

Over time, the understanding of governance in the GVC literature has evolved from a dichotomous view of buyer- versus producer-driven value chains to the more recent understanding of governance structures being found on a spectrum relating to the level of control and complexity of the value chain. Five different structures have been posited—market, modular, relational, captive and hierarchical—which depend on the complexity of the transactions, the producers’ capabilities, and the extent to which they can be codified (Gereffi et al. 2005). These are all based on country case studies.

These governance structures are described in a spectrum from the simplest governance structure (i.e. market) to the most complicated (i.e. hierarchical structure). They are described as follows (Gereffi et al. 2005; Keane 2015):

- Market: In this governance structure the transactions are the least complicated.
- Modular: Transactions are relatively simple, information of product specifications is easily transmitted, and suppliers make products based on customer specifications with little input from the customers.
- Relational: Transactions are fairly complex, resulting in buyers and sellers interacting frequently. The lead firms exert some level of control over the suppliers.
- Captive: Small suppliers are dependent on one or more large buyers, facing significant switching costs, hence the term ‘captive’. Because of this ‘captivity’, small suppliers often operate under conditions set by and usually specific to a specific buyer. Some forms of contract growing fall under this governance structure.
- Hierarchical: Transactions are very complex, product specifications cannot be codified, and highly competent producers cannot be found. This governance structure is generally characterized by vertical integration, particularly in industries where all production is carried out in-house, although this may occur at different geographical locations.

Another important building block in GVC analysis, especially in the realm of policy-making, is industrial upgrading (Gereffi et al. 2001). Upgrading ‘refers to several kinds of shifts that firms or groups of firms might undertake to improve their competitive position in global value chains’ (Gereffi et al. 2001: 5). This involves the learning that organizations undertake to improve their position in the value chain (Gereffi 1999). Upgrading can happen in three distinct ways. Process upgrading refers to improvements in the efficiency of internal processes such that they surpass those of competitors (Fromm 2007: 10). Product upgrading occurs when firms move into producing higher value added products (Gereffi et al. 2001). Finally, functional upgrading occurs when firms increase the value added by moving their production to other parts of the value chain (Gereffi et al. 2001).

There are important links between governance and upgrading because governance determines upgrading opportunities for firms in the chain, such as through providing the commitments required for investments in customer-specific production. However, governance can also be exerted to protect rents in certain parts of the chain, while competition drives them down in other parts. The powerful actors in the chain thus influence the overall competitiveness of the chain by inducing customers and suppliers to changes their procedures (Kaplinsky 2000: 126). The more hierarchical value chains are posited to provide more opportunities for product and process upgrading rather than for functional upgrading because functional upgrading is blocked by lead firms who ‘control more lucrative nodes of production’ (Keane 2015: 5). Moreover, in the case where the governance structure is captive, that is, driven by one dominant player, the interaction with the lead firm tends to take place within the context of an uneven relationship which influences the upgrading trajectory (Humphrey and Schmitz 2002: 1018). Upgrading opportunities, or lack thereof, then determine how the value chain will evolve.

Food value chains are seen as a ‘new model of organization’ in the agricultural business sector (Diamond et al. 2014). Their development is influenced by the increasing demand for more processed, possibly specialized, and differentiated food products. This includes packaging, distribution, and retail channels such as through supermarkets and fast food outlets, which means they are no longer simply homogeneous commodity goods (Diamond et al. 2014). Scale economies in processing, differentiation, and vertical integration imply relative concentration at various levels of each product market’s value chain. Producers of high-value agricultural products are pushed towards vertical integration by retailers in order to allow retailers to standardize quality and reap scale economies (Hellin and Erenstein 2009: 246).

A huge change has also taken place since the 1990s in the role of state regulation. In developing countries, food and agricultural chains were largely state-controlled through marketing boards. State-owned companies were privatized while markets were deregulated. Relevant to the animal feed to poultry value chain, in South Africa the grain marketing board was dismantled and replaced with the South African Futures Exchange (SAFEX). In contrast, Zimbabwe’s Grain Marketing Board (GMB) is still functional, retaining its position as theoretically the most attractive customer for maize farmers in Zimbabwe as they pay the highest price for maize (Chikwati 2015). It also has the highest number and widest network of silos in the country. However, owing to late payments, farmers are reportedly selling to private players at far lower prices as they are guaranteed payment (Chikwati 2015). Interestingly, the GMB has become increasingly commercialised, with the introduction of its SILO range of products for human consumption which include maize meal, popcorn, and rice (GMB 2015). More recently, it has branched out into the production of animal feeds.²²

The change in governance structures has important implications for food value chains, especially since power is unequal at various levels of the value chain. For instance, although SAFEX provides traders with opportunities to make profits from the grain, for farmers this may result in unequal distribution of income along the value chain. For coffee farmers, higher income is skewed towards transnational corporations located in developed countries whereas coffee producers in less-developed countries receive an increasingly lower portion of the income (Kaplinsky and Fitter 2004; Petkova 2006; Ponte 2002).

There is limited literature on regional value chains, especially in the case of value chains in Africa. The GVC literature on Africa either focuses on the effect of Asian firms on African producers or on the demand patterns driven by BRICS countries (i.e. Brazil, Russia, India, China, and South Africa) (Keane 2015). However, the consideration of regional value chains is particularly important because these chains may be more amenable to upgrading than GVCs because of the control of marketing and retailing in the latter by international lead firms (Keane 2015). A consideration of regional value chains for Africa has mostly been in the context of African firms gearing themselves up to be eventually inserted in GVCs (Keane 2015). For example, it was suggested that firms need to create markets in the region first before they try to meet the far more stringent conditions found in European and American markets (Morris and Fessehaie 2014). As such, it is important not only to identify regional value chains that are already present but also to understand their operation and potential for regional industrialization. The next section analyses the growth and competitiveness in the poultry industries in southern Africa, focusing on production, trade, and price data.

²² Interview with Grain Marketing Board, 19 July 2015.

4 Trade and competitiveness in the animal feed and poultry value chain

4.1 Trade

In assessing the trade flows we distinguish between regional flows, which include intra-firm sales across borders, and the deep-sea trade, almost entirely imports. Although South Africa's imports of poultry and animal feed components are from deep-sea sources, there are important intra-regional trade flows in the animal feed part of the value chain. Zambia is a net exporter of maize, and more recently of soybean and oilcakes, to neighbouring countries. Mozambique has also become a net exporter of oilcakes, although on a much lower scale than Zambia. We consider regional trade in intermediate products (oilcake and its constituents) in the context of regional value chains and the implications for regional integration. This includes protectionist measures, the costs of transport, and the role and strategies of large corporations stretching across the countries in the region.

