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The evaluation of the regional value chain: the case of livestock sector in Southern African countries

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The Southern African countries have shown a significant role of the livestock sector and its integration in the regional value chains (RVCs). This sector not fully exploited in the regional value chain among the Southern African countries. The participation of the livestock sector into the value chain is currently constrained by animal health status, trade barriers, high cost of transportation and low utilization of the abattoirs. Within the region, South African play an important role in improving the RVCs. Furthermore, the demand of the livestock products has been increasing among the Southern Africa's countries as well export share of value added livestock products particular for Namibia, Botswana, Swaziland as well as South Africa. The Econometric regression analysis was used to determine the performance of livestock value chain in the Southern African countries as well their participation in the regional value chains. The results reveal that the   income and importation of primary commodities increase livestock exports into the SADC region.   However, the results indicate distance in the market (transport cost imbedded in) as well as border clearance distort the participation of livestock sector in the regional value chain. Therefore, is recommended a coordinated the regional policy framework can improve the regional value chain as well as industrialisation within the Southern Africa region.

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1. Introduction

The Southern African Development Community (SADC) was established in 1980 as a regional economic community now comprising 15 members generated about $609 billion in 2015. It has been observed that the GDP growth of the SADC countries has been increasing at 3% growth rate over the last decade with 4.5% growth rate between 2015 and 2014 (WorldBank , 2016). The services sector constitutes a large portion of GDP with share of 54%, followed by industry with 31 and agriculture 15% value added to the GDP (Southern African Development Community , 2013)

The exports earning plays important role in the SADC countries in terms of economic growth. The region exports more than on third to its countries. In terms of the SADC industrial development framework has been identify commodity exports can made more sustainable path based on industrialisation. Furthermore, as the part of the industrial policy framework has identified the need to enhance competitiveness of the existing policy and promote the development of regional value chain for selected sector (Manufacturing, agriculture and textiles). This will require the improvement of the existing manufacturing capacity, modernising the productive facilities, reinforcement of the institutional support on infrastructure and strengthening the research and innovation capacity.

It has been noted that the regional value chain plays important role in terms of the boosting intra-trade and facilitating the movement of value chain. Therefore, RVCs presents an opportunity to increase productivity for both domestics in terms of export potential as well goods produced that are demanded at the regional level. The RVCs are regarded as the opportunity to advance into the international competitiveness as path for participation the global value chains (United Nations on Trade and Development (UNCTAD), 2013). According to OECD (2013), case of the African continent that is struggling in terms intra-trade and competitiveness, regional cooperation is one way national markets can be enlarged, specialisation can merge and risk can be shared through the regional value chain participation.

(AFDB, 2014) reported that about 40% of Southern Africa accounts on Africa's total GVC participation, one-third of which is through backward integration. The backward integration is known as the share of foreign value added embedded in a country's exports. On in their backward integration matrix suggest that other regional partners estimated to contribute between 0.01% and 0.1% of imported value added into South Africa's exports. South Africa also estimated to provide more than 10% of intermediate goods in Botswana, Namibia, Swaziland, Zambia and Zimbabwe (AFDB, 2014).

A study conducted by the world bank (2016), reported agro-processing in which is about 35% exports by SADC region and South Africa dominating the exports (Trademap, 2017). This sector has been threatened by unpredictable climatic condition that causes the imbalances in terms of production capacity. Given with the climatic variability, South Africa's produce more than enough for the local demand, with imports utilized during off season of production (Barrientos & Visser , 2012). With the significance of South Africa's trade contribution in SADC countries, this an indication South Africa is a key driver of regional value chains, both as a supplier of inputs and as a destination market for exports as stated by World Bank 2016 report. The other countries participation countries in the RVC is mainly limited d governance and institutional coordination among the role players in the value chain (Keane , not dated),

domestic regulation NTBs in and lack physical structure as well transport cost (Grant , Wolfaardt, & Louw., 2012).

Despite of the importance of RVC for SADC region as well as the challenges encountered by livestock sector has presented significant role, which not exploited so far. The livestock sector contributes about 51% of value added exports from region with poultry meat, beef frozen and milk dominating livestock value added exports (Trademap , 2017).   Against this back ground the study aimed to evaluate a role of the reginal value chain on the livestock sector using review trade flows based on the determinants of   trade and the competitiveness in the region. The factors that are reviewed in this paper include Gross domestic product, distance, remoteness, logistics performance index and value-added output of livestock sector within the region. The structure of the paper is structured as follows; section 2 reviews the livestock value chain in the SADC for beef, poultry, diary and leather. Section three   present the performance of the livestock sector and section 4 for literature review on regional value chain. Section 5 present the methodology used for the article and section 6 analysis and presentation of the article. The last section summaries paper and address the policy recommendation need to be consider by SADC regions in terms of connectivity of the value chain within the region.

