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The impact on competition in the fertiliser industry after the Sasol divestiture of blending facilities in 2010

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Abstract

The purpose of this study is to assess the impact of the interventions of the competition authorities in the nitrogenous fertiliser value chain in 2009 and 2010. Prior to the Commission and Tribunal's interventions, various anticompetitive practices existed in the fertiliser market. The study finds that post-intervention many positive outcomes have been observed in the fertiliser industry. In particular, our analysis indicates that the interventions has overall led to several pro-competitive outcomes in the market, including new entry, increased customer choice and price competition, as well as estimated customer savings ranging between R1 billion and R10.5 billion during the first five and half years after the Commission and Tribunal's interventions in the industry in 2010.

Keywords: Customer savings; collusive conduct; exclusionary behaviour; market dynamics

JEL Classification: D02; L40

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1. Introduction

Ammonia is the key input into the production of nitrogenous fertilisers. Nitrogenous fertilisers include Limestone Ammonium Nitrate (“LAN”), Ammonium Nitrate Solutions (“ANS”), and to a limited extent, urea. Ammonia is produced by Sasol at both their Secunda and Sasolburg plants. Other suppliers of imported ammonia in South Africa are Omnia, Foskor and Kynoch (Yara). These firms supply ammonia through their shared ownership of the Richards Bay ammonia import facility, each owning a share of 25%, with Sasol being the fourth shareholder. At present Sasol remains the dominant supplier of ammonia in South Africa.

The ammonia produced by Sasol and imported by Omnia, Foskor and Kynoch (Yara), is used in the production of ammonium nitrate.¹ Ammonium nitrate, in either its liquid (concentrated) or solid form is used in the production of fertilisers or explosives. Sasol, Omnia and AECI have the necessary infrastructure, in particular nitric acid plants, to produce ANS solutions. LAN production, which is essentially ANS reacted with limestone to stabilise it, forms solid (granular) fertilisers. LAN is produced by both Sasol and Omnia.

Further downstream there are blenders and traders, such as Nutri-Flo and Profert, which prior to the Competition Commission’s (“the Commission”) intervention sourced input from Sasol to create blended fertilisers (See Figure 1 below). This level of the market was less concentrated as opposed to the upstream markets in the period prior to the Commission’s intervention. However, the growth of market participants at this level was dependent on Sasol as the key upstream input supplier of ammonia.

In 2003 and 2004 respectively, both Nutri-Flo and Profert filed complaints with the Commission alleging that Sasol, acting in concert with Omnia and Kynoch (Yara), engaged in a series of anticompetitive practices. These ranged from exclusionary abuse of dominance by Sasol and various collusive agreements between Sasol, Omnia and Kynoch (Yara). The alleged conduct had the effect of depressing the ability of the complainants to achieve a competitive outcome in the market for the blending and distribution of nitrogenous based fertilisers. It was further alleged that this interdependence between Sasol, Omnia and Kynoch (Yara) further prevented market participants such as Nutri-Flo and Profert from expanding their businesses and competing effectively.

In May 2005, upon the consolidation of its findings, the Commission referred the Nutri-Flo complaint to the Competition Tribunal (“the Tribunal”) alleging that Sasol had contravened section 8(a); section 8(c) and alternatively 8(d)(ii) of the Competition Act (“the Act”). The Commission later amended the referral to include a contravention of section 4(1)(b) against Sasol, Omnia and Kynoch (Yara). On 25 May 2006, the Commission referred the Profert complaint to the Competition Tribunal (“Tribunal”), alleging that Sasol had contravened sections 9(1), 8(c) and/or 8(d)(ii) of the Act.

Sasol admitted to contravening section 4(1)(b) of the Act and in May 2009 paid an administrative penalty of approximately R250 million. Sasol admitted that together with Omnia and Kynoch (Yara) they acted in concert through agreements on various pricing formulae for, and discounts to, products manufactured or supplied by itself, Kynoch (Yara) and Omnia.² In respect of the section 8 and section 9 contraventions, Sasol reached an agreement with the Commission.

Broadly stated, these agreements effectively imposed behavioural and structural conditions on Sasol. With regards to the former, Sasol undertook to provide fertilisers on an ex-works basis and to further not discriminate across customer types (i.e. blenders, traders and end-

¹ Ammonium nitrate is produced through the reaction of ammonia and nitric acid.

² See Competition Tribunal Case Number: 31/CR/May05 and 31/CR/May05amend.

users) and across geographic regions (i.e. inland and coastal regions). In regards to the structural conditions, Sasol undertook to divest five of its blending plants. The rationale behind these conditions can be seen as limiting Sasol’s presence in the downstream market and thereby reducing Sasol’s ability to manipulate market conditions. Sasol, however, did not admit liability to these contraventions. On the 20th of July 2010 the Tribunal confirmed the settlement order.

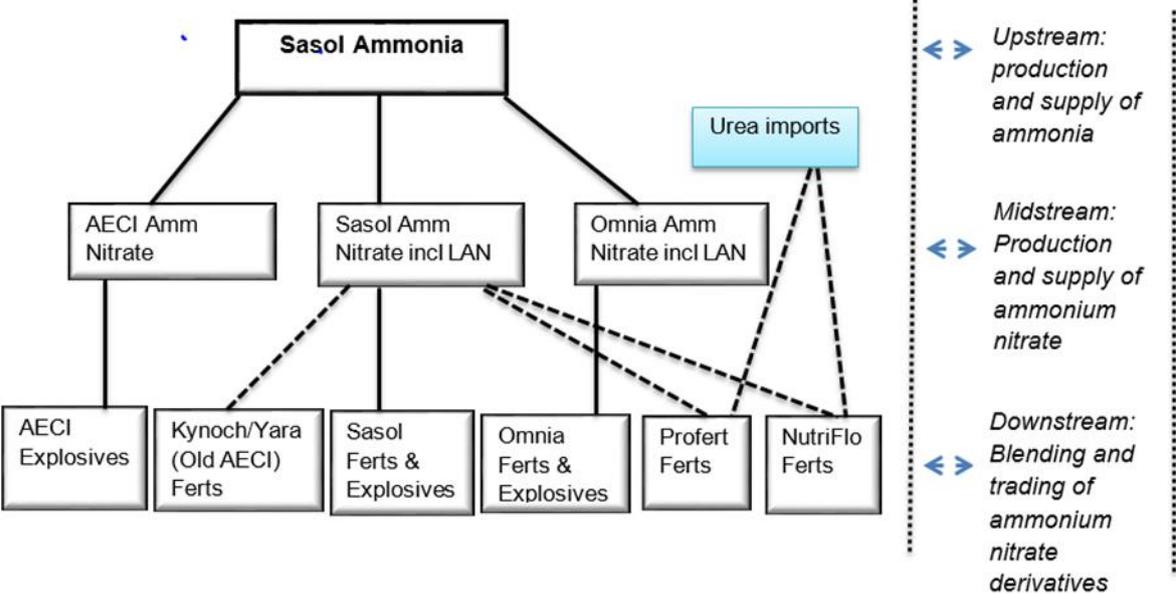
The purpose of this paper is to conduct an ex-post assessment of the competition authorities’ past intervention into the South African nitrogenous fertiliser industry. The assessment entails evaluating whether the intervention achieved its objective in enabling a market structure that brings about a more competitive landscape than that which existed prior to the intervention.

