

***Macro-Economic Impact Analysis of the South African Broiler industry applying the South African INFORUM Model (SAFRIM).***

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by

Christo Joubert<sup>1</sup>, Dr David Mullins<sup>2</sup> and Nomsa Phindile Nkosi<sup>3</sup>

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<sup>1</sup> Manager Agro Food Chains, MERC Division, National Agricultural Marketing Council of South Africa

<sup>2</sup> Head and Founder of Conningarth Economists

<sup>3</sup> Econometrist Conningarth Economist

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## **Abstract**

The South African Broiler sector is one of South Africa's most complex and integrated system. The industry is the biggest agricultural sub sector in terms of value of production which amounts to R31, 5 billion. This was 17.2% of the total value of agricultural gross domestic production in 2013 (DAFF; 2013). South African citizens consumed close to 40 kg of poultry per capita per annum in various formats in same period. The industry employs an estimated 110 000 people in the primary and secondary sectors. The annual poultry imports for 2013 into South Africa was close to 400 000 tons.

The primary objective of this research is to analyse the Macro-economic impact of the South African broiler industry by applying the South African INFORUM model (SAFRIM). The focus will be to analyse various scenarios to assist the further development of the industry. The objective of the scenarios is to compare supporting actions to assist the industry, instead of policies to protect the industry against international competition through import tariffs or other direct import reduction measures.

*JEL Classification: C32; C54; D11; D24; D57; D58; F13*

*Keyword: SAFRIM; Inter Industry Forecasting Model; Broiler; Poultry; Tariffs; Trade*

## **1 INTRODUCTION**

Currently, there is an important debate in South Africa on the lifting of import restrictions on broilers. The production of broilers is a very important agriculture industry in South Africa. Although this industry comprises mostly of large scale producers, it is also a product that can easily be produced by small scale farmers and can be used in the agriculture sector as an empowerment and development product for emerging farmers entering the commercial market. This is due to the simplicity of the production process, and the management and the availability of markets specifically in rural areas.

If the lifting of import restrictions on broilers takes place, this will harm the broiler industry with significant effect on employment, poverty alleviation, food security and sustainability and a destruction of capital investment across the integrated value chain. However on the other side, if broilers can be made available at lower prices due to the lifting of import restrictions, it will improve spending power of the consumers. This project's objective is to calculate the net effect of lifting import restrictions on broilers on the South African economy by making use of the South African Inforum Model (SAFRIM).

The paper is divided into the following sections:

- Overview of the Broiler industry in South Africa
- Challenges and sustainability in the Broiler industry – Import protection debate
- Description of the Case Study – The impact of relaxing import restrictions.
- Methodology
- Preliminary Results of Case Study
- Summary and conclusions

## **2 OVERVIEW OF INTERNATIONAL TRADE**

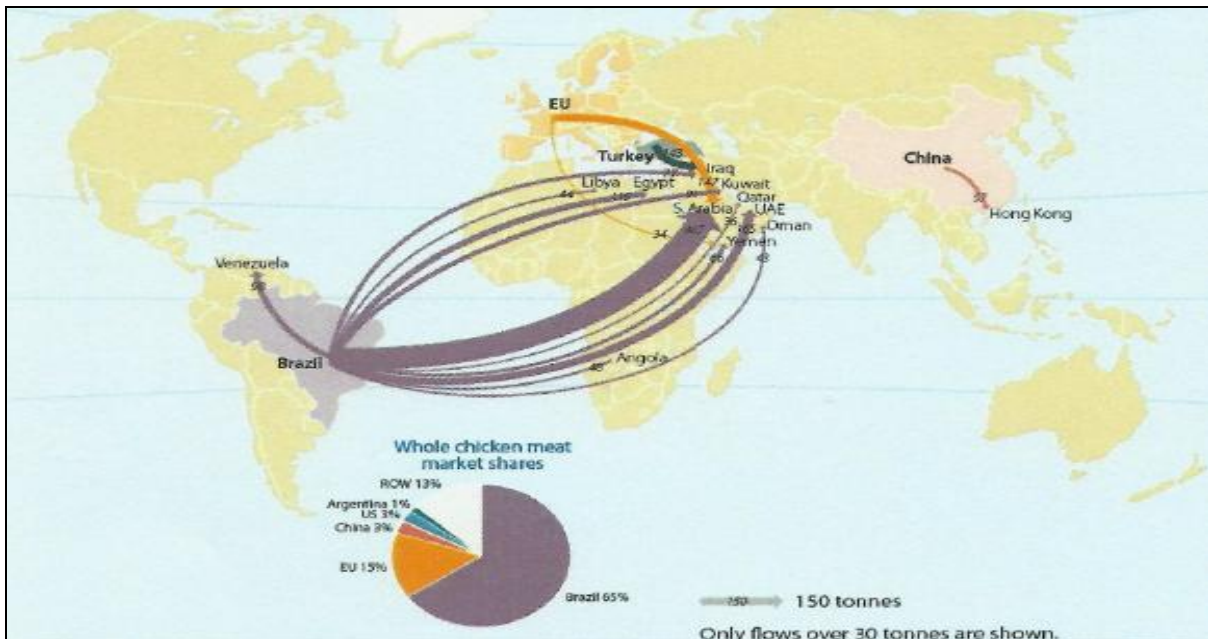
### **2.1 World Poultry Trade**

Although world poultry trade is classified into a lot of HS classification codes, Rebobank split the trade into 3 main categories namely:

- Whole bird frozen products
- Raw products (IQF cuts)