2. Overview of livestock value chains in the SADC region

Livestock constitute an important natural resource for the southern African region, with over 60% of the region's total land area suitable for livestock farming, contributing significantly to food security across the Southern African region. The population of livestock within SADC region was estimated at 64 million cattle, 39 million sheep, 38 million goats, 7 million pigs, 1 million horses and 380 million poultry (SADC, 2017). Traditionally, the livestock animals are mainly sourced for food, skins, fertiliser, traction power, medicine and for other raw materials. Regional value chain (RVCs) have become a dominant feature of today's global economy, and this include wide range of activities to bring a product from its original to end use, such include design, production, distribution and consumer support. The livestock value chain concept has been applied in livestock sectors as an approach to assess potential interventions from a development perspective (Rich & Perry, 2011). The concept of value chain in livestock may not be equally suitable for smallholder access due to limited resources and equipments. (Rich, 2009) noted that African producers of livestock encounter various challenges in the export market for meat products, specifically beef such market information and outbreak of disease

Beef and livestock (along with poultry, leather and dairy) represents a sector that should have significant value chain trade, which thus far remains underexploited. Namibia and South Africa were the main SADC exporters of livestock to the world, which ranked first and second, respectively. According to report produced by world, South Africa exports the live cattle into Namibia with share of 71.1% in 2016 as well Botswana sources minimal imports from South Africa. Namibia and Botswana exports an average of 11 thousand tons of carcass and South Africa exports carcass to Swaziland which is around 4000 tons per year. It has been notable the largest destination of the carcass of cattle is destined to EU for Botswana and Namibia. Furthermore, both market have integrated supply chain through using Cape Town port to their markets (Worldbank, 2016). It has been observed in terms of trade flows, beef and leather value chain has opportunity to be integrated give with significant amount trade compared with

other livestock products. Figure 1 represents value chain of livestock value chain that will represents the fragmentation of cross production for the livestock production.
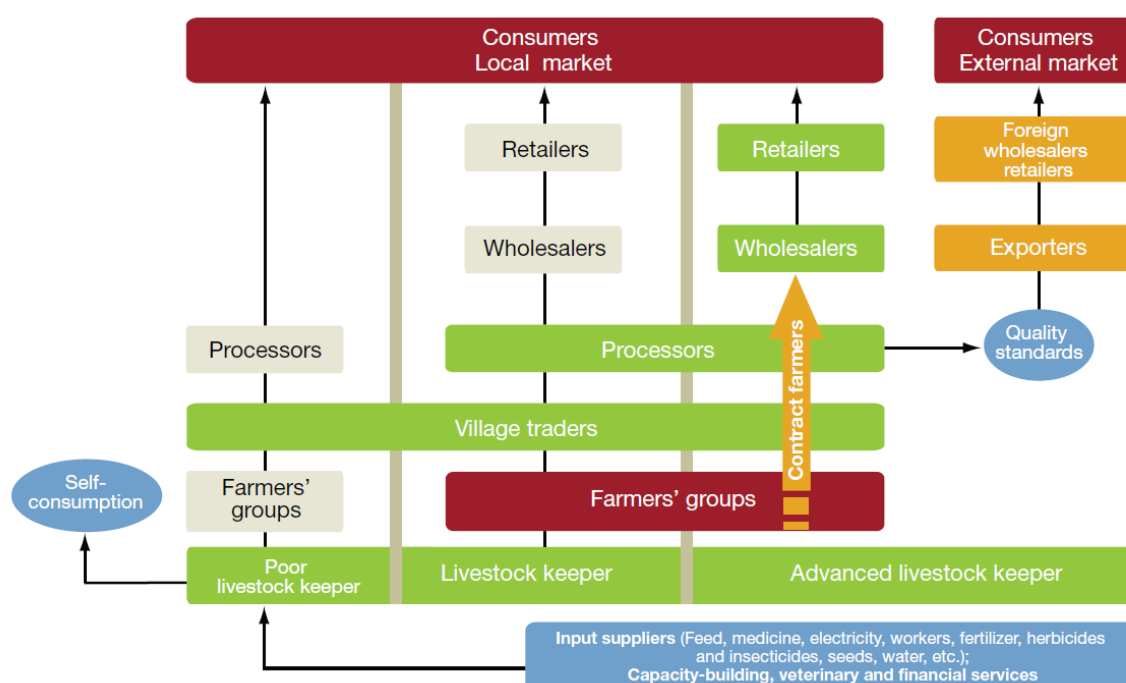

Figure 1: Livestock value chain

2.1 Beef value chain

Beef is the mainstay of the agricultural sector in Southern African countries (such as Botswana and Namibia), as well as a very significant part of the South African agricultural sector. The meat industry has had an abundance of bad publicity of low quality and diseases. Meat intake is associated with various forms of cancer, but the evidence is insubstantial (Hugo, 2005). Beef is a highly perishable product and the maintenance of the cold chain is therefore crucial to ensure product quality. The South African consumers prefer to purchase fresh (not frozen) meat, meaning there is only a short time to get products to the market. The South Africa market differs substantially from the rest of the region. South Africa was a net exporter of beef with an average of 18 054 tons of beef exported for 2016 period and imported 17 970 tons in 2016, mainly from Botswana and Namibia. The South African beef industry is dominated by large competing beef supply chains, which are vertically integrated from the flattening of cattle in feedlots, slaughtering and value adding, to the supply of pre-packed beef cuts (Jooste, 1995)

According to Food and Agriculture Organisation Statactics , (2015), South Africa was the main producer of beef within SADC region, followed by Namibia and Botswana. **Figure 2** highlights the main producers of beef production over the past ten years for SADC region. South Africa was a largest beef producer and exporter of fresh beef, with a value of R1 067 million (Quentec, 2017). Namibia as the leading exporter of livestock was also ranked as the second largest exporter of fresh beef (R898 million) within the region (Trademap 2017). Large share of fresh beef imported within SADC region are destined from South Africa. Mauritius,

