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Appendix A: Reports used in case study one

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

BFAP REPORT 2005-1

by

Jeanette de Beer
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REPORT 2005-1

May 2005

REPORT 2005-1

1. INTRODUCTION

This report is organized into five sections. The first section reports on the latest deterministic and stochastic baseline generated by the South African Grain, Livestock and Dairy Sector Model (developed by BFAP). In the second section the projections and scenarios, simulated during December 2004 and January 2005 are validated. Section three contains a comparison of the rainfall patterns for crop production regions over the past three years. A range of new scenarios are introduced and analysed in section four. Concluding remarks are given in section five.

2. BASELINE PROJECTIONS

2.1 Deterministic projections

The baseline projections are grounded on a series of assumptions about the general economy, agricultural policies, weather and technological change. Macro-economic assumptions are based on forecasts prepared by a number of institutions like Global Insight, the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri, ABSA bank and the Actuarial Society of South Africa (for projections on population). Table 1 and 2 present the baseline projections for key economic indicators and world commodity prices in the model.

Table 1: Economic indicators - Baseline projections:

		2005	2006	2007	2008	2009	2010
Exchange Rate	c/US$	595.98	632.34	670.91	704.46	732.64	754.61
Population	millions	47.49	47.64	47.68	47.65	47.54	47.39
PCGDP	R/capita	15657.23	16001.69	16401.73	16696.96	17114.39	17559.36
CPIF	Index	198.67	205.23	210.97	214.98	221.00	228.51
FUEL	Index	355.24	402.49	454.01	508.04	573.07	649.86
PPI: Total	index	174.63	180.40	185.45	188.97	194.26	200.87
PPI: Agric.Goods	index	180.78	186.74	191.97	195.62	201.10	207.94
Requisites	index	230.33	237.93	244.59	249.24	256.21	264.93
Repair & Maintenance	index	248.63	256.84	264.03	269.05	276.58	285.98
Irrigation equipment	index	196.53	203.01	208.70	212.66	218.62	226.05
Fertilizer	index	244.92	253.00	260.09	265.03	272.45	281.71
Machery & Implements	index	206.385	213.195	219.165	223.329	229.582	237.388

Source: Global Insight, FAPRI, Actuarial Society, ABSA

Table 2: World Commodity Prices - Baseline projections:

		2005	2006	2007	2008	2009	2010
Yellow maize, US No.2, fob, Gulf	**US$/t**	105.00	108.00	109.00	110.00	111.00	112.00
Wheat US No2 HRW fob (ord) Gulf	**US$/t**	145.72	147.33	150.31	152.33	154.99	157.25
Sorghum, US No.2, fob, Gulf	**US$/t**	104.00	103.00	104.00	105.00	106.00	106.00
Sunflower Seed, EU CIF Lower Rhine	**US$/t**	258.00	270.00	277.00	277.00	278.00	278.00
Sunflower cake(pell 37/38%) , Arg CIF Rott	**US$/t**	104.00	106.00	109.00	111.00	112.00	111.00

		2005	2006	2007	2008	2009	2010
Sunflower oil, EU FOB NW Europe	**US$/t**	623.00	643.00	657.00	659.00	661.00	663.00
Soya Beans seed: Arg. CIF Rott	**US$/t**	217.00	227.00	238.00	243.00	243.00	244.00
Soya Bean Cake(pell 44/45%): Arg CIF Rott	**US$/t**	185.00	188.00	189.00	193.00	194.00	194.00
Soya Bean Oil: Arg. FOB	**US$/t**	480.00	492.00	504.00	511.00	511.00	515.00
World fishmeal price: CIF Hamburg	**US$/t**	659.00	669.69	673.25	687.50	691.06	691.06
Nebraska, Direct fed-steer	**US$/t**	1831.00	1773.00	1742.00	1694.00	1645.00	1612.00
Nieu Zealand lamb	**US$/t**	1692.61	1794.16	1901.81	2015.92	2136.88	2265.09
Chicken, U.S. 12-city wholesale	**US$/t**	1478.00	1392.00	1360.00	1352.00	1348.00	1351.00
Hogs, U.S. 51-52% lean equivalent	**US$/t**	1058.00	874.00	906.00	983.00	1067.00	1031.00

Source: FAPRI. Outlook 2005

The deterministic baseline projections for selected commodities that were generated in the model are presented in Table 3 in the form of balance sheets. The most important assumptions and deterministic baseline results can be summarized as follows:

- *The new FAPRI's 2005 Agricultural Outlook* is used for the projections of world prices. This outlook was published in March 2005. The following significant revisions were made compared to the 2004 Outlook:
  - Sunflower seed and cake prices are significantly lower
  - Soybean seed and cake prices have also been adjusted downwards, but to a smaller extend
  - Chicken prices were increase marginally for 2005 but then adjusted downwards from 2006 onwards
  - The cycle in pork prices "bottoms out" in 2006 and starts to increase in 2007 onwards
- It is generally assumed that current agricultural policies will be continued in South Africa and other trading nations.
- The deterministic exchange rate for 2005 is 595 SA cents per US$ after which it depreciates gradually to reach a level of 754 SA cents per US$ in 2010. (The stochastic exchange rate is presented in Figure 1 and the results are discussed in section 2.2 of this report).
- Rainfall is split into the rainfall that influences the area planted and the rainfall that influences the production of each summer crop, which is included in the model. The average rainfall for the past 30 years, for specific months influencing the area planted and the production is used as the forecasted value. The formal rainfall statistics for February, March and April 2005 are not available yet, but the unpublished statistics suggest that the rainfall for the late summer production season was higher than the average of the past 30 years. Section 4 of the report sheds some more light on the impact of rainfall when the rainfall patterns of the past three seasons are compared. This analysis suggests that the early summer rainfall for the 2004/05 season was 9% higher than the previous season's rainfall. For the deterministic baseline projections the average rainfall for the summer area is increased to 8% above the 30-year average (580 mm for critical months). This brings the projected yields of summer crops also

in line with the National Crop Estimates Committee's yield estimates. The stochastic rainfall projections are included in section 2.2.

- After the exceptional yields in the 2003/04 seasons it is now more than likely that the record yields in the history of maize production in South Africa will be achieved this year. In section 3 of the report yield forecasts are discussed in more detail.
- Total white and yellow maize ending stocks have been identified as one of the key uncertainties in the sector model. These stocks levels go hand in hand with the level of exports. In section 5 of the report, scenario 5.3 illustrates the major impact of different ending stock and export levels. These critical variables are also discussed in section 3 of the report. For latest baseline projections the ending stocks have been increased to 4.6 million tons. This is 1.4 million tons higher than the projected ending stock for the previous report in January 2005.
- The first signs of increased export levels for white maize appeared in the first three weeks of April. The level of exports increased drastically to reach a level of 55 000 tons in the third week of May. Despite of this, exports are projected at approximately 900 000 tons. In 2004 white maize exports amounted to a mere 614 000 tons.

Table 3: Deterministic baseline projections for selected commodities

	2005	2006	2007	2008	2009	2010
	thousand hectares					
White maize area harvested	1835.6	1318.6	1476.3	1676.6	1592.6	1599.6
	t/ha					
White maize average yield	3.61	3.48	3.51	3.54	3.57	3.60
	thousand tons					
White maize production	6635.3	4583.7	5181.6	5939.3	5691.8	5765.7
White maize feed consumption	756.5	748.1	698.5	724.9	752.6	757.3
White maize human consumption	3839.2	3761.6	3654.8	3669.1	3685.1	3646.4
White maize domestic use	4920.6	4834.7	4678.3	4719.0	4762.6	4728.6
White maize ending stocks	3254.1	2371.4	2287.3	2648.6	2639.3	2680.7
White maize imports	0.0	139.4	45.3	30.8	5.5	10.5
White maize exports	908.2	771.1	632.7	889.8	943.9	1006.2
	R/ton					
Avg. White maize SAFEX price	575.1	694.9	981.3	977.3	921.0	975.8
	thousand hectares					
Yellow maize area harvested	1083.3	1019.0	986.2	1001.9	1037.5	993.8
	t/ha					
Yellow maize average yield	4.17	4.01	4.05	4.10	4.14	4.18
	thousand tons					
Yellow maize production	4516.27	4082.8	3997.67	4106.44	4297.9	4158.9
Yellow maize feed consumption	3719.00	3671.1	3584.90	3580.94	3635.5	3636.5
Yellow maize human cons.	247.31	248.53	261.24	254.35	247.69	245.56
Yellow maize domestic use	4148.31	4101.7	4028.13	4017.29	4065.2	4064.0
Yellow maize ending stocks	1350.28	1305.	1211.69	1223.35	1294.5	1256.1
Yellow maize exports	192.56	266.05	303.02	282.06	249.93	274.88
Yellow maize imports	147.04	292.23	366.08	359.54	411.40	408.26
	R/ton					
Avg. Yellow maize SAFEX price	599.0	722.0	944.5	980.7	958.8	1024.0

	2005	2006	2007	2008	2009	2010
	thousand hectares					
Wheat summer area harvested	527.3	691.9	592.1	521.7	519.5	534.7
Wheat winter area harvested	313.2	347.7	320.1	304.6	302.6	303.5
	t/ha					
Wheat average yield: Sum. area	2.69	2.71	2.73	2.75	2.77	2.78
Wheat average yield: Winter area	1.71	1.72	1.72	1.72	1.72	1.73
	thousand tons					
Wheat production	1955.7	2472.5	2166.8	1958.5	1959.0	2012.7
Wheat feed consumption	44.5	67.7	79.1	73.2	67.8	71.9
Wheat human consumption	2623.8	2697.9	2728.6	2707.8	2694.5	2703.3
Wheat domestic use	2693.3	2790.6	2832.7	2806.0	2787.3	2800.2
Wheat ending stocks	632.6	694.1	716.8	703.7	692.1	694.7
Wheat exports	22.9	93.7	69.7	58.4	71.6	82.9
Wheat imports	729.7	473.4	758.2	892.9	888.4	873.1
	R/ton					
Wheat average SAFEX price	1468.2	1349.1	1518.7	1645.2	1704.6	1749.2
	thousand hectares					
Sunflower area harvested	488.6	783.4	695.3	654.5	662.1	683.4
	t/ha					
Sunflower average yield	1.39	1.28	1.29	1.30	1.31	1.32
	thousand tons					
Sunflower production	681.0	999.5	895.5	850.6	867.9	903.4
Sunflower crush	643.6	736.8	751.6	752.5	755.1	760.0
Sunflower domestic use	655.56043	748.819	763.5711	764.5125	767.07	772.0342
Sunflower ending stocks	149.2	243.4	208.5	193.4	198.2	209.2
Sunflower net imports	3.5	-156.4	-166.8	-101.2	-96.1	-120.3
	R/ton					
Avg. Sunflower SAFEX price	1743.9	1646.5	1911.6	2045.2	2109.4	2138.8
	thousand tons					
Sunflower Cake Production	270.3	309.5	315.7	316.1	317.1	319.2
Sunflower Cake consumption	252.2	313.8	329.5	347.9	361.4	372.5
Sunflower Cake Change in Stocks	67.8	75.6	76.2	75.7	75.6	76.2
Sunflower Cake Net Imports	49.7	79.9	90.0	107.5	119.9	129.6
	R/ton					
Sunflower Cake Price	1330.0	1342.0	1397.3	1445.9	1495.1	1536.3
	thousand hectares					
Soybean area harvested	155.9	128.1	133.1	130.9	130.3	130.7
	t/ha					
Soybean average yield	1.82	1.76	1.79	1.81	1.83	1.85
	thousand tons					
Soybean production	283.17	225.98	237.85	236.82	238.26	241.26
Soybean crush	35.55	36.31	36.48	36.72	36.91	36.95
Soybean feed consump. (full fat)	167.04	169.30	171.44	175.92	183.72	191.42
Soybean domestic use	263.59	266.61	268.91	273.64	281.63	289.37
Soybean ending stocks	103.97	86.31	74.26	65.44	59.97	56.89
Soybean net imports	-16.11	22.98	19.02	28.00	37.89	45.04
Avg. Soybean SAFEX price (R/t)	1238.3	1951.5	2103.4	2225.7	2312.9	2396.2

	2005	2006	2007	2008	2009	2010
	thousand tons					
Soybean Cake Production	28.44	29.05	29.18	29.37	29.52	29.56
Soybean Cake consumption	593.78	600.50	611.57	618.34	637.64	662.44
Soybean Cake Imports	565.34	571.45	582.39	588.96	608.12	632.88
	R/ton					
Soybean Cake Price	1511.6	1733.0	1846.1	1974.0	2065.5	2133.7
	thousand tons					
Pork production	139.3	140.22	141.4	143.28	145.01	146.48
Pork imports	10.2	12.7	12.73	12.08	11.55	12.09
Pork Domestic Use	146.15	150.41	151.6	152.59	153.59	155.78
Pork Exports	3.35	2.51	2.53	2.77	2.97	2.79
Pork average auction price	1301.5	1463.4	1607.1	1739.3	1893.5	2032.1

2.2 Stochastic projections of selected variables

In the results presented above no risk / uncertainty is taken into account. Risk is inherent in many of the exogenous factors influencing the grain and livestock industry. In the following set of results two critical exogenous variables, exchange rate and rainfall were simulated stochastically in the model.

Figure 1 and 2 illustrate the probability distribution function (PDF) of the exchange rate (expressed as SA cent per US$) and rainfall for the critical months that influence the summer grain production.

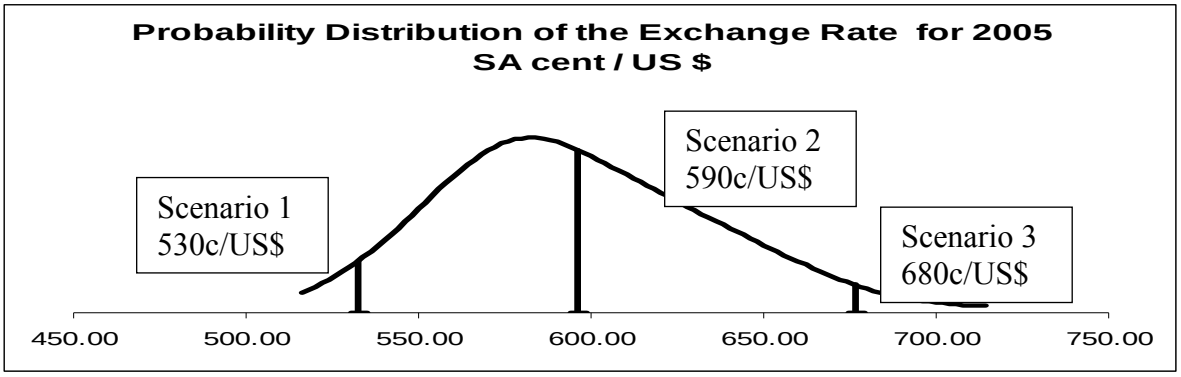


Figure 1: Probability distribution of the Exchange Rate, 2005

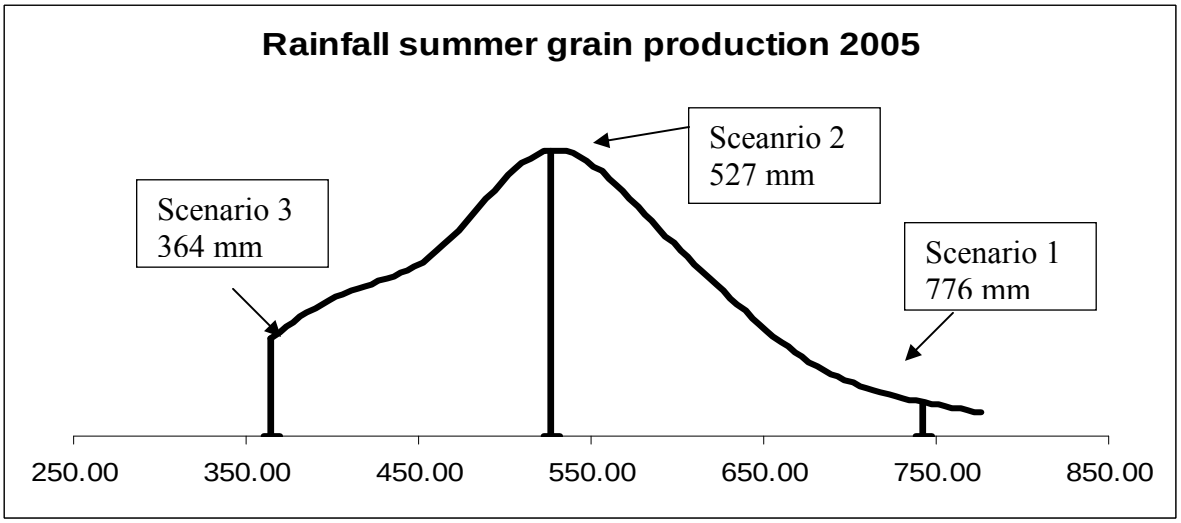


Figure 2: Probability distribution of summer rainfall for 2005

Although the rainfall distribution has not changed the total rainfall for the current production season lies to the right hand side of the figure. This implies that scenario 1 realised with above normal rainfall for the summer production season.

Figures 3 and 4 present the probability distributions for white and yellow maize for 2005. ***Note: These stochastic results are generated by making use of a stochastic exchange rate only and not a stochastic rainfall variable.*** The rainfall for the summer production region is fixed at 580 mm which results in a total maize crop of 11.1 million tons for 2004/05 season.

