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National Agricultural Marketing Council
Promoting market access for South African agriculture

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THE ROLE OF AGRICULTURAL TRADE AND POLICY COMPLEMENTARITIES IN POVERTY REDUCTION IN SOUTH AFRICA

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ABSTRACT

Although South Africa exhibits an increasing positive trend in agricultural exports, poverty still remains a considerable challenge in the country. This study sought to determine whether South Africa's increasing trend in agricultural export performance translated into lower poverty levels between 1996 and 2014. Specifically, the study evaluated the effects of export intensity of agricultural goods disaggregated by end-use category on poverty outcomes with the help of the concept of 'policy complementarities". Rather than the commonly used poverty measures such as poverty head count ratio and poverty gap, relative poverty is used in this study. Export intensity is individually interacted with proxies of access to credit, educational and governance systems to capture the role of policy complementarities. To address the reverse causality problem associated with exports and poverty, a Two Stage Squares (2SLS) estimator was used.

Results suggest that South Africa's agricultural trade performance exhibits significant poverty reducing effects. In presence of supportive complementary domestic policies (e.g. increased access to credit), increasing exports of household consumption goods and intermediate goods reduces poverty outcomes by 21% and 15.2%, respectively. Results also suggest that imports of household consumables significantly reduce poverty levels by 9.5-22%, depending on the model used. Conclusively, South Africa's good performance in agricultural trade translated into poverty reduction. Policy wise, there is need to further enhance the populace's education levels, increase people's confidence in public institutions of governance, as well as boost the depth of the financial sector. It is also necessary to promote importation of household consumables, particularly those that are not necessarily produced in the country.

KEY WORDS Poverty. Access to credit. Global Value Chains, 2SLS estimator

INTRODUCTION

Effective participation in markets (Gani and Adeoti 2011) in presence of coherent policies is believed to be a key driver through which to alleviate rural poverty. Policy frameworks like preferential trade agreements aim at increasing export performance through which economic development is stimulated. Despite the positive export performance trends, poverty remains a challenge in South Africa (Maseko *et al* 2015). Existing literature (e.g. McCaig, 2011; Le Goff and Singh 2014; Thelle *et al.* 2015; Brambilla *et al.* 2012) reveals both positive and negative poverty reducing effects of trade, thus implying that there is no clear relationship between trade performance and poverty reduction.

However, earlier work was based on aggregated trade data yet the increasing nature of Global Value Chains (GVCs) in today's globalised world has led to a growing trend in producing specialised goods due to the fragmentation of production processes, thereby changing the international trade landscape globally. Global Value Chains account for more than 60% of global trade, with an estimated 20% growth rate in value added trade since 1990 (Fundira 2016). It is not uncommon to find that recent datasets compiled by the Organisation for Economic Co-operation and Development (OECD) of some economically comparable countries with fairly the same volume of trade flows exhibit differing proportions of goods categorised by end-use (i.e. capital-, intermediate-, or household consumption- goods). This suggests that any country's informed policy process should be guided by the actual nature of trade flows in the context of GVCs (i.e. the end-use category of good being traded). For instance, it is important for a country to know whether she either imports or exports more of intermediate-, household consumption- or capital goods so as to design apt policies in order to achieve the desired aspects of economic development.

This study thus seeks to empirically answer the question of whether South Africa's increasing trend in agricultural export performance translated into lower poverty levels between 1996 and 2014. Specifically, the study evaluates the effects of export intensity of agricultural goods disaggregated by end-use category on poverty outcomes with the help of the "policy complementarities" concept. To differ from other scholars (e.g. Le Goff and Singh 2014; Thelle *et al.* 2015), this paper's contribution to the existing body of knowledge is 5 fold: *i*) agricultural exports disaggregated by end-use category (i.e. intermediate and household consumption goods) are used in the analysis. The advantage of disaggregated export flows is that one is able to identify the nature of goods upon which a country may draw

much emphasis to effectively address economic development related challenges. For instance, the burgeoning problem of the high poverty rate (36% as of 2012) in the country. To the best of our knowledge, this is the first study to analyse the direct poverty reduction effects of sector specific disaggregated tradable goods.

ii) Other than the commonly used poverty measures, i.e. the poverty head count ratio and poverty gap, relative poverty is used in this paper. Relative poverty refers to people living in households with incomes less than the poverty income (Allexander 2013; van Heerden 2016), which in 2012 was set to range from R1450 per month for one individual to R5170 for a household of eight members or more. The relative poverty measure is advantageous given that it directly relates to the real socio-demographic situation in South Africa. *iii*) Corruption, a governance measure that indicates the extent to which public power is exercised for private gain is also introduced in the specified model. *iv*) The study is based on a smaller sample (one country) so as to address the heterogeneity problem (Singh and Huang 2015; Le Goff and Singh 2014) that may arise as a result of differences in factors that explain poverty across the different countries when a large sample is used.