Swaziland and Mozambique are the top importers of fresh beef in the SADC region. Most of beef exported from South Africa is from feedlots.
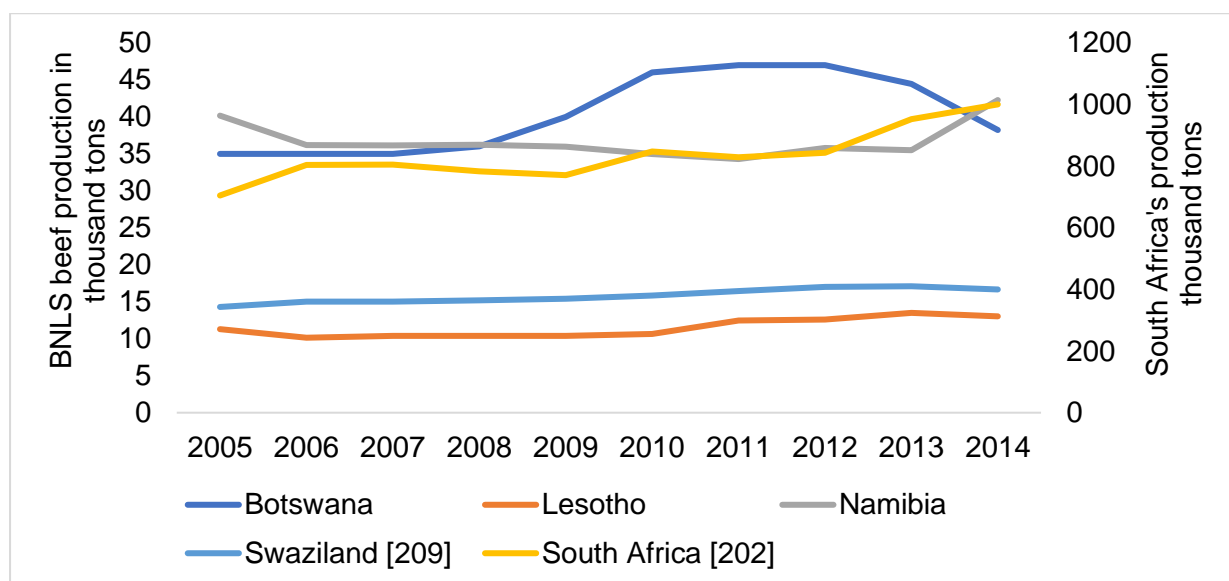

Figure 2: South Africa's beef production, 2017
Source: FAOSTAT, (2015)

2.2 Poultry value chain-meat and animal feed (oilcake)

The animal feed to poultry value chain describes the range of activities and processes required to produce commercial chickens or broilers. South Africa is the largest broiler producer and importer in the Southern Africa, producing 1 754 thousand tons during 2014/15 season. The poultry industry is a very important part of agro-processing, with strong backwards linkages to the production of maize and soya for animal feed. Commercial poultry growth requires investment in breeding operations and in processing and the cold chain for distribution of the final product. Feed costs are critical to the competitiveness of poultry production as they account for around 60 percent to 65 percent of the production costs of a chicken (Zengeni, 2014; Bagopi, et al., 2014).

Notwithstanding the growth in poultry production, the Southern Africa region is a large net importer of poultry meat and of animal feed raw materials, with the trade deficit due largely to deep-sea imports by South Africa. The key inputs imported into the region include oilcakes required for the production of animal feed. The growth of the industry in the region has involved the main vertically integrated companies in South Africa, which have international relationships with global transnational corporations such as for the licensing of breeding stock. In addition, the main South African producers have established and grown operations in other Southern Africa countries. **Figure 3** highlights poultry and oilcakes feed trade over the past five years. The figure indicates that SADC imports more of poultry and oilcakes that it exports.
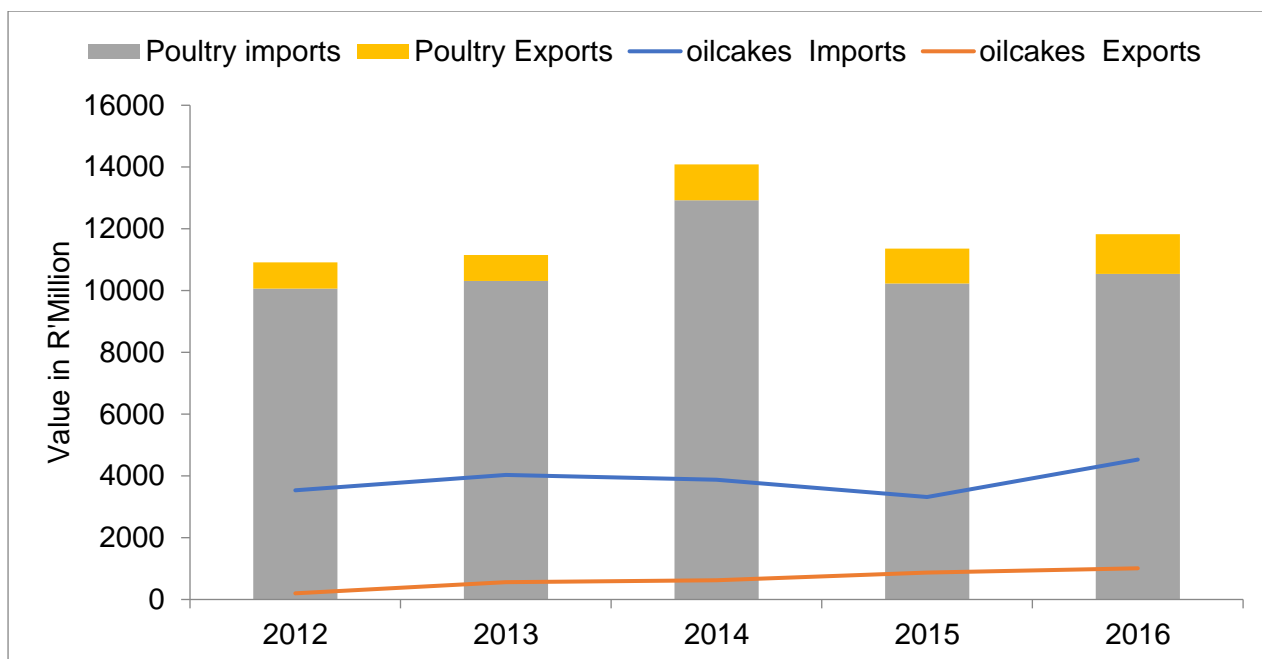
Figure 3: SADC trade of poultry and animal feed products
Source: TradeMap, 2017