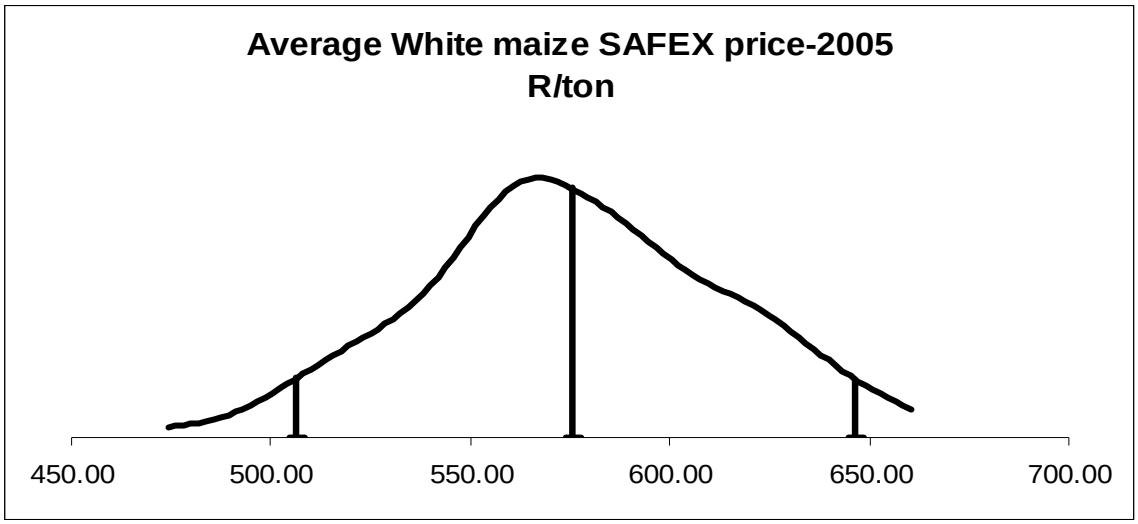


Figure 3: Probability distribution – White maize SAFEX price 2005

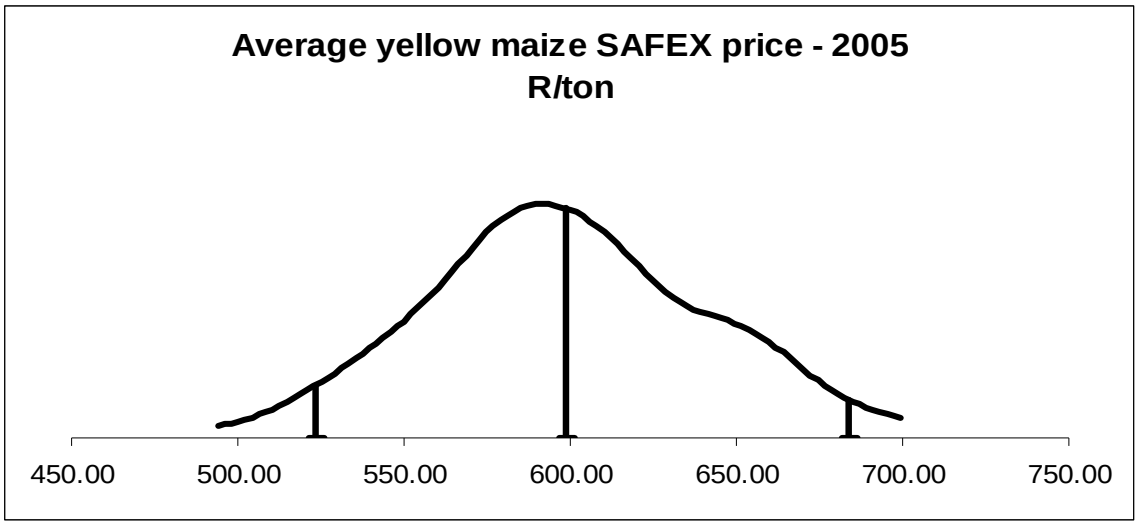


Figure 4: Probability distribution – Yellow maize SAFEX price 2005

3. VALIDATION OF PROJECTIONS AND SCENARIOS OF DECEMBER 2004 AND JANUARY 2005:

As previously mentioned baseline projections are grounded on a series of assumptions about the general economy, agricultural policies, weather and technological change. The aim is to base the projections on the best information available at the time of the forecast. Table 4 presents the deviations for the white and yellow maize sector between the three various baseline projections that were simulated in December 2004, January 2005 and the current projection of April 2005. This section compares these baseline results to the latest baseline results as presented in the first section of the result and discusses the reason for the major deviations in some of the critical variables as well as the alternative measures/improvements to the model that will be introduced to ensure more accurate scenario planning and projections.

Table 4: The major deviations of three baseline projections for 2005

		2004/05 Projections			
White Maize		**04-Dec**	**05-Jan**	**05-Apr**	**Dec Adj.**
	Production	5776.3	6180.5	6635.3	6655.7
	Domestic use	4986.3	5099.2	4920.6	5066.4
	Ending stocks	2463.2	2279	3254.1	2693.0
	Imports	0	0	0	0.0
	Exports	756.3	1205.4	908.2	1325.7
	Avg. annual SAFEX price	933.4	674.9	575.1	771.6
	Actual SAFEX monthly spot price	799.48	734.73	545	**
Yellow maize					
	Production	3731.8	3880.8	4516.3	4536.3
	Domestic use	3884.3	3992.5	4148.3	4082.9
	Ending stocks	1013.7	866.5	1350.3	1307.6
	Imports	423.6	375.4	192.6	290.3

	Exports	164.4	305	147	342.1
	Avg. annual SAFEX price	925.8	742.7	599	733.0
	Actual SAFEX monthly spot price	857.5	778.5	602	**

In December 2004 the SA weather bureau forecast a normal to below normal rainfall season for the summer production area for the remainder of the season. As a consequence the rainfall for the summer production area in the model was adjusted downwards to approximately 25% below the 30-year average. A total maize crop of 9.5 million tons was projected. Total exports were estimated at approximately 900 000 tons and ending stocks at 3.4 million tons. Deterministic white and yellow maize prices were estimated at R933/ton and R925/ton respectively. The last column in table 4, "Dec Adj.", presents the results if the production estimates of the model that was used for the December forecast are increased to the current levels of production. This implies that the total maize production is increased from 9.5 million tons (December 2004 – levels) to 11.1 million tons (April 2005-levels). No further adjustments were made to the exports or ending stocks levels, which results in total exports amounting to 1.65 million tons and ending stocks to 3 million tons. Under these market conditions white and yellow maize prices were estimated at R771/ton and R733/ton. When these results are compared to the April 2005 forecasts it becomes clear that apart from the under estimation of total production, exports and ending stock levels are the main drivers for the current low level of prices. The model overestimated exports, which led to an underestimation of ending stocks.

Rainfall forecasts will always be highly variable at best. Stochastic modelling techniques can be applied to at least obtain some indication of the band in which production might fall. Table 5 presents the stochastic price range for white and yellow maize. Already in December a minimum price of R710/ton was simulated for white maize. This price was generated at a crop of approximately 11.5 million tons. One can argue that if the correct scenarios would have been developed surrounding the level of exports and ending stocks, one could have come up with a more plausible range of prices for the current market situation.

Table 5: Stochastic projections for white and yellow maize - 2005

		Stochastic projections		
		04-Dec	**05-Jan**	**05-Apr**
Stochastic Variables				
	Rainfall	**yes**	**yes**	**No**
	Exchange rate	**yes**	**yes**	**Yes**
White Maize SAFEX Price – R/ton				
	Min	710.62	406.68	474.19
	Mean	930.57	653.70	575.22
	Max	1108.92	845.81	660.37
Yellow maize SAFEX Price – R/ton				
	Min	865.40	464.79	493.91
	Mean	944.28	722.99	598.65
	Max	1013.52	939.97	699.35

The big question is thus what drives export and ending stock levels and why did the sector model overestimate exports. A number of possible explanations can be taken into account. Firstly, although import and export parity pricing is taken into account in the import and export equations, this section of the model needs to be expanded with more relevant pricing, which includes an attempt to incorporate the import and export parity pricing of neighbouring countries. Thus, the equations in the model can be improved with more relevant variables and parameter estimates.

Secondly, since the deregulation of the commodity markets does South Africa still have the infrastructure to export large volumes of maize? This issue has been debated on many occasions. Studying the weekly SAGIS import/export data it appeared that not more than approximately 18 000 tons of maize could be exported on a weekly basis, which implies an annual figure of roughly 900 000 tons. This was proven wrong when the import/export figures, for the week 16-22 April, reported white maize exports to neighbouring countries to the amount of 32 000 tons (1.5 million per annum).

Finally, much uncertainty exists about the stock holding ability of role players in the industry. Especially in the current and previous production season big producers have demonstrated their ability to hold stock for longer periods of time than anticipated. The stock holding ability was clearly also boasted by the bumper crop of 2002, which coincided with record level prices.

Figure 5 and 6 graphically illustrate the comparison between stochastic estimates and the actual SAFEX maize prices. The current SAFEX white maize price is R160/ton below the minimum projected price in December 2004 and the current SAFEX yellow maize price is R250/ton below the minimum price projected in December 2004.

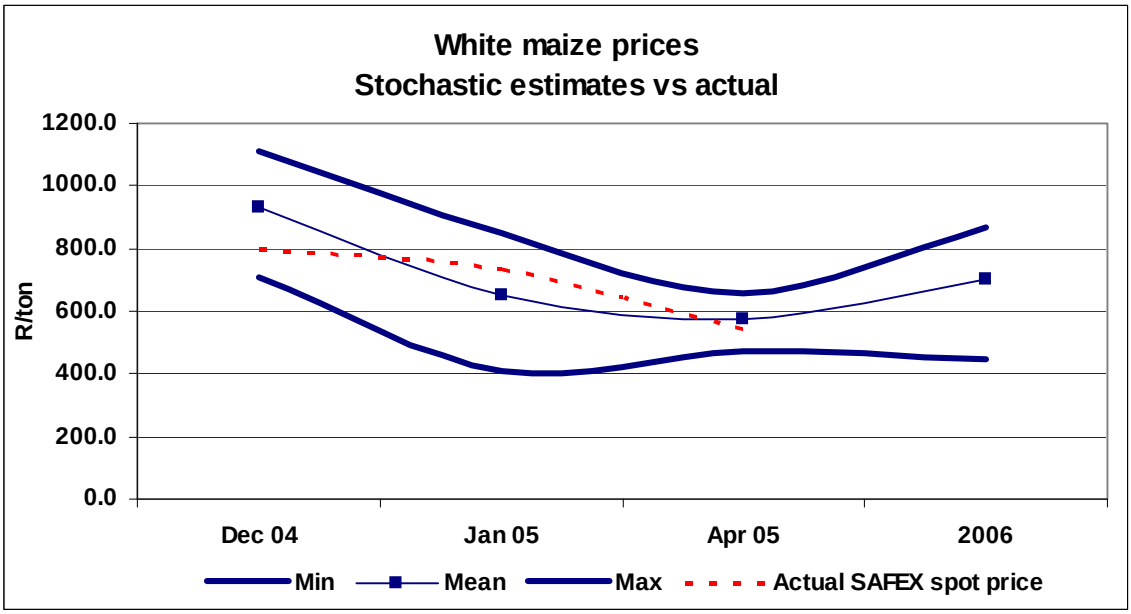


Figure 5: White maize prices – stochastic estimates versus actual spot prices

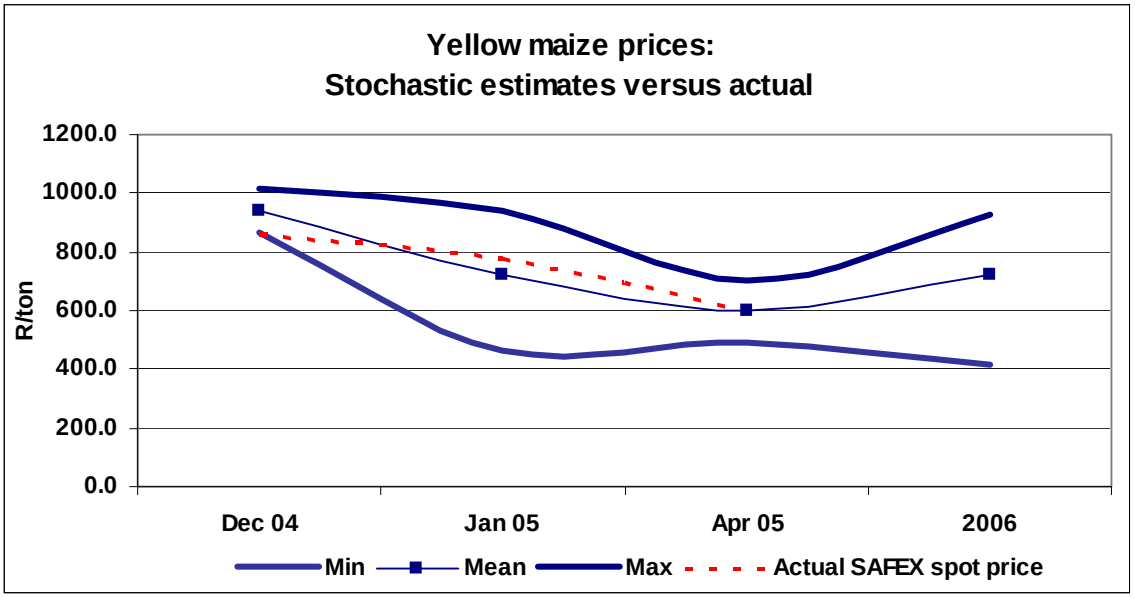


Figure 6: Yellow maize prices – stochastic estimates versus actual spot prices

To summarize, possible improvements to the model have been identified and are listed below. However, the usefulness of scenario planning cannot be underestimated and it forms a vital component of the decision making process. The process of decision-making should be based on knowledge, experience, the results of models and many other strategic planning techniques. It has to be kept in mind that the model projects annual average and despite of the fact that the stochastic ranges of maize prices have significantly narrowed down in the April projections due to a higher certainty about the size of the crop, this does not imply that prices could not move beyond these ranges in the period to come.

Additional measure and Improvements

Sector model structure

- The development of a new price formation section for all commodities that includes more relevant import and export parity pricing. Currently import and export parity prices are taken into consideration in the import and export equations. However, more research is required on the impact of export parity pricing to neighbouring states. (Estimated time for completion: August 2005)
- More research is conducted on stochastic yield analysis. This involves the construction of distribution from the error terms of each yield equation. (Estimated time for completion: August 2005)
- An agreement has been reached with the SA weather bureau to supply the rainfall information as soon as the data has been processed.

Scenario planning and research

- The development of a scenario planning strategy to its fullest potential. This will ensure that a net is cast out further to capture more plausible scenarios. A distinction

will be made between short-term and long-term scenarios. This initiative is already introduced in section 5 of the report.

- Improved integration of the scenario planning exercises into the technical modelling framework.
- More detailed research is currently undertaken on consumption trends of main food items in South Africa
- Training industry specialist is one of the core building blocks of the BFAP philosophy. It takes time to train people, who have a strong academic background, to become true industry specialist with a clear understanding of and feeling for the industry.

4. RAINFALL

In September 2004 forecasts were published by the *Climate Prediction Center/NCEP* in Washington, which indicated that an El Niño like pattern would most probably reveal itself. What in December was regarded as a possible drought year with low crop yields by many role players in the industry, turned out to be an outstanding year with most probably the best crop yields in the history of maize production in South Africa. This section serves as a primer/"first word" for a new initiative introduced by BFAP to research weather patterns in more detail in order to better understand long-term weather forecasts and improve stochastic estimates in the model. For this report some of the basic characteristics of the El Nino phenomenon are briefly explained after which the rainfall patterns of the past three seasons will be compared.

El Nino patterns are associated with warmer temperatures and below-average rainfalls. El Nino patterns are important in assessing future weather conditions as they account for approximately 30% of the actual weather experienced, but they cannot be viewed in isolation, as there are many other factors to take into account. The fact that SA comprises of so many unique regions makes it dangerous to make generalisations about what's going to happen with the weather, and how it could influence the agricultural scene.

Most parts of the maize producing areas received higher rainfall (between 30 mm and 100 mm) during April – August 2004 than was the case for the same period in 2003. This made excellent initial soil moisture conditions possible at planting time. (Maize Vision No 63, 21 Sept 2004, See Fig 7)

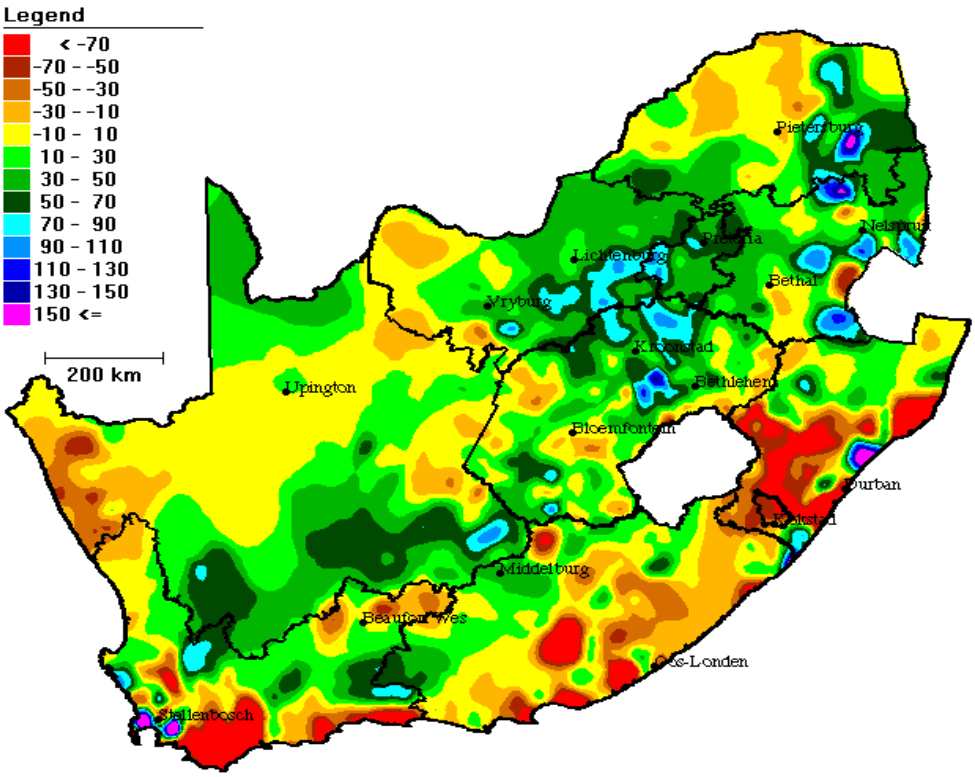


Figure 7 Differences in rainfall totals between 2003 and 2004 with positive values (green, blue and purple) indicate a higher rainfall for 2004 than 2003 and negative values (yellow, brown and red) indicate that more rain fell in 2003 than in 2004.

In 2004 *Weather SA* shed some light on the following issues with respect to El Nino and its consequences: The following range of relevant questions were quoted out of the report (Source: www.weathersa.co.za):

"Is this summer (2004) an El Niño season? Yes. The current weak El Niño conditions are expected to prevail throughout the summer into early 2005

Does El Niño cause drought in South Africa? No. Although some El Niño years have below-normal rainfall, the impact of El Niño on the agriculture is often reduced by the high level of rivers, dams, sufficient groundwater and soil moisture content carried over from the previous season.