Poultry trade

South African poultry trade flows dwarf those of other countries. The value of imports of poultry into South Africa rose from approximately US\$60 million per quarter or around US\$240 million annually in 2010 to almost US\$380 million for 2014 as a whole. Prior to 2012, the main source of imports was Brazil. Thereafter, there was a switch towards imports from the EU, with which South Africa has a free trade agreement (Kwaramba and Tregenna 2014). While there was a 50 per cent increase in the value of imports between 2010 and 2011, this was a gradual increase over time. In contrast, two significant spikes led to applications for anti-dumping duties, a spike in the third quarter of 2012 and that in the first quarter of 2014 (Figure 3). The spike at the end of 2012 saw imports increasing from US\$80 million to US\$140 million, a 75 per cent increase from one quarter to the next. The spike at the beginning of 2014 was also substantial, even though only increasing to the levels at the end of 2011.

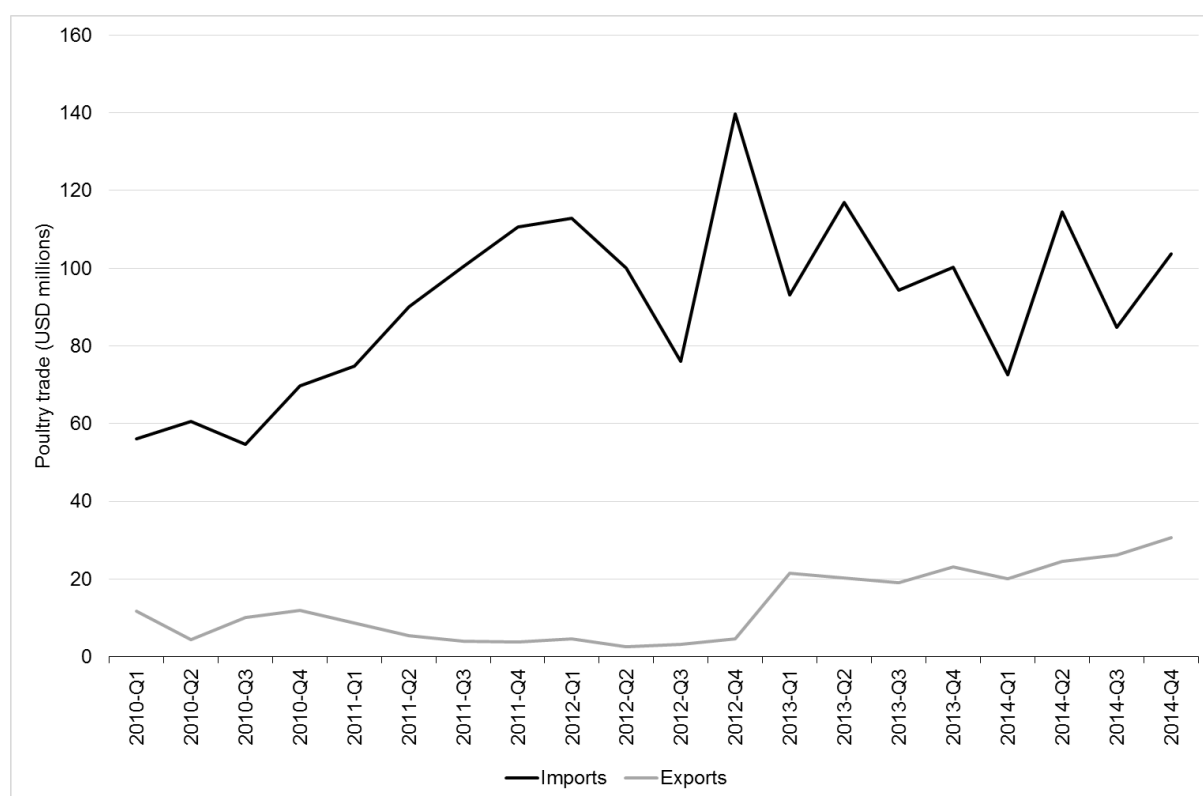
South Africa's exports are mainly to the Southern African Customs Union (SACU). At the beginning of 2013, poultry exports increased from US\$4.7 million in the fourth quarter of 2012 to US\$22 million in the first quarter of 2013 and remained at around these levels thereafter (Figure 3). The increase was largely due to a sharp recorded increase in exports to Lesotho and Namibia as a result of the improvement in the recording of intra-SACU trade from 2013 and under-reporting before that point.

The imports reflect different chicken consumption patterns found in North American and EU countries when compared to that in South Africa. In the South African market, bone-in portions are the most widely consumed, generally in the form of IQF portions (SAPA 2014). In contrast, high-income overseas markets mostly consume fillets such as breast portions that are sold at a premium. Since bone-in portions are not in high demand in overseas markets, they are then sold in other markets, such as South Africa, for a lower price.²³ It is alleged that overseas players, including Brazilian producers, make their margins on fillet meat and sell bone-in portions at costs that allow them to cover the tariffs and logistical costs of shipping the meat to South Africa.²⁴

²³ Interview with Daybreak, 30 June 2015.

²⁴ Interview with Daybreak, 30 June 2015.

Figure 3: South Africa poultry trade flows



Source: Trade Map (ITC 1999–2005).

After the imposition of anti-dumping duties on Brazilian imports, there was a decline—albeit with fluctuations—in the value (Figure 3) and the volume of imports (Table 1). The anti-dumping tariffs—ranging from 12 to 82 per cent—were imposed on whole birds, boneless cuts, bone-in portions, and offal imported from Brazil (ITAC 2013). However, these anti-dumping duties did not apply to EU countries as a result of the free trade agreements between South Africa and the EU (Tregenna and Kwaramba 2014). The spike in imports at the beginning of 2014 was due to a sharp increase in imports from Europe. This increase led to another bid for an anti-dumping investigation being submitted by SAPA to ITAC in 2014. ITAC made a final determination on 27 February 2015, recommending the imposition of anti-dumping duties of 31.30–73.33 per cent on Germany, 3.86–22.81 per cent on the Netherlands, and 12.07–30.99 per cent on the United Kingdom (ITAC 2015). In its determination on this matter, ITAC indicated that though the poultry industry suffered material injury from dumping, other factors also contributed to its performance such as rising production costs related to feed, fuel, electricity, and labour costs (ITAC 2015). That said, ITAC asserted that these other factors do not detract from the material injury suffered by poultry producers as a result of the dumping of poultry products from Europe. It also pointed to the challenge of lowering costs and improving efficiencies through the value chain.

More recently, as part of negotiations with the United States to extend Agoa benefits, a duty-free quota of poultry imports from the United States of 65,000 tons has been agreed (Ensor 2015). This equates to approximately 16 per cent of poultry imports based on import data from 2014.

Oilcake, maize, and soya trade

Maize and soybean meal are two key inputs to animal feed. South African imports of oilcakes used in the production of animal feed, mostly made up of soybean oilcake, are larger than the

imports of poultry. Argentina is the main source of South Africa's imports, accounting for 54 per cent of the total share of oilcake imports in 2014.