2.3 Dairy value chain

The concept of dairy value chain begins with agricultural inputs, including livestock, land, labour, animal feed, etc. The primary production activities include raising livestock (in particular dairy cattle) and ultimate collection of the milk. After collection, the raw milk moves to the processing stage, this can either occur on the farm or elsewhere. The dairy value chain has a variety of entrepreneurial actors; smallholder and commercial producers, small and large processors, service and inputs providers, farmers' organizations, and cooperatives. Dairy producers and downstream actors in the value chains face many challenges in getting milk to market. For the most part, milk collection, chilling and transport, is not well organized and there are few economies of scale (Shrestha, et al., 2014)

During primary processing, all milk produced must first be chilled, and then undergo pasteurisation, clarification, separation and standardization and homogenisation. Usually the produced milk are bottled, packaged and distributed to a wholesaler, retailer or even directly to the consumer. The rest of the milk is distributed according to categories: liquid dairy and cultured dairy products, concentrated dairy products and cheese, powdered dairy products. South Africa is the largest producer of dairy products within the Southern African region and its dairy market is divided into 60% liquid and 40% concentrated products. Most of SADC member countries are heavily reliant on milk and milk imports from South Africa. **Table 1** shows that exports of milk and dairy products declined from R3 554 million in 2015 to R3 404 million in 2016, this might be due to declined Malawi dairy exports in 2016. There was a significant increase for South Africa's and Zambian dairy products in 2016. Milk and cream (concentrated and not concentrated) and butter cream and yoghurt were most exported dairy products in SADC during 2016 period, while milk and cream (concentrated and sweetened) and cheese & curd commanded the greatest share of imports to SADC region in 2016

Table 1: SADC leading importers and exporters of dairy products (HS: 04)

Exporters	Exported value in R'000		Importers	Imported value in R'000	
	2015	**2016**		**2015**	**2016**
World	**951398879**	**1062609396**	**World**	**983410772**	**1076883591**
SADC	3553619	3403618	SADC	8633783	9322798
SA	82.4%	94.6	Angola	19.4	22.1
Zambia	1.6	1.8	SA	19.1	20.0
Mauritius	0.7	1.2	Mauritius	13.5	16.2
Namibia	0.2	0.8	Botswana	7.5	7.7
Madagascar	0.2	0.4	Namibia	5.7	5.9
Tanzania	0.5	0.4	Mozambique	6.5	5.5
Botswana	0.2	0.2	DRC	5.0	5.4
Swaziland	1.1	0.2	Swaziland	4.2	3.2
Malawi	12.7	0.1	Lesotho	3.3	3.1
Mozambique	0.0	0.1	Madagascar	2.3	3.0
Zimbabwe	0.3	0.1	Zimbabwe	4.1	2.1
Lesotho	0.1	0.0	Zambia	3.5	1.8
DRC	0.0	0.0	Tanzania	1.5	1.7
Seychelles	0.0	0.0	Seychelles	2.5	1.1
			Malawi	1.8	1.1

Source: TradeMap, 2017

2.4 Leather value chain

The hides, skin and leather is a critical strategic sector for the economic and industrial development of SADC region. It is labour intensive with the potential to be major source of employment all along leather value chain. SADC has identified the leather and leather products value chain as one of the top four most promising industries in the region due to its strong backward linkages to the rural economy, and potential for poverty reduction. Meat consumption drives the supply of hides and skins to the market in the region and all over the world. Maintaining a large herd of animals is a traditional sign of prosperity, heightening the social status of the owner while contributing to a continual shortage of hides and skins in the leather value chain (Keane & te Velde, 2008)