Jolliffe and Serajuddin (2015) provide evidence to discredit the assumption that global poverty estimates based on poverty counts from all countries are comparable. *v*) The Two Stage Least Squares (2SLS) estimation technique is employed unlike previous studies in which the System of Generalized Method-of-Moment (GMM) estimator was used. Like the GMM, the 2SLS estimator controls for both fixed effects and the reverse causality concerns.

LITERATURE REVIEW

Much of the related literature investigates how financial development indirectly contributes towards poverty reduction through economic growth or directly through the McKinnon conduit effect. Noticeably, such studies (e.g. Guillaumont and Kpodar 2011; Kpodar and Singh 2011; Singh and Huang 2015) capture the trade effects by including a trade openness variable, measured as the proportion of total bilateral trade flows to Gross Domestic Product (GDP). Another strand of literature, for instance work by Chang *et al*. (2009), Loayza *et al*. (2005), Dollar and Kraay (2004) focuses on how trade openness indirectly affects poverty levels through economic growth. A few studies (for instance, Thelle *et al*. 2015; Le Goff and Singh 2014; Brambila *et al*. 2012; McCaig 2011; Topalova 2010) directly assess poverty reduction effects of trade performance although work by McCaig (2011), Topalova

(2010) and Brambila *et al*. (2012) focuses on the ex-post effects of market access policy changes. Thus, studies by Topalova (2010), McCaig (2011) and Brambila et al. (2012) are beyond the scope of this particular study. Furthermore, recent studies also incorporate various measures of policy complementarities (e.g. Thelle *et al* 2015; Singh and Huang, 2015; Le Goff and Singh 2014; Kpodar and Singh 2011; Chang *et al*. 2009).

Literature that analyses the effect of financial development or trade on poverty mainly uses the head count ratio and poverty depth as measures of the level of poverty and trade openness (Singh and Huang 2015; Thelle *et al.* 2015; Le Goff and Singh, 2014; Kpodar and Singh, 2011; Guillaumont and Kpodar, 2011; Dollar and Kraay, 2001). Although there are other measures of trade openness such as incidence-based measures (Spilimbergo *et al*. 1999), the reviewed literature in this paper anchors on the former. Furthermore, most studies adopt a time series/panel data framework and employ the System of Generalized Method-of-Moment (GMM) are estimation technique (Dollar and Kraay 2004; Chang *et al.* 2009; Guillaumont and Kpodar, 2011; Kpodar and Singh 2011; Le Goff and Singh 2014; Thelle *et al.* 2015).

In general, mixed results are eminent in the literature, i.e. trade performance exhibits both positive and negative poverty reducing effects. Winters *et al*. (2004) notes that no general conclusion may be deduced about the trade-poverty nexus but the long-run picture seems to suggest that trade contributes towards poverty reduction. Poverty reducing potential of trade is also reported by other scholars like Thelle *et al*. (2015), Singh and Huang (2015), Krueger (1983), Dollar and Kraay (2004), and Frankel and Romer (1999) but most of that work also emphasises that poverty reduction arises in presence of right domestic policies, synonymously referred to as policy complementarities. For instance, Thelle *et al*. (2015) examined how export performance impacts on a developing country's level of poverty and found that exports exhibit poverty reducing effects, especially if it is easy to access credit services.

Frankel and Romer (1999) assessed how international trade influences the standard of living. Their findings reveal that trade plays a key role in reducing poverty levels. Basing on both individual cases and cross-country analysis, Dollar and Kraay (2004) also evaluated the effect of trade on poverty outcomes in developing economies and found that trade enhances poverty reduction. Although Kpodar and Singh (2011) mainly focused on assessing the impact of the financial system on poverty in a number of developing countries while taking

into account of policy complementarities, they incorporate a covariate to capture the effect of trade openness. Their findings suggest that trade openness does not necessarily help to reduce poverty levels unless complemented by favourable policy reforms such as better education, better financial development as well as good governance.

Such findings concur with results by Beck *et al*. (2007), Chang *et al.* (2009), Le Goff and Singh (2014), and Thelle *et al*. (2015) who also carried out related studies. Singh and Huang (2015) also used the trade openness variable while investigating the impact of financial deepening on poverty, among other aspects. Their findings are mixed, *viz*: show that trade openness has no significant impact on poverty (head count index) but when they used the Feasible Generalised Least Squares (FGLS) estimator, trade performance was found to significantly increase poverty levels. However, it is worthwhile to note that the related literature generalises all developing countries and none of the above reviewed studies focuses on specific sectors such as agriculture yet a large proportion of the population in developing countries is reliant on agriculture. Thus, the focus of this paper is to empirically evaluate the poverty reducing effects of disaggregated agricultural exports with the help of the concept of 'policy complementarities".