Specifically, the paper uses both a qualitative and quantitative approach to assess the extent to which the measures arrived at in the settlement agreement helped to restore competition, in the nitrogenous fertilisers industry after Sasol’s divestiture of its blending facilities located in Durban, Bellville, Potchefstroom, Endicott and Kimberley.

2. Background to the South African fertiliser industry

Figure 1 below shows the fertiliser value chain and the link between the various market participants, as well as the products produced. As evidenced in the diagram, Sasol is the monopoly supplier of ammonia to independent (non-vertically integrated) manufacturers of fertilisers and is also active throughout the rest of the value chain.

Figure 1: The fertiliser value chain



Source: Commission’s expert report (Case Number: 31/CR/May05 and 31/CR/May05amend)

Upstream segment: production and supply of ammonia

Ammonia is the main active ingredient in the production of all nitrogenous fertilisers and explosives. Ammonia can be produced from natural gas or from the liquid fuel from coal process. In terms of ammonia application to the production of nitrogenous fertilisers, the Commission found during its previous investigations that there are no good alternatives for ammonia in these applications. The Commission also established that ammonia is supplied at

a national level, within which the inland region and the coastal region may also form separate subsets of the national market.³

Prior to the Commission's intervention Sasol was the sole supplier of ammonia in South Africa. Sasol's production of ammonia from natural gas amounted to 50% of its total production, whilst the remaining volumes were produced from its liquid fuel from coal processes. It should be noted in this regard that Sasol became the monopoly supplier of ammonia in South Africa in 1999 when the production facilities of African Explosives and Chemical Industries ("AECI") were closed down. At present Sasol remains the only local producer of ammonia. Post the Commission's intervention, Omnia has undertaken significant investments into the rail wagons required to transport imported ammonia, as well as investments into expansion of its nitric acid plants. However, it is important to note that Omnia's imports of ammonia are strictly for internal use in its own downstream operations and are not available for use by third parties.

Midstream segment: production and supply of ammonium nitrate

Ammonium nitrate is produced through the reaction of ammonia with nitric acid in a nitric acid plant. It is important to note that ammonium nitrate is highly explosive. Ammonium nitrate is used in explosives or fertiliser production.

The production and supply of ammonium nitrate market segment is highly concentrated. Prior to the Commission's intervention in 2009 and 2010 the firms that were involved in the manufacture of ammonium nitrate included Sasol, Omnia and AECI. These firms possessed their own nitric acid and ammonium nitrate plants. At the time of the Commission's investigation in 2005 it was noted that Sasol produced more than 40% of the country's ammonium nitrate. The collusive agreements (amongst others) entered into between Sasol, Omnia and Kynoch, reduced Omnia's incentive to effectively utilise its ammonium nitrate plants.

Further, it was also observed that due to its vertical integration Omnia supplied very little ammonium nitrate to the open market. Furthermore, Omnia was reliant on imported ammonia for its operations which in itself was riddled with many problems, the key concern of which was the reliability of the rail wagons in transporting ammonia up from the Richards Bay import facility. AECI produced ammonium nitrate under an agreement with Kynoch (Yara) which ceased in 2004. Smaller players requiring ammonium nitrate were therefore solely dependent on Sasol. Currently Sasol remains the main supplier of ammonium nitrate in South Africa.

Downstream segment: blending and trading of ammonium nitrate derivatives

Blending is an important aspect of the production of ammonium nitrate derivatives which provides a means for growers to receive the correct ratio of nitrogen, phosphorus, potash, and micro nutrients.⁴ Ammonium nitrate in fertiliser production can either be diluted with water to form ANS or combined with limestone/ calcium to form LAN or Calcium Ammonium Nitrate ("CAN").

³ The inland market concerns Secunda where Sasol manufactured product, whilst the coastal market refers to the Kwa-Zulu Natal and Western Cape regions.

⁴ <http://www.ajsackett.com/PDFs/Blending%20Systems.pdf> accessed on 16/09/2016.

3. Competition authorities' interventions

The exclusionary abuse of dominance by Sasol, as well as collusive conduct with Omnia and Kynoch (Yara), led to complaints being filed at the Commission by both Nutri-Flo and Profert in 2004 and 2005 respectively. It was through these complaints that the Commission uncovered various anticompetitive practices that were impeding the fertiliser industry. Following the consolidation of the complaints into one investigation, the Commission intervened in the industry in 2009 and 2010 with the aim of restoring competition in the relevant markets. In order to rectify the situation in the market, the Tribunal (pursuant to the filing of the complaints) imposed a series of conditions on Sasol. These were broadly restrictive on Sasol and highlighted in the section that follows.

3.1. Settlement agreement and administrative penalty

The settlement agreement between Sasol and the Commission contained two central features designed to dilute Sasol's market power and prevent price discrimination based on location. Firstly, it settled both the Nutri-Flo and Profert complaints. Secondly, it aimed at ensuring that Sasol's presence in the retail market for nitrogenous fertilisers was reduced, thereby restricting Sasol's ability to manipulate conditions in the downstream market.

It is important to note that these allegations were never tested at the Tribunal in a full hearing. However, Sasol did reach a settlement with the Commission, regarding the section 8 and section 9 (excessive pricing, refusal to supply and price discrimination) contraventions, without an admission of guilt. In respect of the collusive conduct, Sasol paid a fine of R250 million and in doing so implicated both Kynoch (Yara) and Omnia.⁵

3.2. Divestiture of the blending facilities

The Tribunal advocated as part of the conditions that Sasol must divest certain of its fixed assets. Sasol undertook to divest the blending facilities located in Durban, Bellville, Potchefstroom, Endicott and Kimberley.

The conditions were aimed at restoring a more competitive landscape in the market for nitrogenous fertilisers. In order to reduce Sasol's presence in the downstream market and limit the ability to manipulate pricing in the retail segment, the Tribunal ordered that Sasol must dispose or divest of all its blending facilities. This also serves to undermine the collusive agreements that were in place between Sasol, Omnia and Kynoch.

The ability of Sasol to discriminate in pricing across regions and by customer was eliminated through the Tribunal's order that all ammonium nitrate based fertilisers must be sold on an ex-works basis. With this condition, Sasol cannot impose any restrictions or obligations upon the customer with respect to the terms of usage and resale of fertilisers. Furthermore, Sasol may not differentiate in its pricing other than on standard commercial terms such as volume and off-take commitments. This is further aided by the requirement that any discounts and/or allowances granted shall be transparent and available to all customers willing and able to meet such volume and off-take commitments. This condition aimed to ensure that there would be greater transparency in the market.