- Processed meat

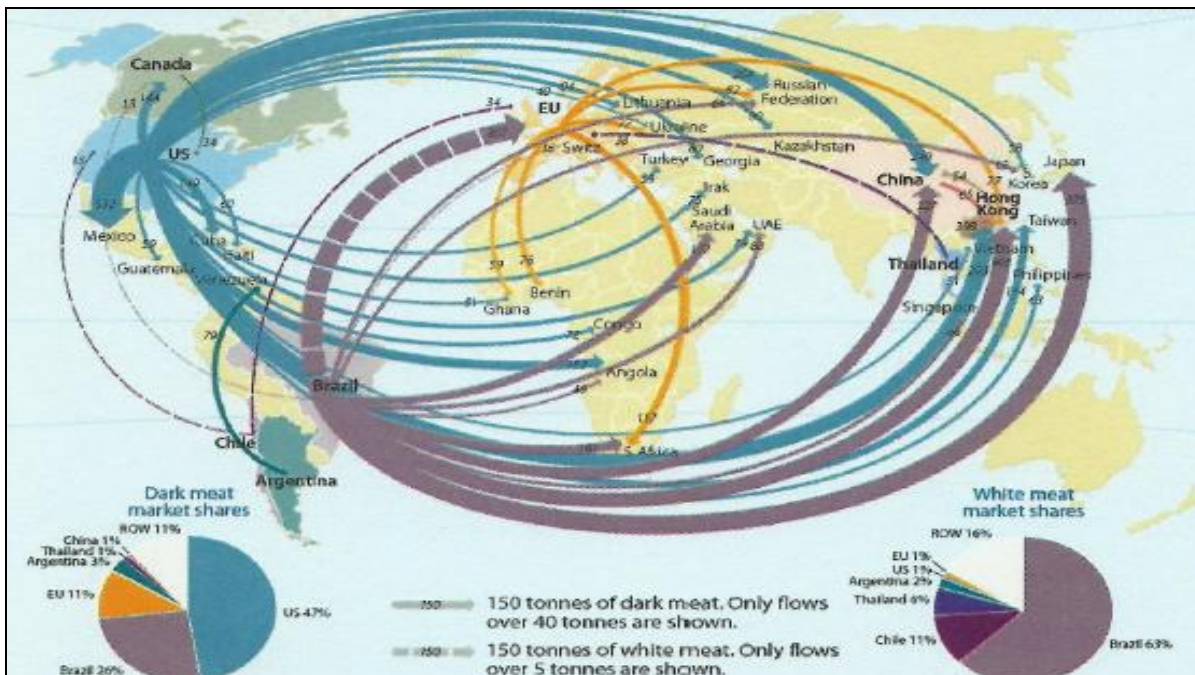
The whole bird trade market is concentrated and dominated by Brazil. Most of the trade is focused on the Middle East, Japan, Angola and Venezuela.



**Figure 1: Global whole chicken trade in 2012**

Source: Rabobank; 2014

The raw chicken meat trade can be split into 2 main categories namely white and dark chicken meat. The western market preferred the white chicken meat product and Asia and Africa prefer the dark chicken meat product as illustrated in figure 3.



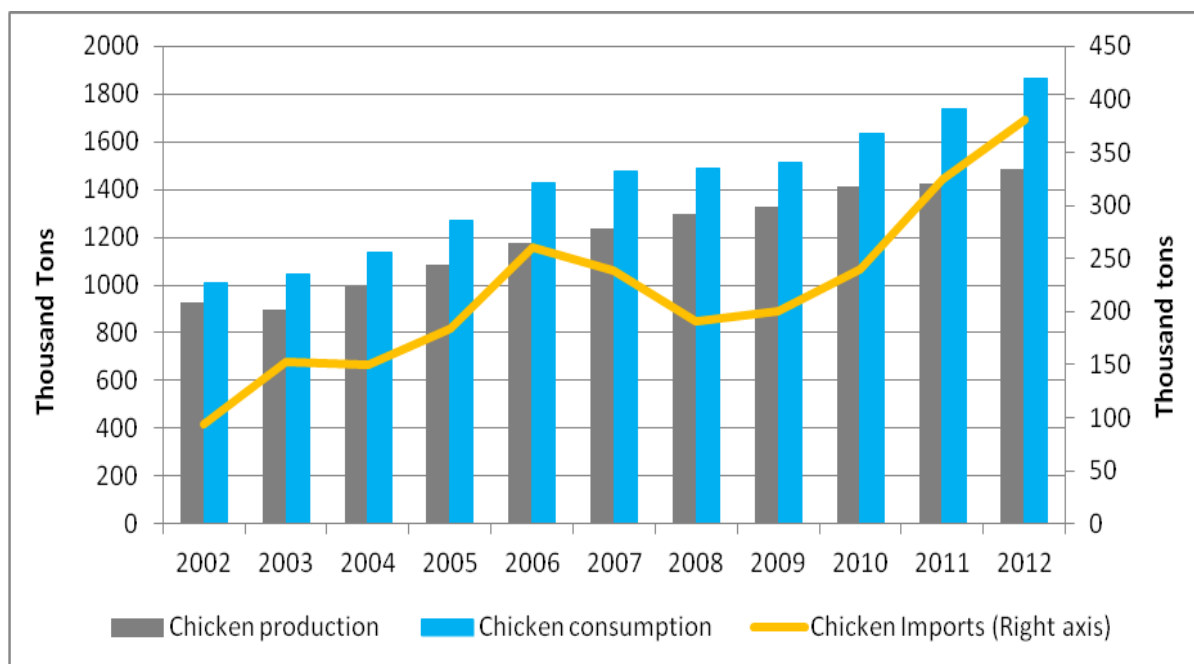
**Figure 2: Global white and dark chicken meat trade in 2012**

Source: Rabobank; 2014.

It is also the opinion of the authors that white meat is seen as more healthy and therefore gets higher prices. On the other hand the dark meat can then be sold for much cheaper to developing countries. The South African Poultry Association is of the opinion that the selling price of dark meat is below production cost.

### 3 OVERVIEW OF THE BROILER INDUSTRY IN SOUTH AFRICA

Chicken meat representing the most affordable source of animal protein, consumption has grown rapidly through the past decade, driven mainly by increased consumer income per capita. While chicken consumption grew at an average rate 8.4 % per annum for the period from 2002 to 2012 (BFAP, 2013), domestic production has not matched this growth, resulting in an increasing deficit in the local market (Figure 3), and a trend of increasing imports into South Africa. In 2011 the South African industry produced 1.42 million tons of broiler meat domestically, an increase of only 0.8 % from 2010 (SAPA, 2012), despite an increase of 3.3 % in per capita consumption from 2010 to 2011, implying that growing consumption was met by imports, as opposed to increased domestic production.