POLICY COMPLEMENTARITIES, AGRICULTURAL TRADE PERFORMANCE AND POVERTY IN SOUTH AFRICA

Policy Complementarity

According to Aziz and Westcott (1997), the concept of policy complementarity refers to the mutually reinforcing benefits of policies that seem to be jointly critical in stimulating development. This definition is based on the recent advances in institutional economics. Rather than emphasising conflict between different policies instruments, the concept accents on their coherency (Ok, 2004) in enhancing development. In institutional economics, the notion of policy complementarities is vital in understanding the being or not of the internal coherence of an economic system and or its evolution. In this context, the internal relationship between the various policy complementaries in the South African economy and economic performance, measured by relative poverty levels associated with agricultural trade and these complementarities reflects the coherence of the economic system.

Therefore, so as to properly assess the poverty reduction effects of agricultural trade and the degree to which this depends on complementary policies, three policy complementarities were taken into account given that they may reinforce each other at the equilibrium and make the system persistent. The three policy complementarities are; the quality of governance and the functionality of the country's educational and financial systems. A further discussion of the proxies for these complementarities is provided in the methodology section. Ok (2004) however cautions that the use of complementarities should be modified to suit the context of economic policies given that they are as a result of various policy decisions and conventions between economic agents. Conclusively, it is argued that if an economy loses its internal coherence due to poor institutions, this will negatively affect economic performance (i.e. increase the level of poverty in this case).

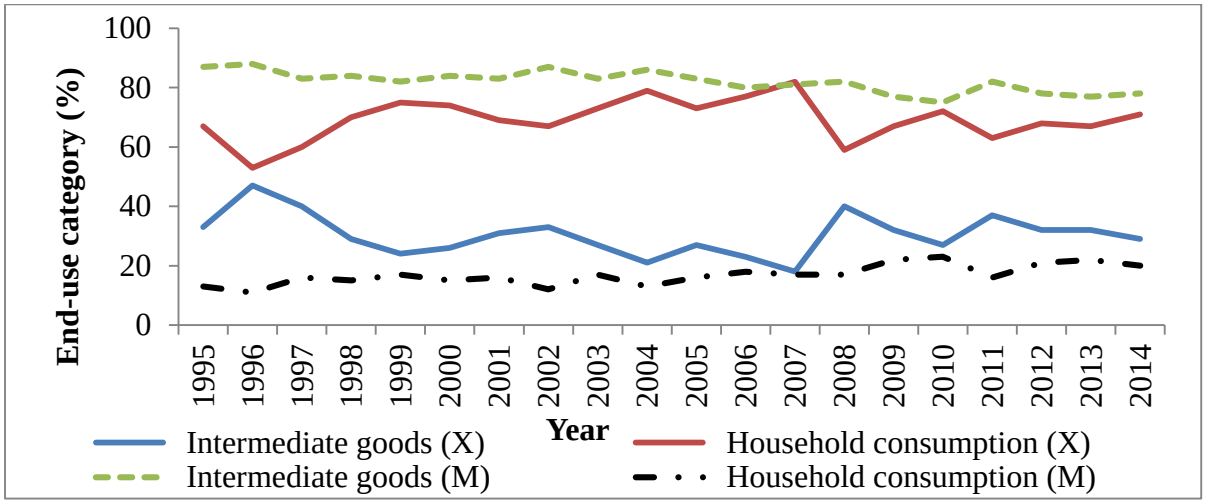
Agricultural, Forestry and Fishery (AFF) Export Performance

South Africa's export trade performance in AFF products discussed in this sub-section is based on data obtained from the OECD database, which provides an insight into trade patterns of the various end-use categories of goods, i.e. intermediate-, household consumption-, capital- and mixed end-use goods. The database is advantageous given that it enables one to track global production networks and supply chains, thereby helping in addressing policy issues such as trade in value added and trade in tasks (OECD database, 2016). TradeMap database is also used to provide an overview of the nature of South Africa's AFF trade. Given that preamble, it is important to indicate that South Africa is a net exporter of AFF products to the world and her exports increased by 42% from R81.5 billion in 2010 to R140.7 billion in 2015 (Trade Map database). The European Union (EU) remains the major export destination, accounting for about 24% share of South Africa's total exports to the world, followed by Namibia (7.7%), Botswana (6), China (6%) and Mozambique (5%) among others.

In the context of GVCs, OECD data reveals that South Africa's AFF exports by end-use category largely comprise of household consumption- and intermediate goods, while the contribution of capital- and mixed end-use- goods is very marginal. For instance, since 2011, exports categorised as capital goods generated less than US$ 10,000 except in 2013 when the economy exported goods worth US$ 11160 only. On average (1995–2014), household consumption goods account for about 70% while intermediate goods assume slightly more

than 30% share of all AFF exports. Capital and mixed end-use exports account for less than 0.15% collectively.

Conversely, South Africa's AFF imports are by far dominated by intermediate goods (82% on average), followed by household consumption goods (17%) and the rest being both capital and mixed end-use goods (Fig. 1). The dominance of intermediate goods among AFF imports may be associated with South Africa's commercial agricultural sector and the fast growing agro-processing industry that makes use of such goods as inputs in the production and manufacturing processes, respectively. Furthermore, the large proportion of household consumption goods in exports affirms the fact that South Africa undertakes value addition initiatives on AFF products hence the exporting of products ready for domestic consumption. TradeMap database reveals that Citrus fruits (0805), wine (2204) and Chemical wood pulp (4702) were the major exports in 2015, accounting for about 10%, 6% and 6% of all AFF exports, respectively. These are basically household consumable goods.