Zambia has been a net exporter since 2010 (Table 3). The majority of these are to Zimbabwe, with the remainder going to Namibia, Botswana, and South Africa. The big change happened from 2011 to 2012. Mozambique has also reduced its trade deficit with substantial growth in local production and has recorded a small surplus in 2014. As with poultry, South Africa has some exports of oilcake to neighbouring countries, with the main markets being Namibia and Zimbabwe. The growth in exports to Namibia is explained by the fact that in 2012 Namibia started producing chickens and therefore the established companies had to rely on imported raw materials, particularly feed and day-old chicks, to support domestic production.

Table 3: Trade of oilcakes used in the production of animal feed (US\$ millions)

		2010	2011	2012	2013	2014
Botswana	Imports	29	30	30	32	
	Exports	2	3	4	3	
Mozambique	Imports	6	14	239	16	17
	Exports	7	13	22	11	28
South Africa	Imports	530	593	618	582	502
	Exports	198	191	236	201	245
Zambia	Imports	10	22	25	20	21
	Exports	17	28	132	81	75
Zimbabwe	Imports	23	71	59	134	62
	Exports	8	9	18	12	8

Source: Trade Map (ITC 1999–2015).

Only two countries have been engaged in soybean exports on a large scale—Zambia and South Africa (Table 4). Zambia is now a net exporter of soybean, with the sharp increase in exports between 2013 and 2014 being driven by increased demand from Zimbabwe and South Africa. These two countries combined accounted for 86 per cent of Zambia's soybean exports in 2014, an increase from 69 per cent in the previous year.

Table 4: Soybean trade (US\$ millions)

		2010	2011	2012	2013	2014
Botswana	Imports	1.5	1.9	2.6	1.7	0.2
	Exports					
Mozambique	Imports	0.02	1.15	2.8	0.9	0.7
	Exports		0.02		0.3	0.7
South Africa	Imports	0.96	0.9	0.9	3.4	51
	Exports	51	23.6	95	11	2
Zambia	Imports	0.0	1.1	0.3	1.15	0.8
	Exports	6	1.1	1.4	2.4	13.9
Zimbabwe	Imports	9.6	1.8	0.3	2.9	8.8
	Exports			0.1	0.6	1

Source: Trade Map (ITC 1999–2015).

There are also relatively small trade flows of soybeans (Table 4). South Africa had substantial exports in 2010–12; however, the implementation of DTI's soybean strategy (DTI 2012) has meant investment in processing capacity and has reduced imports of soybean meal from 2012. There have been imports of soybeans as the processing capacity is much larger than agricultural production. Through this strategy and financing from the Industrial Development Corporation in 2013, South African soybean crushing capacity has been substantially expanded to approximately 2.1 million tons per year.²⁵ However, given that the country only produces 1

²⁵ Interview with AFMA, 15 July 2015.

million tons per year,²⁶ there is now an over-investment in soya crushing capacity with South Africa having limited prospects of producing enough soya to move to a net export position.

In contrast with Zambia and South Africa, Zimbabwe, Botswana, and Mozambique do not have significant exports over the period under review and have been running trade deficits. In the case of Zimbabwe and Botswana, this reflects production constraints in the key raw materials (i.e. maize and soya), whereas in Mozambique while production has been growing strongly, demand growth has continued to outstrip production. Soybeans were introduced into Mozambican farming in 2004 and production has expanded rapidly. By 2011–12, 26,750 farmers were producing 31,500 tons of soybeans, which was an increase from 11,200 farmers and 7500 tons in 2009–10 (Smart and Hanlon 2014). The increase in soybean production is driven by the chicken feed market.

In contrast with soya exports, South Africa has maintained substantial net exports of maize in almost all years (Table 5). Zambia has also had maize surpluses. As a result, the region as a whole has been in a net export position. This is reflected in maize prices in South Africa and Zambia which are generally the lowest in the region, and prices in South Africa have been in line with those of deep-sea exports (the computed export parity values; see Figure 4). However, since the trade data does not distinguish between yellow and white maize trade, it is difficult to ascertain from the data how much is destined for animal feed and how much is for human consumption. It seems that, at least recently, almost 75 per cent of the maize exported from South Africa is yellow maize, mostly destined for Asia (FAO 2015a). In fact, the exports in 2012 and 2013 were largely driven by increases in exports to Japan. That said, the largest destination of South Africa's maize exports is southern African countries.

Table 5: Maize trade (US\$ millions)

		2010	2011	2012	2013	2014
Botswana	Imports	10	17	20	50	48
	Exports	0.06	0.2	0.14	0.07	0.02
Mozambique	Imports	18	32	6	19	37
	Exports	3	6.4	1.7	0.4	13
South Africa	Imports	11	30	75	11	37
	Exports	309	841	396	767	608
Zambia	Imports	2.5	1.5	2	6	5
	Exports	36	190	420	153	66
Zimbabwe	Imports	57	122	269	108	114
	Exports	0.35	1.3	0.8	1.5	0.7

Source: Trade Map (ITC 1999–2015).

Zambian exports of maize have increased between 2010 and 2014, reaching a peak of US\$420 million in 2012, even surpassing those originating from South Africa. A great deal of maize from Zambia is going to Zimbabwe. In fact, recent reports indicate that the GMB in Zimbabwe has been engaged by the Food Reserve of Zambia to use its storage facilities as they have excess storage capacity (Mtomba 2015). Zimbabwe has the highest imports in the region.

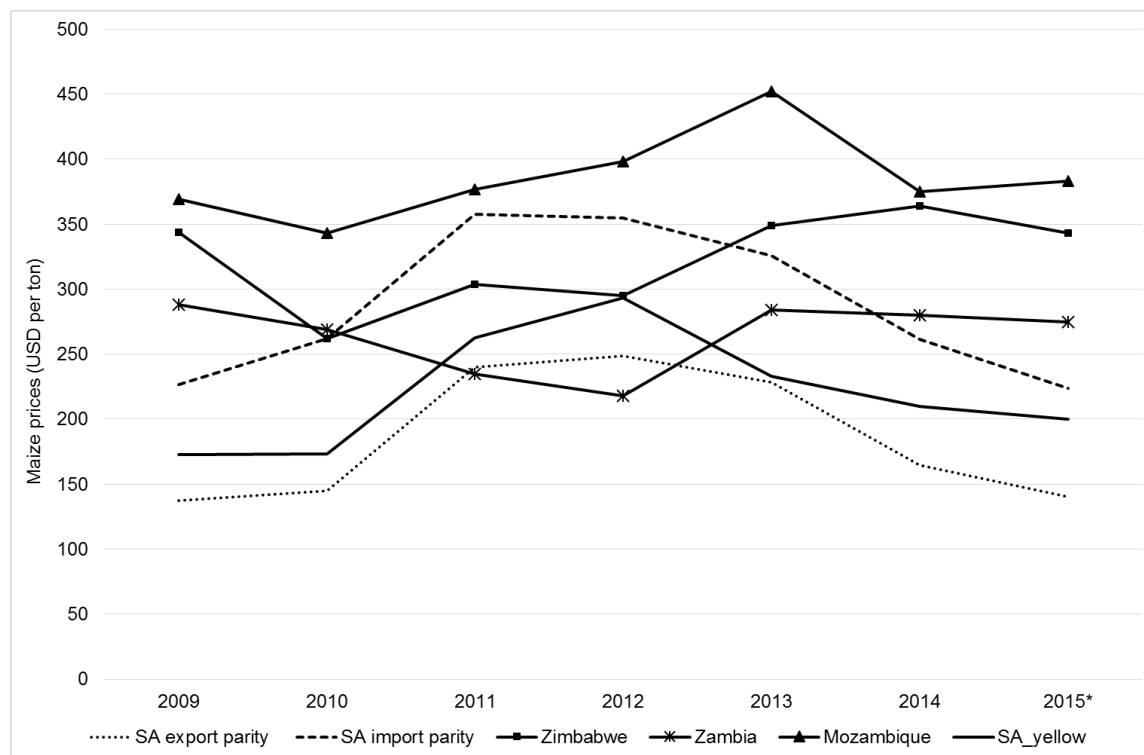
4.2 Input price: prices of maize in the region