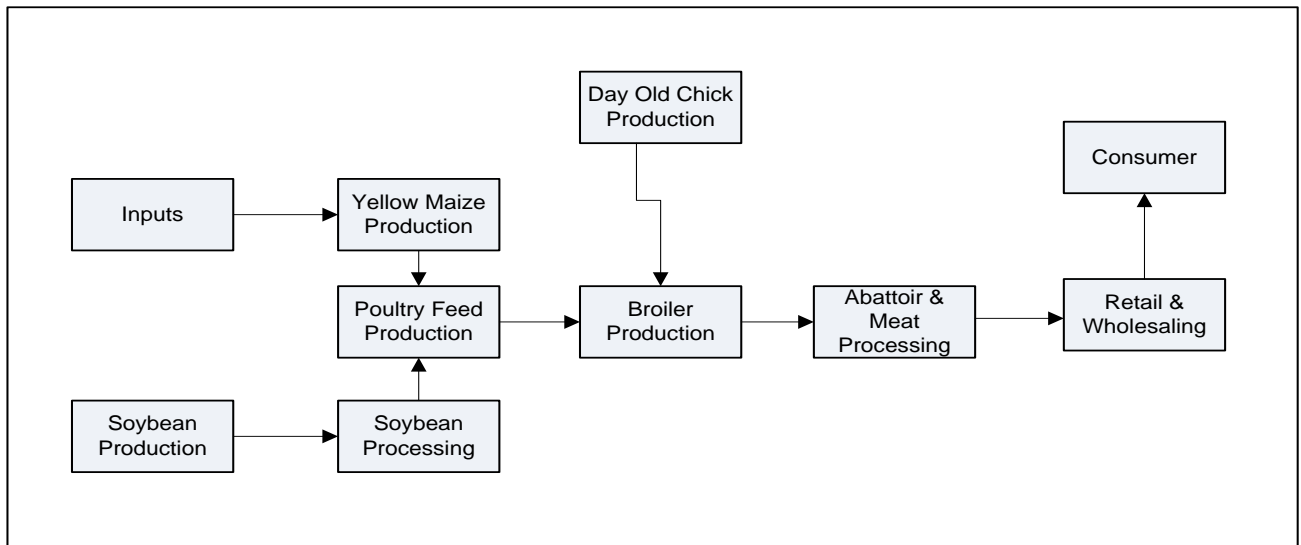


**Figure 3: Production, consumption and imports of broiler meat by South Africa: 2000 – 2011**

Source: Compiled from SAPA statistics

### 3.1 The South Africa broiler food system

The broiler value chain is highly dependent of the efficiency of other value chains, as illustrated in Figure 4. The chain forms part of a global food system and can be seen as a complex integrated structure of different chains, interacting with each other.

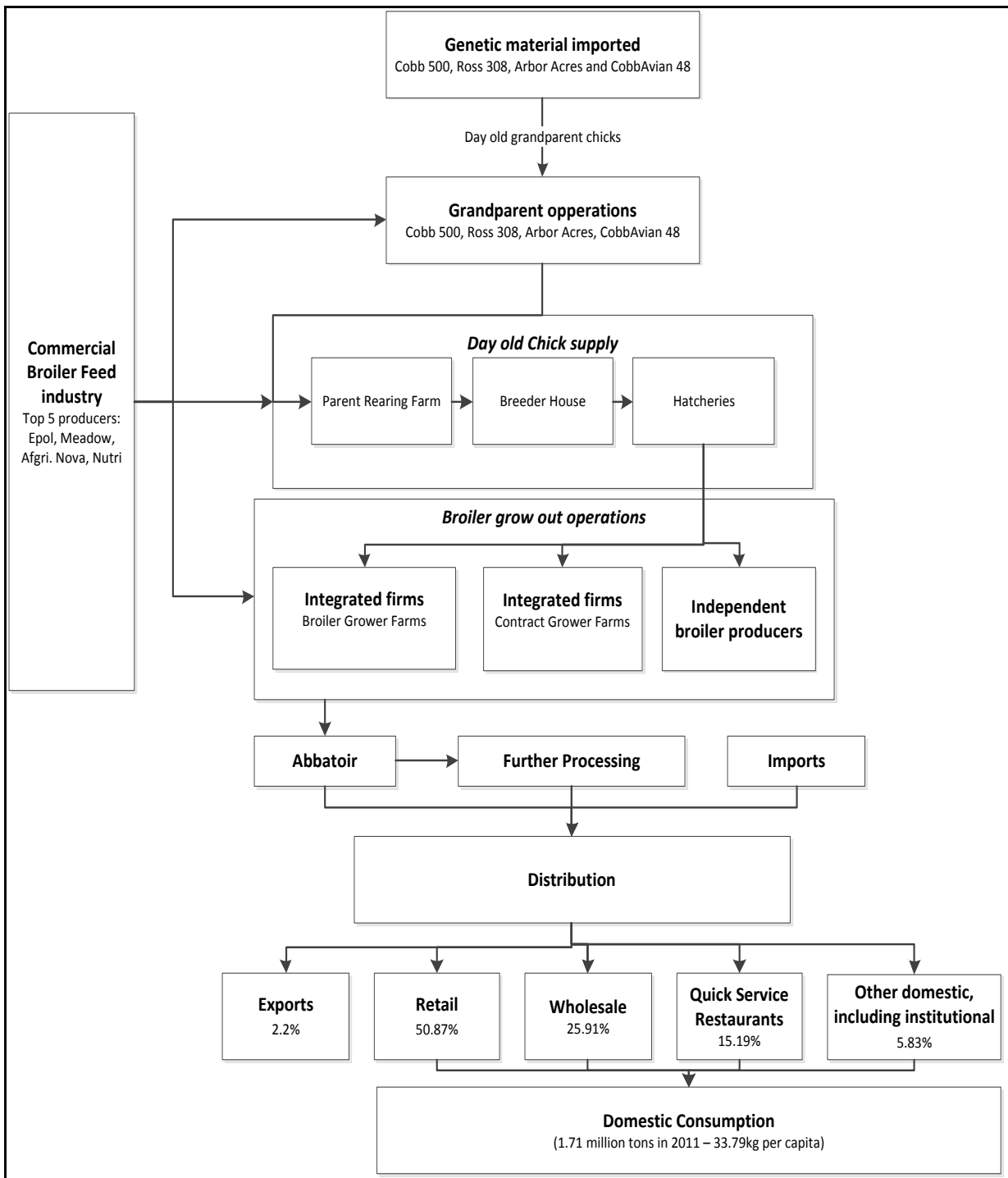


**Figure 4: The integrated broiler food system**

Source: Own compilation

### 3.2 The South African broiler value chain

The South African broiler value chain is complex. The value chain consists of several role players interacting with each other through the system. An illustration of the broiler value chain is provided by Davids (2013) in Figure 5. The commercial broiler industry consists of approximately 275 broiler producers and 231 contract growers, producing exclusively for specific holding companies (SAPA, 2013).



**Figure 5: Diagrammatic representation of a generic broiler supply chain in South Africa**

Source: Davids (2013).