X denotes exports while M denotes imports

Source: OECD database (2016)

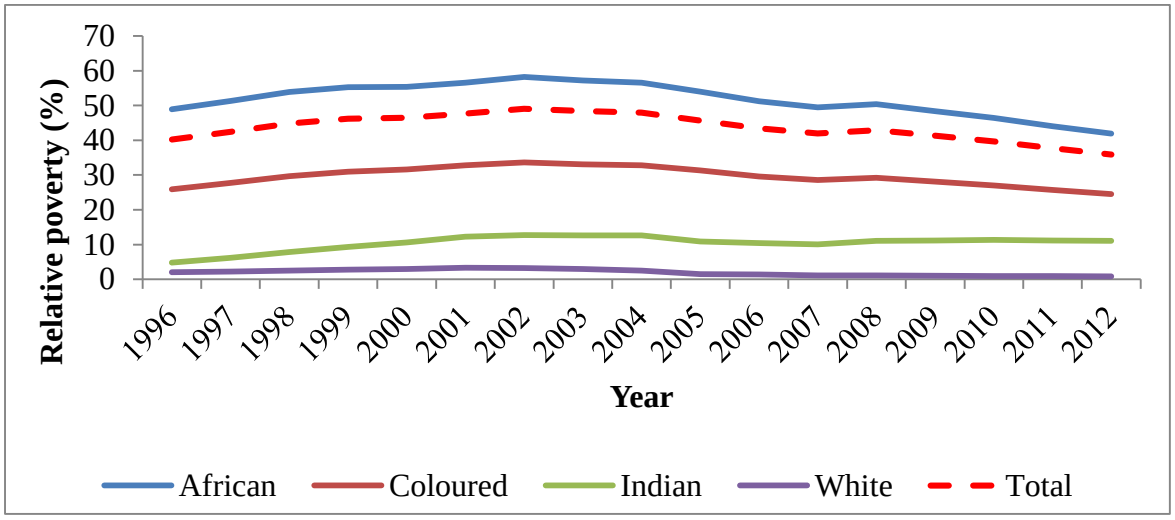
Figure 1: South Africa's AFF trade performance by end-use category in percentage

Relative Poverty in South Africa

According to the National Planning Commission (NPC) established by the presidency in 2010 as cited by Alexander (2013), South Africa does not have a single official poverty line. The government uses $2 per day or R524 a month per person as a guide although such figures may not be official. Well, it is also acknowledged that there are other internationally accepted measures of poverty, *viz*: the poverty head count ratio and poverty gap by the World

Bank but to time series' data limitations, this section is limited to providing an insight into relative poverty based on South Africa survey publications by the Institute of Race Relations (IRR). This measure of poverty captures the poverty line in accordance with the cost of living and it varies according to the number of people living in the household. For example, a household's poverty line with one person was set at a monthly income of R443 in 1996 and R1450 in 2012 while if the household comprised of eight people or more, the poverty line was at R1770 and R5170 in 1996 and 2012, respectively (Alexander 2013).

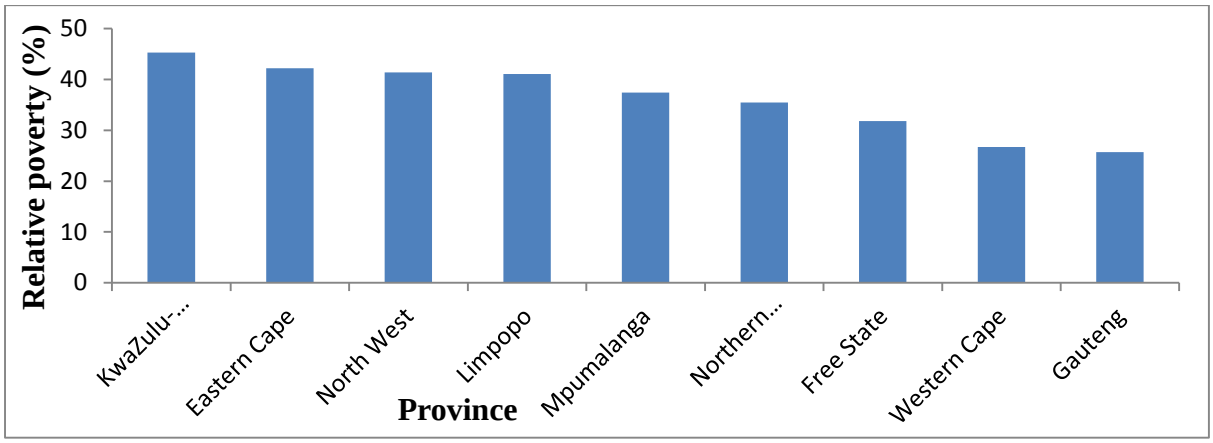
Overall, Figure 2 reveals that national relative poverty declined by 11% from 40.2% in 1996 to about 36% in 2012 but a major declined (5%) was realised between 2011 (37.7%) and 2012 (35.9%). With the exception of Indians whose relative poverty increased by 132% between 1996 and 2012, other races registered a decline in poverty levels by 60% for whites, 14% (blacks) and 5% for the coloureds.