How does El Niño influence the rainfall? The influence of El Niño on rainfall in South Africa is not straightforward. It differs from region to region and from season to season."

As previously explained in the sector model rainfall is split into the rainfall that influences the area planted and the rainfall that influences the production of each crop. A further distinction is made between the summer and winter rainfall region. The rainfall for a specific season is calculated as the simple average rainfall for the specific months that influence the area planted and the production respectively. The winter and summer

regions are split up into districts, as illustrated in Figure 8 below. Rainfall data is collected by Weather SA, whereupon only the applicable regions' rainfall figures are imported into the BFAP sector level model.

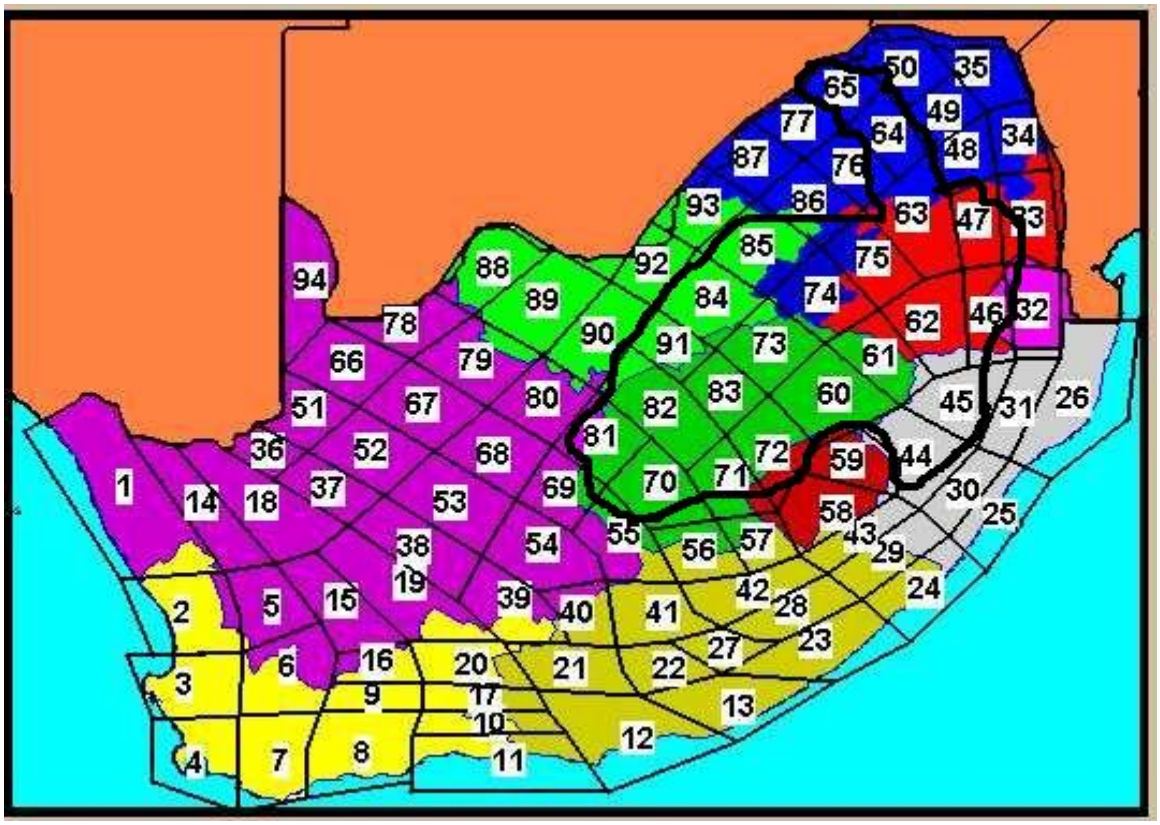


Figure 8: Rainfall district of South Africa

Table 6 below clearly depicts the specific months influencing area and production for each of the crops in the model. All the winter crops fall in the winter rainfall region category, except for the wheat summer area planted and harvested.

Table 6: Relevant rainfall months for various production seasons

	Jan	Feb	Mrt	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Summer area												
Summer production												
Winter area												
Winter production												
Maize area												
Sunflower area												
Sorghum area												
Soya area												

Figures 9 and 10 present comparisons of rainfall statistics for the critical months over the past three production seasons. The addition of the rainfall data for February to April for each production season (2005 data for March, April and May not available yet) will add much more detail to the picture since it were exactly these months where the amount of

rain was much higher than forecasted over the past two production seasons. This led to significant increases in yields.

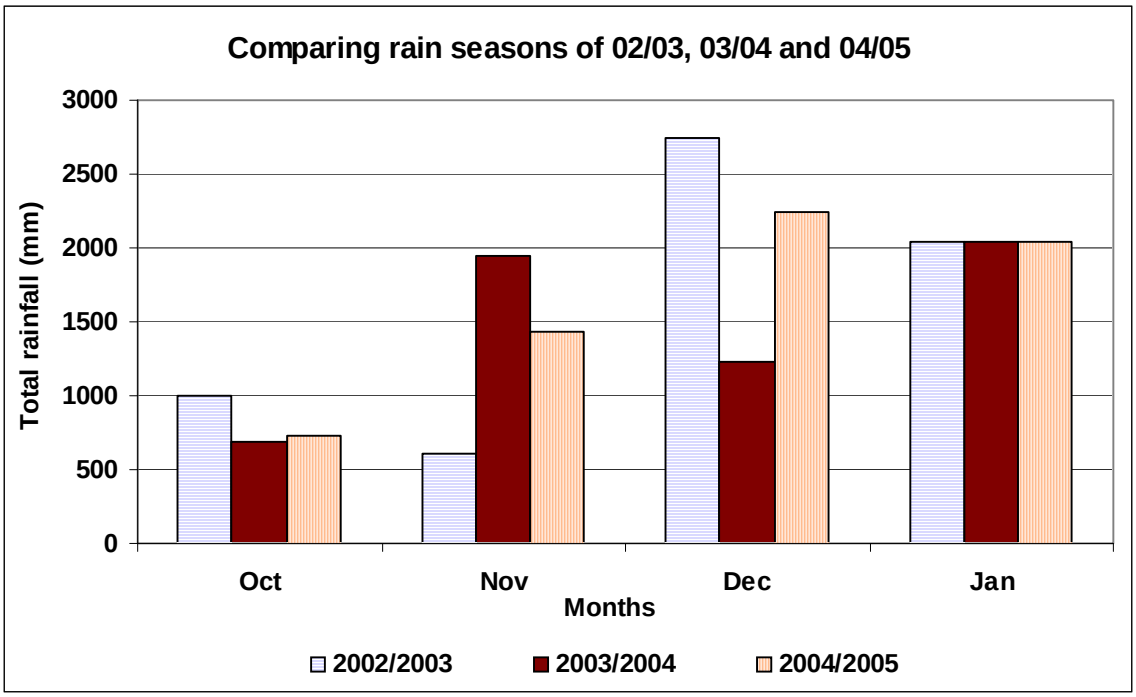


Figure 9: Rainfall district of South Africa

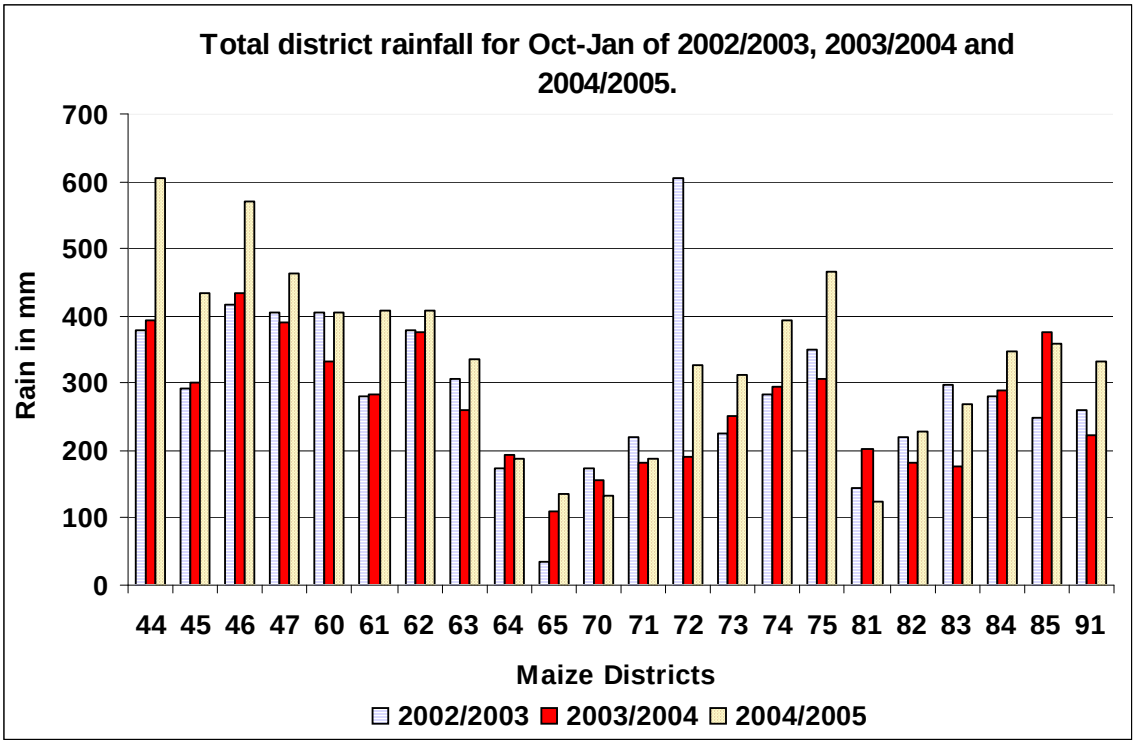


Figure 10: District rainfall for the period October – January for the past three production seasons, including 2004/05.

From Figure 10 it is evident that for most of the districts in the summer production area the 2004/05 production season recorded the highest rainfall over the past three production seasons.

5. SCENARIO ANALYSES

The purpose of this section is to introduce a range of new scenarios. These scenarios vary in nature; ranging from short term to long term. The purpose of this section is to share some thoughts on the construction and possible outcome of each scenario in order to facilitate feedback from the company as well as future scenario planning sessions for the expansion of these scenarios. The medium term and long-term scenarios follow the short-term scenarios.

5.1 Exchange Rate

Earlier this year a report came out which identified 3 drivers that influence the SA exchange rate. The three drivers were the interest rate differential between SA and other countries (particularly the US and the EU), the US/EU exchange (strength of the US$) as well as the gold price. In the last 2 months the interest rate differential has increased due to an increase in the US interest rate and a decrease in the SA interest rate. After gold sales by the IMF in an effort to lower third world debt were proposed earlier this year, experts around the world are still divided about the idea and thus gold prices are still very uncertain.

Proposed Scenario: An exchange rate of R/US$ 8.

5.2 Lower Beef Prices

This season's low maize prices have coincide with the highest beef prices in three years. This has resulted in farmers finishing weaners that can be sold in August/September this year. The higher SA prices along with Namibia and Botswana losing export contracts to the EU due to foot-and-mouth disease, have also led to higher SA beef imports from Namibia and Botswana.

These factors led to the question of the possibility of lower beef prices toward the end of the year and what the possible substitution effect could be on the pork industry. At this time these concerns are incorporated in the model through higher beef production figures. Table 7 below clearly presents the lower projected beef prices for 2005 due to an increase in beef production of approximately 28 000 tons (4.9%). Beef consumption is also projected to increase due to lower beef prices.

Table 7: Beef baseline projections

	2004	2005	2006	2007	2008	2009	2010
Beef production (1 000 t)	580.6	609.2	584.4	583.3	584.2	586.3	587.0
Beef Domestic Use (1 000t)	637.9	662.3	644.7	646.5	648.8	652.5	655.7
Beef average auction price	1326	1219	1334	1464	1540	1615	1707

5.3 Maize exports and ending stock

On April 21 I-NET Bridge reported that the Zimbabwe government needs up to 1.2 million tons of maize to make up for a shortfall. If one adds the Malawi demand for 300 000 to 500 000 tons, then SA could see 1.7 million tons of exports this year. Will SA have sufficient infrastructure to move the amount of maize if the demand exists in the neighbouring countries? As mentioned previously, in the third week of May 55 000 tons of maize were exported, which could mean an annual export level in access of 2 million tons.

It is envisaged that by the time of the next meeting with the company, the first version of a more advanced model, that incorporates a new import and export pricing section, will be ready for these analyses. In the mean time, some preliminary scenario analysis will be conducted with the current model.

5.4 Ethanol

Ethanol, also known as ethyl alcohol, alcohol, grain spirit, or neutral spirit, it is a clear, colourless, flammable oxygenated fuel (READI, 2002), which can be produced using crops such as maize and sugar. Biodiesel, in turn, refers to the monoalkyl esters of long chain fatty acids derived from plant or animal matter (Radich, 2004?). The possibility of producing ethanol in SA is currently drawing attention due to the domestic trends in maize production and its relatively low price. The feasibility of constructing small ethanol plants that uses the dry milling process (as opposed to the wet milling process) is being examined. The reasons for examining this particular option in more detail is related to the nature of agricultural production in SA as well as the characteristics of the dry milling process. The wet and dry milling methods of ethanol production have different cost structures and by-products, which in turn have different values. These differences will be examined along with countries which are currently playing an important role in the international markets for ethanol and biodiesel.

Proposed Scenario: A total of 7 ethanol plants and planned for construction. Each plant has a capacity of 370 000 tons per annum, which generates an additional maize market in South Africa of 2.6 million tons to supply 1 260 950 000 litres of ethanol. Approximately 1 million tons of DDGS (Dried distillers grain) will enter the feed market. At an exchange rate of R6/US$ - R7/US$ the breakeven price of maize for these plants is in the region of R800 – R900/ton.

What would happen if these 7 plants are brought into production?

LONG TERM

5.5 Shift in Production Maize Areas

The following scenarios are just the starting blocks for more extensive scenarios on above-mentioned issue, and therefore need to be thought through by the group, changed, expanded and enriched. After the scenarios have been completed, leading indicators need to be identified, which will indicate which scenario or mix of scenarios are playing out.

Key drivers:

- Infrastructure development
- Foreign investment
- High rainfall and fertile soils
- World trade negotiations
- World food programs
- Biotech
- South African agricultural industry survivability

Key uncertainties:

- Successful infrastructure development
- Input suppliers
- Local markets
- Export markets for biotech food
- Political unrest
- World support/finance/investment
- Commodity prices and debt levels

Countries involved:

- Angola
- Zimbabwe
- Zambia
- Mozambique
- Tanzania
- DRC
- Uganda
- Kenya

Four scenarios:

Scenario 1:
Infrastructure development does take place to an extent. However, due to world trade negotiations as well as world food programs, local markets are flooded with imported products while export markets are too competitive. Thus, commercial grain production is not viable over the long-term, and subsistence farming continues. Very little investment takes place from foreign countries including investment from South African companies. The fruit from investments flows back to investing country, and not to locals.

Scenario 2:
Infrastructure development is relatively successful. Some input suppliers invest in countries and some commercial farming does take place. However, subsistence farming is most prevalent, and infrastructure is mostly used to transport people and small amounts of farm products to local markets. Food programs still play major role. Foreigners do invest in agricultural sector, and some of the fruits of the investment flow to the locals. World trade negotiations

Scenario 3:
Infrastructure development is successful. The good infrastructure leads to investment from foreign companies. Commercial farming takes place to large extent as well as subsistence farming leading to a dualistic agricultural sector. Wealth is accumulated by a few selected locals from the foreign investments. However, the political unrest begins due to accumulated wealth leading to power struggles. This leads to periods of destabilization in the region hampering foreign investment.

Scenario 4:
Infrastructure development is successful. The good infrastructure leads to investment from foreign companies. Commercial farming takes place to large extent as well as subsistence farming leading to a dualistic agricultural sector. Wealth is accumulated by a greater part of the locals from the foreign investments. Good governance takes place, leading to political stability and more foreign investment. Commercial farmers are highly competent relative to rest of the world due to good infrastructure, supply of technology and good production knowledge. Region becomes net exporter of grain and livestock products.

6. CONCLUSION

Report 2005-2 will be completed after the next meeting. This report will consist of the latest baseline projections as well as the recommended adjustments and expansions to the range of scenario analyses. Short-run scenario analyses will include comprehensive analyses of grain markets in 2006 with respect to area planted, production and prices. Also included will be the first results of the farm-level model.

Scenario Planning for The Company

Scenarios on maize price and maize price effect on pig producers

Constructed for The Company by BFAP

November 2005

Introduction and assumptions

During the scenario session, the company indicated that the Rand/$ exchange rate, the US maize price (US Nr 2), rainfall in the summer grain production region and the area planted with maize is likely to be the four key drivers during the South African 2005/2006 maize production season. Bird flu is seen as a key uncertainty since it can significantly influence the international feed market and therefore the South African feed market as well.

The following assumptions with regards to the probability distributions of the Rand/$ exchange rate and US Nr.2 price were made in the simulations of the various scenarios. These probability distributions are based on the views of the company.