## 4 CHALLENGES AND SUSTAINABILITY IN THE BROILER INDUSTRY – IMPORT PROTECTION DEBATE

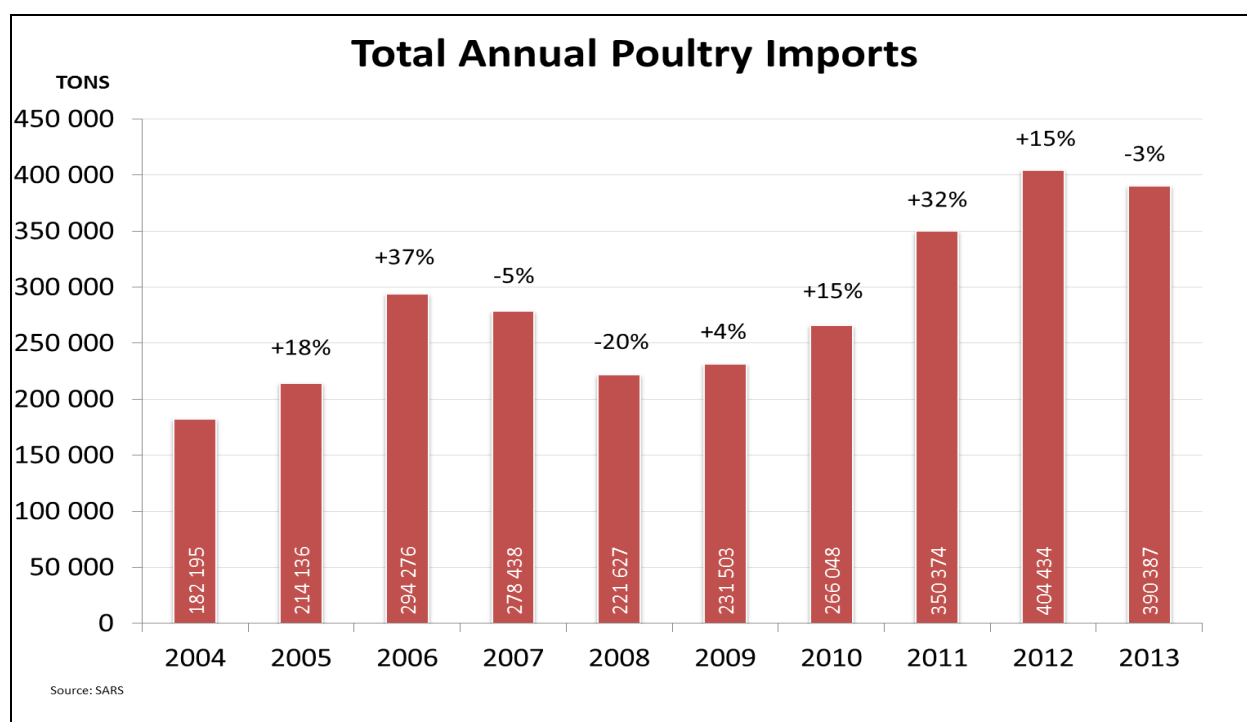
### 4.1 Import protection debate

Since 2008, domestic broiler prices in South Africa have been under pressure due to cheaper imports, while feed prices increased sharply within a particularly volatile environment, resulting in uncertain profitability. Louw *et al.* (2011) argues that feed prices represent between 60 % and 80 % of input costs for broiler growers, a figure that was verified in interviews with key broiler producers in South Africa (Davids, 2014).

Broiler producers in South Africa have been under pressure for some time, mainly as a result of significant increases in feed costs, combined with stagnant broiler prices. As a net importer of chicken, the industry is integrated into international markets and prices are expected to follow global trends. While feed costs increased by 157 % from 2001 to 2012, the chicken price was capped by the increased flow of cheaper imports, resulting in an increase of only 61 % through the same period. Thus the only mechanism for remaining economically sustainable was through efficiency gains, mainly in the form of improved feed conversion rates. As a result of the cost pressures, many smaller producers that do not have integrated feed producers and economies of scale benefits have been unable to stay in production. This has increased concentration levels in a market where the two biggest producers already account for almost 50 % of total production. High concentration levels in turn raises concern of uncompetitive behaviour, as illustrated by numerous enquiries from the competition commission (Davids, 2014).

At the heart of the recent debates surrounding imports and the dilemma faced by the industry is the issue of competitiveness. While the importance of the broiler industry within the South African agricultural sector cannot be denied, its inability to compete within the global context raises concern regarding its long-term sustainability. At the same time, the cost of increased tariff protection, as well as the segment of the population that is likely to bear the cost makes the issue particularly sensitive. Despite this sensitivity, given its pivotal role in food security and the economy in general, the long-term health and sustainability of the industry must be prioritised.

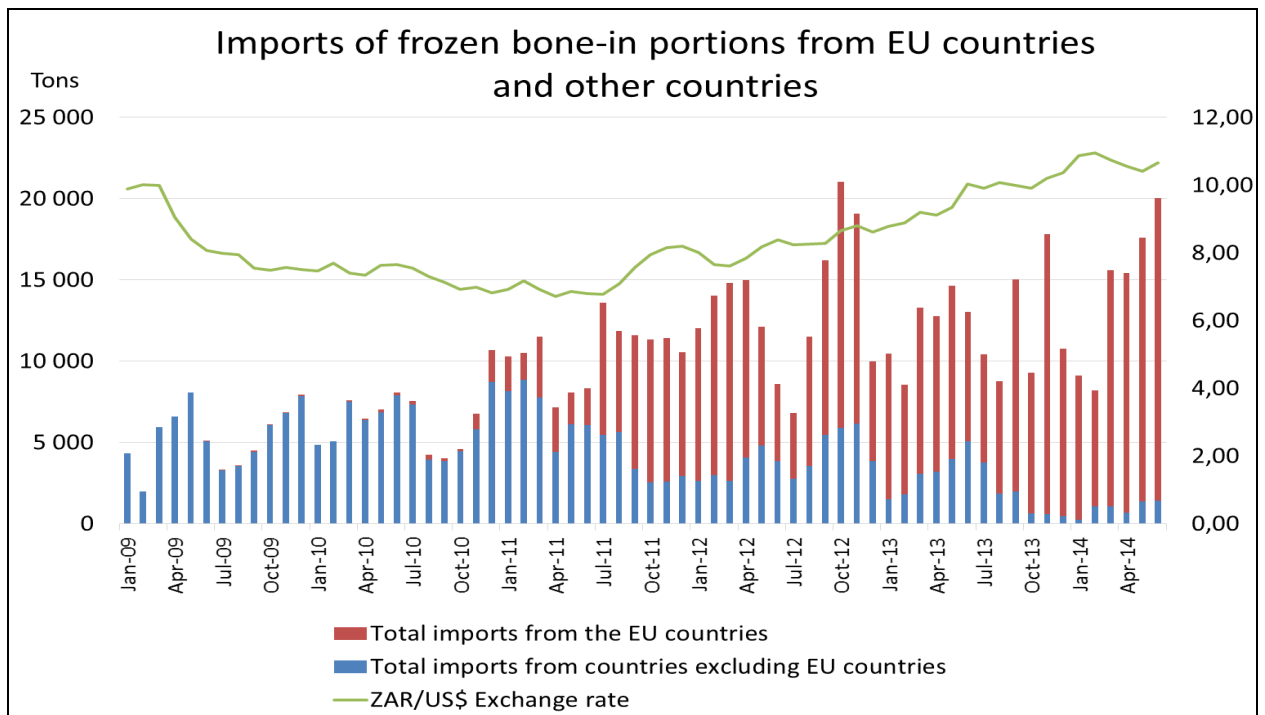
Poultry imports into South Africa are influenced by the relative cost of imported products in relation to domestically produced products, implying a significant influence from the exchange rate. Underpinned by a stronger rand in a period when feed costs increased rapidly, substantial increases in imports since 2010 have impacted negatively on the potential expansion of domestic production. During 2012, the annual imports under tariff headings 0207 (raw poultry) and 1602 (processed poultry) were approximately 20 % of domestic consumption. Figure 6 illustrates imports from 2004.