Source: Allexander (2013) and van Heerden (2016)

Figure 2: South Africa's relative poverty in percentage, by race

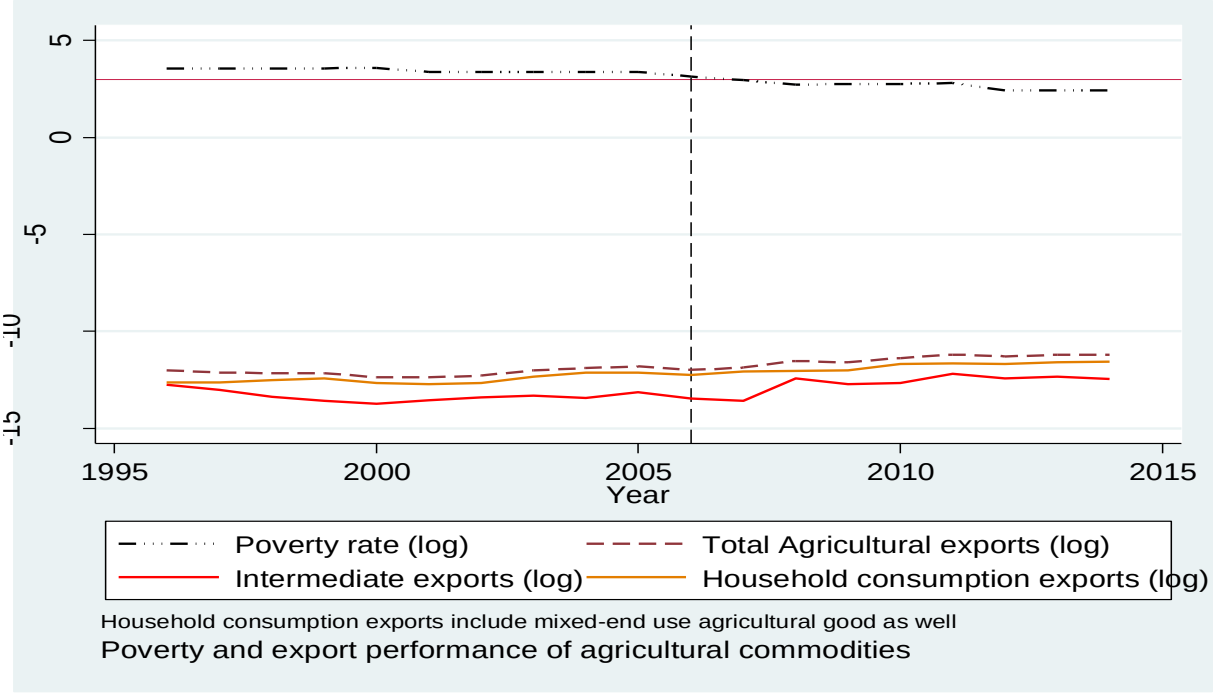
Further scrutiny at provincial level presented in Figure 3 reveals that KwaZulu-Natal exhibited the highest level relative poverty in 2012, estimated at 45.3%, followed by Eastern Cape (42.2%), North West (41.4%) while Guateng registered the least level of relative poverty estimated at 25.7%.



Source: Allexander (2013) and van Heerden (2016)

Figure 3: South Africa's relative poverty by province in 2012

A graphical illustration in Figure 4 suggests that there is a negative relationship between relative poverty rates and agricultural exports although no concrete deductions may be reached based on that, hence the need to refer to the empirical econometric analysis.



Sources: Allexander (2013), van Heerden (2016) and OECD database (2016)

Figure 4: Relationship between relative poverty and agricultural exports in South Africa

METHODOLOGY

To ascertain the extent to which the increasing performance of agricultural exports (export intensity) affects the level of poverty in South Africa, agricultural exports were

disaggregated by end-use category into intermediate and final household consumption goods. Furthermore, relative poverty was used given that data was available for all the years under consideration. Average relative poverty for 2010-2012 was used as the proxy for 2013 and 2014. Data for relative poverty was obtained from South Africa's survey publications by IRR (2016) and IRR and ICRA (2013). The effect of export intensity on poverty outcomes was isolated from other determinants of poverty that may also influence export flows by including other variables. Among other variables, South Africa's import intensity was included but its computation was also decomposed in terms of intermediate and final household consumption goods. Inclusion of import intensity was motivated by the fact that agricultural imports may lead to more competition on the domestic market, thereby crowd out local production in certain sectors. Hence, it is probable that competition by such imports could lead to higher poverty levels. Increased poverty outcomes arise especially if the imports are majorly produced by the poor.