⁵ This matter is currently on-going. The Commission was granted permission by the Tribunal to amend its complaint referral in light of the information submitted by the Sasol. The Commission's leave to appeal was dismissed by the Competition Appeals Court, however in the concurrent application to the Supreme Court of Appeal, the Tribunal's ruling was upheld. The implications are that the Commission now has the power to initiate an investigation against Omnia.

Other conditions imposed by the Tribunal included separating the business units responsible for ammonia production in Sasolburg from the business unit responsible for the marketing of ammonia produced at Sasolburg and supplied from Secunda. The separation of the business units eliminates the scope for shorting the supply of ammonia as planning becomes difficult to co-ordinate.

Further, Sasol undertook to cease all importation of ammonia into South Africa, within a period of 25 months of confirmation of the settlement agreement, other than those imports on behalf of third parties that may be occasioned due to supply and logistic disruptions and plant maintenance shutdowns. Prior to the intervention Sasol played a major role in facilitating ammonia imports. Competitors such as Omnia were deterred from importing and used locally produced Sasol ammonia. However, it has been noted during our assessments for this study that Omnia has since invested in improving railcars needed to transport imported ammonia and has begun importing ammonia to supply its new nitric acid plant.

In addition, to address any unintended consequences that may arise from the imposed conditions, Sasol undertook not to sell ammonium nitrate explosives into export markets below the average price achieved in South Africa. This condition serves to ensure that Sasol satisfies local demand first and does not divert ammonium nitrate into explosives with the intent of shorting local LAN supply in an effort to artificially increase local prices of LAN.

As per the order of the Tribunal all five blending plants were divested by Sasol.⁶ Ammonia was moved to a separate business unit and Sasol ceased importing ammonia on behalf of third parties in the phased manner as stipulated in the settlement agreement.

4. Post-intervention competitive dynamics

This section uses a qualitative approach in evaluating how market dynamics have changed following the divestiture of Sasol's blending facilities. In particular, we assess changes in fertiliser supply; market entry/expansion; market exit; the degree of vertical integration of upstream and downstream market participants; and pricing dynamics in the post-intervention period.

4.1. Market entry and expansion

Production and supply of ammonia

Post-intervention, there has not been any entry in the production of ammonia and Sasol remains the sole producer of ammonia in South Africa. This can be explained by the significant capital outlay required in building an ammonia plant. However, we note that there has been an increase in the importation of ammonia since 2010.

Production and supply of ammonium nitrate

There has not been any greenfield entry in the production of ammonium nitrate after the Commission's intervention. However, Omnia⁷ expanded its operations for the production of

⁶ The Potchefstroom and Bellville plants were acquired by Profert in March and August 2011 respectively. The Durban Plant was acquired by GWK in June 2011, while the Endicott and Kimberly plants were acquired by Farnisco in July and December 2011 respectively.

⁷ Omnia Holdings Limited Interim results presentation period ended 30 September 2011. http://www.omnia.co.za/MediaLib/OmniaHome/Financials/InterimResults/2011/interim_results_sep_2011.pdf

ammonium nitrate post-intervention. In particular, Omnia undertook a large investment in a new nitric acid plant.⁸

We note that cartels typically have the effect of restricting output and raising prices. In further considering that post the breakdown of the cartel Sasol undertook to cease importation of ammonia, this implies that there was a shortage of the key feedstock. This may have resulted in Omnia having to seek alternative sources of raw materials for their plants, primarily in the form of imports. Therefore, although the expansion undertaken by Omnia may not have been solely attributable to the Commission's intervention as noted above, it is important to note that the Commission's intervention did contribute significantly to the breakdown of artificial barriers to entry in the market. For instance, prior to the intervention there was little incentive for such investment due to the cartel for both fertiliser production and imports of ammonia.

Omnia's entry into the market provides some competition to Sasol as it increases the number of competitors in the upstream market from one to two. However, although the production of LAN changed from being a monopoly to a duopoly post-intervention, the bulk of Omnia's production is dedicated towards internal consumption. Therefore post-intervention, Sasol remains as the main supplier of LAN to the open market.

Blending and trading of ammonium nitrate derivatives

Our study has found that the divestiture of blending facilities by Sasol has created opportunities for expansion and entry downstream, particularly in the market for fertiliser blending and distribution. As a result of the divestiture, there has been significant entry by blenders and traders. The firms that were previously traders and reliant on Sasol for LAN/ANS input supplies have subsequently expanded and acquired their own blending plants in the period post-intervention.

After the Tribunal's confirmation of the settlement agreement between the Commission and Sasol in 2010, Profert acquired Sasol's Potchefstroom and Bellville plants in Cape Town in March and August 2011 respectively. GWK, an agricultural cooperative that is also involved in the blending and distribution of granular and liquid fertiliser products, acquired Sasol's Durban plant in June 2011. Farmisco (Pty) Ltd t/a Kynoch acquired both Sasol's Kimberley and Endicott plants.⁹ The divestiture of Sasol's blending facilities implies that there is increased competition along the nitrogenous fertiliser value chain in the post-intervention period, given that the level of Sasol's vertical integration along the value chain has been reduced.

Other than the large firms who acquired Sasol's divested plants, a new feature of the fertiliser blending market that we observe in the post-intervention period is the entry of smaller players at the blending level post-intervention. The smaller entrants complement fertiliser supply by the larger players because they supply small quantities of specialised fertilisers which would ordinarily not be supplied by larger players.

4.2. Fertiliser supply

Our study finds that the Commission's intervention resulted in increased supply of ammonia and nitrogenous fertilisers due to the entry of new players and market expansion at both the upstream and downstream levels of the value chain.

⁸ Nitric acid, in combination with ammonia, is used to produce ammonium nitrate and this forms the base input into the production of LAN, blended fertilisers and explosives.

⁹ The Endicott plant is located in Mpumalanga and is also a liquid blending plant.

At the upstream level, it was found that Omnia's new ammonia nitrate facility has the capacity to produce 40% more nitric acid per annum compared to its first nitric acid plant's capacity of 73 000 tons which was in operation during the pre-intervention period. The nitric acid plant and related infrastructure has resolved the long-term shortage of nitric acid and related products in the South African market, thereby reducing Omnia's own requirement for imported fertiliser. This is due to the improved availability of raw material for its own downstream granulation plants.¹⁰

Further, Omnia has increased the importation of ammonia post-intervention. Prior to the competition authorities' intervention, there was high reliance on Sasol as the supplier of an essential input in the form of ammonia. Imports were not viable for smaller firms as they lacked the scale to justify importing. Further difficulty in importing was due to Sasol's joint ownership of the only import facility with Omnia and Kynoch. The decision by Omnia to increase importation of ammonia may partly have been necessitated by the Commission's settlement condition which required Sasol to cease all importation of ammonia into the country for a period of 25 months. Omnia's investment in the new rail wagons also ensured more reliability and efficiency in the importation of ammonia.

At the downstream level, the entry of more firms in the production and supply of nitrogenous fertiliser essentially means an increase in the supply of fertiliser in South Africa, which in turn results in lower prices of fertiliser products.