As maize constitutes the single largest cost in the production of animal feed—and consequently the production of chicken—the price of maize plays a crucial role in the level of competitiveness of a firm or country's broiler production. For South Africa as the largest net exporter, the export parity and import parity prices are also presented (Figure 4). Given that South Africa actually

²⁶ Interview with AFMA, 15 July 2015.

mostly uses yellow maize for the production of animal feed, South African yellow maize prices are also presented for comparison with the rest of the countries that use white maize. The prices of yellow and white maize in South Africa are not very different.

Figure 4: Maize prices (US\$ per ton)



Note: The South African (SA) import and export parity prices are imputed figures calculated by the South African Grain Information Services (SAGIS). The export parity price is imputed by estimating a FOB (free on board) Gulf value for maize in Rands and subtracting transport, finance, and loading costs to get the export realization. The import parity price is imputed by estimating a CIF (cost, insurance, freight) value for maize and adding transport and discharging costs to get the delivered price. Average annual prices are given except for 2015*, where prices are up to March for Zimbabwe and Mozambique, to February for Zambia, and to August for South Africa.

Source: FAO (2015b), SAGIS (2015), and SMA (2015).

Mozambique has the highest prices of maize for the countries under study at above US\$350 per ton during the period under review. The country also protects its poultry industry. Zimbabwe has the second highest prices. Before the land reform programme Zimbabwe used to produce excess maize and export, with relatively low local prices.²⁷ This has since changed as there are now shortages and the country now relies on maize imports (approximately 500,000 tons in 2014) to supplement local production, particularly outside the harvest seasons.²⁸

As the largest producers of maize in the region, South Africa and Zambia have the lowest prices. South Africa's export parity prices are the net-back prices for exports to deep-sea markets which are low given competition in these markets and the transport costs that have to be subtracted to obtain the net export price in inland regions.²⁹ However, these lower prices are not seen in countries such as Zimbabwe as there is a ban on GMO maize which is the product found in

²⁷ Interview with Drummonds Farm Fresh Chickens, 17 August 2015.

²⁸ Interview with Drummonds Farm Fresh Chickens, 17 August 2015.

²⁹ The reference point is Randfontein, close to Johannesburg.

South Africa. Zambia's price reflects exports to its neighbours. Zambia is Zimbabwe's main source of maize imports as it produces non-GMO maize. For much of the period from 2011 to 2015, Zimbabwean maize prices track Zambian prices, with a premium that should reflect transport and logistics costs between the two countries.

In conclusion, we note that there has been an increase in both demand and production of poultry and oilcake in the region. South Africa is the largest producer in absolute terms of both poultry and animal feed; it is also the largest importer and exporter of these products in the region. South Africa also provides the region with the most likely catalyst for growth and development given its high levels of excess demand for poultry meat, as well as persistent deficits in soya. Zambia has the ability to competitively produce the main animal feed component crops of maize and soya. It has recorded rapid growth in production of poultry, maize, and soya, first meeting its own needs and then exporting to neighbouring countries in the region. Producers in Zimbabwe still rely on the imports of maize and soya owing to low levels of production. Given the unique geographic advantages afforded to countries such as Zambia and Zimbabwe, it is expected that these countries will experience more growth driven by South African demand.³⁰

5 Industrialization and the poultry value chain

The poultry industry in the region has grown strongly due to investments by a small number of regional producers who are vertically integrated and have international relationships, such as for sourcing breeding stock. As previously mentioned in Section 2.2, the main poultry and animal feed companies in South Africa, Zambia, and Botswana are all inter-related and spread across the region, with (largely) South African firms leading the growth of the Zambian and Mozambican poultry industries.

The development of the sector across the region has thus been related to the strategies and investments of large firms. The management of the production at different levels is critical because of the co-ordination required to ensure competitiveness of the overall chain. This actual and potential competitiveness is an important motivator for investments. In this section, we draw on the value chain theory as outlined in Section 3 to consider the nature of governance of value chains, the different means of co-ordination, including full vertical integration, and the processes of upgrading (Keane 2015). We relate this to industrialization through agro-processing and the development of regional value chains.

As previously mentioned in Section 3, governance in the GVC literature is most recently understood through five different governance structures. In the southern African region, the largest poultry firms are generally characterized by high levels of vertical integration, particularly with breeding operations and feed production. Downstream the firms have used out-growers, while owning the abattoir. There are some variations between firms. Rainbow Chicken has been the most integrated, whereas Astral has had a breeding joint venture with other firms. The smaller firms that have grown in the sector have generally been vertically integrated into feed production.

Where animal feed production is concerned, the products generally have a standard specification. Most animal feed is made up of 60 per cent maize, 30 per cent soybeans, and the rest (10%) is

³⁰ It must be noted that because the complete data for 2015 has not been released at the time of writing, the effects of the drought which is currently affecting most parts of southern Africa have not been analysed in this working paper.

made up of vitamins and minerals. Differences may occur in composition, particularly depending on the phase of the feed—starter, grower, or finisher—and also as animal feed producers try to minimize the feed conversion ratio. Because animal feed accounts for such a large portion of the cost of producing broilers—roughly 60 per cent—it is a crucial determinant of competitiveness in broiler production. Vertical integration into feed production ensures supply at reasonable costs, as compared with arms-length transactions where the buyer can be subject to the exertion of market power. Thus, although the transactions are fairly simple and product specifications are fairly easy to communicate, vertical integration among the large players with animal feed has been widely observed. However, some broiler producers are not integrated with animal feed production and depend on the large firms for their supply of animal feed.

In the production of day-old chicks, vertical integration is also a key characteristic, particularly for the large firms. However, the reasons for vertical integration may differ slightly with those for feed production. Because the production of day-old chicks from great-grandparent stock is a process that takes up to 18 months, co-ordination is important to ensure that day-old chicks are delivered to customers on time. However, some level of co-ordination is required between the feed suppliers and poultry farmers in order for the feed to be delivered on time as chickens need to be fed at specific intervals.