Figure 4 illustrates value of imports and exports of raw hides, skins and leather by SADC region from the world between 2007 and 2016 period. The figure further highlights that exports of raw skins and leather are higher than imports (SADC is a net exporter of raw skins and

leather). It is also important to note that South Africa was a main player in SADC trade of raw skins and leather, South Africa constitutes 76% of exports and 79% of imports. Zimbabwe, Namibia, Zambia and Botswana are SADC top exporters of raw skins and leather.
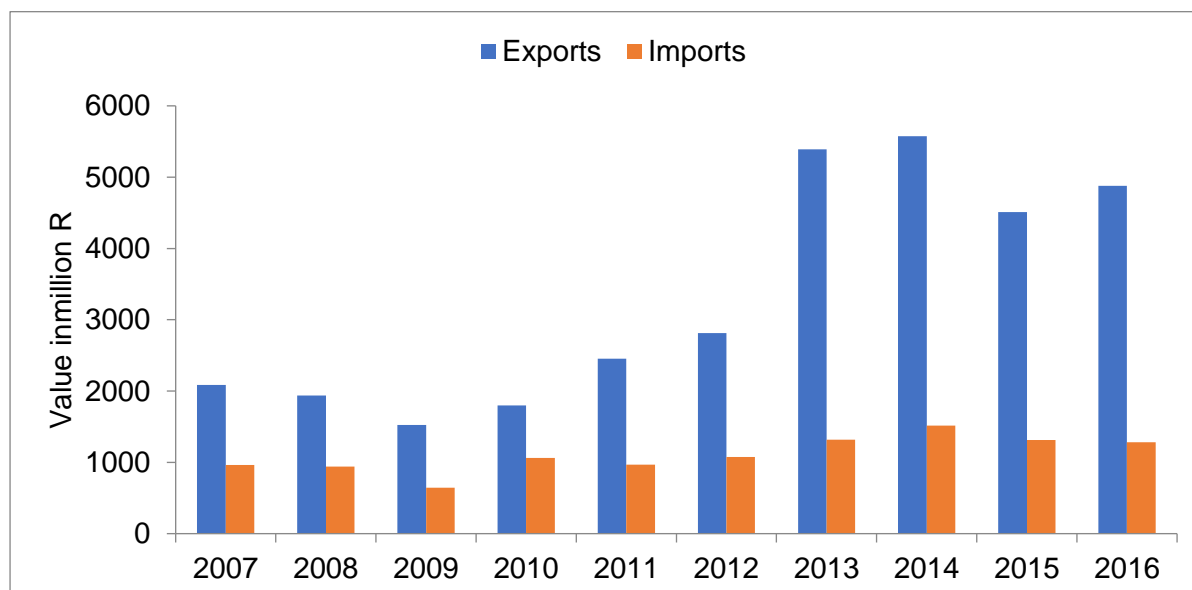

Figure 4: SADC trade of raw hides and leather
Source: TradeMap, 2017

3. Intra-regional trade performance for SADC livestock sector

Regional trade integration and the promotion of southern Africa's trade with the rest of the world are central to SADC's agenda as outlined in the treaty of SADC of 1992 and SADC protocol on trade. Key to improved regional and international trade is the creation of a conducive environment for agriculture and food related regional trade by rationalizing trade measures and reducing trade impediments; supporting farmers and traders to access and compete in regional and international markets. SADC region has proposed interventions of promoting regional value chains, business to business and public private partnership (PPP) in order to increase production including importation, and distribution of agricultural inputs and provide markets for outputs (SADC, 2014)

Table 2 compares intra-SADC trade with SADC imports from the rest of the world, whilst SADC imports R885 thousand of poultry meat from other SADC member countries, it exports about R1 285 thousand to the rest of the world, and still imports about R10 538 thousand. In SADC member countries, South Africa continues to dominate the international of meat and edible meat offal, and is ranked number one as supplier and importer, accounting to R2 billion of SADC exports and R782 million of total SADC imports.

Table 2: Livestock sector intra-trade performance

Product label	SADC's imports from SADC		SADC's exports to world		SADC's imports from world	
	2015	2016	2015	2016	2015	2016
Poultry meat	803038	885376	1126334	1284562	10228251	10537602
Beef frozen	564382	739082	1800630	2189005	2554353	1905461
Beef fresh	337668	447789	2494800	2789197	430399	538504
Mutton	217439	247256	292880	275687	696530	708011
Pork meat	258191	236192	293920	272578	2966511	2236738
Edible offal of bovine animals	129503	87495	139331	135213	1292782	1093117
Meat and edible offal	61529	52763	75253	63782	400719	358432
Meat of other animals	30734	25911	219796	358623	46841	32887
Pigs and poultry fat	4657	5349	4046	3913	23390	21910
Meat of horses, asses, mules	26	44	38	806	26	1231