4.3. Degree of vertical integration

Post-intervention, the degree of vertical integration across the value chain remains low. Although Omnia has increased its upstream and midstream presence through increased importation of ammonia and production of nitric acid on one hand and production and supply of nitrogenous fertilisers on the other, the degree of vertical integration of Sasol has been reduced as a result of the divestiture of Sasol's blending facilities. Sasol's operations at the retail level of the industry have also declined. The closure of Sasol's Secunda blending facility will further reduce the degree of integration in the fertiliser industry in South Africa. Therefore, post-intervention, there has not been much change regarding the degree of integration between the upstream and downstream market participants.

4.4. Market exit

Post-intervention, none of the firms involved in the production and supply of ammonia and ammonium nitrate have exited the market. However, our study shows that at the blending and trading level of the value chain, a number of firms have exited the market. Despite numerous instances of smaller firms entering fertiliser trading and blending post-intervention, some of the smaller entrants have failed to stabilise and register growth in the market. Further, the closure of Sasol's blending facility in Secunda in May 2015 raises potential future competition concerns in the fertiliser industry, in that it may reduce the pro-competitive benefits across the value chain that arose from the increased competition at the upstream level. In particular, the closure of the Secunda plant will substantially lower the quantity of ammonium nitrate available to the open market.

4.5. Pricing dynamics

The Commission conducted a quantitative analysis to understand the competitive pricing behaviour of Sasol in the pre and post-intervention periods. Based on information submitted by Sasol and other publically available data we conducted the following sets of analyses:

¹⁰ See Omnia website: <http://www.omnia.co.za/investors-and-media/investment-case> accessed on 25 August 2015.

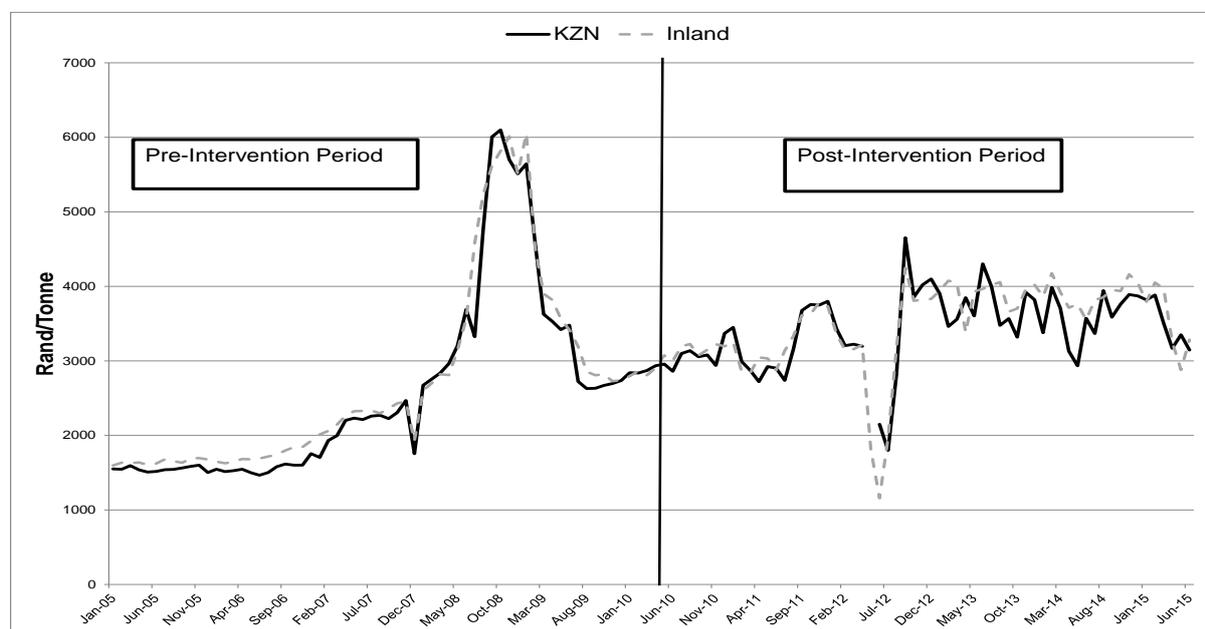
- i. An assessment of Sasol's transactional prices for LAN across all customer groups; and
- ii. An analysis of the extent to which demand for fertiliser is related to Sasol pricing of fertiliser.

4.5.1. An assessment of Sasol's transactional prices for LAN across all customer groups

This section presents a quantitative assessment of Sasol's transactional prices for LAN across all customer groups, for both the pre- and post- intervention periods. The assessment is conducted as a comparison between inland regions and coastal regions.¹¹ This is in order to establish whether or not post-intervention prices were influenced by economic fundamentals rather than artificial factors resulting from Sasol's abuse of market power.

Figure 2 below shows the overall¹² inland and coastal monthly price trends for LAN between 2005 and 2015. It is important to note that in 2008, fertiliser prices rose dramatically due to a combination of factors such as increased demand as a result of higher food prices and increased energy costs which are particularly important in producing nitrogenous fertilisers.¹³ The high prices slowed down after 2009 and for this reason, the 2008 and 2009 periods are excluded from the analysis, given that it may distort the conclusions reached in this regard. Hence, the pre-intervention period considered in this analysis is from January 2005 to December 2007, while the post intervention period is from January 2010 to June 2015.¹⁴

Figure 2: Overall Inland and Coastal Monthly Price Trends (Jan 2005-June 2015)



Source: Sasol

¹¹ Inland regions include North West, Northern Cape, Eastern Cape, Mpumalanga, Gauteng and Limpopo. Coastal region refers to KwaZulu Natal. The Western Cape Province was excluded because it was considered a completely separate market because of significantly high transport costs.

¹² Overall prices encompass average prices to blenders, traders, and farmers.

¹³ See Future Agricultures. 2008. The Global Fertiliser Crisis and Africa, Policy Brief. www.future-agricultures.org

¹⁴ While the consent order was signed in July 2010, negotiations started before that time and it is likely that some changes may have been effected by Sasol.

Figure 2 above shows that inland customers were generally charged higher prices than coastal customers during the pre-intervention period. This phenomenon was driven by cartel conduct rather than economic fundamentals. Pre-intervention, Sasol was also able to maintain lower prices in the coastal region where it faced import competition. Without a cartel, inland prices to customers would have been expected to be lower than prices charged to coastal customers. This is because inland customers are located much closer to Sasol's production plants compared to coastal customers. The customers in the coastal regions are expected to be charged higher prices to factor in the higher transport costs.

Post-intervention, we observe that inland customers are generally charged marginally lower prices than coastal customers. It therefore appears from our analysis of Sasol's pricing data that the divestiture of Sasol's blending facilities has served to limit Sasol's dominance and its ability to discriminate across customers between inland and coastal regions. Therefore, post-intervention pricing of ammonia across regions appears to be determined more by economic factors such as transport costs other than artificial market dynamics derived from the abuse of market power by Sasol.