**Figure 6 Total Annual Poultry Imports.**

Source: Lovell, 2014

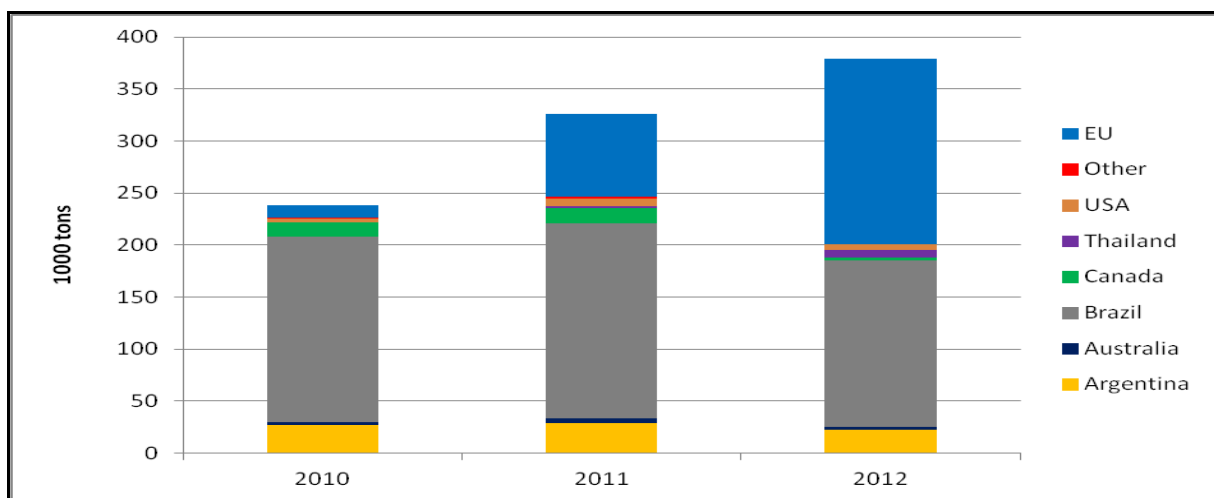
Historically, imports have originated from Brazil and Argentina, who have a strong comparative advantage in producing chicken due to relatively cheaper feed production costs and their status as net exporters of maize and soya cake. In the past two years, however, the EU has come to the fore as a major player where the origin of imported chicken is concerned. The change in market share of partnering countries in the origin of South African imports is illustrated in Figure 7. Due to a change in import tariff classification codes in 2009, the composition of imports is shown only for 2009. It is necessary to bear in mind that free trade agreement with the EU.



**Figure 7: Imports of frozen bone-in portions from EU countries and other countries.**

Source: Lovell, 2014

While Brazil was the origin of 73 % of South African imports in 2010, only 40 % of imports originated in Brazil in 2012. The share of imports originating from the EU increased from 5 % in 2010 to 47 % in 2012 as illustrated in figure 8. This represents an increase from 12.29 thousand tons in 2010 to 137.51 thousand tons in 2012. The change in patterns concerning the country of origin is of great importance, as imports from the EU are currently duty free under the Trade Development Cooperation Agreement (TDCA).



**Figure 8: Origin of South African chicken imports: 2010–2012**

Source: South African Revenue Service statistics, 2013

Imports into South Africa are classified using the Harmonised System (HS) classification codes, a standardised, numeric system of classifying products traded in the global market, ensuring standardised tariff application. Raw poultry is represented by eight different tariff classifications at eight-digit level, as illustrated in Table 1.

**Table 1: Classification of raw poultry products imported by South Africa**

| HS Code  | Description   |
|----------|---|
| 02071100 | Fowls, not cut in pieces: fresh or chilled                  |
| 02071210 | Fowls, not cut in pieces, frozen: mechanically deboned meat |
| 02071220 | Fowls, not cut in pieces, frozen: carcasses                 |
| 02071290 | Fowls, not cut in pieces, frozen: other                     |
| 02071300 | Fowls, cuts and offal, fresh or chilled                     |
| 02071410 | Fowls, cuts and offal, frozen: boneless cuts                |
| 02071420 | Fowls, cuts and offal, frozen: offal                        |
| 02071490 | Fowls, cuts and offal, frozen: other                        |

Source: SARS, 2013

Frozen chicken cuts and offal represents the greatest share of total imports into South Africa in value terms (Table 2), followed by whole frozen chicken (Tariff code 020712), which includes mechanically deboned meat. The significant increase in imports from 2010 to 2012 was driven by frozen cuts, which compete with domestically produced individually quick frozen portions. Imported cuts tend to be larger, given the longer production cycle in the countries of origin. While imported cuts provide the benefit of being packaged by a single cut as opposed to mixed packets, weaker demand for these cuts in the USA and Europe leads to products that are very competitively priced within the South African market. The share of fresh or chilled chicken in total imports is negligible.