Source: Trademap

SADC region is a net importer of livestock with dairy and poultry products amongst the main imports. Intra-regional trade remains low and declining, currently estimated at 17% total trade. Constraints to trade are prevalent at each stage of the value chain (SACAU, 2016). **Figure 5** shows intra-SADC trade flow trends of the livestock over the past five years. The Intra-SADC imports and exports of livestock were fluctuating under review period, and flow at the same trend. SADC imports from the world have increased to R2 449 million, while intra-SADC imports declined to R1 724 million in 2016.
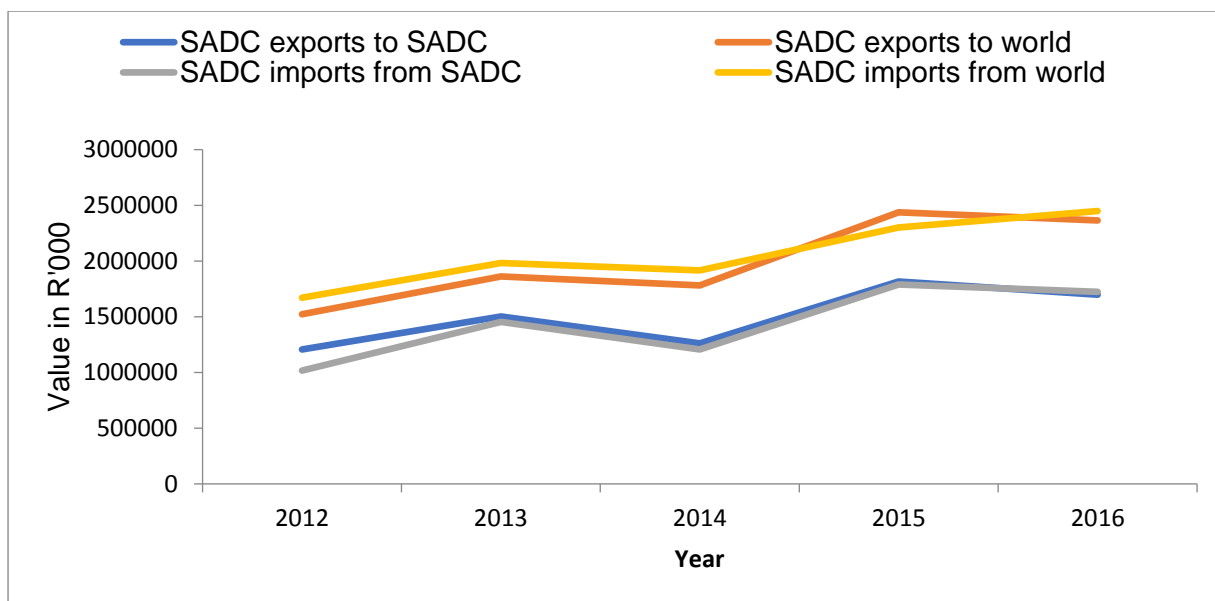
Figure 5: intra-SADC livestock trade, 2016
Source: TradeMap, 2017

4. Literature review on the regional value chain

There is limited literature in determine the evaluation regional value but there is a literature of global value chain participation's indicators. The literature on the global value chain is mostly focused on the development of the indicators on the global value chain (GVCs). The indicators of the global value chain include indirect domestic value-added exports, foreign valued added exports as well as gross exports. The indicators measure the level of the involvement of the country in the vertical and fragmented production. Furthermore, the literature indicators gauges whether the country is likely to be upstream or downstream on GVCs. The country that is upstream is the indication that the country is producing the inputs are raw materials and whereas a downstream is processor of inputs towards the end of production process (Mantalbano, Nenci and Rotili 2015)

The gravity model is mostly used to measure fragmentation of production value chain across borders. The studies conducted by authors such as Noguera, (2012)(Yucer, Siroen & Guilhoto, not dated), and Montalbano, Nenci & Rotili (2015) used gravity model to determine the connectivity of global production. The studies provided the determinants of bilateral trade flows through using static and dynamic standard form of regression analysis. In the most of the studies, in order to determine the connectivity of production a trade value added and gross exports a global input-output data is used. Furthermore, the model has been considered of the products in terms sales and expenditure (known as GDP) as well as an inverse relation of the distance spearing the economies. It has been used to point out the relevance global value chain as they represent left and rights of gross term among the two nations. For this study was considered to use the standard form of gravity model without deriving the due fact that input and output data in SADC has not been ready available and the following section explained the gravity model used for this study.

5. Methodology
5.1 Gravity model of global value chain

The model was firstly introduced by Tinbergen, (1962) with the intuitions of measuring the bilateral trade flows between the countries. The structural form of the gravity model explains the bilateral flows of expenditure for importing country and the sales of exporting countries with prices embedded on the expenditure and sales as well as trade cost. The gravity model, in its standard form, is derived from a consumer expenditure system in which the price term is eliminated using the general equilibrium structure of the theoretical. In Anderson and van Wincoop (2003), the demand for the products of *i* by entity *d*erived by maximizing the CES utility function of the consumer *j*, is as follows

$$X_{ij} = \left(\frac{\beta_i p_i t_{ij}}{p_j}\right)^{1-\sigma} Y_i \ (1)$$

Where by P_1 represents the supply price of country i, t_{ij}, the trade cost, P_j the consumer price index in country j and Y is total output of I for the aggregates exports of i to all partners and is expressed as follows

$$Y_i = \Sigma_i X_{ij} \ (2)$$

This represent the market clearance and the trade form of the equilibrium is represented as follows;

$$X_{ij} = \frac{Y_{ij}}{\Omega_i} \left(\frac{t_{ij}}{P_j}\right)^{1-\sigma} Y_j \ (3)$$

Where $\Omega_i = \Sigma_j\left(t_{ij}/P_j\right)^{1-\sigma}Y_j \ (4)$

It important to note the above model relies of the assumption that the product exported depends products produced in country i. Based on the literature of gravity model, the X_{ij}, is measured as gross exports and Y_i is measured by value added basis of GDP. However, in the vertical specialisation is different because the value added of origin and the volume of exports are not the same and gross exports are much higher that the amount of domestic value added due to number of imports content of exports. In this case, the ratio of imported goods on exports are considered in the econometric model as fixed function (Guilhoto, Siroenm & Yucer 2015). However, this is not directly observed in the global/regional direct production partner. The follow section represents the linear gravity model in its standard form for the estimation of the of livestock gross exports into the SADC region.

