI | -0.3510 | -1.7368 | 0.0627 |

*Source: Own calculation*

The VECM short-run results are interesting as far as food poverty is concerned in South Africa. The results suggest that a one percent increase in manufacturing sector's exports (LMAN), food poverty decreases by 0.0444% in South Africa and the trade variable (LMAN) was significant at 5% significance level. The result suggests that more exports in the manufacturing sector or more trade activities in the sector has positive effects on reducing the total number of people who are food poor in the country (Winters et al., 2014).

The short-run results also indicates that economic growth has poverty reduction effects, and it is statistically significant. A one percent increase in economic growth in South Africa reduces the number of people who are below the food poverty line by 0.023% in the short run. Looking at economic growth data for South Africa, the economy over the last decade and a half has never grown beyond 3%. That might suggest that, if the South African economy can manage to grow continuously above 3%, the impact of economic growth of food poverty might be large.

Further, the human development index has also shown expected results given that a one percent increase in the index decreases food poverty in South Africa by 0.35% and it is statistically significant in the short run. Continuous improvement of the attributes that make up the human development index will go a long way in reducing the number of South Africans that continue to live under the food poverty line.

Lastly, we found an interesting result from our short-run VECM results as foreign direct investment (FDI) has a positive coefficient suggesting that a one percent increase in FDI increase food poverty by 0.0869% in South Africa. This of cause is opposed to what we had set as an a priori expectation. This finding might be suggesting that as more FDI is flowing into the country, it is going into industries that does not require low skilled workers in the short run as a result the positive association with poverty. Gohou and Soumaré (2012), however, found the same for Southern Africa when they analysed the impact of FDI on poverty in Africa. Their results found that FDI has a positive impact on reducing poverty in Central and East but non- significant in Northern and Southern Africa. However, looking at section 4.2 below where long-run results are explained, FDI was found to have poverty reducing effects in the long-run. That may suggest that FDI flows into South Africa start absorbing people with little or no skills in the long run, hence the poverty reducing impact.

**4.2 Long-run results**

The above section presented the short-run results of the VECM estimation, and we will finish by discussing the long-run results. The estimation was done using an optimum lag length 1 as was suggested by the Schwarz Information criteria (SIC). To see the summarised results of the long-run results, refer to equation 3 below.

$$D(FPL) = -0.0985\ ECT\ (-1) + 0.1421(FPL(-1) - 0.0015\ D\ (LMAN(-1) - 0.0351\ D(LGDP(-1) -$$

$$0.0041\ D(LFDI(-1) - 0.0841\ D(HDI(-1) - 0.003$$

(3)

According to equation 3 above, the speed of adjustment has a value of $-0.0985$ and is significant at 5% level. The error correction term indicates that the model returns to steady state at a speed of 9.9% from the short to the long run. As shown in equation 3 above, manufacturing exports are significant at 1% level (0.003) when it comes to their influence on food poverty reduction in South Africa. In the long run, a percentage increase in manufacturing exports (LMAN) reduces food poverty by 0.0015 percent. Economic growth (GDP) explains reduction in poverty by 0.035% after a 1 percent change. When it comes to human development index (HDI), it explains a 0.08% decrease in food poverty as a result of a percentage change.

Lastly, foreign direct investment, unlike in the short-run, it helps reduce food poverty in the long-run. Foreign direct investment explains for 0.004% reduction in the long-run, meaning that FDI has no immediate impact on food poverty in South Africa but has a long-run effect of reversing poverty reduction.

**5.0 Concluding remarks.**

The objective of the paper was founded on the premise to find the impact of trade on food poverty in South Africa focusing on manufacturing exports. The study was motivated by the ever-increasing poverty rates especially among the historically disadvantaged South Africans, yet the country tops the continent as one of the most industrialised and also the number one exporter of goods and services. Understanding food poverty is very important in South Africa, given that the government has continued to offer safety nets for the vulnerable through different kinds of intervention including social grants, but poverty has remained stubbornly high in the country (see figure 1). To then understand the impact of trade on poverty, we modelled manufacturing exports and food poverty line index in a VECM. The VECM estimations gave us long-run and short-run coefficients, allowing us to understand how poverty responds to manufacturing exports in the long and short-run. We found that exports from the manufacturing sector were significant in explaining food poverty reduction. Also, economic growth and the human development index (HDI) were found to have poverty reducing effects both in the short-run and the long-run. Interestingly, we found foreign direct investment increasing food poverty in South Africa in the short-run but reducing it in the long-run. Drawing from our findings, we then came up with proposed policy considerations. Our paper recommends that, South Africa should continue with its pursuance of export led growth especially in industries and sectors that can absorb labour from those with little or no skills. We believe that can grow demand in the economy which then create a conducive environment for private sector growth which will then create further opportunities.

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**Appendices**

Date: 07/20/21 Time: 23:26
Sample (adjusted): 1992 2019
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: FPL LAGRI LMAN GDP HDI FDI
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.785405 | 115.2655 | 95.75366 | 0.0012 |
| At most 1 * | 0.619640 | 72.17344 | 69.81889 | 0.0321 |
| At most 2 | 0.467272 | 45.10762 | 47.85613 | 0.0886 |
| At most 3 | 0.431131 | 27.47478 | 29.79707 | 0.0905 |
| At most 4 | 0.339917 | 11.67983 | 15.49471 | 0.1729 |
| At most 5 | 0.001745 | 0.048904 | 3.841466 | 0.8250 |

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values