To the best of my knowledge, no work has been come across using disaggregated trade flows (intermediate and final household consumption goods) to compute a country's import intensity. This is advantageous given that the measure of intensity based on either intermediate or final household consumption goods reveals the nature of a country's market towards foreign goods which directly impact on the country's export competitiveness. Furthermore, by following Thelle *et al*. (2015) and Le Goff and Singh (2014), other variables such as the level of education, governance, access to financial credit and the consumer price index are included.

The level of education was measured using Barro-Lee's indicator, defined as the percentage share of the non-educated aged 15 or more of the country's population. The indicator is presented at 5 years' interval but given that this study uses annual data, the five years are assigned the same value of the indicator and this slightly differs from the approach used by Thelle *et al*. (2015). For instance, the percentage of South Africa's population aged 15 years or more with no education between 2006 and 2010 was 5.65%. Thus, each year during that period was assigned the value of 5.65% to account for the level of education. Data for Barro-Lee's indicator was obtained from Barro-Lee educational data available on the World Bank Education statistics database.

Access to credit refers to the percentage share of domestic credit to the private sector of Gross Domestic Product (GDP). The consumer price index is a proxy for macroeconomic stability. Data for GDP and the consumer price index were obtained from the World Development indicators' database of the World Bank. The estimate for the level of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. The index ranges from -2.5 to 2.5 with higher figures relating to better perceptions. An average of two years was used in case a given year exhibited missing data. Index estimates were obtained from the World Bank Governance indicators.

Export intensity and poverty are interdependent on each other; hence, there is no surety of the direction of the causal relationship between the two variables as well as other control variables. Therefore, estimation of the OLS was inapt given that the estimates become biased due to endogeneity problems. A Two Stage Least Squares (2SLS) estimator was then used. The estimator is based on the assumption that exogenous variables correlate with the problem variable (relative poverty) but are uncorrelated with the error. Since the analysis used time series data, instrumental variables were regarded as the lagged values of the endogenous variables given that lagged values are less likely to be affected by current shocks. That is, while poverty levels may affect export intensity and vice versa it is less likely that export intensity can influence previous poverty levels. The 2SLS estimator also controls for both fixed effects and the reverse causality concern. Furthermore, given that the sample was small; few instrumental variables were used to avoid biased estimates of the endogenous variables (Roodman 2008).

Since the estimator brings into perspective the fact that the poverty outcome in the future may be influenced by the current poverty outcome, a lagged variable of the poverty outcome was also included, thereby implying that a dynamic model was estimated. A simple fixed static model was also run to so as to compare estimates with those obtained from the dynamic model. The generic specified model is as follows:

$$Pov_{i,t} = \beta_1 Pov_{i,t-1} + \beta_2 (\frac{X}{GDP})_{1,t} + \beta_3 (\frac{M}{GDP})_{1,t} + \beta_4 Z_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $Pov_{i,t}$ denotes relative poverty in year t as a function of the relative poverty in the previous period ($Pov_{i,t-1}$), export intensity in agricultural goods (either total, intermediate or

final household consumables) ($(X/GDP)_{1,t}$), intensity of imported agricultural goods ($(M/GDP)_{1,t}$) and a vector of control variables ($Z_{i,t}$) as discussed earlier. All variables are expressed in natural logarithms except for corruption. To further check if the effect of export intensity is influenced by contemporary policies, the generic model was extended by separately interacting export intensity with education, access to credit and corruption as done by Thelle *et al*. (2015), Le Goff and Singh (2014) and Chang *et al*. (2009).

RESULTS AND DISCUSSION

Baseline results based on total agricultural exports are presented in Table 1. With the exception of the corruption variable that was not log transformed, coefficients of all the other variables are interpreted as elasticities. Hence, a negative coefficient suggests a decrease in relative poverty among South Africa's households while the reverse is also true. Both static- and dynamic model estimates obtained without individually interacting export intensity with education, access to credit and the corruption indicate that intensifying agricultural exports on their own have no significant effect on the poverty outcomes in South Africa.

Table 1: Baseline results for total agricultural exports

	Dependent variable = Relative poverty (%) (No interaction terms)		**Dependent variable = Relative poverty (%)** (With interaction terms)	
	Static model	**Dynamic model**	**Static model**	**Dynamic model**
Export intensity (log)	-0.029	0.149	-0.082	0.144
	(0.234)	(0.169)	(0.168)	(0.204)
Import intensity (log)	-0.085	-0.105	-0.115	-0.147*
	(0.104)	(0.071)	(0.077)	(0.072)
Share with no education	0.085***	0.025	2.018***	1.532**
(log)	(0.024)	(0.023)	(0.536)	(0.565)
Access to credit (log)	0.015	-0.010	-0.945**	-0.870**
	(0.027)	(0.019)	(0.342)	(0.312)
Macroeconomic stability	-0.281	-0.379***	-0.060	-0.247
(CPI) (log)	(0.163)	(0.113)	(0.154)	(0.178)
Corruption	-0.179	-0.164	-0.278**	-0.208*
	(0.141)	(0.095)	(0.105)	(0.104)
Poverty of the last period		0.577***	-	0.387
(log)		(0.154)		(0.232)
Export intensity *	-	-	-0.074**	-0.068**
Access to credit			(0.027)	(0.025)