Although the level of co-ordination required implies benefits from vertical integration, recent restructuring has included vertical disintegration. In South Africa, the changes in Pioneer to form Quantum involved the closure of their abattoir and an agreement with Astral for supply of live birds, effectively making Quantum a very large outgrower as Quantum exited from the two areas requiring the largest investments and scale of operations. Moreover, the increased use of independent outgrowers across the region, coupled with backward integration into animal feed production, indicates not only a need to cut costs but also the level of control actually required at different stages of the value chain. As such, a competitive poultry value chain involves relationships between relational and hierarchical structures, owing to the vertical integration found upstream and the increased use of independent outgrowers. There are also independent firms that have modular relationships for feed and sourcing breeding stock, but this does not provide the certainty to grow operations. Scale economies are critical at breeding level and at slaughtering and processing, in particular, while investment along the value chain needs to be co-ordinated to ensure throughput, meaning overall growth of the industry is driven by investments of large integrated firms.

New entrants often enter the market as contract growers who buy day-old chicks and feed from the large producer to whom they are contracted (Bagopi et al. 2014). Because large firms control the animal feed, have licences for the high-performing breeds, and provide the opportunity for entry into the poultry industry through outgrowing, they hold the key to development in the poultry value chain in the region. Entry on a large scale requires substantial linked investments and a significant amount of time to bring production on-stream, as in the case of production of day-old chicks; thus, building a business will involve a considerable period before returns are realized, as seen in the case of South Africa's latest entrant, GFC.

Concentration in the key inputs means market power can be exerted over non-integrated firms and entrants. Concentration is highest in breeding stock, although there has also been an oligopoly in feed production in the countries studied here. For example, in Zambia, the prices of day-old chicks have been much higher than those in South Africa despite Zambia being a net exporter (Bagopi et al. 2014). This is an indication of the exertion of market power by the two largest suppliers who account for 75 per cent of the market (Bagopi et al. 2014). There have also been milling cartels in South Africa and supply is relatively concentrated.

Another example of the exertion of market power by large firms is seen in the case that was brought to the Competition Commission of South Africa by CBH against Astral. After gaining unilateral control of the Elite Breeding Farms joint venture in 2002, Astral enforced restrictive provisions lessening the ability of rivals to compete (Robb and Ngwenya 2011; see also Competition Tribunal 2011, 2013). Astral enforced provisions restricting independents from sourcing from other breeders (entrants and small participants) and tied in its feed purchases from its own operations (Meadow). The joint venture had been formed in the 1980s between a number of parties who were rivals to the dominant firm Rainbow Chickens and who needed a supply of breeding stock. It had thus been pro-competitive. When Astral acquired sole control it enforced restrictive arrangements over customers who were also downstream rivals. The end of these restrictive arrangements has seen the growth of smaller producers, substantially increased effective rivalry, increased investment, and lower margins. Astral admitted to abusing its dominant position in the breeding market in restricting a smaller rival, CBH, from competing in the broiler market by introducing a new breeding stock (see Competition Tribunal 2013: paragraph 4.2).

5.1 The poultry sector as part of regional industrialization in agro-processing?

There have been a number of developments in the animal feed to poultry value chain related to agro-processing in the region. Across the spectrum, the developments have been related to investments, a move towards contract farming, upgrading, particularly in the South African poultry market, and regional integration. The rest of this section assesses each of these developments in detail.

Investments

The animal feed and poultry industries have seen a great deal of investment in the region. The investments in the region differ by country and speak directly to the needs and the distinct industry structures in each country. South Africa, with its high levels of concentration and vertical integration, has seen entry most recently in the form of contract farmers and also in the form of producers vertically integrated with feed production—Afgri and GFC. After having entered the South African market in 2005, Afgri, which also had breeding operations, has since sold off its poultry operations that now operate as Daybreak. GFC entered the South African poultry industry in 2010, started operating in 2012, and made its first profit in its 2014 financial year.

In other countries in the region the large investments have been made by the main established producers expanding their operations across southern African borders, mainly into Zambia and Mozambique. This has sustained very high rates of growth. In Zimbabwe, where the industry has not performed well by comparison, the poultry industry has seen investments mainly in the form of new entry of animal feed producers and the increase in hatcheries, and also small-scale investments in the form of the proliferation of small-scale poultry producers. Botswana's poultry industry is mainly dominated by vertically integrated South African firms.

Contract farming

There has been a big move towards contract farming in both South Africa and Zimbabwe. For Zimbabwe's largest player Irvine's, the move to contract farming happened around 2009, which is when dollarization happened. Irvine's switched from producing 70 per cent of their production internally to having 70 per cent of their production come from contract growers. The

switch from internal production is driven by the need to reduce overheads and to spread the risk associated with growing chickens to several farmers.³¹

In South Africa, where almost all production is large scale, there has been a steady move towards contract farming. As previously noted in Section 2, contract growing in the production of broilers in South Africa accounts for approximately 60–80 per cent of total production. This is largely owing to the increased costs associated with rearing birds, including the costly nature of owning farm land. Although there are some new farms, a number of contract growers have entered the industry by buying existing farms from the larger producers. For example, Daybreak has sold seven of its farms in the last six months ending June 2015 to black-owned entities that are now supplying Daybreak with 20 per cent of its broiler offtake on a five-year contract. Of total Daybreak chickens, 80 per cent is produced by contract growers with the remaining 20 per cent stemming from its own operations.

Upgrading and capabilities

The most sophisticated capabilities are required in the breeding operations. There is an important impact on the overall performance as upgrading the breeds being produced means better performance in terms of feed conversion ratios, mortality, and resistance to disease.

There are also important upgrading issues at the broiler rearing level. The feed conversion ratio has decreased over the last few decades from roughly 2.2 in 1980 to between 1.7 and 1.8 in more recent years.³² The feed conversion ratio is determined by a number of factors. First, it depends on how well the birds are managed as they need to be fed at specific intervals. Second, the birds need to have the correct feed at the correct stage. More recently, in South Africa, animal feed producers have gone from three-phase feeds to five-phase feeds, indicating that animal feed has become more specific and poultry production is becoming more technical. A higher number of phases requires more knowledge on the part of the producers of the birds, and also indicates a higher level of sophistication required for the production of birds. A final determinant of feed conversion ratio is the development in the distinction between broiler and layer feed. While layers are fed with mash feed, which is in the form of meal, broilers are fed with pellets. The distinction has been made in order to increase the efficiency of animal feed in broilers, which need to grow to their full size within a roughly 35-day period. As such, each pellet is said to contain the correct amount of nutrients needed by the broilers. In contrast, layers are fed with mash because it is not optimal for them to grow fast as this would affect their egg-laying capabilities.