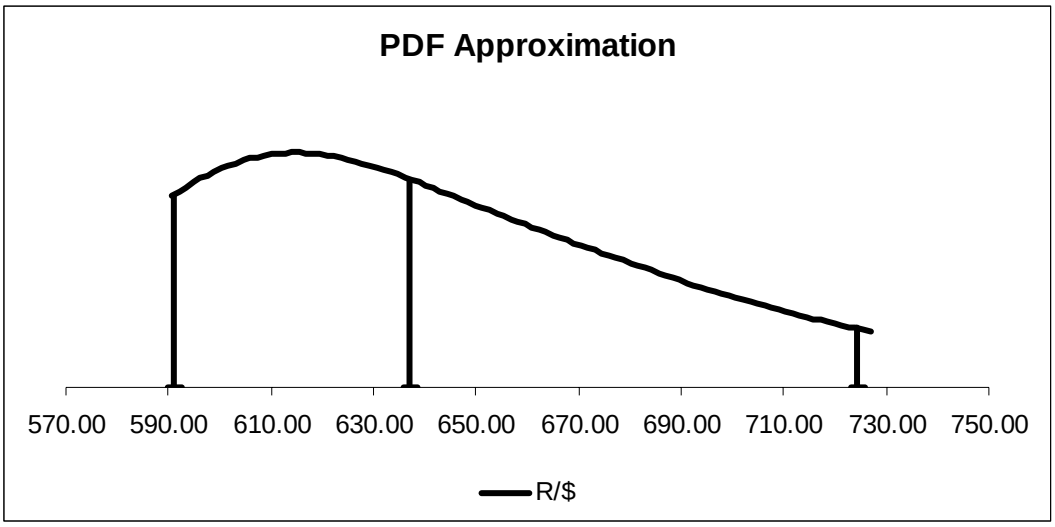


Figure 1: R/$ probability distribution

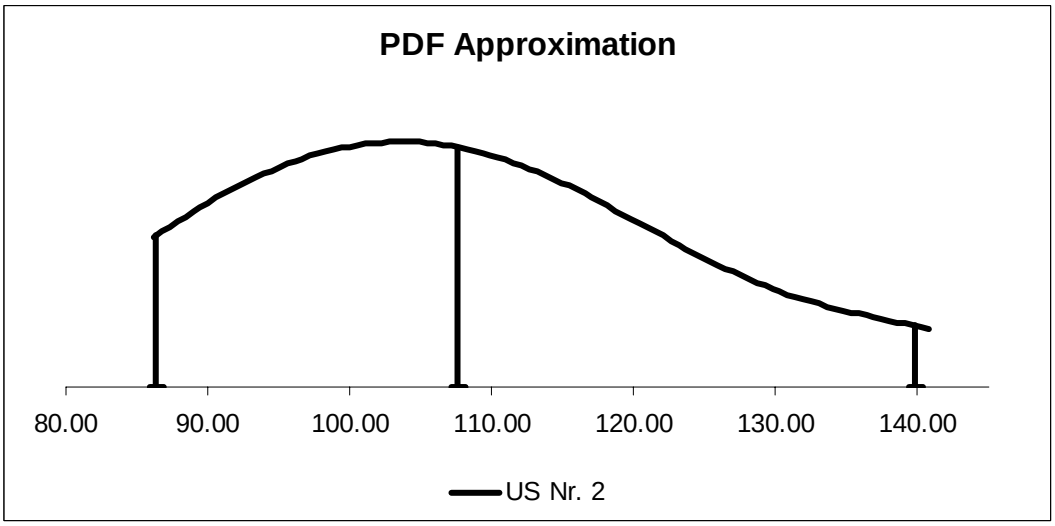


Figure 2: US Nr. 2 probability distribution

The probability density function (PDF) of the Rand/$ indicates that the average R/$ exchange rate for 2006 is likely to be R6,37/$, that the Rand is more likely to move in the area of R6,05 to R6,30 while there is a smaller probability that it might depreciate up to a level of R7,24/$ and beyond. The PDF of the US Nr. 2 price indicates an average price of $107/ton with the price more likely to move between $90/ton and $115/ton. There is a small probability of the price rising to $140/ton and beyond.

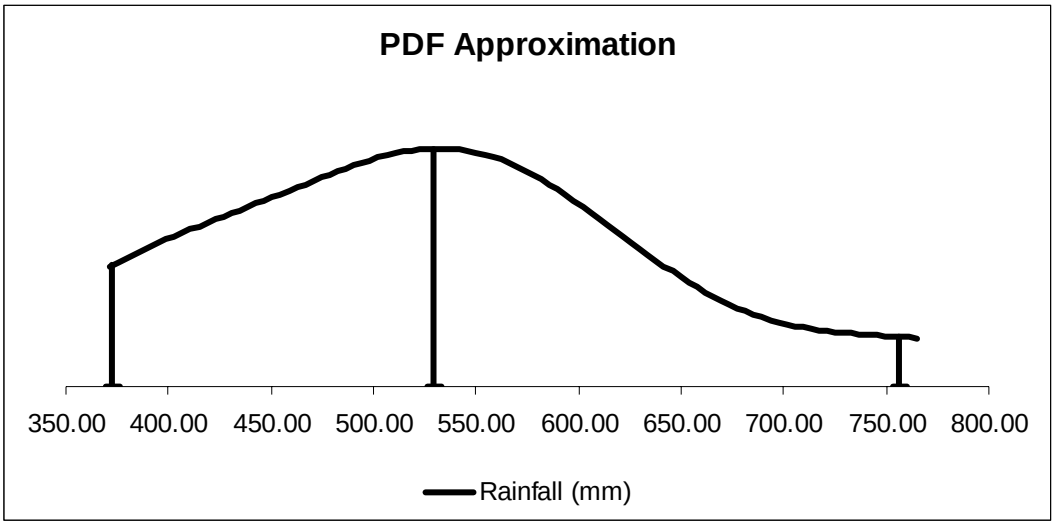


Figure 3: Rainfall (mm) during months influencing yield in summer grain area

Maize price and maize production scenarios

This section of the report presents the scenarios surrounding the area planted under maize for the 2005/06 production season along with the assumptions on the Rand/$, US Nr. 2 price and rainfall as presented in the introduction. Domestic price formation can take place at three alternative trade regimes, namely **import parity** (shortage in domestic market), **export parity** (surplus in domestic market), and **autarky** (domestic market between import and export parity). At import and export parity the cointegration between the domestic price, exchange rate and the world prices is much higher than when the market is trading at autarky. In other words, a shock in the exchange rate and the world prices has a larger impact on the domestic price if the domestic market trades at import or export parity levels. When the domestic market trades at autarky, domestic demand and supply conditions mainly determine the domestic price.

It is therefore appropriate to develop scenarios that illustrate how markets respond to exogenous shocks under the three various trade regimes. For example, the model solves for prices at import parity levels when a shortage is created in the market. Hence, by simulating three different production levels the model can solve for prices under the three various market regimes. Due to the fact that risk is inherent on most of the exogenous factors influencing the grain and livestock sectors, stochastic modelling techniques are applied to generate probability distributions for each of these exogenous factors. The level of import and export parity prices is mainly determined by the world prices and the

exchange rate. Based on the stochastic simulation results of the exchange rate and world prices, probability distributions can be constructed for grain and livestock commodity prices.

The various trade regimes were simulated by shocking the area planted under white and yellow maize in 2006 as follows:

Import parity: 500 000 ha white maize, 500 000 ha yellow maize
Autarky: 1.21 million ha white maize, 895 000 ha yellow maize
Export parity: 1.8 million ha white maize, 1.2 million ha yellow maize

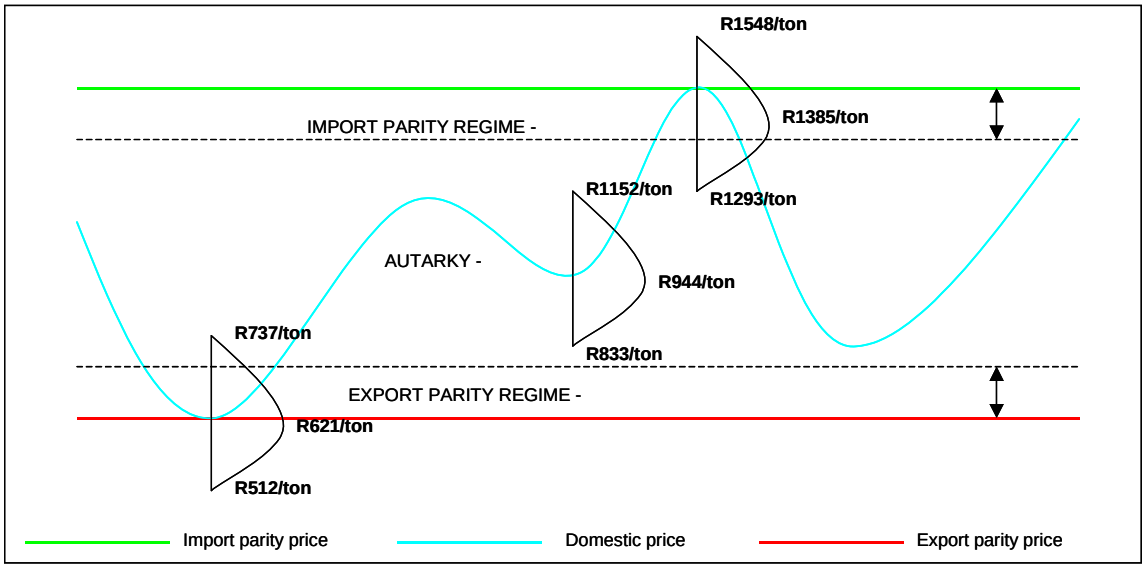


Figure 4: White maize SAFEX price distributions, 2006

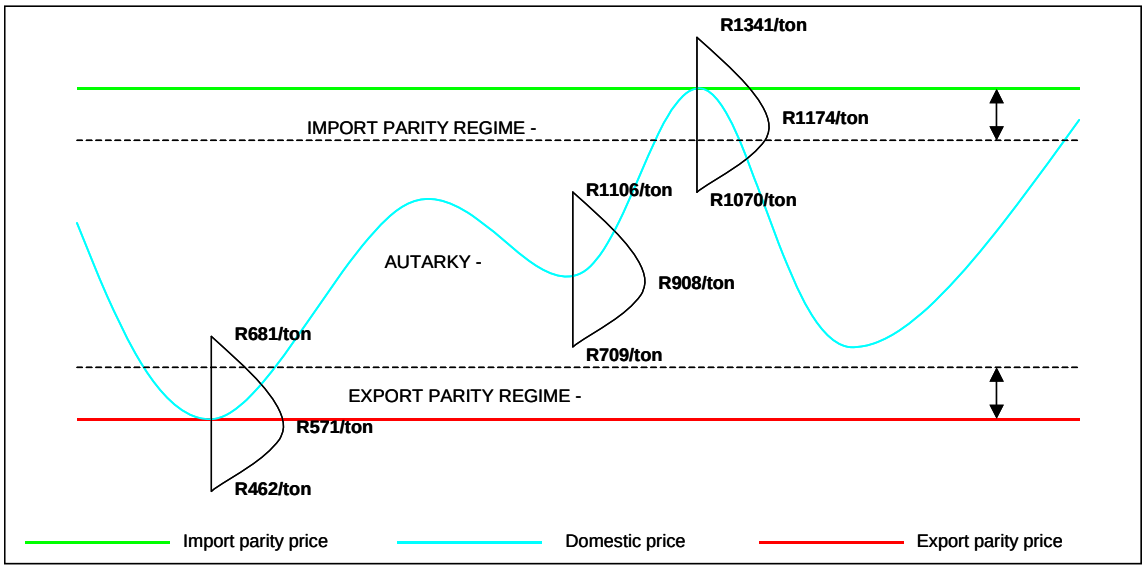


Figure 5: Yellow maize SAFEX price distributions, 2006

Given the variation in rainfall as well as the other key drivers as identified in the introduction, the PDF's of the total production of maize under the three different scenarios of import parity, autarky and export parity can be illustrated as follows:

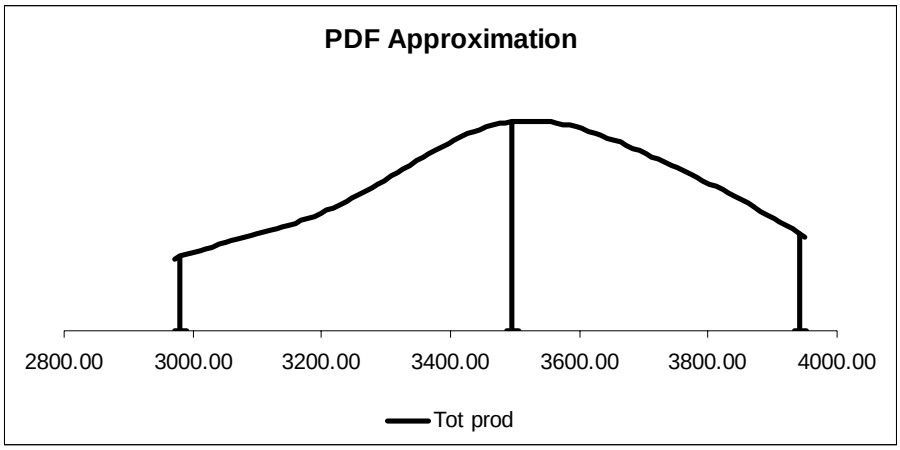


Figure 6: Total maize production (thousand tons) PDF under import parity scenario

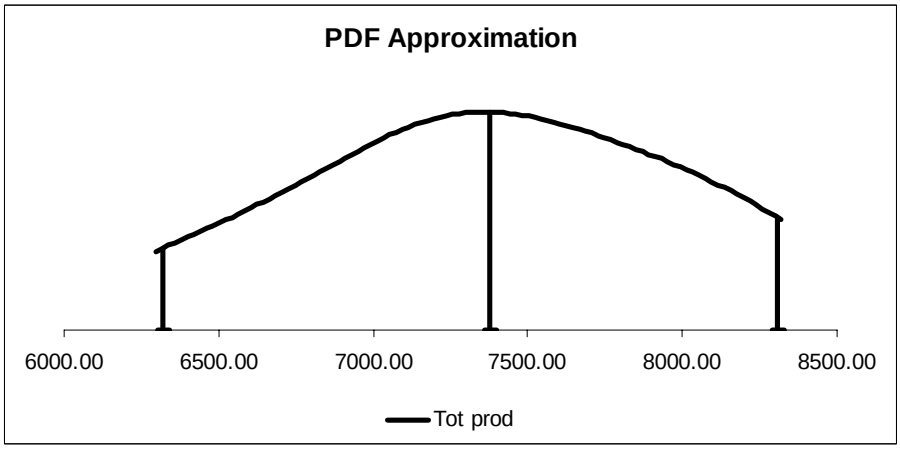


Figure 7: Total maize production (thousand tons) PDF under autarky scenario

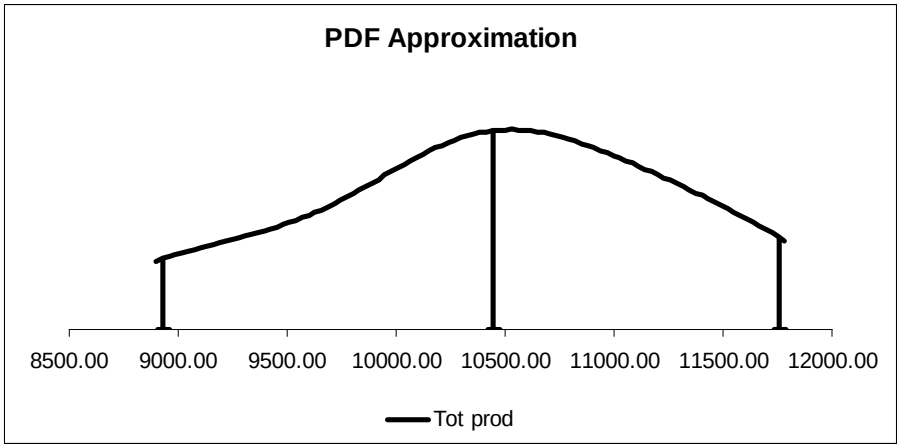


Figure 8: Total maize production (thousand tons) PDF under export parity scenario

Pork price scenarios

Based on the possible variation of the maize price in the three different scenarios, the pork price PDF's are as follows:

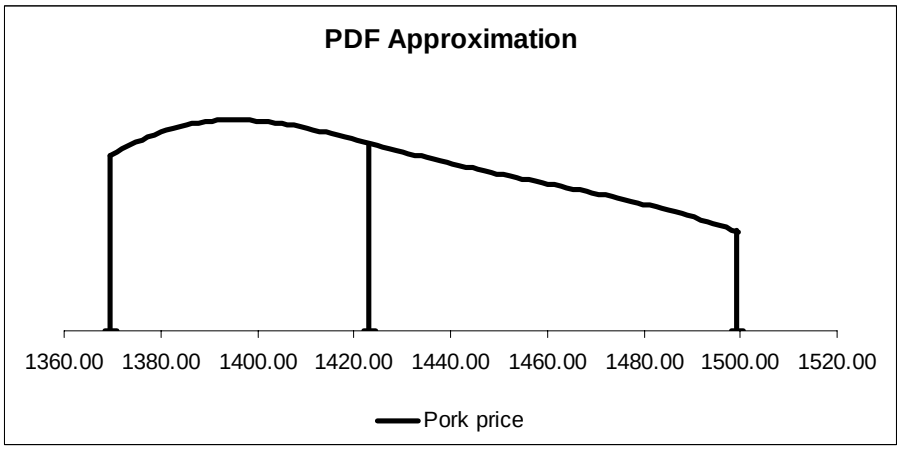


Figure 9: Pork price PDF (R/kg) under import parity scenario

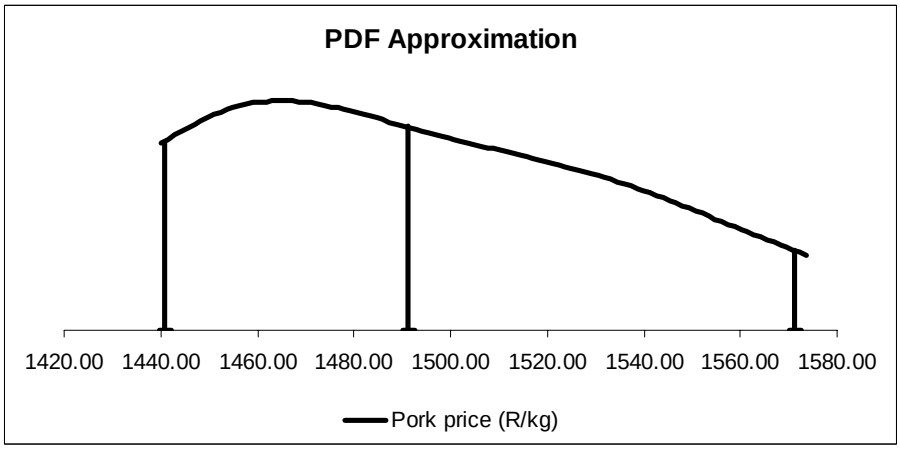


Figure 10: Pork price PDF (R/kg) under autarky scenario

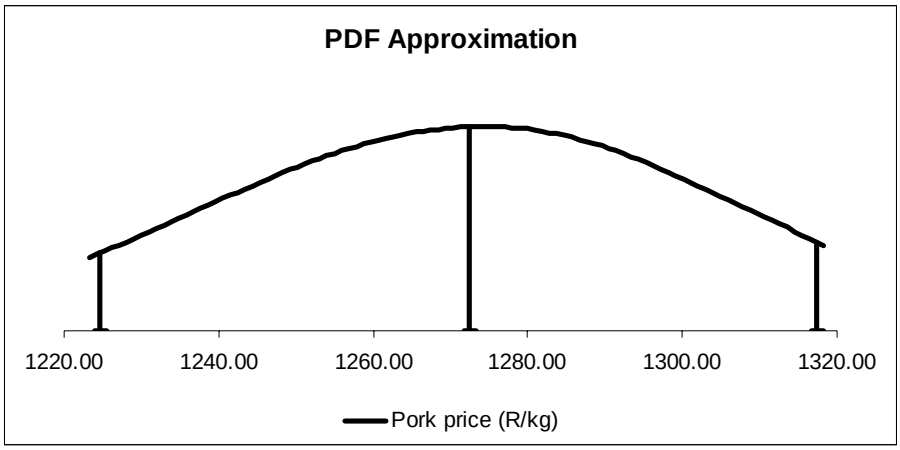


Figure 11: Pork price PDF (R/kg) under export parity scenario

Profit before interest and tax (PBIT) scenarios

The following assumption were made in terms of the production of a kilogram of pig meat on a pig farm:

Table 1: Pig farm assumptions (2500 sow unit)

Item	Assumption
Production and price assumptions	
Baconer sales (amount)	46 800 pigs
Baconer weight (kg)	70 kg
Baconer price (R/kg)	R10,50/kg
Porker sales (amount)	5 200 pigs
Porker weight (kg)	55 kg
Porker price (R/kg)	R12,00/kg
Boar sales (amount)	50 pigs
Boar weight (kg)	150 kg
Boar price (R/kg)	R6,66/kg
Sow sales (amount)	1000 pigs
Sow weight (kg)	150 kg
Sow price (R/kg)	R6,66/kg
Cost of sales (Rand/sow)	
Feed	R9 500
Veterinarian	R88
Medicine	R400
Bedding	R2
Clothing	R2
Detergents	R6
Transport	R400
Repairs and maintenance	R700
Heating	R200
Breeding stock replacement cost	R1 360
Total cost of sales (R/sow)	**R12 658**
Fixed costs (R/sow)	R2 370
Total costs (R/sow)	R15 028
Total kilograms of meat sold on farm for the year	**3 719 500 kilograms**
Financial summary	
Income (R/kg)	R10,45/kg
Cost of sales (R/kg)	R8,51/kg
Fixed costs (R/kg)	R1,70/kg
Total costs (R/kg)	R10,21/kg
Profit before interest and tax (R/kg)	R0,25/kg

Given the maize price and pork price scenarios, the PDF's of the profit before interest and tax (PBIT) are illustrated as follows:

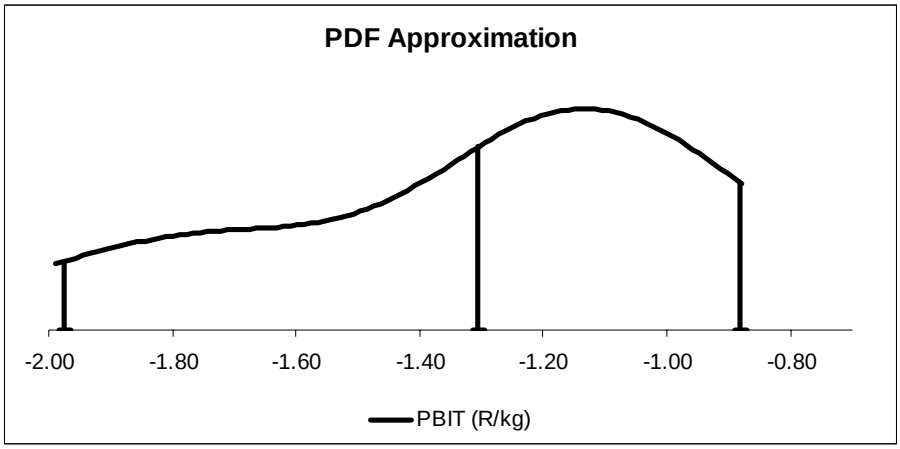


Figure 12: PBIT under import parity scenario

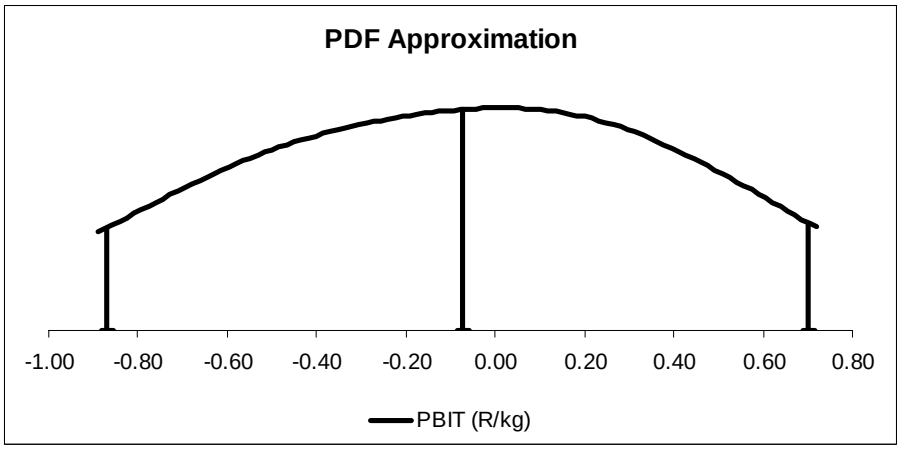


Figure 13: PBIT under autarky scenario

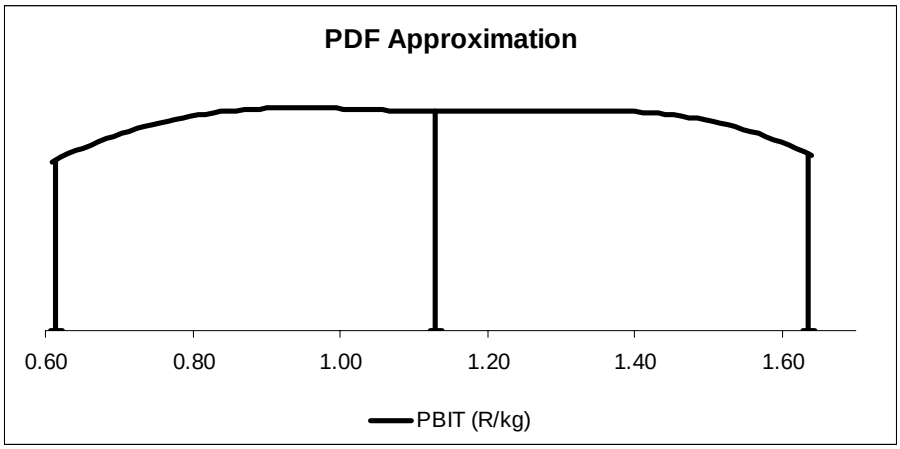


Figure 14: PBIT under export parity scenario

Appendix B: Rank correlation matrix, probability distributions used in case studies one and two

Yellow maize, Argentinean Rosario	Yellow maize, US No. 2	Wheat US No. 2 HRW	Sorghum US No. 2	Sunflower seed EU CIF Lower Rhine	Sunflower cake (pell37/38%) Arg CIF Rotterdam	Sunflower oil EU FOB NW Europe	Soybean seed Arg CIF Rotterdam	Soybean cake (pell 44/45%), Arg Clf Rotterdam	Soybean oil, Argentina	Nebraska, Direct fed steer	Chicken, US 12-city wholesale	Hogs, US 51-52% lean equivalent	Rand/$ exchange rate	US refiners acquisition price
1	0.94	0.64	0.94	0.49	0.29	0.61	0.67	0.41	0.67	-0.02	-0.06	-0.23	-0.33	-0.38
	1	0.66	0.97	0.5	0.25	0.65	0.63	0.4	0.64	-0.02	-0.03	-0.14	-0.25	-0.28
		1	0.69	0.43	0.55	0.46	0.73	0.7	0.51	0.22	0.08	0.06	-0.42	0.12
			1	0.51	0.34	0.66	0.74	0.49	0.71	0.11	0.04	-0.06	-0.33	-0.19
				1	0.3	0.85	0.58	0.25	0.81	0.01	-0.18	-0.1	-0.18	-0.24
					1	0.08	0.67	0.89	0.22	0.35	-0.03	0.18	-0.12	0.35
						1	0.61	0.2	0.89	0.05	0	-0.06	-0.31	-0.27
							1	0.82	0.77	0.24	0.16	0.21	-0.36	0.09
								1	0.33	0.39	0.18	0.31	-0.2	0.41
									1	0.05	-0.08	0.04	-0.4	-0.23
										1	0.35	0.48	-0.29	0.7
											1	0.4	-0.07	0.27
												1	-0.16	0.68
													1	0.06
														1

Table of probability distributions for key input variables for 2005/06 maize season(exogenous variables)

Variable	Yellow maize, Argentinean Rosario, FOB	Yellow maize, US No. 2	Wheat US No. 2 HRW	Sorghum US No. 2	Sunflower seed EU CIF, Lower Rhine	Sunflower cake (pell37/38%) Arg CIF Rotterdam	Sunflower oil EU FOB, NW Europe	Soybean seed Arg CIF Rotterdam	Soybean cake (pell 44/45%), Arg CIf Rotterdam	Soybean oil, Argentina	Nebraska Direct fed steer	Chicken, US 12-city wholesale	Hogs, US 51-52% lean equivalent	Rand/$ exchange rate	US refiners acquisition price	Rainfall summer area
Mean	108	107	147	103	270	106	643	227	188	492	1771	1393	875	617	56	525
Min	79	78	108	74	205	66	455	185	135	320	1354	1253	621	482	31	364
Max	160	169	206	160	314	159	822	298	268	641	2268	1636	1182	992	78	776
Std dev	16.39	16.14	24.69	16.16	32.01	18.70	86.33	30.96	32.26	84.82	282	110.64	148	137	12.22	94.22
CV	15.16	14.98	16.73	15.69	11.84	17.62	13.41	13.61	17.15	17.22	15.92	7.94	16.92	22.31	21.81	17.94

Note: these probability distributions were obtained through 500 stochastic iterations along with 3 000 internal model iterations per stochastic iteration. This implies a total of 1,5 million iterations were done in order to generate these correlated distributions. The reason for doing 3000 internal model iterations is because the model is a multi-market, simultaneous, stochastic, regime switching model as described in chapter two. Hence, for the model to obtain equilibrium in the case of one stochastic iteration it first need to run 3000 internal iterations in order to run the specific regime switch applicable to the values picked for each of the sixteen exogenous stochastic variables.

Appendix C: Reports used in case study two

BFAP / Kooperasie Scenario sessie: 09/09/2005

Drywers:
Reënval
Graan kopers
Boere finansiële posisie
Finansierders
Wisselkoers

Onsekerhede:
Finansiering van aanplantings
Suid-Amerika
Droë voorjaar
Graan teruggehou
Opbrengs – is hoer opbrengste 'n blywende tendens?
Groot kopers se posisies in graanmarkte
Afrika mark – uitvoermoontlikhede

Scenarios:

"Hoop"

Die Rand/Dollar wisselkoers bly beweeg tussen R6/$ en R7/$ vir die oorblywende gedeelte van 2005 asook vir 2006. Die meerderheid boere ervaar kontantvloeidruk gedurende 2005 weens lae graanpryse veral mieliepryse, wat hul aanplantingspotensiaal vir die 2005/2006 somergraanseisoen beperk. Finansierders is konserwatief wat betref finansiering van produksiekostes vir 2005/2006 somergraanseisoen weens boere se verswakte finansiële posisie. 'n Daling in aanplantings van mielies word ondervind a.g.v. lae mieliepryse asook minder goeie finansiële posisie. 'n Droë voorjaar word in die grootste gedeelte van die somergraanproduksiegebied ondervind, wat lei tot 'n verdere daling in aanplantings. Die totale daling in aanplantings is ongeveer 40%, waarvan 30% toegeskryf kan word aan lae pryse en minder goeie finansiële posisie en 10% aan finansieringsbeperkings. 'n Normale najaar wat reënval betref word ondervind, wat lei tot bo-gemiddelde per hektaar opbrengste wat mielies, sonneblom en sojas betref.

Opsomming van drywers:

Wisselkoers:
2005: R6.20 / VSA $
2006: R6.70 / VSA $
Wêreldpryse:
2006: 10% toename in wêreldkommoditeitspryse

Olie:
2005: $55/vat
2006: $40/vat
Mielie area
2006: 40% afname vanaf 2004/05 seisoen
Reënval:
Planttyd: Onder gemiddeld (Laer as basislyn)
Produksie periode: Normaal (Onveranderd vanaf basislyn)

Opbrengste
Mielies, sonneblom, sojas - hoër as basislyn
Koring – dieselfde as basislyn

"Balbreker"

Die Rand/Dollar wisselkoers bly beweeg tussen R6/$ en R7/$ vir die oorblywende gedeelte van 2005 asook vir 2006. Die meerderheid boere ervaar kontantvloeidruk gedurende 2005 weens lae graanpryse veral mielieprys, wat hul aanplantingspotensiaal vir die 2005/2006 somergraanseisoen beperk. Finansierders is konserwatief wat betref finansiering van produksiekostes vir 2005/2006 somergraanseisoen weens boere se verswakte finansiële posisie. 'n Daling in aanplantings van mielies word ondervind a.g.v. lae mielieprys asook minder goeie finansiële posisie. 'n Droë voorjaar word in die grootste gedeelte van die somergraanproduksiegebied ondervind, wat lei tot 'n verdere daling in aanplantings. Die totale daling in aanplantings is ongeveer 40%, waarvan 30% toegeskryf kan word aan lae pryse en minder goeie finansiële posisie en 10% aan finansieringsbeperkings. 'n Onder-normale najaar wat reëval betref word ondervind, wat lei tot onder-gemiddelde per hektaar opbrengste wat mielies, sonneblom en sojas betref. Die per hektaar opbrengste vir witmielies is 2,1t/ha en vir geelmielies is dit 2,2t/ha.

Opsomming van drywers:

Wisselkoers:
2005: R6.20 / VSA $
2006: R6.70 / VSA $
Wêreldpryse:
2006: 10% toename in wêreldkommoditeitspryse
Olie:
2005: $55/vat
2006: $40/vat
Mielie area
2006: 40% afname vanaf 2004/05 seisoen
Reënval:
Planttyd: Onder gemiddeld (Laer as basislyn)
Produksie periode: Onder gemiddeld (Laer as basislyn)
Opbrengste
Mielies: wit=2,1t.ha, geel=2,2t/ha (laer as basislyn)

Sonneblom, sojas = ondergemiddeld (laer as basislyn)
Koring = ondergemiddeld (laer as basislyn)

"Katarsis"

Die Rand/Dollar wisselkoers bly beweeg tussen R6/$ en R7/$ vir die oorblywende gedeelte van 2005 asook vir 2006. Die meerderheid boere ervaar kontantvloeidruk gedurende 2005 weens lae graanpryse veral mieliepryse, wat hul aanplantingspotensiaal vir die 2005/2006 somergraanseisoen beperk. Finansierders is konserwatief wat betref finansiering van produksiekostes vir 2005/2006 somergraanseisoen weens boere se verswakte finansiële posisie. 'n Daling in aanplantings van mielies word ondervind a.g.v. lae mieliepryse asook minder goeie finansiële posisie. Bo-normale reënval gedurende die voorjaar word in die grootste gedeelte van die somergraanproduksiegebied ondervind, wat lei tot 'n toename in aanplantings van wat oorspronklik verwag is. Die totale daling in aanplantings is ongeveer 20%, waarvan 10% toegeskryf kan word aan lae pryse en minder goeie finansiële posisie en 10% aan finansieringsbeperkings. 'n Onder-normale najaar wat reëval betref word ondervind, wat lei tot onder-gemiddelde per hektaar opbrengste wat mielies, sonneblom en sojas betref. Die per hektaar opbrengste vir witmielies is 2,5t/ha en vir geelmielies is dit 2,6t/ha.

Opsomming van drywers:

Wisselkoers:
2005: R6.20 / VSA $
2006: R6.70 / VSA $
Wêreldpryse:
2006: 10% toename in wêreldkommoditeitspryse
Olie:
2005: $55/vat
2006: $40/vat
Mielie area
2006: 20% afname vanaf 2004/05 seisoen
Reënval:
Planttyd: Bo gemiddeld (Hoër as basislyn)
Produksie periode: Onder gemiddeld (Laer as basislyn)

Opbrengste
Mielies: wit = 2,5t/ha, geel = 2,6t/ha
Sonneblom: onder gemiddeld (laer as basislyn)
Sojas: onder gemiddeld (laer as basislyn)
Koring: onder gemiddeld (laer as basislyn)

Appendix D: Reports used in case study three

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

SCENARIO ANALYSIS FOR The Commercial Bank

By

THE BUREAU FOR FOOD AND AGRICULTURAL POLICY (BFAP)

February 2008

INTRODUCTION

The purpose of this report is to present the results of a scenario session held with the commercial bank on February 6th, 2008.

The report consists of three sections. Section 1 contains the baseline projections generated by the latest version of the BFAP sector model for the grain, oilseed, livestock, and potato industries in South Africa. Section 2 contains the scenario results on the various industries. Section 3 presents a discussion on table grape markets, informing decision makers on the key uncertainties and drivers likely to be faced by the table grape industry during the 2008/09 season.

BASELINE

2.1 The baseline story

The baseline is driven by several central themes currently shaping international and local markets.

Theme: "Investors on the move"[11]

From the discussions with \the commercial bank, it became evident that current beliefs are that Scenario 2 (see Appendix A for details) seems to be the one that could most likely play out with respect to the future macro-economic environment and can thus be regarded as the baseline for this report. The macro-economic assumptions are as follows:

Oil price remains high but stable since economies of Far Eastern countries and the EU continue to grow. In other words, US economic problems have less of an impact on these countries than what would otherwise be expected.
Rand weakens against other currencies including US$, because risk averse investors rather invest in more stable and growing economies such as EU, China and India.
Inflation remains high because of stable oil price and depreciating Rand.
Interest rates, therefore, remain high but stable. SARB does not increase interest rates in fear of seriously damaging already frail economy.