**Table 2: South African chicken imports by product**

| HS Code                 | Product                                  | Value of imports (Rand million) |        |        |        |
|-------------------------|--|---------------------------------|--------|--------|--------|
|                         |  | 2010                            | 2011   | 2012   | 2013   |
| <b>SA total imports</b> |  | 1516.2                          | 2415.4 | 3164.5 | 3422.7 |
| 020714                  | Chicken cuts and offal, frozen           | 1072                            | 1774.9 | 2487.7 | 2586.5 |
| 020712                  | Whole chicken, frozen                    | 443.9                           | 640.2  | 676.7  | 835.6  |
| 020713                  | Chicken cuts and offal, fresh or chilled | 0                               | 0.3    | 0      | 0.5    |
| 020711                  | Whole chickens, fresh or chilled         | 0.3                             | 0      | 0.1    | 0      |

Source: ITC, 2014

Exports promise a window of opportunity for the industry, although access to large markets such as the EU and USA remains problematic as sanitary measures prohibit local exports to these regions. In addition, potential exports must compete with nations like Brazil, where production costs such as feed, which accounts for around 70 % of total input costs, are substantially lower than in South Africa. While exports into the SADC region have increased through the past five years, exports remain a small and largely insignificant part of the South African broiler market. Given the investments made by South African companies into production within SADC markets in recent years, further expansion of exports into the region will depend on the relative production costs in South Africa and other SADC countries.

## 2.1. Trade regulation in the South African broiler market

South Africa applies import tariffs based on the Harmonised System (HS) eight-digit classification codes. Following an application by the industry, the general duty on imported products was increased in October 2013, as illustrated in Table 3. In addition to the tariffs indicated in Table 3, South Africa applies anti-dumping tariffs for frozen bone-in portions (including leg quarters) originating from the USA. Anti-dumping tariffs for boneless cuts and frozen whole birds originating from Brazil were instituted provisionally for six months from February to August in 2012, while the investigation by the International Trade Administration Commission of South Africa (ITAC) was completed (ITAC, 2012). Upon completion of the investigation by ITAC, the Department of Trade and Industry (DTI) in South Africa did not institute anti-dumping tariffs further.

**Table 3: Import tariffs for chicken meat products applied by South Africa**

| HS Classification Code | Description  | General Tariff  | EU Tariff | SADC Tariff |
|------------------------|--|---|-----------|-------------|
| 02071100               | Fowls, not cut in pieces, fresh or chilled                             | 0 %   | 0 %       | 0 %         |
| 02071210               | Fowls, not cut in pieces, frozen, mechanically deboned                 | 0 %   | 0 %       | 0 %         |
| 02071220               | Fowls, not cut in pieces, frozen, carcass with cuts removed            | 31 %  | 0 %       | 0 %         |
| 02071290               | Fowls, not cut in pieces, frozen, other                                | 82 %  | 0 %       | 0 %         |
| 02071300               | Fowls, cuts and offal, fresh or chilled                                | 0 %   | 0 %       | 0 %         |
| 02071410               | Fowls, cuts and offal, frozen, boneless cuts                           | 12 %  | 0 %       | 0 %         |
| 02071420               | Fowls, cuts and offal, frozen, offal                                   | 30 %  | 0 %       | 0 %         |
| 02071490               | Fowls, cuts and offal, frozen, other                                   | 37 %  | 0 %       | 0 %         |
| 02071490               | Fowls, cuts and offal, frozen, other originating and imported from USA | Anti-dumping tariffs on products originating from the USA: 940 c/kg |           |             |

Source: SARS (2014).

Following the industry's application for increased tariffs in 2013, the South African Poultry Association (SAPA), the Association of Meat Importers and Exporters (AMIE) and the Competitions Commission briefed the Portfolio Committee on Agriculture, Forestry and Fisheries on the status of poultry tariffs in South Africa and the possible impact of the proposed tariff increase for poultry imports in 2013. The decision regarding increased tariffs had to weigh the negative effect of increased food prices on consumer welfare with the need to ensure the sustainability of South Africa's largest agricultural sub-sector. Additional considerations related to the segment of the population that consumes chicken products, as well as the argument for self-sufficiency. Ultimately, increased tariff protection would have to allow the industry to improve its competitiveness in the long run. While imports provide competition in an industry characterised by high levels of concentration and integration, the effect of a sharp depreciation in the rand on the domestic chicken price through the end of 2013 highlights the extent to which macroeconomic fluctuations affect prices under a net import situation, further illustrating the importance of sustainable domestic production.

Domestic prices have increased considerably since the tariff increase in 2013; however, tariffs alone did not account for this increase, given the sharp depreciation of the rand during the same period. The tariff increase does not apply to products originating from within the EU, while mechanically deboned meat used in processed food also remains duty free. Given the composition of South African imports in 2012, the increased tariff affects only 30 % of total imports, while the small increase in tariff lines traditionally consumed by the poorest consumers compared to significant increases in the more expensive tariff classifications reduces the cost to lower income consumers, while simultaneously assisting domestic production. It remains to be seen, however, if the price increase in the absence of a weaker rand will be sufficient to encourage investment and increase domestic production

## **5 DESCRIPTION OF THE CASE STUDY – THE IMPACT OF RELAXING IMPORT RESTRICTIONS.**

The current average import tariff for the various broiler meat cuts is about 25%. The base for this analysis is that this 25% will be phased out with an impact on the

current 2013 production of 10%. The current production of broiler is 1667 million tons which therefore mean that local production will decrease by about 166 700 tons and that imports will increase by the same amount. It was further assumed that the relaxing on the import restriction will happen over a 3 year period. Furthermore, it was also assumed that the future production will never be less than the 166 million tons of 2013 and that the impact of the relaxing of the tariff, the current import restriction measure, will only have a bearing on future production. It was assumed that the broiler sales growth rate is 4% per annum. The annual loss in production is shown in Table 4.

**Table 4: Model Inputs – Financial losses to the broiler industry and financial gains to broiler consumers (R Million, 2013 constant prices)**

|  | 2014   | 2015   | 2016   | 2017   | 2018   | ... | 2031   | 2032   | 2033   |
|--|--------|--------|--------|--------|--------|-----|--------|--------|--------|
| <b>Investment in the broiler industry</b>                                | -1 278 | -1 329 | -588   | -      | -      | ... | -      | -      | -      |
| <b>Government income</b>   | -283   | -577   | -707   | -707   | -707   | ... | -707   | -707   | -707   |
| <b>Production (operational cost and profits) in the broiler industry</b> | -1 131 | -2 307 | -2 827 | -2 827 | -2 827 | ... | -2 827 | -2 827 | -2 827 |
| <b>Positive price/cost impact on the consumer</b>                        | -508   | -1 077 | -1 373 | -1 428 | -1 485 | ... | -2 473 | -2 572 | -2 675 |

Various economic impacts stem from this namely;

### 5.1 Direct impact emanating from the broiler industry

- Less investment in the broiler industry;
- Less production (operational cost and profits) in the broiler industry; and
- Less government income.