Regional integration and industrialization

Regional integration and industrialization plays out in a number of different ways in the poultry industry. The largest South African poultry companies—RCL, Astral, and CBH—have expanded to other parts of the region, mainly Zambia and Mozambique. They all have vertically integrated poultry operations in these countries, with some of them exporting fertilized eggs to their operations outside South Africa. In Zimbabwe, most imports of raw materials come from the region. Animal feed inputs (i.e. maize, soybeans, and oilcake) are largely imported from Zambia.³³ Because Zimbabwe has a ban on GMO maize, it does not import maize for animal feed production from South Africa which has the cheapest maize source because of its use of

³¹ All information/data regarding Irvine's here is based on an interview with Irvine's, 21 August 2015.

³² Interview with CBH, 3 July 2015.

³³ Interview with LMAC, 19 August 2015.

GMO seeds. As such, Zambia is the closest non-GMO maize source. This indicates that the value chain for poultry production is becoming more regional in nature.

As far as regional industrialization is concerned, all the firms that have set up operations outside South Africa have fully integrated operations. In addition, RCL has invested in crushing capacity in Zambia, with the aim of bringing down the price of animal feed. RCL has also expanded its Zambian poultry operations by setting up in northern Zambia to supply the Copperbelt region and the Democratic Republic of Congo.

6 Conclusion

The increases in urbanization in the southern African region have led to strong and sustained growth in demand for poultry. Although this has been accompanied by production growth, apart from Zambia, all countries in the region continue to run trade deficits. Poultry has strong and important backward linkages to the animal feed production sector and, in turn, to agricultural output. Competitive production of the final output requires matching linked investments in efficient production facilities at different levels in the value chain, in what are essentially industrial activities, with low-cost primary inputs from agriculture. This presents important opportunities for industrialization with agro-processing being put forward as a means by which developing countries, particularly those in Africa, can increase economic development.

This working paper provides an overview of the animal feed to poultry value chain in the region, positioning it within the debates around industrialization, value chains, and market power. The poultry industry in the region has several important characteristics. First, the industry is driven by commercialized production, particularly in South Africa, with the rest of the region increasing its commercialized production. Second, the industry is characterized by vertical integration with key inputs such as animal feed and breeding operations. Third, the value chain is regional in nature, characterized by intra-regional trade in animal feed components and also the regional spread of large poultry companies that govern the chain.

The cross-country investments being made by large poultry companies in the region indicate that a degree of regional integration is being fostered by firms in the region, largely in the absence of agreements between neighbouring states and in spite of barriers to trade that have been put in place. However, the predominance of large firms in the value chain also raises important questions about the strategies lead firms are pursuing, including vertical integration and agreements, and the implications for the development of local and regional agro-processing capabilities. Two important aspects of industrialization in the poultry value chain—upgrading of feed and breeds, and co-ordinated investments across the region—have been led by large firms. This underlines the importance of large firms in the development of the animal feed to poultry value chain in southern Africa.

The linkages created through the large investments across the region indicate that a stronger and more regional value chain is developing across southern Africa. The analysis suggests that there is the potential for substantially improved performance if poultry production can be internationally competitive and, at the minimum, replace imports. However, this will only happen once soya oilcake for the production of animal feed can be sourced competitively from within the region to complement the existing competitive supply of maize. The logistics required is an important part of the picture given that the main potential for agricultural expansion is in countries such as Zambia, located quite far from the main sources of demand. Key policy challenges for governments in the region involve a coherent regional strategy for the poultry industry, including ensuring the competitiveness of animal feed produced in the southern

African region, as well as the expansion of sophisticated production capabilities involved in commercial poultry and its processing and supply to consumer markets.

References

- AfDB (African Development Bank), Organisation for Economic Co-operation and Development, and United Nations Development Programme (2014). *African Economic Outlook 2014: Global Value Chains and Africa's Industrialisation*. Paris: UN Economic Commission for Africa. Available at: http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/2014/PDF/E-Book_African_Economic_Outlook_2014.pdf (accessed 5 December 2015).
- AgriProFocus (2015). 'Market Study on Investment Opportunities of Zambian Poultry Sector in Domestic and Regional Markets'. Available at: http://agriprofocus.com/upload/Market_Study_on_Investment_Opportunities_in_Poultry_Industry1436419679.pdf (accessed 8 September 2015).
- Bagopi, E., E. Chokwe, P. Halse, J. Hausiku, M. Humavindu, W. Kalapula, and S. Roberts, (2014). 'Competition Dynamics and Regional Trade Flows in the Poultry Sector: The Case of South Africa, Botswana, Namibia, and Zambia'. Paper presented at the *Pre-ICN Forum*, 22 April, Palmeraie Golf Palace. Marrakech: International Competition Network. Available at: http://agriprofocus.com/upload/post/2014_Poultry_Trade_flows_in_S_Africa_Botswana_Namibia_Zambia_ICN_Confpaper1443600533.pdf (accessed 26 January 2016).
- Bair, J. (2008). 'Global Commodity Chains'. In J. Bair (ed.), *Frontiers of Commodity Research*. California: Stanford University Press, pp. 1–34.
- Chawafambira, K. (2015). 'Zimbabwe Poultry Production up 22pc'. *Daily News*, 28 April. Available at: <http://www.dailynews.co.zw/articles/2015/04/28/zim-poultry-production-up-22pc> (accessed 7 December 2014).
- Chikwati, E. (2015). 'Farmers Holding On to Surplus Grain'. *The Herald*, 20 August. Available at: <http://www.herald.co.zw/farmers-holding-on-to-surplus-grain/> (accessed 7 December 2015).
- Competition Tribunal (2011). 'The Competition Commission v. Astral Operations Ltd, Elite Breeding Farms, and Ross Poultry Breeders (Pty) Ltd'. Case 74/CR/Jun08, 30 June 2008, Pretoria. Available at: <http://www.saflii.org/za/cases/ZACT/2011/83.html> (accessed 9 November 2015).
- Competition Tribunal (2013). 'The Competition Commission v. Astral Operations Limited'. Case 015891, 5 November, Pretoria. Available at: <http://www.comptrib.co.za/assets/Uploads/015891.pdf> (accessed 9 November 2015).
- Cramer, C. (1999). 'Can Africa Industrialize by Processing Primary Commodities?: The Case of Mozambican Cashew Nuts'. *World Development*, 27(7): 1247–66.
- DAFF (Department of Agriculture, Forestry and Fisheries) (2014). *A Profile of the South African Broiler Market Value Chain*. South Africa: DAFF. Available at: <http://www.nda.agric.za/daaDev/sideMenu/Marketing/Annual%20Publications/Commodity%20Profiles/Livestock/Broiler%20market%20value%20chain%20profile%202014.pdf> (accessed 7 December 2015).