5.2 Specification of the model

The aim of the study is to evaluate regional value chain for livestock sector in the SADC region in terms of trade flows. The econometric traditional gravity model as introduced by Tinbergen (1962). was used on this study was used to determine the bilateral trade flows the livestock products within the SADC region. The gravity model has been advanced by the authors such as Anderson, (1979), Deardorff, (1998) Anderson & Van Wincoop, (2003) and Baier & Bergstrand, (2007). The advancement of the model has resulted to the inclusion of the multilateral trade resistance as well as the use of fixed effects. The estimation of the of the model is presented as follows;

$$\log X_{ij} = \alpha + \log \beta_1 \, GDP_j + \log \beta_2 \, PRIMP_i + \log \beta_3 \, D_{ij} + \log \beta_4 \, LPI_i + \log \beta_5 \, R_i + \log \beta_6 \, OUTP_i$$
$$+ fe + \varepsilon_{ijk}$$

Where by T_{ij} represents the SADC livestock gross exports i to destination country j, $Primp_i$ is primary imports into SADC, D is the distance between state I and partner j, GDP_i the gross domestic gross domestic of state i. In determining the evaluation of the livestock sector in the region the logistic performance indicator was used as well the remoteness of state I to rest of the world was included. R_i is the remoteness of state i from the rest of the world ($m\neq j$), aside from its partner country j. This represented as follows;

$$R_{ij} = 1/\sum_{m\neq j}[GDP_m/D_{im}]$$

According to Yucer, Siroen, and Guilhoto (not rated), reported that the higher the Ri, the more distant in country sate from countries m ($m\neq j$) or the closer to countries whose GDP are relative small. Therefore, the more remote the state, the higher the trade returns expected between country I and its partner j since the state i's access to the other markets m is limited.

The ordinary least squares (OLS), passion regression as well linear regression with fixed effects was used to determine the impact livestock value added trade flows within the SADC region. The results of the non-availability of input-output data on SADC countries except for South Africa, data o trade flows from TradeMap was sourced for this presented in million dollars. The national GDP values are given in the current dollars sourced from the World bank's world Developmental indicators. The Logistic Performance index was source from

the World Bank, the index takes into consideration customs, infrastructure within the region, time spent at the borders, the infrastructure as well shipping times.

6. Estimation Results and discussion

Table 1 reports the estimation results of bilateral gravity model with all the variables expected sign and magnitude as based on gravity model literature. For this study, the dependant variable observed was bilateral gross exports into the SADC region for livestock products for model (I) and Model (II). The model I represent OLS regression and Model 2 is Poisson regression

Table 1: The estimation results

Indicators	Model (I) logEx (Possion)	Model (II) (OLS)	Model (III)
LogPrimp	0.104 (0.029)***	0.91 (0.92)***	0.20 (0.13)
LogLPI	0.21 (0.307)	2.45(1.65)	-0.35(1.19)
logOutput	0.20(0.75)	2,003(5.39)	-0.95(1.96)
logD	-0.069(0.09)*	-0.53(0.49)**	
logR	0.0065(0.25)	0.093(1.65)	-0.27(0.110)
logGDP	0.081 (0.034)**	0.805 (0.25)***	0.34 (0.66)
constant	-2.21(6.36)	-14.44(41.81)	
Fixed effects	no	No	Yes
R^2 or Pseudo	0.34	0.0674	0,74
N	110	110	97

*** P>0.1, **P>0.05, & * P>0.01

The estimates of the GDP and Remoteness are shown on the sixth and seventh column of the table in both model I & II. Based on the literature the, both estimators showed a positive impact as the bilateral distance has influence towards the exports to countries. However, the remoteness is not significant based on the logistic of that delays exports in the regions that include road infrastructure, time spent in the border as well custom clearance. The imports of the primary commodity from the third countries which acts as the intermediate commodity shows a positive impact on the livestock into the SADC region significantly 1% under OLS and poisson regression model.

For, the distance coefficient, passion estimates have lower values because the take into account zeros and is a better treatment for the hetoroskedacity. The other variable obverse in the model such as logistic performance index and the value added domestic output showed positive impact on trade flows although they are not statistical significant for both OLS and Poission regression model. In nutshell, the GDP and the primary imports played an import role in terms of the increase of the value-added livestock exports within the region as the shown positive significant effect although the distance was significantly however having negative effects towards trade as presented by its negative sign.

7. Conclusion

The SADC regional value chain present great opportunity to developed given with the outflows and inflows among the countries. For example, the beef industry stands an opportunity to increase their cross-border production, however they are limited by the food safety requirements as well as the cost of transportation between the countries. The order industry such as poultry, leather as well diary also present an opportunity for firms to participate on the regional value chain however are constrained by domestic regulation, infrastructure and the cost of transportation. It has been observed in terms of the intra-trade of the value-added products, SADC exports approximately 35%, and this is an indication the regional has opportunity to integrate the cross-border production. The literature, presented in order to determine the fragmentation of production value chain input-output database is used in recently conducted studies. This study used the available data to evaluate the role of the regional value chain for livestock sector through is using the gravity model.