Figure 2 also shows that coastal and inland prices fluctuate more during the post-intervention period relative to the pre-intervention period. It therefore appears that post-intervention the pricing of fertiliser is more sensitive to seasonal changes than during the pre-intervention period. The limited price sensitivity to seasonal changes shows the artificial price fixation by Sasol during the pre-intervention period. Higher price sensitivity during the post-intervention period reflects the correction of artificial pricing experienced during the pre-intervention period.

The basic pricing analysis above appears to confirm that there is increased competition in the fertiliser industry in the post-intervention period.

4.5.2. An analysis of the extent to which demand for fertiliser is related to Sasol pricing of fertiliser

Below we conduct an analysis of the extent to which demand for fertiliser is related to Sasol's pricing of fertilizer. We conduct this analysis by way of (i) quantity-price trend assessment and (ii) elasticity analysis for both the inland region and the coastal region.

Inland region

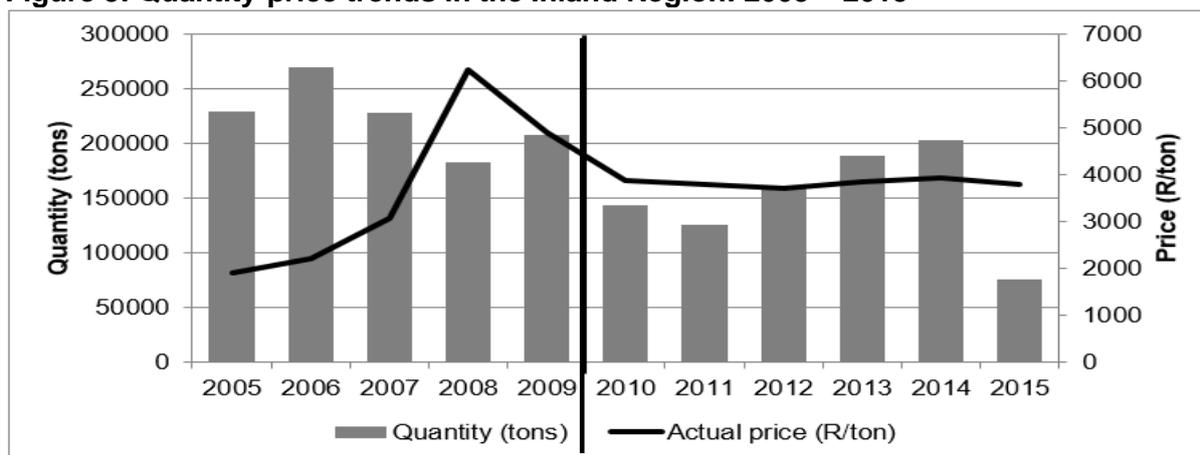
Quantity-price assessment

The quantity-price analysis is conducted to determine the extent to which the volume of granular fertilizer purchased by customers is influenced by prices charged by Sasol. This assesses the extent to which the market forces influence demand and pricing of granular fertilizer in the inland region. This analysis is based on the principles of the law of demand which states that the greater the quantity demanded by customers for a particular good, the lower the price of the product. The inland region is assumed to be free of market distortions.¹⁵

A priori, we expect a negative relationship between quantity demanded and price. Figure 3 below depicts the quantity-price relationship of fertiliser in the inland region. Note that in the analysis, we exclude the periods 2008 and 2009 on the basis that it coincides with the period of the global financial crisis during which prices escalated abnormally. Including this period in the analysis would result in an upward price bias.

¹⁵ Pre-intervention, Sasol was engaged in a price discrimination conduct wherein it charged its coastal customers prices that were higher than the competitive level. Prices in the inland regions were competitive.

Figure 3: Quantity-price trends in the Inland Region: 2005 – 2015



Source: Sasol

Figure 3 shows that in both the pre and post intervention periods, the quantity price relationship is mixed. In the post intervention period, we observe that price has been falling between 2010 and 2012 while quantity fell from 2010 to 2011 and rose from 2011 to 2012. Thus, based on this assessment, there is no clear cut relationship between the quantity of fertiliser demanded and fertiliser prices.

We then employed the elasticity approach to explore the overall quantity-price relationship pre and post intervention periods in the inland region.

Elasticity analysis

The elasticity analysis gives a better indication of the sensitivity of quantity demanded to price changes. A negative value of price elasticity of demand means that when the price of fertilizer rises, the demand for fertilizer falls, and *vis a vis*. *A priori*, a negative relationship between the two variables is expected.

Table 1 below gives the price elasticity of demand for granular fertilizer in the inland region. The price elasticity of demand is calculated as a percentage change in the quantity of granular fertilizer demanded by Sasol’s customers in the inland regions divided by the percentage change in the price of fertilizer charged by Sasol to its customers in the inland region.

Table 1: Inland price elasticity of demand

	Pre intervention	Post intervention
Price elasticity of demand	0.3	-0.14

Source: Own calculations based on Sasol’s data

Table 1 indicates that pre intervention, price and quantity related positively in the inland region while post intervention, the variables related negatively. In the pre-intervention period, price elasticity of demand is 0.3, meaning that a 1% price rise would result in a 0.3% rise in fertiliser demand. This implies two things. Firstly, it shows that in the pre-intervention period, customers were less sensitive to price changes. Secondly, it shows that the market had distortions such that an increase in price would lead to an increase in demand. These two outcomes are likely a result of the fact that competition was limited and there were fewer alternatives in the pre intervention period. The results of the pre-intervention period are in line with Sasol’s conduct during the period because during the pre-intervention period, fertiliser prices were not determined by market forces but by Sasol’s anticompetitive behaviours in the market.

In the post-intervention period, demand for fertiliser is relatively price elastic compared to the pre-intervention period, implying that customers are relatively sensitive to price changes. The price elasticity of demand is (0.14), meaning that a 1% price rise would result in a 0.14% decline in fertiliser demand. This shows that in the post-intervention period it is more feasible for customers to switch from Sasol to other suppliers and to imported fertiliser including urea whenever fertiliser prices increase. Thus negative price elasticity of demand in the post intervention period shows that demand for fertiliser is determined by the prices of fertiliser set by Sasol. Therefore, the intervention had a positive effect in the fertilizer industry in the inland region with respect to customers' switching abilities.