- DTI (Department of Trade and Industry) (2012). 'Strategy for the Development of the Soybean Sector in South Africa'. South Africa: Agro-Processing Unit, Industrial Development Policy Development Division, DTI. [Accessed via private communication.]
- DTI (Department of Trade and Industry) (2016). 'Press Statement on President Obama's 11th January 2016 Proclamation'. Available at: <http://www.thedti.gov.za/editmedia.jsp?id=3627> (accessed 26 January 2016).
- Diamond, A., D. Tropp, J. Barham, M.F. Muldoon, S. Kiraly, and P. Cantrell (2014). 'Food Value Chains: Creating Shared Value to Enhance Marketing Success'. Agricultural Marketing Service Report. Washington, DC: US Department of Agriculture. Available at: <http://dx.doi.org/10.9752/MS141.05-2014> (accessed 7 December 2015).
- Dolan, C., and J. Humphrey (2000). 'Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticulture Industry'. *The Journal of Development Studies*, 37(2): 147–76.
- Ensor, L. (2015). 'Agoa Compromise Mixed Blessing for SA'. *Business Day*, 9 June. Available at: <http://www.bdlive.co.za/business/trade/2015/06/09/agoa-compromise-mixed-blessing-for-sa> (accessed 7 December 2015).
- FAO (Food and Agriculture Organization) (2013). 'Poultry Sector: Mozambique'. *FAO Animal Production and Health Livestock Country Reviews*, 5. Rome: Rome. Available at: <http://www.fao.org/3/a-i3487e.pdf> (accessed 7 December 2015).
- FAO (Food and Agriculture Organization) (2015a). 'GIEWS Country Briefs: South Africa'. Rome: Global Information and Early Warning System (GIEWS) on Food and Agriculture. Available at: <http://www.fao.org/giews/countrybrief/country.jsp?code=ZAF> (accessed 7 December 2015).
- FAO (Food and Agriculture Organization) (2015b). FPMA—Food Price Monitoring and Analysis Tool. Available at: <http://www.fao.org/giews/pricetool/> (accessed 14 November 2015).
- Fessehaie, J., R. das Nair, P. Ncube, and S. Roberts (2015). 'Growth Promotion through Industrial Strategies: A Study of Zambia'. IGC Working Paper 6/2015. London: International Growth Centre. Available at: <http://www.theigc.org/wp-content/uploads/2015/06/Roberts-et-al-2015-Working-paper.pdf> (accessed 7 December 2015).
- Fromm, I. (2007). 'Upgrading in Agricultural Value Chains: The Case of Small Producers in Honduras'. GIGA Working Paper 64/2007. Hamburg: German Institute of Global and Area Studies (GIGA). Available at: https://giga.hamburg/en/system/files/publications/wp64_fromm.pdf (accessed 24 August 2015).
- Gereffi, G. (1999). 'International Trade and Industrial Upgrading in the Apparel Commodity Chain'. *Journal of International Economics*, 48(1999): 37–70.
- Gereffi, G., and K. Fernandez-Stark (2011). 'Global Value Chain Analysis: A Primer'. Discussion Paper. Durham, NC: Center on Globalization, Governance & Competitiveness, Duke University. Available at: http://www.cggc.duke.edu/pdfs/2011-05-31_GVC_analysis_a_primer.pdf (accessed 5 November 2015).
- Gereffi, G., J. Humphrey, R. Kaplinsky, and T.J. Sturgeon (2001). 'Introduction: Globalisation, Value Chains and Development'. *IDS Bulletin*, 32(3): 1–8.

- Gereffi, G., J. Humphrey, and T. Sturgeon (2005). 'The Governance of Global Value Chains'. *Review of International Political Economy*, 12(1): 78–104.
- GMB (Grain Marketing Board) (2015). 'About GMB'. Available at: <http://www.gmbdura.com/gmbdura/About> (accessed 20 July 2015).
- Hellin, J., and O. Erenstein (2009). 'Maize–Poultry Value Chains in India: Implications for Research and Development'. *Journal of New Seeds*, 10(4): 245–63.
- Humphrey, J., and H. Schmitz (2001). 'Governance in Global Value Chains'. *IDS Bulletin*, 32(3): 19–29.
- Humphrey, J., and H. Schmitz (2002). 'How Does Insertion in Global Value Chains Affect Upgrading in Industrial Clusters?'. *Regional Studies*, 36(9): 1017–27.
- Innscor Africa Limited (2014). '2014 Annual Report'. Harare: Innscor Africa Limited. Available at: http://www.innscorafrica.com/?wpfb_dl=52 (accessed 14 August 2015).
- Innscor Africa Limited (2015). '2015 Annual Report'. Harare: Innscor Africa Limited. Available at: http://www.innscorafrica.com/?wpfb_dl=71 (accessed 26 January 2016).
- ITAC (International Trade Administration Commission of South Africa) (2013). 'Increase in the Rates of Customs Duty on Frozen Meat of Fowls of the Species *Gallus domesticus*: Whole Bird, Boneless Cuts, Bone-in Portions, Carcasses and Offal'. ITAC Report 442. Pretoria: ITAC. Available at: http://www.itac.org.za/upload/document_files/20140923013120_Report-no-442.pdf (accessed 22 July 2015).
- ITAC (International Trade Administration Commission of South Africa) (2015). 'Investigation into the Alleged Dumping of Frozen Bone-in Portions of Fowls of the Species *Gallus domesticus*, Originating from Germany, The Netherlands and the United Kingdom: Final Determination'. ITAC Report 492. Available at: http://www.itac.org.za/upload/document_files/20150306125607_Report-No-492.pdf (accessed 22 July 2015).
- ITC (International Trade Centre) (1999–2015). 'Trade Map: Trade Statistics for International Business Development'. Geneva: ITC/UNCTAD/WTO. Available at: www.trademap.org (accessed 7 December 2015).
- Jensen, H.G., and R. Sandrey (2015). 'African Agricultural Trade: Recent and the Future'. *African Journal of Agricultural and Resource Economics*, 10(2): 146–57.
- Kaplinsky, R. (2000). 'Globalisation and Unequalisation: What Can Be Learned from Value Chain Analysis?'. *Journal of Development Studies*, 37(2): 117–146.
- Kaplinsky, R., and R. Fitter (2004). 'Technology and Globalisation: Who Gains When Commodities Are De-commodified?'. *International Journal of Technology and Globalization*, 1(1): 5–28.
- Kaplinsky, R., and M. Morris (2001). *A Handbook for Value Chain Research*. Prepared for the International Development Research Centre. Milton Keynes: The Open University. Available at: <https://www.ids.ac.uk/ids/global/pdfs/VchNov01.pdf> (accessed 7 December 2015).
- Keane, J. (2015). 'Firms and Value Chains in Southern Africa'. World Bank Working Paper. Washington, DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/2016/02/25858463/firms-value-chains-southern-africa>