The results of the study present that the GDP and the importation of the inputs/intermediate inputs increase the exports of value added for livestock products. The distance has negative effects as indicated in the literature that increase the cost of transportation among the trading countries. Given with results presented for this study, it is clear the livestock sector has opportunity to integrate its cross-border production value chain in the region given with the capability of production in terms of beef, raw leather and other livestock products. South African has indicated to be a key play important role in the RVC given to its infrastructural development. Therefore, it is recommended that countries with the SADC countries to harmonise the national policies as to participate on the regional value chains. Furthermore, a coordinated industrial developmental policy that speaks to nation policy among the SADC countries.

References

Anderson, J. E., 1979. A Theoretical Foundation for the Gravity Equation. *American Economic Review ,* 69(1), pp. 106-16.

Anderson, J. & Van Wincoop, E., 2003. Gravity with Gravitas: A solution to the Border Puzzle. *American Economic Review,* 93(1), pp. 170-192.

Bagopi, E. E. et al., 2014. *Competition Dynamics and Regional Trade Flows in the Poultry Sector: The Case of South Africa, Botswana, Namibia, and Zambia,* Geneva: African Competition Forum.

Baier, S. L. & Bergstrand, J. H., 2007. Do free trade agreements actually increase members' international trade?. *Journal of International Economics,* 71(1), pp. 72-95.

Bank, A. D., 2014. *Global Value Chains and Africa's industrialisation: African Economic Outlook 2014,* Paris: Organisation for Economic Co-operation and Development, African Development Bank and United Nation Development Programme.

Barrientos, S. & Visser , S., 2012. *South African horticulture:opportunites and Challanges for Economic and SOcial Upgrading in Value chains ,* Manchester : University of Manchester .

Deardorff, A. V., 1998. *Determinants of Bilateral Trade:Does Gravity Work in a Neoclassical World?" In The Regionalization of the World Economy,* Chicago: University of Chicago Press.

Development, O. f. E. C.-o. a., 2013. *Aid for trade at clance: connecting value chains ,* Paris : OECD.

Food and Agriculture Organisation Statactics , 2015. *Food and agriculture database,* Washington : FAO.

Grant , J., Wolfaardt, A. & Low, A., 2012. *Maize Value Chain i the SADC region,* Pretoria : USAID Southern Africa.

Guilhoto, J., Siroen, J.-M. & Yucer, A., 2015. *The gravity model, global value chain and Brazillian States,* Paris : Universite Paris .

Hugo, A., 2005. *Diet and red meat – is there a place for red meat in the modern diet?,* Pretoria : South African Meat Industry Company .

Jooste, A., 1995. *Regional beef trade in Southern Africa,* Pretoria: University of Pretoria.

Keane , J., not date . *Regional inytegration, sustaianable development and global value chain in Southern Africa ,* London: Overseas Development institute .

Keane , J. & te Velde, D. W., 2008. *The role of textile and clothing industries in growth and development strategies ,* Paris : Overseas Development Institute .

Montalbano, P., Nenci, S. & Rotili, L., 2016. *Trade and Global Value Chain in the EU: Dynamic Augumented Gravity Model ,* Rome : University of Roma Tre.

Noguera, G., 2012. *Trade Cost and Gravity Model for Gross and Value Added Trade,* Columbia : UC Berkeley and Columbia University .

Rich, K. M., 2009. What can Africa contribute to global meat demand: opportunities and contraints. *Outlook on Agriculture,* 38(#), pp. 223-233.

Rich, K. M. & Perry, B. D., 2011. The economic and poverty impacts of animal diseases in developing countries: New roles, new demands for economics and epidemiology. *Preventive Veterinary Medicine ,* 101(3-4), pp. 133-147.

SADC, 2014. *Regional agricultural Policy endorsed by SADC council members ,* Garabone : SADC secratarist .

Shrestha, S., Bhatarai, N. & Paudyal, G., 2014. *Value Chain Analysis on Dairy Interprise ,* Nepal: WWF.

Southern African Development Community , 2013. *SADC Facts and figures ,* Garabone : SADC.

Tinbergen, J., 1962. *Shaping the Worlf Economy: Suggestion for international Policy ,* New York : The Twentieth Century Fund .

Trademap , 2017. *Trade statistics for international business developmentMonthly, quarterly and yearly trade data. Import & export values, volumes, growth rates, market shares, etc.,* Geneva: International Trade Centre.

United Nations on Trade and Development (UNCTAD), 2013. *World Investment report 2013,* Geneva: UNCTAD.

WorldBank , 2016. *Factory Southern Africa? SACU in Global Value Chain ,* Washington : WorldBank.

Yucer, A., Siroen, J.-M. & Guilhoto, J., not dated . *Gravity model, interregional input-output and trade in value added. A new approach applied to Brazillian international and international trade,* Sao Paulo: University of Sao Paulo.

Zengeni, T., 2014. *The competiveness and Performance of the Zimbabwe Poultry industry: ,* Johannesburg : University Of Witwatersrand.