Export intensity *	-	-	0.165***	0.127**
Education			(0.045)	(0.047)
Export intensity *		-	-0.013	-0. 003
Corruption			(0.007)	(0.008)
Constant	3.359	3.699**	1.838	3.518*
	(2.255)	(1.526)	(1.653)	(1.801)
R-squared	0.934	0.973	0.982	0.987

***, **, * denote significant at 1%, 5% and 10% level respectively

Only increased stability of the macroeconomic environment was however noted to contribute towards poverty reduction by about 38% (-0.379, $p<0.01$) while a unit increase in the proportion of the uneducated population and poverty level of the previous period are associated with 8.5% (0.085, $p<0.01$, *for static model*) and 57.7% (0.577, $p<0.01$, *for dynamic model*) rise in poverty. This concurs with findings of Kanayo (2013) and Maseko *et al* (2015) who argue that in the failing education system is a hindrance poverty alleviation. When the interaction terms between export intensity and education, access to credit and the corruption were introduced, export intensity still exhibited no significant effects on poverty outcomes but significant poverty reducing effects were observed to arise from agricultural imports, particularly for the dynamic model. The statistically significant negative estimate (-0.147, $p<0.10$) suggests that a 1% increase in the import intensity of agricultural goods is associated with a 14.7% reduction in poverty outcomes.

The poverty reduction effects associated with agricultural imports may be attributed to the importation of household consumption goods, especially major food items like wheat (100199) and rice (100630) given that they do not necessarily crowd out local production. Realistically, South Africa does not produce rice while the quantity of wheat produced cannot sustain the domestic market demand. Thus, findings suggest that importation of such food items may not necessarily lead to competition with the local producers. Some food items like rice are subjected to duty free access into South thereby making them more affordable to the poor populace. This concurs with the argument by Idan *et al*. (2014) that lower food prices effectively increase incomes of net food purchasers, which in the process reduces the level of poverty. Apparently, significant estimates (-0.074, $p<0.05$, *for static model* and -0.068, $p<0.05$, *for dynamic model*) obtained on the interaction term between export intensity and access to credit suggest that a 1% increase in export intensity coupled with increasing access to credit is on average associated with a 7.1% poverty reduction. Conversely, significant

estimates (0.165, p<0.01, *for static model* and 0.127, p<0.05, *for dynamic model*) obtained on the interaction term between export intensity and education imply that a unit increase in export intensity amidst an increasing share of the uneducated on average leads to approximately 14.6% more poverty.

Furthermore, poverty reducing effects were singly observed to arise from increased access to credit (-0.945, p<0.05 *for static model* and -0.870, p<0.05 *for dynamic model*) as well as better perception that the country has good governance (low level of corruption in this case). The estimates on the variable for corruption must however be interpreted cautiously as illustrated in the following expression: [(2.718281828^ (estimate))-1] *100. Therefore, the significant estimates for the static and dynamic models suggest that a unit increase in the perception that the country is not corrupt is on average associated with 21.4% reduction in poverty outcomes for both models. However, an increase in export performance amidst a growing proportion of the uneducated population on average worsens poverty levels by over 170%. Given that export intensity on its own did not exhibit significant effects on relative poverty as shown by the baseline results (Table 1), the reduction in relative poverty upon introduction of the interaction terms may be attributed to influence of the access to credit and good governance.

Results based on robust checks (Table 2) further affirm that both intermediate and household consumption export intensities have no significant effects on poverty outcomes without the interaction terms between export intensities and the individual policy complementarities. However, the statistically significant negative estimates (-0.183, p<0.05 *for static model* and -0.095, p<0.10 *for dynamic model*) on import intensity for household consumable agricultural goods suggests that 1% growth in household agricultural consumable imports is on average associated with a 13.9% poverty reduction in South Africa's households. This concurs with the earlier argument that such imports especially the food items do not out crowd local production. The other variables that associate with poverty reduction are good governance (corruption) and macroeconomic stability while poverty outcomes of the previous period and an increase in the proportion of the uneducated in the country worsen poverty levels. These findings are also in concurrence with the baseline results.