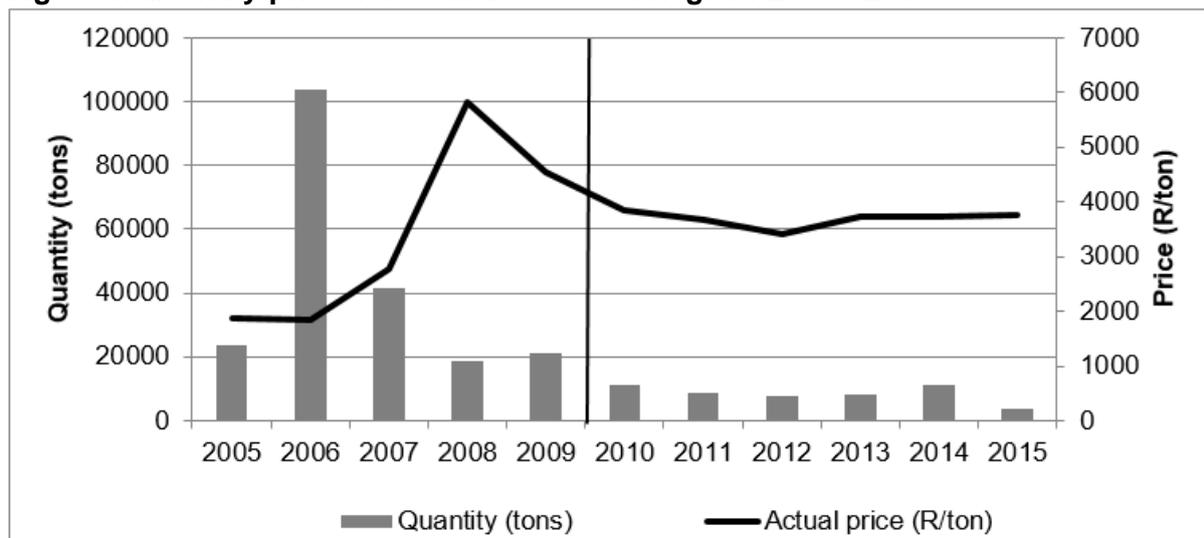
Coastal region

We conducted quantitative analysis for the coastal region which mirrors the analysis conducted for the inland region. The rationale for the quantity-price analysis has already been outlined. We also expect a negative relationship between quantity demanded and price *a priori*.

Quantity-price assessment

Figure 4 below shows the quantity-price trends in the coastal region in both the pre-intervention and post-intervention periods.

Figure 4: Quantity-price trends in the Coastal Region: 2005 – 2015



Source: Sasol

From Figure 4 above it appears that there is a strong negative relationship between prices of fertiliser and volumes of fertiliser purchased from Sasol during the pre-intervention period. During the post-intervention period, the relationship between prices of fertiliser and volumes of fertiliser purchased from Sasol is largely positive. For instance, between 2010 and 2011, the prices of fertiliser and volumes of fertiliser purchased from Sasol move together. We further observe that both the prices of fertiliser and volumes of fertiliser purchased increased each year between 2012 and 2014. However, this positive relationship does not appear to be significant and is much less pronounced than the levels observed in the pre intervention period. The only period the prices of fertiliser and volumes of fertiliser purchased display an inverse relationship is between 2014 and 2015. Overall, the graph suggests that the relationship between quantity and price in the post intervention period is positive. To substantiate our quantity-price analysis, we also implored price elasticity of demand analysis for both the pre-intervention and post-intervention periods.

Elasticity analysis

Table 2 below indicates the price elasticity of demand for fertiliser for both the pre-intervention and post-intervention periods.

Table 2: Coastal quantity compared to coastal prices: 2005 – 2006

	Pre intervention	Post intervention
Price elasticity of demand	-118,7	33.33

Source: Own calculations based on Sasol's data

The table indicates a negative price elasticity of demand during the pre-intervention period and a positive price elasticity of demand during the post-intervention period. The positive price elasticity of demand of 33.33 during the post-intervention period shows less sensitivity to price changes and that customers increase fertiliser purchases despite price hikes. Thus in the post-intervention period market distortions seem to be prevalent in the coastal region. The divestiture may not have yielded significantly more competitive outcomes in the coastal region, which may imply that the coastal region was more competitive than the inland region in the pre-intervention period.

Conclusion on pricing dynamics

Our analysis shows that customers' sensitivity to price changes is different between the coastal region and the inland region. In the post-intervention period, customers in the inland region are more sensitive to price changes. This shows that in the post-intervention period, it is more feasible for customers to switch from Sasol to imported fertiliser, including urea, whenever fertiliser prices increase. It also shows that in the post intervention period, customers have the ability to switch to alternative local manufactures of LAN which have entered in the post intervention period.

Furthermore, a negative price elasticity of demand was found in the post-intervention period. This shows that demand for fertiliser is determined by Sasol's pricing of fertiliser. Therefore, the intervention had a positive effect in the fertiliser industry in the inland region with respect to customers' switching abilities.

A different picture is found in the coastal region in the post-intervention period. Customers in the coastal region are less sensitive to price changes in the post-intervention period. This may imply that the coastal region was more competitive than the inland region in the pre-intervention period.

5. Post-intervention customer savings

In this section, we quantify the impact of the competition authorities' intervention in the fertiliser industry by employing the customer savings approach. The customer savings approach measures the direct benefits of competition policy for consumers by estimating the reduction in prices resulting from competition policy interventions. The reduction in price is then multiplied by the affected volume of fertiliser sales in the post-intervention period. This quantifies how much consumers have saved as a result of the intervention.

The data used to conduct the analysis was largely obtained from Sasol. The data covers a period of up to five and a half years since the competition authorities' intervention.

We made different assumptions about price movements post-intervention to estimate the quantum of customer savings. The assumptions are briefly discussed in four different scenarios presented below. After describing the assumptions in each scenario we tabulate the estimated consumer savings based on the respective scenarios.

Scenario One

In the first scenario, we calculated average price increases in the pre-intervention period. We further assume that during the post-intervention period prices would have been higher than the actual prices charged by a premium of the average price increases in the pre-intervention period if the competition authorities had not intervened. The pre-intervention price change in this scenario excludes the years 2008 and 2009 on the basis that there was a global financial crisis and the prices of fertiliser during these years are outliers. Our calculations show that the average price increase in the inland region is 27.8% between 2005 and 2007. We assumed that without the intervention by the competition authorities, average annual prices would have been 27.8% higher than the actual prices charged by Sasol in the inland region. Therefore, we adjusted the actual price in each year upwards by 27.8% in the inland region.

Our calculations also show that the average price increase in the coastal region is 24.7% between 2005 and 2007. We assumed that without the interventions of the competition authorities, prices would have been 24.7% higher than the actual prices charged by Sasol in the coastal region. Therefore, we adjusted the actual price in each year upwards by 24.7% in the coastal region.

We acknowledge that the assumption regarding the average price increases may significantly overestimate or underestimate what the actual price increases would have been given the influence of market developments including global recession in 2008/9 and the effects of droughts post-intervention. For instance, from 2007 to 2008 average fertiliser prices increased sharply by 103% which would have raised the average fertiliser prices during the pre-intervention period. However, from 2008 to 2009, prices decreased by 21% which would have decreased the average fertiliser prices during the pre-intervention period. **Panel A of Appendix A** provides a graphical depiction of the extent to which the counterfactual prices differ from the actual price charged by Sasol in the post intervention period.

Scenario Two

This scenario makes the same assumption in terms of how prices would have increased without the competition authorities' intervention. We therefore use the same pre-intervention price changes derived above of 27.8% in the inland region and 24.7% in the coastal region. The second scenario assumes that during the post-intervention period if the competition authorities had not intervened, prices would have continued to increase at the pre-intervention average rate annually.