2.2 Deterministic projections

Table 1: Economic indicators for baseline projections:

		2008	2009	2010	2011
Crude Oil Persian Gulf: fob	$/barrel	81.55	80.15	79.47	78.39
Population	Millions	47.63	47.79	47.96	48.13
Exchange Rate	SA c/US$	759.97	810.24	857.31	899.20
South African Real GDP	%	3.50	3.50	3.50	3.50
South African Real per capita GDP	R/capita	17935.7	18563.4	19213.1	19885.6
Interest Rate (Prime)	%	14.50	14.50	14.50	14.50

[11] For a more detailed discussion on the macro-economic environment, see the Appendix.

Table 2: World commodity prices for baseline projections:

		2008	2009	2010	2011
Yellow maize, US No.2, fob, Gulf	US$/t	215.00	215.05	213.76	211.68
Wheat US No2 HRW fob (ord) Gulf	US$/t	374.00	377.05	380.28	381.69
Sorghum, US No.2, fob, Gulf	US$/t	220.00	221.63	222.08	222.11
Sunflower Seed, EU CIF Lower Rhine	US$/t	745.00	740.00	718.49	706.83
Sunflower cake(pell 37/38%) , Arg CIF Rott	US$/t	410.00	403.39	393.29	390.47
Sunflower oil, EU FOB NW Europe	US$/t	1310.00	1322.54	1328.02	1334.61
Soya Beans seed: Arg. CIF Rott	US$/t	482.00	471.21	461.02	455.87
Soya Bean Cake(pell 44/45%): Arg CIF Rott	US$/t	440.00	450.38	451.19	449.65
Soya Bean Oil: Arg. FOB	US$/t	910.00	889.62	870.38	860.66

Source: BFAP

A very important picture is painted by the projections of world commodity prices, namely that most world prices are projected to remain high over the baseline period. Prices are mainly supported by high oil prices and strong growth of Asian economies. It has to be emphasised that these high commodity prices can only be sustained under the assumption of strong economic growth by major world economies. This assumption will be reviewed in the following scenario planning session with THE COMMERCIAL BANK .

The deterministic baseline projections for prices of selected commodities that are generated in the BFAP model are presented in Table 3. The detailed baseline projections are included in the Appendix B in the form of complete commodity balance sheets.

Table 3: SA commodity price projections

		2008	2009	2010	2011
White maize (SAFEX)	R/ton	1678.6	1843.9	1907.5	1951.8
Yellow maize (SAFEX)	R/ton	1666.3	1800.9	1881.1	1940.6
Sorghum	R/ton	1582.5	1652.6	1735.9	1809.5
Wheat (SAFEX)	R/ton	3619.1	3862.9	4101.1	4305.1
Canola	R/ton	3618.6	2886.6	3123.5	3267.7
Sunflower (SAFEX)	R/ton	4061.4	3725.0	3719.4	4156.0
Soybeans (SAFEX)	R/ton	3593.9	3722.5	3861.0	4012.3
Sugarcane	R/ton	207.8	211.4	231.6	240.5
Potatoes – market price fresh	R/10kg	18.09	22.77	22.37	24.57

Source: BFAP Sector Model

The main trends in the baseline projections can be summarized as follows:
In 2009 cereal prices are projected to increase while sunflower and canola prices will decrease from 2008 levels because hectares will move out of cereal production into oilseed production due to excessive favourable margins that exist in the production of oilseeds based on 2008 price levels.
Despite a sharp increase in wheat production, wheat will remain trading at import parity levels and, therefore, prices will increase over time as the exchange rate depreciates and world prices remain high.
Sugar and potato prices are projected to increase as well.

SCENARIO ANALYSES

This section analyses the possible impact on commodity markets if the global economy experience a serious stagnation in growth due to a recession in the US economy. This is in essence scenario 1, as presented in Appendix A. In short, the stagnation in world markets will cause the demand for oil to soften and, therefore, it is assumed that oil prices will decrease to levels between $50 and $60 per barrel. Due to biofuels, agricultural commodities are positively correlated with oil prices, which imply that lower oil prices will cause commodity prices to follow suit and decrease as well. The demand for agricultural produce will further soften by the economic stagnation. The table 4 presents the absolute and percentage deviations from baseline price projections.

The results show that an economic stagnation can have a very large effect on local commodity prices. The shock is introduced in 2008. Once the real effect of the shock starts filtering through the economy, local cereal prices can decrease by more than 35% and some local oilseed prices by as much as 42%.

Table 4: Scenario analyses 1: Absolute and percentage deviations from the baseline

		2008	2009	2010	2011
White Maize SAFEX Price		R/ton			
	Baseline	1678.58	1843.94	1907.53	1951.82
	Scenario	1574.95	1349.68	1499.04	1390.74
	Absolute Change	-103.63	-494.26	-408.49	-561.08
	% Change	-6.17%	-26.80%	-21.41%	-28.75%
Yellow Maize SAFEX Price		R/ton			
	Baseline	1666.34	1800.86	1881.13	1940.63
	Scenario	1572.41	1317.75	1448.77	1334.74
	Absolute Change	-93.93	-483.11	-432.37	-605.89
	% Change	-5.64%	-26.83%	-22.98%	-31.22%
Wheat SAFEX Price		R/ton			
	Baseline	3619.06	3862.92	4101.08	4305.13
	Scenario	3453.41	2630.50	2706.90	2784.16
	Absolute Change	-165.65	-1232.42	-1394.18	-1520.96
	% Change	-4.58%	-31.90%	-34.00%	-35.33%
Sorghum Producer Price			R/ton		
	Baseline	1582.48	1652.56	1735.92	1809.49
	Scenario	1505.95	1030.78	1145.59	1168.19
	Absolute Change	-76.53	-621.79	-590.33	-641.30
	% Change	-4.84%	-37.63%	-34.01%	-35.44%
Sunflower SAFEX Price		R/ton			
	Baseline	4061.39	3724.95	3719.45	4156.03
	Scenario	3995.86	3076.43	2121.26	2958.64
	Absolute Change	-65.53	-648.52	-1598.19	-1197.39
	% Change	-1.61	-17.41	-42.97	-28.81

Soybean SAFEX Price		R/ton			
	Baseline	3593.88	3722.46	3861.01	4012.35
	Scenario	3419.94	2278.08	2366.35	2437.48
	Absolute Change	-173.95	-1444.38	-1494.66	-1574.87
	% Change	-4.84%	-38.80%	-38.71%	-39.25%

An alternative scenario to the baseline as presented in section 2 was requested by The commercial bank. The alternative scenario uses a much higher oil price compared to the baseline. Tables 5 and 6 presents the simulation results compared to the baseline results.

Table 5: Scenario analyses 2: U.S. refiners' acquisition oil price - Absolute change from the baseline – US$/barrel

	2008	2009	2010	2011
Baseline	81.6	80.2	79.5	78.4
Scenario	110.0	111.1	112.2	113.3

Table 6: Scenario analyses 2: Absolute and percentage deviations from the baseline

		2008	2009	2010	2011
White Maize Producer Price		R/ton			
	Baseline	1678.58	1843.94	1907.53	1951.82
	Scenario	1756.55	1918.55	1912.40	1969.83
	Absolute Change	77.96	74.61	4.87	18.01
	% Change	4.64	4.05	0.26	0.92
Yellow Maize Producer Price		R/ton			
	Baseline	1666.34	1800.86	1881.13	1940.63
	Scenario	1675.64	1725.38	1902.23	1960.85
	Absolute Change	9.30	-75.48	21.09	20.22
	% Change	0.56	-4.19	1.12	1.04
Wheat Producer Price		R/ton			
	Baseline	3619.06	3862.92	4101.08	4305.13
	Scenario	3783.34	4047.92	4304.54	4528.28
	Absolute Change	164.28	185.00	203.46	223.16
	% Change	4.54	4.79	4.96	5.18
Sorghum Producer Price			R/ton		
	Baseline	1582.48	1652.56	1735.92	1809.49
	Scenario	1596.09	1659.58	1748.52	1823.00
	Absolute Change	13.61	7.02	12.59	13.51
	% Change	0.86	0.42	0.73	0.75
Sunflower Producer Price		R/ton			
	Baseline	4061.39	3724.95	3719.45	4156.03
	Scenario	4084.77	3813.75	3816.36	4221.94

		2008	2009	2010	2011
	Absolute Change	23.39	88.80	96.91	65.91
	% Change	0.58	2.38	2.61	1.59
Soybean Producer Price		R/ton			
	Baseline	3593.88	3722.46	3861.01	4012.35
	Scenario	3599.02	3729.20	3869.13	4020.48
	Absolute Change	5.13	6.73	8.11	8.13
	% Change	0.14	0.18	0.21	0.20

TABLE GRAPE INDUSTRY DISCUSSION

The current 2007/08 season for table grapes looks promising thus far. Though South African volumes appear to be closer to the lower end of the projected range of 48.3 to 54.0 million cartons, volumes from other Southern Hemisphere (SH) countries also appear to be down and prices are up from last year. Prices on the European continent responded well to the lower volumes, but in the UK prices are a bit sluggish to adjust upwards. The weaker Rand is favouring the Rand realisation price received by the farmer. On the down side, some losses may be associated with the phyto-sanitary import restrictions imposed by Thailand.

This brief summary of the first half of 2007/08 season touches on the three key drivers in the table grape industry as summarised below. These drivers and uncertainties will dictate to a large extent the setting of the 2008/09 season and beyond.

Key drivers:
Export supply from Southern Hemisphere (SH) countries: Table grape exports from SH countries increased on average by 6% per annum over the past six years. During this time the price for South African grapes showed an average decline of 8% per annum. Future export supply from South Africa and other SH countries will have a major impact on prices. Volumes may stabilise over the next two seasons, as profit margins have come under pressure the past two seasons. However, the increasing trend in total volumes is expected to resume thereafter, though probably not at the same rate of the past six years.
Maintaining and creating new markets: Maintaining market share in existing markets and creating additional demand by opening new markets are required to boost prices. Non-tariff barriers, e.g. phyto-sanitary requirements, become increasingly important in market access and trade negotiations.
The exchange rate: The exchange rate is an important determinant in the export realisation price for the producer.

Key uncertainties:
Future export supply from South America and the future demand for grapes in the US during their winter months: Approximately 76% of total SH grape exports are from South American countries, with the majority of exports destined for the United States. Will grape export supply from South American countries continue to increase and how much

of these exports will be absorbed by the US? The uncertainty of the future demand for grapes in the US is linked to the uncertain economic outlook for the US.
If volumes are down, to what extent will prices adjust upwards? Should volumes be low in our traditional export markets (UK and continental Europe), to what extent will prices adjust upwards? A number of factors come into play including the power of the supermarkets, the prominence of wholesale markets in the future, relationships among exporters and importers/supermarkets, the knowledge and ability of exporters to negotiate prices and the fragmentation or unity of the table grape industry.
What is the exchange rate going to be?

CONCLUDING REMARKS

Although expectations currently are that global and, therefore, domestic grain and oilseeds prices are to remain high at least until the end of 2008, it is clear that possible changes in a combination of factors could change this picture significantly from 2009 onwards. Probably the most important driver that will determine the profitability of the agricultural sector in the next two years is the sharp rise in input costs. In most of the industries output prices are extremely favourable, but input prices are catching up at a fast rate putting profit margins under pressure again. It can, therefore, be concluded that clear risks and uncertainties exists that can and should be monitored to ensure that proactive changes can be made in order to manage risks and potential losses.

APPENDIX A OF REPORT

BFAP MACRO-ECONOMICS

SCENARIOS FOR 2008/09

1. Introduction

During 2003 to 2007, South Africa's economy experienced one of its strongest growth periods in history. This was due to the confluence of various positive factors creating growth, namely prudent macro-economic and fiscal management, the boom in commodity prices world-wide, expansion in global and continental integration, and rapid spending of a burgeoning middle-income group. However, since the middle of 2007, the macro-economic landscape has been changing drastically due to various factors interacting such as a slowdown in world economic growth, debt problems in the US, inflation running above monetary policy limits mainly due to spiralling fuel and food costs, increasing interest rates leading to pressure on consumer expenditure, and an increase in the current account deficit of South Africa due to large amounts of goods being imported into South Africa to supply the thirst of consumer expenditure. The question is, therefore, where could the South African macro-economic landscape be moving towards over the next two years?

2. Key drivers, key uncertainties and wild cards

In order to draw plausible macro-economic scenarios, the rules of the game, players of the game, key uncertainties and wild cards need to be identified and explored.

Rules of the game:

- Investors are generally risk averse: the implication of this driver is that investors will seek haven where the level of risk is in line with the level of potential profit. Hence, in a situation where the world economy is unstable, investors will in general opt for the less risky and stable investment environment.
- In general, the US economy has a significant impact on the rest of the world's economy: the implication is that if the US sneezes, the rest of the world gets a cold. Except maybe for China and India?

Key uncertainties:

- Will the US economy go into a recession? At this stage nobody is sure of the answer to this question. Some give it a 50% probability, others say it's a given.
- Should a US recession occur, what will be the macro-economic impacts specifically on the EU, China and India? In case the EU, China and India have enough internal momentum to keep their economies growing independently of a US recession, investors will see these economies as a haven. This implies international funds will flow towards these three economies leaving the rest of the world economies high and dry. If the EU, China, and India do not have enough internal momentum, implying that a US recession also leads their economies into

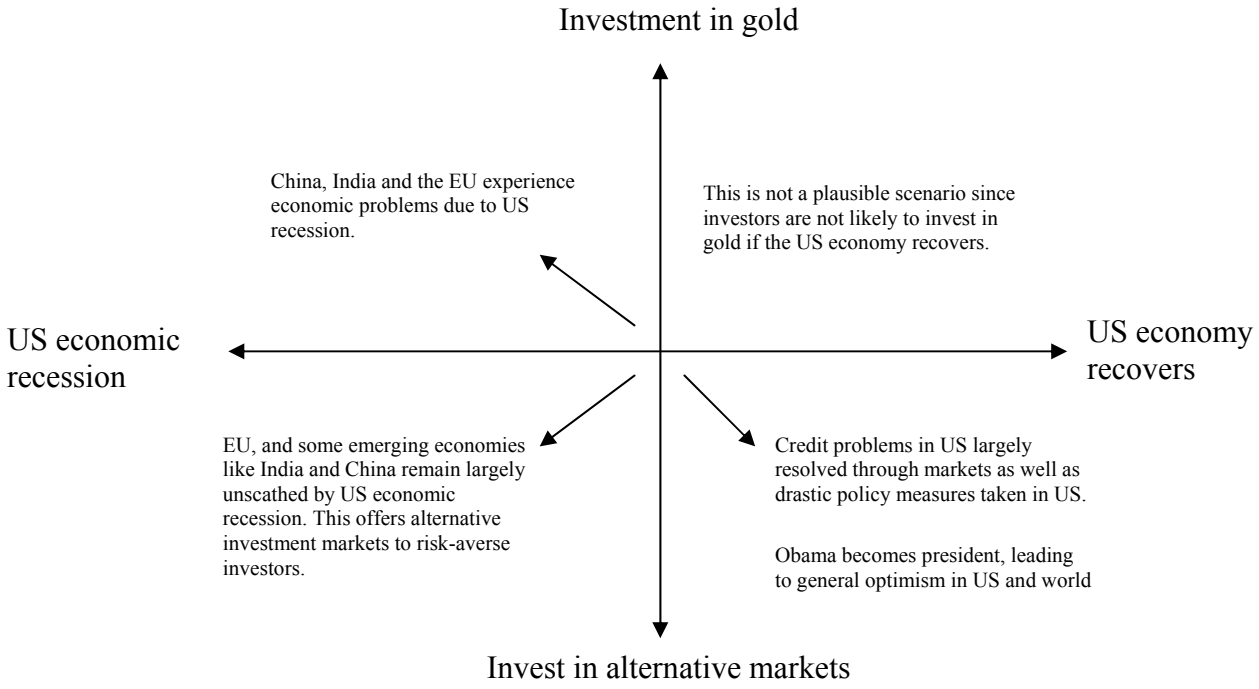
a recession, investors have very few safe havens left and gold will become an attractive option.

Wild Cards and players of the game:

- If Obama becomes president of the US, will it have a significant impact on the morale of US citizens leading to optimism and hence influencing investment in the US positively? Also, what will be the impact on the "war against terror" and hence how will it influence key diplomatic relationships e.g. the Middle East, Europe and China. Also, if the stance against the "war on terror" changes significantly, it could have a significant impact on Chinese economic growth since Chinese policies are geared towards an open, free and stable world economy.
- It is unknown if the drastic monetary policy measures taken recently by the Fed will swing the US back unto a growth path, and if so, how soon. Hence, will the US economy first go into a shallow recession, or will it stabilize at a very low growth level and then take off again?
- If a US recession does occur, what will be the reaction of OPEC be in terms of changing production policies? If they increase production or keep it stable to lower oil prices and, therefore, decrease energy costs to jump-start the world economy, the recession might be shorter and shallower than expected. If oil prices remain high and stable, the recession might last long as much fear. This could have a significant negative impact on Chinese economic growth.
- Will Eskom be able to manage power crisis successfully and assure investors that South Africa is a good long-term investment destination?
- Will the power struggle between the present government and the newly elected ANC executive committee have a crippling effect on the perception of South Africa as a potentially stable and prosperous investment haven or will the ANC and the present government manage to collaborate on key issues and hence create a perception of a stable and prosperous country.
- Will Jacob Zuma become the next president of South Africa? If he does, will he continue on the current policy paths, or will he drastically change policies in order to create a more social-democratic state driven by more socialist types of policies?

3. Scenarios

Scenario 1



Scenario 2

Scenario 3

Note: The key uncertainties form the two axes of the game board.

4. Implications of scenarios

Scenario 1:

- Rand on annual average stable against US$ and remains between R7 and R8 per $ since investors significantly invest in gold.
- However, Rand is highly volatile on daily basis against all currencies due to uncertainty in world markets.
- SA inflation generally high due to high world inflation, but follows a declining trend as world economy weakens and global inflation pressure weakens.
- Interest rate, therefore, remains high but also follows a slightly declining trend due to SARB being careful of adjusting interest rates because of frail economy.
- Oil price declines due to stagnating global economic growth.

Scenario 2:

- Oil price remains high since economies in Far Eastern countries and EU continue to grow. US economic problems have less of an impact on these countries' economies.
- Rand weakens against other currencies including US$, because risk averse investors rather invest in more stable and growing economies such as EU, China and India.
- Inflation remains high because of stable and high oil price and depreciating Rand.

- Interest rate, therefore, remains stable but high. SARB does not increase interest rates in fear of seriously damaging already frail economy.