### 5.2 Impacts on the consumer

- Positive price/cost impact on the consumer

#### 5.2.1 Investment

The loss in investment was calculated by multiplying the lower broiler production with the direct capital/production ratio. A capital/output ratio of 1.13 was assumed which means that for every one rand of output, R1.13 of future investment will be forfeited (see Table 4 for the investment magnitude per annum).

### 5.2.2 Government

Government income will also be directly affected due to the phasing out of the customs tariff. The amount is equal to the tariff of 25% multiplied by the total value of imports projected before the removal of the tariff which relates to the base case value of imports (see Table 4 for the impact on government income per annum).

### 5.2.3 Impact on the consumer

The positive impact on the consumer is equal to the additional imported broilers that can be obtained at a lower price (import price). The local production price of broilers is R16 960 per ton while the imports price is R9 600 per ton. This constitutes a saving for the consumer of R7323 per ton (see Table 5).

## 6 METHODOLOGY

For calculating the impact of the relaxing the import duties, the South African Inforum Model (SAFRIM) has been used. The framework of the model is provided in figure 9. The framework depicts the dynamic and inter-related workings of the Multi-sectoral modelling system. A description of each variable that has to be estimated is shown.

The model “loop” begins on the production block side, where the expenditure components on GDP (supply side) are estimated in constant prices. Next, the personal savings propensity is applied to calculate what portion of total household real disposable income will be spent on consumption. From this total figure, the distribution of per-capita consumption expenditures per income group is calculated.

Exports are usually calculated outside the model (i.e. exogenously) given the dependence of exports on international economic conditions. However, for the purpose of macro-economic impact analysis, it is also defined endogenously. Exports are also defined as a function of the change in relative world prices. The investment equations model the substitution (or complementarily) of capital equipment with labour and energy.





multiplying the wage rate with the total hours worked, total labour remuneration per industry is obtained.

Labour remuneration is the largest component of national income, usually about 60%, and certainly has a major effect on prices. However, it is also important that the various components of capital remuneration are taken into account. Private enterprise gross profits are needed to be able to calculate a number of aggregates viz. company taxes, retained earnings and depreciation of capital assets which make up business savings, which together with personal savings impacts heavily on the savings-investment equation in the economy. Furthermore, dividends, proprietors' income, interest income and rental income generated in the private sector all ultimately contribute to personal income.

To calculate prices, value added by industry is summed to total value added, and then passed through a product-industry bridge, to obtain value added per product. Once value added at the product level has been obtained, commodity prices are calculated. The import content of intermediate consumption is taken into account here.

## 6.1 Methodology for Activating the Model

**A technical discussion of how the model was activated for the various linkages is as follows:**

### 6.1.1 Construction phase (investment impact)

For the construction phase, the model was activated on the following final demand identity (constant prices).

$$fdc = pcec + invc + govc + exc - imc + fdrc + trcc + capex_b \quad (1)$$

Where:

fdc = total final demand

pcec = private consumption expenditure

invc = investment (investment excluding investment in the mitigation measures)

govc = government

exc = exports

|         |  |
|---------|--|
| imc     | = imports                                      |
| fdrc    | = residual                                     |
| trcc    | = transfer costs                               |
| capex_b | = total net investment of the broiler industry |

The investment related to the various GHG mitigation measures were added in the variable capex total on an annual basis over the period 2013-2033. The investment was broken down to the various assets/commodities (e.g. construction, machinery and other equipment, transport equipment, etc.) for the broiler industry.

### 6.1.2 Government Impact

For the government income loss, the model was activated on the following final demand identity (constant prices).

$$fdc = pcec + invc + govc + exc - imc + fdrc + trcc + gov_b \quad (1)$$

Where:

|       |   |
|-------|---|
| fdc   | = total final demand  |
| pcec  | = private consumption expenditure   |
| invc  | = investment (investment excluding investment in the mitigation measures) |
| govc  | = government  |
| exc   | = exports   |
| imc   | = imports   |
| fdrc  | = residual  |
| trcc  | = transfer costs  |
| gov_b | = government income losses from the broiler industry                      |

### 6.1.3 Operational impact

The following production formula was used to activate the model for the operational impact (constant prices) on the broiler sector.

$$outc = (!/I-AMC) * fdc + opex_b \quad (2)$$

Where:

outc = total output (production)

!(I-AMC) = inverse matrix

fdc = total final demand

oper\_imp = total net operational impact of the broiler industry

The total net operational impact of the broiler sector is added to the production function that is calculated by adding it to the function  $outc = !(I-AMC) * fdc$ . The operational impact is added on a detail sector basis per annum.

#### 6.1.4 User Price/Cost Impact

Both the intermediate users (food industry) and the private consumers will benefit from the lower price of imports.

##### Intermediate users

In this instance, the intermediate user (food industry) will have a cost reduction that will increase its domestic and international competitiveness. This effect is largely reflected in the prices of the goods and services produced by the food sector, which could have an effect on the international competitiveness of the country. Depending on the price elasticities of the demand for local products, this in turn could have an effect on local production and employment.

The identity below explains where the cost reduction is added in the model.

$$va = lab + gos + itprd - isprd + itprs - isprs + price\_b \quad (3)$$

Where:

va = total value added

lab = compensation of employees

gos = gross operating surplus

itprd = indirect taxes on production

isprd = indirect subsidies on production

itprs = indirect taxes on products

isprs = indirect subsidies on products

price\_b = additional savings brought about in the economy by the by relaxing the import restrictions (more broiler imports coming into the country at a lower price)

The next function shows how value added impacts on prices in the economy

$$uc = va/outc \quad (4)$$

Where:

uc = value added unit cost

va = value added

outc = output/production (constant prices)

The value added unit cost is calculated by dividing value added by the output of a sector.

$$tot\_uc = impr+uc \quad (5)$$

Where:

tot\_uc = total unit cost

impr = import unit prices

uc = total value added unit cost

This is an interim step whereby the total unit cost is calculated by adding the import unit price to the unit cost.

$$ppi = (tot\_uc) * DPINV \quad (6)$$

Where:

ppi = producer price index

tot\_uc = total unit cost

DPINV = domestic price inverse

This formula is calculating the total domestic price (ppi) by multiplying the total unit cost by the domestic price inverse.