The second scenario also tries to smoothen the prices in 2008 and 2009 where outliers are observed due to economic crises. Therefore, instead of adjusting prices post-intervention, we applied the price changes on the actual price in 2007 (which is the last year of pre intervention period excluding 2008 and 2009) to get the counterfactual price in 2010 (which is the first year on the post-intervention period). Thereafter, the price in each year is calculated by applying the pre-intervention average prices as the adjustment factor.

For example, to get the counterfactual price for the inland region in 2011, the 2010 counterfactual price is adjusted upwards by 27.8%. The weakness of this approach is that it assumes a linear price movement post intervention as shown in **Panel B of Appendix A**. In reality, prices are expected to fluctuate from time to time especially in the agricultural industry wherein factors such as seasonal variation in demand are pertinent.

Scenario Three

This scenario adopts the approach of Scenario Two above, with the only difference being that the calculation of the average price increases in the pre intervention period now includes 2008

and 2009. Further, the price adjustments using pre-intervention price increase starts from 2010.

Panel C of Appendix B depicts the extent to which the counterfactual prices differ from the actual price charged by Sasol in the post intervention period. In addition to the weakness stated to scenario two above, the price adjustment factors in this scenario are likely to be overstated as a result of the high prices experienced during the global financial crisis in 2008/9. This would result in an overestimation of the quantum of customer savings.

Scenario Four

In Scenario Four we estimate the counterfactual price in 2010, separately for the inland and the coastal region, by applying the Producer Price Index (PPI) on the actual price in 2009. Thereafter, the counterfactual price in each year is calculated by applying the PPI of that year on the previous year's counterfactual price.

Panel D of Appendix A depicts the extent to which the counterfactual prices differ from the actual price charged by Sasol in the post intervention period. The weakness of this approach is that it assumes that fertiliser prices in the post-intervention period would increase by PPI. This assumption is more in line with a competitive market. Therefore, it fails to capture price increases that would exist had Sasol continued to abuse its dominance. In reality, Sasol's prices pre-intervention were at IPP and way above the IPP.

The quantum of consumer savings when applying the different scenarios are presented below.

Customer savings in the inland region and the coastal region

For each of the scenarios discussed above, we calculated annual customer savings between 2010 and 2015 as the difference between the revenue at actual prices and the revenue at the counterfactual prices. This was done separately for the coastal region and the inland region. We therefore summed up the annual customer savings to get the customer savings in the entire post-intervention period.

The summarised results of the four scenarios are presented in Table 3 below.

Table 3: Customer savings for the four different scenarios

	Inland Savings (Rand)	Coastal Savings (Rand)	Total Savings (Rand)
Scenario One	955,331,318	46,511,597	1,001,842,915
Scenario Two	7,826,129,024	288,669,764	8,114,798,788
Scenario Three	10,014,244,502	470,328,223	10,484,572,725
Scenario Four	1,698,543,866	78,467,384	1,777,011,250

Source: Own calculations based on Sasol's transactional data

Table 3 above shows that total customer savings range between approximately R1 billion (Scenario One) to R10.5 billion (Scenario Three). Scenario One represents the most conservative estimate of customer savings. We note that Scenario One may therefore represent the most accurate estimation of customer savings in light of the various assumptions that were made to estimate customer savings, as explained in the section above.

6. Conclusion

The purpose of this study is to assess the impact of the Commission's intervention in the nitrogenous fertiliser value chain in 2009 and 2010. Prior to the Commission's intervention,

various anticompetitive practices existed in the fertiliser market that can be grouped into two mutually reinforcing categories. The first one relates to practices that arose from Sasol's dominance and desire to maintain the dominance, whilst the second category relates to collusive practices among major fertiliser blenders and distributors.

The study found that post-intervention many positive outcomes have been observed in the fertiliser industry. For instance, post-intervention, Omnia has expanded its ammonium nitrate operations through significant investment in a nitric acid plant. Furthermore, after the divestiture of Sasol's blending facilities we observe that there have been entry and expansion into the blending and distribution level of the value chain. The firms that were previously traders and reliant on Sasol for LAN/ANS input supplies, expanded and acquired their own blending plants, thereby increasing the number of players at that level of the value chain. The entrants include Profert, GWK and Kynoch, which acquired Sasol's divested plants. There has also been entry by smaller blenders and traders post-intervention. The smaller entrants complement fertiliser supply by the larger players because they supply small quantities of specialised fertilisers which would ordinarily not be supplied by larger players. The entry of new players in the fertiliser industry has increased competition while at the same time increasing the security of supply of fertiliser domestically.

In addition, the study also shows that post-intervention we observe an increase in the supply of ammonia and ammonium nitrate due to the increase in the production and importation of ammonia and ammonium nitrate. The entry of more players in blending and distribution of fertiliser post-intervention has also resulted in an increased supply of fertiliser in South Africa.

Our study shows that the post-intervention period is characterised by more competitive prices to the benefit of farmers. This is reflected by the fact that the prices of fertiliser in both the coastal and inland regions fluctuate more during the post-intervention period relative to the pre-intervention period. However, the study shows that customers' sensitivity to price changes is different between the coastal region and the inland region. In the post-intervention period, customers in the inland region are more sensitive to price changes than customers in the coastal region. It can therefore be concluded that the intervention had a positive effect in the fertiliser industry in the inland region with respect to customers' switching abilities. This may be because the coastal region was relatively more competitive than the inland region pre-intervention.

The divestiture of the blending facilities has served to limit Sasol dominance and its ability to discriminate across customers and between inland and coastal regions. Post-intervention, prices in the inland region which are closer to production facilities are relatively lower than the prices charged in the coastal areas which are farther away from the production facilities. Therefore, post-intervention fertiliser pricing across regions appears to be influenced by economic factors such as transport costs other than the artificial factors derived from Sasol's abuse of market power.

Our study found that the Commission's intervention has contributed to substantial customer savings in the fertiliser industry. The intervention dampened the magnitude of price increases in the post-intervention period, thereby generating substantial customer savings. Notwithstanding the limitations of our assumptions on the price increases post-intervention, it is estimated that due to the Commission's intervention, South African consumers of granular fertiliser saved between R1 billion and R10.5 billion between 2010 and June 2015. This estimate does not account for the additional benefits such as increased customer choice and price competition due to the entry of several new entrants in the market.

The study also found that the increase in the number of players across the fertiliser value chain is likely to have positively contributed to employment. Although we were unable to collect employment data to quantify the resultant employment, it is inferred that the

increase in the number of blenders and traders post-intervention have positively contributed to employment in the fertiliser industry post-intervention. Further, Omnia's investment expansion in the nitric acid plant is expected to have had a positive effect on employment.

Despite the competitive gains resulting from the competition authorities' intervention, the study also noted some market developments in the post-intervention period which are both negative and positive. The negative market developments which we observe in our study in the post-intervention period include increased importation of cheaper low quality fertiliser and the depressed margins in the industry. Further, the exit of Sasol from blending and trading level of the value chain raises some potential future competition concern in the fertiliser industry. Sasol's Secunda blending plant was closed down in May 2015. The exit of Sasol from blending and trading may potentially reduce the pro-competitive benefits that arose from the increased competition at the upstream level with the investments made by Omnia. There is also concern regarding the lack of growth of the smaller blenders and traders after significant market entries post-intervention. Despite numerous smaller firms entering fertiliser trading and blending post-intervention, some of the smaller entrants have failed to stabilise and register growth in the market.