Scenario 3:

- Dollar strengthens against all currencies due to new optimism amongst investors. This causes the Rand to weaken significantly, especially due to Eskom and political uncertainties in Southern Africa leading to investors becoming risk averse towards SADC investments.
- Oil price increase significantly due to renewed global economic growth.
- Rand weakness and increasing oil prices lead to significant inflationary pressure in SA.
- Interest rate remains high and stable.

APPENDIX B OF REPORT

Commodity balance sheets for baseline projections

		2008	2009	2010	2011
White Maize					
White maize area harvested	1000ha	1654.4	1532.0	1611.23	1648.56
White maize average yield	t/ha	4.14	3.73	3.76	3.79
White maize production	1000 tons	6853.1	5720.4	6065.28	6254.47
White maize feed consumption	1000 tons	704.0	683.4	692.23	706.27
White maize human consumption	1000 tons	3883.1	3853.2	3861.10	3869.24
White maize domestic use	1000 tons	4765.0	4714.5	4731.32	4753.51
White maize ending stocks	1000 tons	1560.5	1570.6	1694.82	1825.99
White maize imports	1000 tons	0.0	0.0	0.00	0.00
White maize exports	1000 tons	1266.0	995.8	1209.76	1369.79
White maize SAFEX price	R/ton	1678.6	1843.9	1907.54	1951.82
Yellow maize area harvested	1000ha	1140.6	1014.1	1072.76	1109.98
Yellow maize average yield	t/ha	4.20	4.04	4.08	4.13
Yellow maize production	1000 tons	4789.1	4099.4	4382.03	4579.61
Yellow maize feed consumption	1000 tons	3351.8	3306.7	3290.33	3326.22
Yellow maize human consumption	1000 tons	281.8	275.8	272.54	270.39
Yellow maize ethanol use	1000 tons	0.0	0.0	0.00	0.00
Yellow maize domestic use	1000 tons	3815.6	3764.5	3744.87	3778.61
Yellow maize ending stocks	1000 tons	826.1	746.7	788.99	862.84
Yellow maize exports	1000 tons	609.3	414.3	594.83	727.15
Yellow maize imports	1000 tons	0.0	0.0	0.00	0.00
Yellow maize SAFEX price	R/ton	1666.3	1800.9	1881.13	1940.63
Wheat					
Wheat summer area harvested	1000 ha	493.7	598.1	633.65	652.24
Wheat winter area harvested	1000ha	393.8	441.6	456.88	470.12
Wheat average yield: Summer area	t/ha	2.75	2.77	2.78	2.80
Wheat average yield; Winter area	t/ha	2.50	2.51	2.51	2.51
Wheat production	1000 tons	2342.6	2761.1	2909.76	3006.76
Wheat feed consumption	1000 tons	9.2	8.9	4.10	0.99
Wheat human consumption	1000 tons	2644.7	2670.7	2684.48	2705.68
Wheat domestic use	1000 tons	2673.5	2699.3	2708.24	2726.33
Wheat ending stocks	1000 tons	292.6	219.9	181.26	163.74
Wheat exports	1000 tons	201.1	235.4	247.04	253.40
Wheat imports	1000 tons	378.5	100.9	6.93	0.00
Wheat SAFEX price	R/ton	3619.1	3862.9	4101.08	4305.13

		2008	2009	2010	2011
Canola					
Canola area harvested	1000ha	40.5	48.6	43.60	44.85
Canola average yield	t/ha	1.2	1.2	1.19	1.20
Canola production	1000 tons	47.3	57.4	51.93	53.89
Canola crush	1000 tons	40.0	40.0	40.00	40.00
Canola domestic use	1000 tons	45.1	54.1	54.24	55.48
Canola ending stocks	1000 tons	3.2	6.5	4.18	2.59
Canola net imports	1000 tons	0.00	0.00	0.00	0.00
Canola producer price	R/ton	3618.6	2886.6	3123.50	3267.65
Sorghum					
Sorghum area harvested	1000ha	94.7	105.4	106.06	106.51
Sorghum average yield	t/ha	2.96	2.97	2.98	3.00
Sorghum production	1000 tons	280.1	313.3	316.52	319.25
Sorghum feed consumption	1000 tons	9.4	14.4	13.15	12.24
Sorghum human consumption	1000 tons	165.6	164.9	163.09	161.96
Sorghum domestic use	1000 tons	185.0	189.3	186.23	184.20
Sorghum ending stocks	1000 tons	61.4	68.5	69.12	69.68
Sorghum net exports	1000 tons	59.7	116.9	129.70	134.49
Sorghum producer price	R/ton	1582.5	1652.6	1735.92	1809.49
Sunflower Seed					
Sunflower area harvested	1000ha	545.5	638.5	582.98	558.37
Sunflower average yield	t/ha	1.30	1.31	1.32	1.33
Sunflower production	1000 tons	708.9	837.0	770.57	743.95
Sunflower crush	1000 tons	559.4	593.0	637.55	670.32
Sunflower crush: Biodiesel	1000 tons	0	0	0	0
Sunflower domestic use	1000 tons	573.6	609.8	652.96	685.19
Sunflower ending stocks	1000 tons	245.9	468.2	583.96	646.36
Sunflower net imports	1000 tons	11.7	-4.9	-1.87	3.65
Sunflower SAFEX price	R/ton	4061.4	3725.0	3719.45	4156.03
Soybean Seed					
Soybean area harvested	1000ha	217.4	231.8	241.91	250.79
Soybean average yield	t/ha	1.86	1.88	1.90	1.91
Soybean production	1000 tons	405.2	436.1	459.01	479.90
Soybean crush	1000 tons	193.5	173.4	201.16	228.19
Soybean crush: Biodiesel	1000 tons	0	0	0	0
Soybean feed consumption (full fat)	1000 tons	187.7	201.1	209.65	219.03
Soybean domestic use	1000 tons	391.2	386.6	422.81	459.22

		2008	2009	2010	2011
Soybean ending stocks	1000 tons	100.3	88.8	83.37	81.15
Soybean net imports	1000 tons	-36.8	-61.0	-41.66	-22.90
Soybean SAFEX price	R/ton	3593.9	3722.5	3861.01	4012.35
Sugar					
Area in sugarcane	1000 ha	422.6	421.3	419.65	420.27
Sugarcane area harvested	1000 ha	317.4	317.0	315.91	315.52
Sugarcane average yield	t/ha	65.62	65.68	65.77	65.91
Sugarcane production	1000 tons	20828.1	20822.8	20775.91	20795.88
Sugarcane for sugar	1000 tons	20828.1	20822.8	15781.31	15821.70
Sugarcane for ethanol	1000 tons	0.0	0.0	4994.61	4974.18
Sugar extraction rate	Percent	11.8	11.8	11.76	11.76
Sugar production	1000 tons	2449.0	2448.4	1855.59	1860.34
Sugar domestic use	1000 tons	1290.6	1297.0	1303.69	1310.78
Sugar exports	1000 tons	1153.9	1146.9	547.39	545.04
Sugar statistical discrepancy	1000 tons	4.5	4.5	4.51	4.51
Sugar recoverable value	R/ton	1701.9	1732.5	1904.09	1979.78
Sugarcane average price	R/ton	207.8	211.4	231.62	240.52
Potatoes					
Total Area	1000ha	55.17	52.56	54.78	54.33
Total Production	1000 tons	2031.25	1950.37	2063.29	2080.00
Average Yield	t/ha	36.82	37.10	37.66	38.29
Potatoes Import	1000 tons	19.36	23.23	27.87	28.50
Consump: Fresh formal	1000 tons	693.85	608.76	652.00	633.91
Consump: Fresh Informal	1000 tons	570.99	588.58	619.07	642.90
Consump: Processing	1000 tons	443.89	431.74	465.05	473.50
Consump: Seed	1000 tons	232.55	217.40	229.59	226.67
Unexplained	1000 tons	0.31	0.34	0.34	0.22
Potatoes per capita consumption	kg/capita	35.88	34.09	36.20	36.37
Domestic Use	1000 tons	1941.59	1846.83	1966.05	1977.21
Potatoes Export	1000 tons	70.30	80.31	69.37	74.30
Market price – fresh	c/10kg	1809.62	2277.26	2237.83	2457.18

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SCENARIO ANALYSIS FOR THE COMMERCIAL BANK

By

THE BUREAU FOR FOOD AND AGRICULTURAL POLICY (BFAP)

May 2008

INTRODUCTION

The commercial bank and BFAP met during April 2008 to review and update the baseline and scenario as presented previously in the February 08 scenario report. The purpose of this report is to present the updated baseline and scenario results.

THE COMMERCIAL BANK BASELINE

2.1 The baseline story

The macro-economic assumptions underlying the baseline as presented in this report (Table 1) represents the situation where global economic growth in general is not seriously dented by US and EU economic struggles, implying that emerging economies such as China, India, and Russia experience strong economic growth. This in turn causes oil prices to remain high, and the exchange rate to weaken moderately, relative to the Dollar and Euro. Due to high oil prices and a weakening Rand, inflation remains fairly high, supporting high interest rates. The result is that the South African economic growth slows down and only in 2011 does it reach the same growth rate it experienced during the period of 2003 to 2006/07.

2.2 Deterministic projections

Table 1: THE COMMERCIAL BANK's baseline projections - Economic indicators:

		2008	2009	2010	2011
Crude Oil Persian Gulf: fob	$/barrel	105	110	115	121
Population	Millions	47.63	47.79	47.96	48.13
Exchange Rate	SA c/US$	780	830	857	899
South African Real GDP	%	3.5	4.0	5.0	5.5
South African Real per capita GDP	R/capita	18104	18828	19769	2085
Interest Rate (Prime)	%	15	15	14	13

Table 2: THE COMMERCIAL BANK's baseline projections - World commodity prices:

		2008	2009	2010	2011
Yellow maize, US No.2, fob, Gulf	US$/t	243.67	239.27	238.06	231.56
Wheat US No2 HRW fob (ord) Gulf	US$/t	371.36	297.60	293.96	292.11
Sorghum, US No.2, fob, Gulf	US$/t	223.07	201.68	206.83	200.44
Sunflower Seed, EU CIF Lower Rhine	US$/t	723.74	642.36	647.71	650.58
Sunflower cake(pell 37/38%) , Arg CIF Rott	US$/t	316.97	273.45	258.50	249.76
Sunflower oil, EU FOB NW Europe	US$/t	1860.00	1716.65	1765.90	1817.99
Soya Beans seed: Arg. CIF Rott	US$/t	490.98	501.11	473.29	477.92
Soya Bean Cake(pell 44/45%): Arg CIF Rott	US$/t	422.36	399.12	355.89	338.19
Soya Bean Oil: Arg. FOB	US$/t	1423.85	1462.28	1566.22	1663.71

Source: BFAP

Table 3: THE COMMERCIAL BANK baseline - SA commodity price projections:

		2008	2009	2010	2011
White maize (SAFEX)	R/ton	1975.9	2062.2	2101.7	2132.3
Yellow maize (SAFEX)	R/ton	1966.9	2055.4	2085.0	2115.4
Sorghum	R/ton	1691.6	1610.2	1683.4	1724.5
Wheat (SAFEX)	R/ton	3871.2	3595.6	3720.8	3913.4
Canola	R/ton	4091.6	3994.7	4362.8	4670.9
Sunflower (SAFEX)	R/ton	4652.7	4394.3	4508.6	5094.8
Soybeans (SAFEX)	R/ton	3818.5	4107.5	4022.7	4253.0
Sugarcane	R/ton	1779.7	1942.2	2200.2	2465.2
Potatoes – market price fresh	R/10kg	2477.1	3007.6	3070.8	3360.7

Source: BFAP Sector Model

The main trends in the THE COMMERCIAL BANK baseline projections can be summarized as follows:

- Important to note is that despite the oil prices, world commodity prices are projected to decrease somewhat from the record high levels achieved in 2008. This is due to a general expansion in the global area planted to field crops, normal weather conditions and a slower growth in world demand.
- In the domestic market maize and soybean prices are projected to increase in 2009 while sunflower and canola prices will decrease from 2008 levels because some hectares will move out of maize production into oilseed production due to excessive favourable margins that exist in the production of oilseeds based on 2008 price levels.
- Wheat will also gain hectares lost to maize. However, despite a sharp increase in local wheat production wheat will continue to trade at import parity levels. Therefore, after an initial decrease in 2009 due to lower world prices, local prices will increase over time on the back of a weakening exchange rate and high and stable world prices.
- Sugar and potato prices are projected to increase as well. The reason for the increase in potato prices is a decrease in area planted due to significant increases in input costs which both decrease the potential profitability and increase the risk of potato production disproportionately to other alternatives such as maize.

SCENARIO PROJECTIONS

The scenario presented below indicates a global economy, which is severely affected by a recession in the US economy as well as overheating due to excessive high fuel and food prices. The assumption is, therefore, that the BRIC countries (Brazil, Russia, India, and China) do not have enough internal momentum to keep their economies growing at rates seen during the past few years, and also that inflationary pressure (due to excessive fuel and food prices) forces the economic growth in these countries to slow down in order to avoid excessive overheating. The macro-economic assumption underlying this scenario is presented in Table 4.

Table 4: Scenario Projections: Economic indicators

		2008	2009	2010	2011
Crude Oil Persian Gulf: fob	$/barrel	105.00	80.00	79.47	78.39
Population	Millions	47.63	47.79	47.96	48.13
Exchange Rate	SA c/US$	780.00	900.00	945.00	992.25
South African Real GDP	%	3.00	3.00	4.00	3.50
South African Real per capita GDP	R/capita	18,017	18,557	19,300	19,975
Interest Rate (Prime)	%	15.00	14.00	12.00	10.00

Due to a change in the interest rate differential between the EU and the US, the Dollar strengthens, which forces oil prices down. On the back of this, the pressure on the demand for oil slightly weakens since trade and consumption of general goods and commodities slow down. The result is that oil prices drop unexpectedly to levels of around $80 per barrel.

The impact on the South African economy is a slowdown in economic growth, and a slowdown in inflation, which forces the Reserve bank to decrease interest rates more than expected in an attempt to get the economy back on the targeted growth path. This, however, does not happen and economic growth is generally below the 4% level except in 2010.

Table 2: Scenario projections - World commodity prices:

		2008	2009	2010	2011
Yellow maize, US No.2, fob, Gulf	US$/t	227.95	190.25	160.90	156.51
Wheat US No2 HRW fob (ord) Gulf	US$/t	243.67	203.38	172.00	167.30
Sorghum, US No.2, fob, Gulf	US$/t	223.07	171.42	149.43	144.82
Sunflower Seed, EU CIF Lower Rhine	US$/t	723.74	578.12	553.79	556.24
Sunflower cake(pell 37/38%) , Arg CIF Rott	US$/t	316.97	246.11	221.02	213.55
Sunflower oil, EU FOB NW Europe	US$/t	1860.00	1417.14	1407.75	1388.62
Soya Beans seed: Arg. CIF Rott	US$/t	490.98	451.00	404.67	408.62
Soya Bean Cake(pell 44/45%): Arg CIF Rott	US$/t	422.36	359.20	304.29	289.16
Soya Bean Oil: Arg. FOB	US$/t	1423.85	1084.84	1077.65	1063.01

Source: BFAP

Table 3: Scenario projections - SA commodity price projections:

		2008	2009	2010	2011
White maize (SAFEX)	R/ton	1976.2	1870.0	1746.8	1877.8
Yellow maize (SAFEX)	R/ton	1966.8	1885.4	1644.3	1709.7
Sorghum	R/ton	1692.1	1486.5	1361.3	1417.8
Wheat (SAFEX)	R/ton	3871.2	3350.0	3487.0	3636.9
Canola	R/ton	4091.6	3794.6	4277.3	4638.2
Sunflower (SAFEX)	R/ton	4652.7	4213.9	4216.9	4607.6
Soybeans (SAFEX)	R/ton	3818.4	4002.8	3783.0	3994.0
Sugarcane	R/ton	1787.1	1961.8	2086.4	2192.1
Potatoes – market price fresh	R/10 kg	2465.6	2867.4	2891.2	3122.9

Source: BFAP Sector Model

The main trends in the scenario projections can be summarized as follows:

- Due to the general slow down in the economy, world commodity prices decrease rapidly in 2009 and 2010. This does, however, not imply that prices pull back to historical levels. Commodity prices still remain relatively high.
- Commodity prices in the local market are expected to decrease in 2009 and 2010. As a result, farmers will respond to the lower commodity prices by reducing the area planted to field crops, especially on the back of high input costs, which are in general sticky and therefore do not decrease at the same rate as commodity prices. This causes pressure on profit margins and also increases the risk of production significantly. The decrease in area (and supply), causes prices to rise again by 2010.

CONCLUDING REMARKS

From the baseline and scenario it is clear that the instability in commodity markets could potentially remain in the market place longer than expected. The world economy is moving into a situation where macro-economic and social stability is increasingly polarized and pressured; hence the uncertainties around commodity prices and input costs only increase.

It is, therefore, important that a robust framework is developed which can be used to capture and interpret various exogenous shocks and signals to understand future impacts and trends. This report provides only two possible outcomes of future scenarios.

APPENDIX A OF REPORT

BFAP MACRO-ECONOMICS

SCENARIOS FOR 2008/09

1. Rules of the game, players of the game, key uncertainties and wild cards

In order to draw plausible macro-economic scenarios, the rules of the game, players of the game, key uncertainties and wild cards need to be identified and explored.

Rules of the game:

- Investors are generally risk averse: the implication of this driver is that investors will seek havens where the level of risk is in line with the level of potential profit. Hence, in a situation where the world economy is unstable, investors will in general opt for the less risky and stable investment environment.
- In general, the US economy has a significant impact on the rest of the world's economy: the implication is that if the US sneezes, the rest of the world gets a cold. Except maybe for China and India?

Key uncertainties:

- Will the US economy go into a recession? At this stage nobody is sure of the answer to this question. Some give it a 50% probability, others say it's a given.
- Should a US recession occur, what will be the macro-economic impacts specifically on the EU, China and India? In case the EU, China and India have enough internal momentum to keep their economies growing independently of a US recession, investors will see these economies as a haven. This implies international funds could flow towards these three economies, depending on general risk of the investment environment and the interest rate differentials, leaving the rest of the world economies high and dry. If the EU, China, and India do not have enough internal momentum, implying that a US recession also leads their economies into a recession, investors have very few safe havens left and low risk invetsments will become an attractive option e.g. gold, money market etc.