- Kwaramba, M., and F. Tregenna (2014). 'International Trade Administration Commission Tariff Investigations: An Analysis of the Poultry and Paper Cases'. *Journal of Economic and Financial Sciences*, 7(S): 619–40.
- le Cordeur, M. (2016). 'New Agoa deadline set as Obama announces SA suspension date'. *Fin24*, 12 January. Available at: <http://www.fin24.com/Economy/breaking-obama-announces-sa-suspension-from-agoa-on-march-15-20160112> (accessed 1 February 2016).
- LMAC (Livestock and Meat Advisory Council) (2014). '2014 Annual Report'. Harare: LMAC. Available at: <http://www.livestockzimbabwe.com/images/LMAC%202014%20Annual%20Report,%20Final.pdf> (accessed 25 January 2016).
- Louw, A., J. Schoeman, and M. Geysers (2013). 'Pork and Broiler Industry Supply Chain with Emphasis on Feed and Feed-Related Issues'. *Journal of Agricultural Economics and Development*, 2(4): 134–46.
- Lovell, K. (2012). 'The South African Poultry Industry and Its Outlook Going Forward'. Presented at the *Animal Feed Manufacturers' Association Annual General Meeting*, 7 September. Mount Grace Country House and Spa, Magaliesburg: Animal Feed Manufacturers' Association. Available at: <http://www.afma.co.za/imgs/Mr%20Kevin%20Lovell%20-%20SA%20Poultry%20Industry%20and%20its%20outlook%20going%20forward%20-%20AFMA%20AGM%207%20September%202012.pdf> (accessed 7 October 2015).
- Magwaza, N. (2014). 'Broilers for Astral, Tight Focus for Pioneer'. *Business Report*, 4 April. Available at: <http://www.iol.co.za/business/news/broilers-for-astral-tight-focus-for-pioneer-1.1670923#.VISSYHYrLcs> (accessed 7 December 2015).
- McCleod, A., O. Thieme, and S.D. Mack (2009). 'Structural Changes in the Poultry Sector: Will There Be Smallholder Poultry Development in 2030?'. *World's Poultry Science Journal*, 65(2): 191–200.
- Mnyandu, E. (2015). 'Davies Off to Washington to Defuse Poultry Spat'. *Business Report*, 2 April. Available at: <http://www.iol.co.za/business/markets/davies-off-to-washington-to-defuse-poultry-spat-1.1840292#.Ve6StxGqqko> (accessed 7 December 2015).
- Morris, M., and J. Fessehaie (2014). 'The Industrialisation Challenge for Africa: Towards a Commodities based Industrialisation Path'. *Journal of African Trade*, 1(2014): 25–36.
- Mtomba, V. (2015). 'Zambia Eyes GMB's Silos'. *NewsDay*, 1 September. Available at: <https://www.newsday.co.zw/2015/09/01/zambia-eyes-gmbs-silos/> (accessed 7 December 2015).
- Ouma, S., and L. Whitfield (2012). 'The Making and Remaking of Agro-industries in Africa'. *The Journal of Development Studies*, 48(3): 301–7.
- Petkova, I. (2006). 'Shifting Regimes of Governance in the Coffee Market: From Secular Crisis to a New Equilibrium?'. *Review of International Political Economy*, 13(2): 313–39.
- Ponte, S. (2002). 'The "Latte Revolution"? Regulation, Markets and Consumption in the Global Coffee Chain'. *World Development*, 30(7): 1099–122.
- Raikes, P., M.F. Jensen, S. and Ponte (2000). 'Global Commodity Chain Analysis and the French Filière Approach: Comparison and Critique'. *Economy and Society*, 29(3): 390–417.
- Robb, G., and A. Ngwenya (2011). 'Theory and Practice in the Use of Merger Remedies: Considering South African Experience'. *The South African Journal of Economic and Financial Sciences*, 4: 203–20.

- Smart, T., and J. Hanlon (2014). *Chickens and Beer: A Recipe for Agricultural Growth in Mozambique*. Maputo. Kapicua.
- SAGIS (South African Grain Information Service) (2015). ‘Historic Database’. Available at: [http://www.sagis.org.za/Flatpages/Historiese%20SAGIS%20Info%20\(Hoofblad\).asp](http://www.sagis.org.za/Flatpages/Historiese%20SAGIS%20Info%20(Hoofblad).asp) (accessed 26 January 2016).
- SAPA (South African Poultry Association) (2014). ‘2014 Annual Report’. South Africa: SAPA. [Accessed via private communication.]
- SAPA (South African Poultry Association) (2015). ‘Zambia Country Report 2015’. South Africa: SAPA. Available at: <http://www.sapoultry.co.za/pdf-statistics/zambia-country-report.pdf> (accessed 7 December 2015).
- SMA (Stockfeed Manufacturers’ Association) (2015). ‘Raw Materials Usage and Feed Production Returns’. *SMA Newsletter*, March. [Accessed via private communication.]
- Stamm, A. (2008). ‘Agribusiness and Poverty Reduction: What Can Be Learned from the Value Chain Approach?’. In C. Stringer and R. Le Heron (eds), *Agri-food Commodity Chains and Globalising Networks: The Dynamics of Economic Space*. Aldershot: Ashgate, pp. 23–34.
- Steinfeld, H., T. Wassenaar, and S. Jutzi (2006). ‘Livestock Production Systems in Developing Countries: Status, Drivers, Trends’. *Scientific and Technical Review*, 25(2): 505–16.
- Takala-Greenish, L., W. Chambati, S. Moyo, M. Mwansa, G. Chigumira, and K. Vrolijk (2014). ‘Regional Industrialisation from the Perspective of the Soy Value Chain in South Africa, Zambia and Zimbabwe’. Unpublished research report. South Africa: Trade and Industry Policy Strategies (TIIPS) and Department of Trade and Industry (DTI).
- Technoserve (2011a). ‘Southern Africa Regional Soybean Roadmap: Final Report’. Available at: <http://www.technoserve.org/files/downloads/technoserve-bmgf-regional-presentation.pdf> (accessed 5 December 2015).
- Technoserve (2011b). ‘Growing Poultry Industry Transforms Lives in Mozambique’. Available at: <http://www.technoserve.org/blog/growing-poultry-industry> (accessed 5 December).
- Tregenna, F., and M. Kwaramba (2014). ‘An Institutional Analysis of the International Trade Administration Commission of South Africa of the Poultry and Paper Cases’. *Journal of Economic and Financial Sciences*, 7(S): 641–60.
- Watanabe, M., N. Jinji, and M. Kurihara (2009) ‘Is the Development of the Agro-processing Industry Pro-poor?: The Case of Thailand’. *Journal of Asian Economics*, 20(2009): 443–55.
- World Bank (2004). ‘Case Studies of Agricultural-based Growth Strategies: Options and Trade-offs with Relevance for Ethiopia’. Background Report. Africa Region: Poverty Reduction and Economic Management 2, Country Department for Ethiopia, The World Bank.
- Zengeni, T. (2014). ‘The Competitiveness and Performance of the Zimbabwe Poultry Industry’. Unpublished Masters dissertation. Johannesburg: University of the Witwatersrand.
- ZPA (Zimbabwe Poultry Association) (2013). *ZPA Newsletter*, March. [Accessed via private communication.]