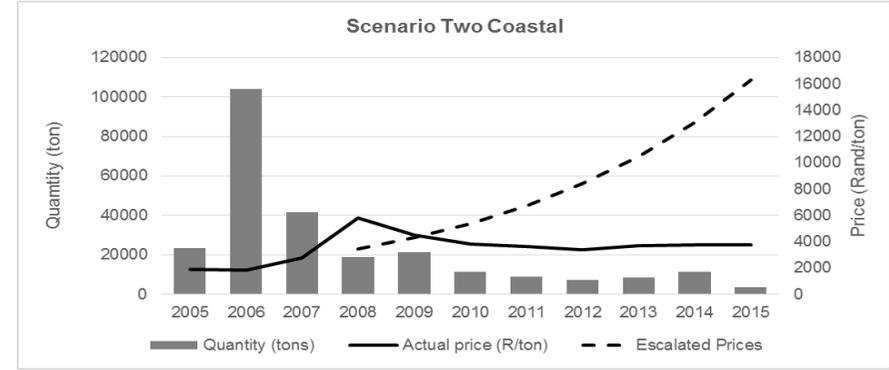
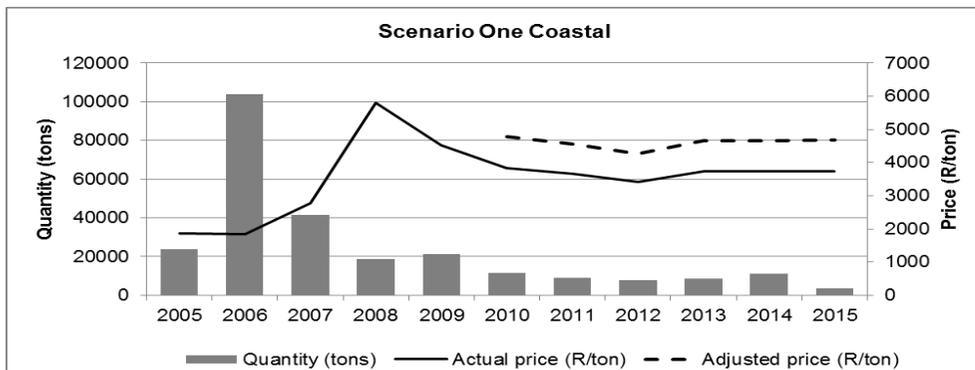
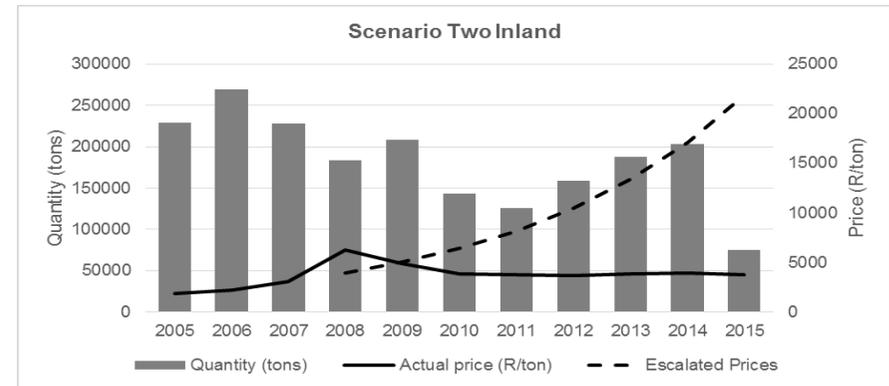
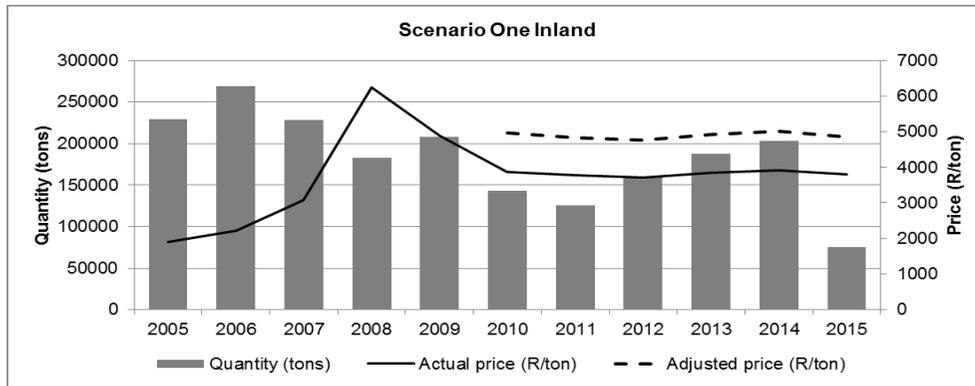
We recognise that the positive outcomes in the fertiliser industry cannot solely be attributed to the Commission's intervention. There may also be other factors at play such as independent investment decisions resulting in market entry. For instance, Omnia's investment in the nitric acid plant may be a culmination of various factors and not solely because of the Commission's intervention. Despite the potential role played by other market factors and dynamics in contributing to the positive outcomes realised in the fertiliser industry post-intervention, we do note that the Commission's intervention has also contributed significantly to the break-down of artificial barriers to entry at all levels of the fertiliser value chain.

We conclude that the Commission's interventions in the nitrogenous fertiliser industry has overall led to several pro-competitive outcomes in the market, including new entry, increased customer choice and price competition, as well as estimated customer savings ranging between R1 billion and R10.5 billion during the first five and half years after the Commission and Tribunal's interventions in the industry.

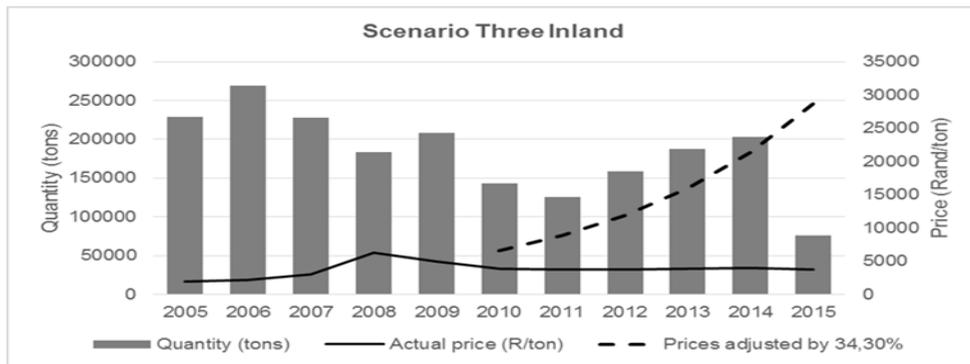
Appendix A

Panel A

Panel B



Panel C



Panel D