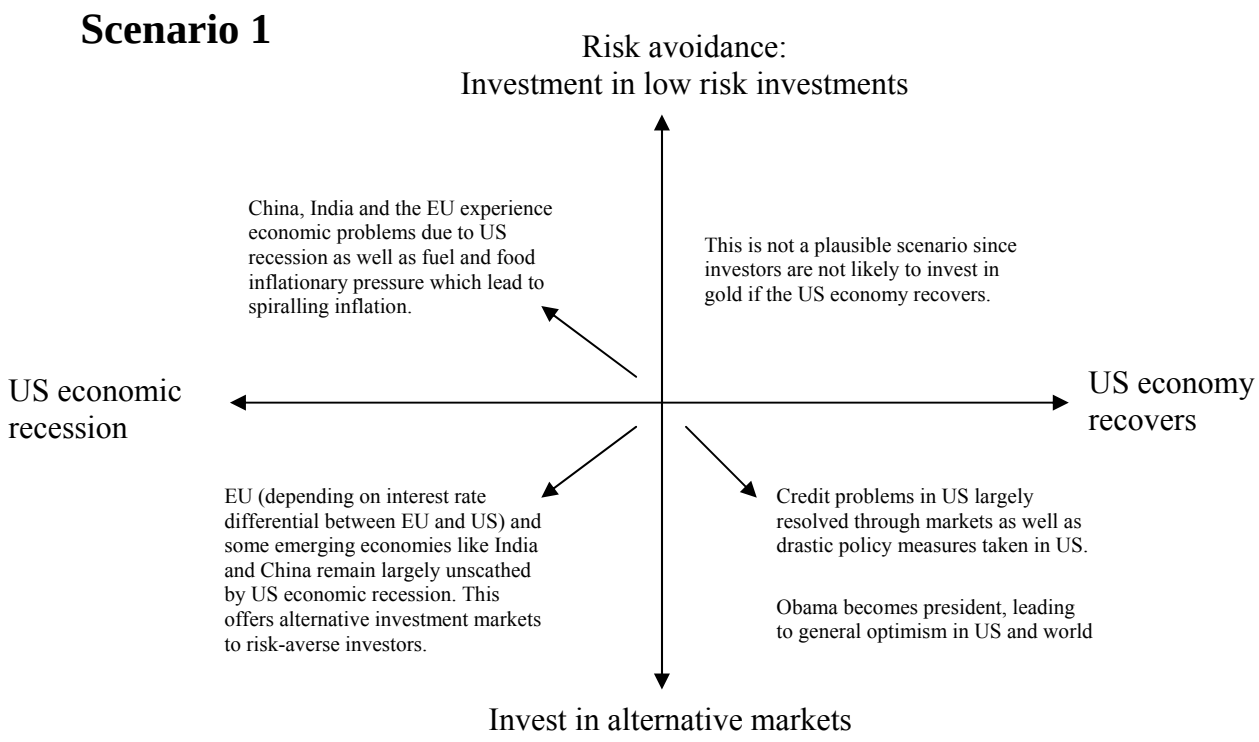
Wild Cards and players of the game:

- If Obama becomes president of the US, will it have a significant impact on the morale of US citizens leading to optimism and hence influencing investment in the US positively? Also, what will be the impact on the "war against terror" and hence how will it influence key diplomatic relationships e.g. the Middle East, Europe and China. Also, if the stance against the "war on terror" changes significantly, it could have a significant impact on Chinese economic growth since Chinese policies are geared towards an open, free and stable world economy.
- It is unknown if the drastic monetary policy measures taken recently by the Fed will swing the US back unto a growth path, and if so, how soon. Hence, will the

US economy first go into a shallow recession, or will it stabilize at a very low growth level and then take off again?

- If a US recession does occur, what will be the reaction of OPEC be in terms of changing production policies? If they increase production or keep it stable to lower oil prices and, therefore, decrease energy costs to jump-start the world economy, the recession might be shorter and shallower than expected. If oil prices remain high and stable, the recession might last long as much fear. This could have a significant negative impact on Chinese economic growth.
- Will Eskom be able to manage power crisis successfully and assure investors that South Africa is a good long-term investment destination?
- Will the power struggle between the present government and the newly elected ANC executive committee have a crippling effect on the perception of South Africa as a potentially stable and prosperous investment haven or will the ANC and the present government manage to collaborate on key issues and hence create a perception of a stable and prosperous country.
- Will Jacob Zuma become the next president of South Africa? If he does, will he continue on the current policy paths, or will he drastically change policies in order to create a more social-democratic state driven by more socialist types of policies?
- Will the Zimbabwe situation be solved in such a manner that the perceptions of international investors will become much more positive in terms of Southern Africa as a stable and profitable investment area?

3. Scenarios



Note: The key uncertainties form the two axes of the game board.

4. Implications of scenarios

Scenario 1:

- Rand weakens significantly against the US$ and the €.
- SA inflation generally high due to high world inflation, but follows a declining trend as world economy weakens and global inflation pressure weakens.
- Interest rate, therefore, remains high but also follows a sharper declining trend than expected due to SARB being careful of adjusting interest rates because of frail economy.
- Oil price at first decrease significantly and then moves mostly sideways on the back of slowing demand, and unwillingness from OPEC to adjust production and production capacity.

Scenario 2:

- Oil price remains high since economies in emerging countries continue to grow. US economic problems have less of an impact on these countries' economies.

- Rand weakens against other currencies including US$, because risk averse investors rather invest in more stable and growing economies.
- Inflation remains high because of stable and high oil price, high international agricultural commodity prices, a depreciating Rand, as well as the inflationary whiplash of services inflation. Food inflation is a strong driver in this scenario, but the impact does however lessen over time since emerging economies keep growing and hence consumers can afford and get used to higher prices.
- Interest rate, therefore, remains stable but high. SARB does not increase interest rates in fear of seriously damaging already frail economy.

Scenario 3:

- Dollar strengthens against all currencies due to new optimism amongst investors. This causes the Rand to weaken significantly, especially due to political uncertainties in Southern Africa leading to investors becoming risk averse towards SADC investments.
- Oil price increase significantly due to renewed global economic growth. Is $200/barrel of oil possible in this scenario as forecasted by an international institution during the week of 4 May 2008?
- Rand weakness and increasing oil prices lead to significant inflationary pressure in SA.
- Interest rate remains high.

APPENDIX B OF REPORT

Commodity balance sheets for baseline projections

		2008	2009	2010	2011
White Maize					
White maize area harvested	1000ha	1716.3	1590.1	1568.2	1550.7
White maize average yield	t/ha	3.84	3.73	3.76	3.79
White maize production	1000 tons	6594.9	5937.5	5903.1	5883.0
White maize feed consumption	1000 tons	698.0	690.0	690.2	704.1
White maize human consumption	1000 tons	3811.5	3735.8	3730.8	3731.1
White maize domestic use	1000 tons	4687.5	4603.7	4599.0	4613.2
White maize ending stocks	1000 tons	1466.4	1611.6	1686.0	1726.6
White maize imports	1000 tons	0.0	0.0	0.0	0.0
White maize exports	1000 tons	1204.2	1188.5	1229.7	1229.2
White maize SAFEX price	R/ton	1975.9	2062.2	2101.7	2132.3
Yellow maize					
Yellow maize area harvested	1000ha	981.7	989.2	1078.4	1102.0
Yellow maize average yield	t/ha	4.20	4.04	4.08	4.13
Yellow maize production	1000 tons	4121.9	3999.0	4405.0	4546.6
Yellow maize feed consumption	1000 tons	3259.0	3251.6	3307.8	3405.8

		2008	2009	2010	2011
Yellow maize human consumption	1000 tons	266.2	262.5	261.9	261.2
Yellow maize ethanol use	1000 tons	0.0	0.0	0.0	31.7
Yellow maize domestic use	1000 tons	3707.2	3696.1	3751.7	3880.7
Yellow maize ending stocks	1000 tons	609.8	614.8	752.5	863.5
Yellow maize imports	1000 tons	0.0	0.0	0.0	0.0
Yellow maize exports	1000 tons	336.8	297.8	515.7	554.8
Yellow maize SAFEX price	R/ton	1966.9	2055.4	2085.0	2115.4
Wheat					
Wheat summer area harvested	1000 ha	437.0	568.8	540.7	536.7
Wheat winter area harvested	1000ha	354.3	415.2	392.9	392.5
Wheat average yield: Summer area	t/ha	2.75	2.77	2.78	2.80
Wheat average yield; Winter area	t/ha	2.50	2.51	2.51	2.51
Wheat production	1000 tons	2087.7	2613.9	2490.5	2488.4
Wheat feed consumption	1000 tons	25.8	53.6	51.9	47.7
Wheat human consumption	1000 tons	2826.3	2947.8	2992.1	3028.4
Wheat domestic use	1000 tons	2871.8	3021.1	3063.7	3095.8
Wheat ending stocks	1000 tons	343.6	338.5	345.9	351.7
Wheat exports	1000 tons	153.0	176.4	156.8	153.2
Wheat imports	1000 tons	767.5	578.4	737.4	766.5
Wheat SAFEX price	R/ton	3871.2	3595.6	3720.8	3913.4
Canola					
Canola area harvested	1000ha	39.1	47.7	45.8	46.9
Canola average yield	t/ha	1.17	1.18	1.19	1.20
Canola production	1000 tons	45.7	56.3	54.6	56.4
Canola crush	1000 tons	40.0	40.0	40.0	40.0
Canola domestic use	1000 tons	35.6	38.7	36.2	36.7
Canola ending stocks	1000 tons	18.4	35.9	54.3	74.0
Canola net imports	1000 tons	0.0	0.0	0.0	0.0
Canola producer price	R/ton	4091.6	3994.7	4362.8	4670.9
Sorghum					
Sorghum area harvested	1000ha	91.8	103.6	104.1	101.0
Sorghum average yield	t/ha	2.96	2.97	2.98	3.00
Sorghum production	1000 tons	271.7	307.9	310.8	302.8
Sorghum feed consumption	1000 tons	20.2	29.2	25.3	24.8
Sorghum human consumption	1000 tons	165.2	164.8	162.3	160.1
Sorghum domestic use	1000 tons	195.4	203.9	197.6	195.0
Sorghum ending stocks	1000 tons	59.9	69.4	70.2	69.0

		2008	2009	2010	2011
Sorghum net exports	1000 tons	41.9	94.5	112.4	109.1
Sorghum producer price	R/ton	1691.6	1610.2	1683.4	1724.5
Sunflower Seed					
Sunflower area harvested	1000ha	535.1	690.7	611.6	595.0
Sunflower average yield	t/ha	1.40	1.31	1.32	1.33
Sunflower production	1000 tons	748.9	905.5	808.34	792.79
Sunflower crush	1000 tons	611.6	695.1	745.73	776.51
Sunflower crush: Biodiesel	1000 tons	.	.	.	.
Sunflower domestic use	1000 tons	626.6	713.2	761.89	792.36
Sunflower ending stocks	1000 tons	270.5	456.2	502.19	507.34
Sunflower net imports	1000 tons	12.0	-6.5	-0.50	4.71
Sunflower SAFEX price	R/ton	4652.7	4394.3	4508.61	5094.83
Soybean Seed					
Soybean area harvested	1000ha	175.5	227.8	235.16	238.70
Soybean average yield	t/ha	1.71	1.88	1.89	1.90
Soybean production	1000 tons	300.3	428.7	443.83	454.71
Soybean crush	1000 tons	179.8	270.2	279.52	289.16
Soybean crush: Biodiesel	1000 tons	.	.	.	.
Soybean feed consumption (full fat)	1000 tons	181.0	175.5	181.58	183.61
Soybean domestic use	1000 tons	370.8	457.6	473.11	484.77
Soybean ending stocks	1000 tons	98.9	87.5	87.87	87.78
Soybean net imports	1000 tons	46.8	17.5	29.63	29.97
Soybean SAFEX price	R/ton	3818.5	4107.5	4022.71	4252.98
Sugar					
Area in sugarcane	1000 ha	422.4	420.0	419.3	421.2
Sugarcane area harvested	1000 ha	317.3	316.4	315.3	315.7
Sugarcane average yield	t/ha	65.62	65.65	65.78	65.94
Sugarcane production	1000 tons	20821.6	20775.3	20737.6	20818.3
Sugarcane for sugar	1000 tons	20821.6	15726.4	11708.5	9198.9
Sugarcane for ethanol	1000 tons	0.0	5048.9	9029.1	11619.4
Sugar extraction rate	Percent	11.8	11.8	11.8	11.8
Sugar production	1000 tons	2448.2	1849.1	1376.7	1081.6
Sugar domestic use	1000 tons	1293.6	1301.2	1310.9	1322.1
Sugar exports	1000 tons	1150.2	543.5	61.3	-245.0
Sugar statistical discrepancy	1000 tons	4.5	4.5	4.5	4.5
Sugar recoverable value	R/ton	1779.7	1942.2	2200.2	2465.2
Sugarcane average price	R/ton	217.0	236.1	266.4	297.6

		2008	2009	2010	2011
Potatoes					
Total Area	1000ha	50.52	45.12	45.84	45.24
Total Production	1000 tons	1887.13	1711.20	1768.93	1775.45
Average Yield	t/ha	37.35	37.93	38.59	39.24
Potatoes Import	1000 tons	19.36	23.23	27.87	28.50
Consump: Fresh formal	1000 tons	583.33	465.00	487.12	460.03
Consump: Fresh Informal	1000 tons	578.28	581.57	604.24	627.76
Consump: Processing	1000 tons	412.12	368.20	380.51	390.36
Consump: Seed	1000 tons	223.24	204.25	211.12	208.31
Unexplained	1000 tons	0.31	0.34	0.34	0.22
Potatoes per capita consumption	kg/capita	33.04	29.60	30.69	30.71
Domestic Use	1000 tons	1797.28	1619.36	1683.33	1686.69
Potatoes Export	1000 tons	70.49	68.61	57.73	60.26
Market price – fresh	c/10kg	2486.99	3044.61	3112.42	3407.59

Appendix E: Rank correlation matrix, probability distributions used in case study three

Yellow maize, Argentinean Rosario	Yellow maize, US No. 2	Wheat US No. 2 HRW	Sorghum US No. 2	Sunflower seed EU CIF Lower Rhine	Sunflower cake (pell37/38%) Arg CIF	Sunflower oil EU FOB NW Europe	Soybean seed Arg CIF Rotterdam	Soybean cake (pell 44/45%), Arg CIf	Soybean oil, Argentina	Nebraska, Direct fed steer	Chicken, US 12-city wholesale	Hogs, US 51-52% lean equivalent	Rand/$ exchange rate	US refiners acquisition price
1	0.95	0.76	0.95	0.63	0.49	0.64	0.72	0.48	0.68	0.11	-0.02	-0.05	-0.42	0.06
	1	0.72	1	0.59	0.44	0.58	0.66	0.45	0.59	0.11	-0.01	0.03	-0.40	0.16
		1	0.73	0.51	0.61	0.46	0.7	0.66	0.52	0.28	0.00	0.16	-0.47	0.30
			1	0.60	0.49	0.57	0.68	0.47	0.59	0.12	-0.04	0.03	-0.38	0.18
				1	0.39	0.87	0.69	0.32	0.82	0.13	-0.09	0.07	-0.29	0.10
					1	0.15	0.73	0.87	0.25	0.40	0.04	0.22	-0.13	0.56
						1	0.63	0.22	0.90	0.09	0.04	-0.04	-0.27	-0.12
							1	0.83	0.74	0.39	0.18	0.23	-0.38	0.33
								1	0.34	0.58	0.33	0.43	-0.35	0.58
									1	0.11	-0.07	0.02	-0.41	-0.08
										1	0.43	0.59	-0.43	0.66
											1	0.48	-0.04	0.34
												1	-0.26	0.69
													1	-0.12
														1

Table: Estimated probability distributions for key exogenous variables used to simulate maize prices for 2007/08 season

Variable	Yellow maize, Argentinean Rosario, FOB	Yellow maize, US No. 2	Wheat US No. 2 HRW	Sorghum US No. 2	Sunflower seed EU CIF Lower Rhine	Sunflower cake (pell37/38%) Arg CIF Rotterdam	Sunflower oil EU FOB NW Europe	Soybean seed Arg CIF Rotterdam	Soybean cake (pell 44/45%), Arg CIf	Soybean oil, Argentina	Nebraska, Direct fed steer	Chicken, US 12-city wholesale	Hogs, US 51-52% lean equivalent	Rand/$ exchange rate	US refiners acquisition price	Rainfall summer area
Mean	194	211	371	207	723	317	1860	491	422	1420	2089	1689	971	793	95	525
Min	143	159	258	158	545	190	1291	380	294	898	1550	1491	670	642	45	364
Max	280	321	509	314	951	481	2356	648	579	1844	2523	1943	1222	1223	161	776
Std dev	36.04	41.45	67.58	40.61	98.62	62.64	257	74.95	75.96	244	332	141	157.96	160	29.13	94.22
CV	18.56	19.64	18.18	19.60	13.63	19.74	13.81	15.26	17.98	17.22	15.90	8.34	16.26	20.26	30.66	17.94

Table: Estimated probability distributions for key exogenous variables used to simulate maize prices for 2008/09 season

Variable	Yellow maize, Argentinean Rosario, FOB	Yellow maize, US No. 2	Wheat US No. 2 HRW	Sorghum US No. 2	Sunflower seed EU CIF Lower Rhine	Sunflower cake (pell37/38%), Arg CIF Rotterdam	Sunflower oil EU FOB NW Europe	Soybean seed Arg CIF Rotterdam	Soybean cake (pell 44/45%), Arg CIf Rotterdam	Soybean oil, Argentina	Nebraska, Direct fed steer	Chicken, US 12-city wholesale	Hogs, US 51-52% lean equivalent	Rand/$ exchange rate	US refiners acquisition price	Rainfall summer area
Mean	190	207	297	187	641	273	1717	501	399	1458	2041	1681	1044	842	89	525
Min	141	156	206	143	484	164	1191	388	277	922	1514	1484	720	682	43	364
Max	275	316	408	284	844	415	2174	662	547	1894	2464	1934	1314	1298	151	776
Std dev	35.39	40.71	54.15	36.71	87.53	54.04	237	76.50	71.78	251	324	140	169	170	27.41	94.22
CV	18.56	19.64	18.18	19.60	13.63	19.74	13.81	15.26	17.98	17.22	15.90	8.34	16.26	20.26	30.66	17.94