### 6.1.5 Private consumers

The impact of broiler prices means that the consumer has more money in their pockets to spend on other products or to save more. Per definition, this boils down to an increase in their personal income

$$PDI = PI - CTIW + price\_b; \quad (7)$$

Where:

PDI = Personal disposable income

PI = Personal income

CTIW = Current taxes on income and wealth

Price\_b = cost saving as a result of lower broiler prices

## 7 PRELIMINARY RESULTS OF CASE STUDY

In this section the total macro-economic impact is presented. As already indicated the impact on only two macro-economic variables has been modelled. They are Gross Domestic Product (GDP) and the impact on employment. The results of the various types of impacts are showed separately. The total impact is shown in terms of the incremental impact and the dynamic impact. The difference between the net incremental impact and the dynamic impact can be ascribed to the fact that at the dynamic impact, all the various impacts are run simultaneously in the model while the next impacts consists of the individuals' impacts added together.

A technical adjustment to the model was necessary to ensure that the economy as far as the international trade gap (x-m) and the funding gap (s-i) is in balance again. It is important to note that these two gaps are per definition always the same. For these purposes the deficit on the current account of balance of payments as a percentage of the country's overall economic activity (GDP), was taken as a controlling measure demonstrating the ability of the economy to financially carry the burden of relaxing the import restrictions. For instance, the deficit on the current account of the balance of payments amounts to 6% of the GDP in the base case scenario, i.e. no changes to the existing energy policies, then for controlling

purposes the deficit in the current account of the balance of payments was constrained to 6%.

In terms of National Accounting Theory, a deficit on the current account of the balance of payments (exports less imports) must be equal to the deficit on the capital account (savings less investment). Everything being equal this implies that given the limited pool of the domestic savings, investment in some of the other projects would have to be adjusted downwards to make provision for the required investment and life cycle costs implied by the mitigation option(s). The model, simulating the workings of a market economy, will in case/cases where domestic savings are insufficient to meet the investment needs, use an increase in the real interest rate to restore equilibrium in the capital markets. The effect of this will be a decrease of overall domestic demand (therefore increasing savings and decreasing other investment (excluding investment in mitigation option in particular).

The results of the scenario that depicts the relaxing of the import restrictions on broilers are shown in Table 5. The impact is given a per annum average over the total period from 2013 to 2033. Both the results of the Scenario as well as the Baseline is given in the table. The impact is defined as the Scenario minus the Baseline.

**Table 5: Summary of Results for Economic Impact with Gross Value Added (GDP, R Million 2013 constant prices) and Employment (Numbers). (Average impact over the period 2013-2033)**

|                   | Additional (Net)<br>Investment Impact<br>(Construction<br>Impact) | Additional<br>(Net)<br>Operational<br>Cost | overnment<br>Income<br>Loss | Impact due<br>to Price<br>Change | Total<br>Incremental<br>Impact | Total Dynamic Impact<br>Before Balance of<br>Payments Adjustment | Total Dynamic Impact<br>After Balance of<br>Payments Adjustment |
|-------------------|---|--|-----------------------------|----------------------------------|--------------------------------|--|---|
| <b>GDP</b>        | 1   | 2  | 3                           | 4                                | 5                              | 6  | 7   |
| <b>Scenario</b>   | 2 531 810   | 2 531 041                                  | 2 531 694                   | 2 532 229                        |                                | 2 530 366  | 2 530 366   |
| <b>Baseline</b>   | 2 532 438   | 2 532 438                                  | 2 532 438                   | 2 532 438                        |                                | 2 532 438  | 2 532 438   |
| <b>Difference</b> | -629  | -1 397                                     | -744                        | 209                              | -2 561                         | -2 072   | -2 072  |
|                   |   |  |                             |                                  |                                |  |   |
| <b>Employment</b> |   |  |                             |                                  |                                |  |   |
| <b>Scenario</b>   | 16 220 620  | 16 206 239                                 | 16 218 691                  | 16 224 757                       |                                | 16 198 062   | 16 198 062  |
| <b>Baseline</b>   | 16 226 233  | 16 226 233                                 | 16 226 233                  | 16 226 233                       |                                | 16 226 233   | 16 226 233  |
| <b>Difference</b> | -5 613  | -19 994                                    | -7 542                      | 1 476                            | -31 673                        | -28 171  | -28 171   |
|                   |   |  |                             |                                  |                                |  |   |



The following aspects are of importance:

- The net effect in terms of GDP and employment is negative which means that the economy will lose out in terms of economic growth (GDP) and employment creation if the restrictions on the imports of broilers is relaxed. The GDP will decrease by R-2 072 million and about -28 000 potential jobs can be lost (see column 7 of table 5);
- The negative impacts on the economy is created by the less investment (column 1, GDP = R-629 million and Employment = -5 613 jobs), reduction in the local production of broilers (column 2, GDP = R-1 397 million and Employment = -19 994 jobs ) and the decrease in government income (column 3, GDP = R-744 million and Employment = -7 542 jobs );
- The positive impact on the economy is due to the price reduction of broilers in South Africa and its positive effect on the intermediate consumers of broilers and the private consumers (column 4, GDP = R-2 561 million and Employment = 1 476 jobs); and
- It is important to note that the adjustment to the balance of payments didn't really have a huge effect on the results.

## **8 SUMMARY AND CONCLUSIONS**

The objective of the analysis was to estimate the macro-economic impact of the relaxing of import restrictions on the broiler industry for the period 2013 to 2033.

The industry is a very important sub sector for South Africa. Chicken meat can be seen as one of the most favourable and most affordable protein sources for South Africans. The industry is highly integrated into other industries and account for the biggest contributor to agriculture GDP. The industry therefore contributes highly towards food security and food sustainability.

The economic impacts was calculated by making use of a general equilibrium modelling system which is of a dynamic and multi-sectoral of nature forecasting the economy in a bottom up approach fashion. Macro-economic aggregates are built up from detailed levels at the industry or product level. The various impacts in this analysis are the loss in investment by the broiler industry, reduction in production (operational cost and profits) in the broiler industry, loss of government income from relaxing the import restrictions and a positive effect on the buying power of the private consumer due to a reduction to the price of broilers.

The results of the scenario show clearly that the positive effects that the consumers will receive due to cheaper broiler prices will be overwhelmed by the negative effects which relate to the effects that the broiler industry has to bear. It seems that there is a net loss of nearly R-2 072 million in GDP and -28 000 jobs.

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