Table 2: Results based on disaggregated agricultural exports (<u>No interaction terms</u>)

Dependent variable = Relative poverty (%)				
Category of export	**Intermediate exports**		**Household consumption exports**	
	Static model	**Dynamic model**	**Static model**	**Dynamic model**
Export intensity (log)	-0.097	-0.007	0.148	-0.062
	(0.057)	(0.051)	(0.170)	(0.063)
Import intensity (log)	-0.056	-0.040	-0.183**	-0.095*
	(0.047)	(0. 035)	(0. 083)	(0.041)
Share with no	0.082***	0.030	0.063**	0.014
education (log)	(0.025)	(0.025)	(0.027)	(0.021)
Access to credit (log)	0.037	0. 005	0.011	0.019
	(0. 030)	(0.024)	(0. 025)	(0.021)
Macroeconomic	-0. 293**	-0. 288***	-0. 335**	-0.118
stability (CPI) (log)	(0. 099)	(0. 073)	(0. 149)	(0.095)
Corruption	-0. 264*	-0. 221**	-0. 168	-0. 174**
	(0.123)	(0.092)	(0. 098)	(0.067)
Poverty of the last		0. 578***		0. 469**
period		(0. 180)		(0.133)
Constant	2.772**	2.204**	4.227**	0. 307
	(0. 998)	(0. 755)	(1.799)	(1.138)
R-squared	0.935	0.968	0.940	0.979

***, **, * denote significant at 1%, 5% and 10% level respectively

Results based on the interactions of policy complementarities with export intensity are presented in Table 3. The statistically significant negative estimates on export intensity for the intermediate (0.152, $p<0.05$) and the household consumption (0.201, $p<0.10$; *average value*) exports suggest that in presence of coherent domestic policies, exports of those goods are associated with 15.2% and 20.1% (average) reduction in poverty outcomes, respectively. The high level of poverty reduction outcomes for household consumption exports may be attributed to the fact that South Africa dominantly exports household consumables (see Fig. 1and 4). As earlier observed in the baseline results and findings in Tables 2 and 3 (*household consumption goods*), it is very clear that intensifying imports of household consumables exhibits very significant poverty reducing effects at all levels.

Table 3: Results based on disaggregated agricultural exports (<u>With interaction terms</u>)

Dependent variable = Relative poverty (%)

Category of export	Intermediate exports		Household consumption exports	
	Static model	**Dynamic model**	**Static model**	**Dynamic model**
Export intensity (log)	-0. 152**	-0. 096	-0.172**	-0.245*
	(0. 049)	(0.072)	(0.070)	(0.110)
Import intensity (log)	0. 006	-0. 005	-0.212***	-0.229***
	(0. 041)	(0.042)	(0.038)	(0.044)
Share with no education (log)	1.909***	1.420*	0.682	0.351
	(0. 531)	(0. 703)	(0.570)	(0.694)
Access to credit (log)	-0. 832*	-0. 628	0.093	0.369
	(0. 285)	(0. 343)	(0.277)	(0.425)
Macroeconomic stability (CPI) (log)	-0. 239**	-0. 267**		
	(0.087)	(0. 090)		
Corruption	-0. 403***	-0. 343**	1.001	2.233
	(0. 096)	(0. 111)	(1.249)	(1.907)
Poverty of the last period		0.267		-0.286
		(0.253)		(0.332)
Export intensity * Access to credit	-0. 060**	0. 267	0.006	0.028
	(0.020)	(0. 253)	(0.022)	(0.034)
Export intensity * Education	0.140***	-0. 046*	0.052	0.023
	(0.041)	(0. 024)	(0.046)	(0.058)
Export intensity * Corruption	-0. 008	0. 104*	0.089	0.188
	(0. 006)	(0. 007)	(0.102)	(0.155)
Constant	3.033***	2.741**	-1.590	-1.767
	(0. 888)	(0. 924)	(0.977)	(1.011)
R-squared	0.976	0.979	0.984	0.985

***, **, * denote significant at 1%, 5% and 10% level respectively

Results further reveal that the estimate of the individual interaction of export intensity with increased access to credit for intermediate goods is significantly associated with poverty reduction by 6%. Although the coefficient (0.140, p<0.01 *for static*) of the interaction of between export intensity and education suggests that increasing exports of intermediate goods with an increasing proportion of uneducated aggravates poverty outcomes by 14%, the estimate based on the dynamic model suggests otherwise; *Viz,* a 4.6% poverty reduction. This may be associated with the fact that the uneducated people may acquire the desired skills to produce intermediate goods overtime through on job training.

CONCLUSION AND POLICY IMPLICATIONS

In absence of coherent domestic policies (policy complementaries), agricultural exports were not significant in influencing poverty outcomes in South Africa. Poverty reduction is strongly enhanced if the increase in export intensity is supported with better means of access to credit. Agricultural imports coupled with favourable domestic policies exhibit significant effects in reducing poverty outcomes, especially in the case of household consumption goods. Probably due to food imports that do not necessarily crowd out local production. A large proportion of uneducated people have far reaching negative effects on poverty outcomes while increasing agricultural exports in well governed economy also has promising results of reducing poverty outcomes. In a nutshell, South Africa's trade performance in the agricultural sector may be associated with poverty reduction effects in the country but this can best be realised in presence of supportive complementary domestic policies. Policy wise, there is need to further enhance the education levels of the populace, increase people's confidence in public institutions of governance, as well as boost the depth of the financial sector. It may also be necessary to promote importation of household consumables that are not necessarily produced in the country.

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