THE FUNCTIONING OF THE AGRICULTURAL FUTURES MARKET FOR GRAINS AND OILSEEDS IN THE LIGHT OF CONCERNS EXPRESSED BY GRAINSA

Report prepared by the

National Agricultural Marketing Council¹



May 2009

¹ Main report prepared by Prof Johann Kirsten and Dr Mariette Geyser with inputs from Proffs André Jooste and Herman van Schalkwyk. All contributions and input from individuals and stakeholder organisations in preparing this report are herewith acknowledged.

THE FUNCTIONING OF THE AGRICULTURAL FUTURES MARKET AS A PRICE FORMING MECHANISM FOR GRAINS AND OILSEEDS

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EXECUTIVE SUMMARY

GrainSA requested the National Agricultural Marketing Council to investigate concerns regarding the proper functioning of the Agricultural Derivatives Market of the JSE Limited and the purpose of this report is therefore to specifically look at their concerns.

A point that needs to be raised is the fact that many of the prevailing concerns were addressed by the Food Price Monitoring Committee's (FPMC) investigation during 2002/03. It seemed that the findings of the report were not fully appreciated since many of the findings of the FPMC are still relevant. The study found that **emotions** and **sentiment** does influence the market and that it is difficult for players to 'corner the market'. The JSE instituted position limits on speculative positions on white maize on 1 July 2003 to prevent individual market participants from cornering the market.

This report further attempted to explore the fundamental factors that impact on the market. It was found that the Agricultural Products Division of the JSE Limited (referred to as SAFEX in this report) is a well functioning market for grains and oilseed price forming in South Africa. Prices are influenced by supply and demand (both regional and international) and the Rand Dollar exchange rate. The study further found that deliveries from foreign origin do not impact negatively on the price of wheat. The proposed changes of the JSE on foreign wheat deliveries are acknowledged. The report however raises a concern about the basis on which the origin discounts, to account for quality difference of foreign wheat delivered on SAFEX, was determined. In order to ensure greater transparency in the market the criteria on which this discount is based should be substantiated scientifically. The NAMC therefore recommends that a study is undertaken to determine a sound and scientific basis on which such a discount is based and adjusted from time to time.

This report concludes that in theory area differentials should not influence prices negatively and that there should exist many other alternatives to farmers to market their product (in possible other geographical areas) to obtain a better price. Obviously, the argument about the number of buyers in a particular region – thus the competitive nature of the market has to be considered. When there are no alternative buyers in a region it is rather difficult for farmers to bargain and to negotiate price with different buyers and as a result farmers have no alternative but to accept the price being offered (SAFEX minus location differential). The situation in the Western Cape specifically is further complicated by the fact that the major farmer cooperatives/agribusiness are all shareholders in the company (Pioneer) that buys virtually all of the Western Cape wheat crop.

During 2008 it became clear that more inclusive dialogue is required to address the discomfort and emotion around the transport differential. As an interim the NAMC recommended:

- i) that the transport differential is maintained for the interim;
- ii) that an investigation is launched into how it is determined and whether it actually serves its purpose; and
- iii) that the state of competition of the wheat market in the Western Cape is investigated by the Competition Commission

In terms of recommendation ii) above the NAMC recommended reference group meetings with grain traders, millers, producers, the JSE and agribusinesses. The goal of the reference group meetings was to get inclusive input, provide a platform for discussions and lastly to establish some form of a decision on the future of the transport differential. In addition, Prof Matthew Roberts, Associate Professor in the Department of Agricultural, Environmental, and Development Economics at The Ohio State University, USA, was contracted to compile an independent

opinion about the working of the transport differential in South Africa. He attended all reference group meetings with stakeholders. A final reference group meeting was held in February 2009 where all stakeholders that were interviewed were present. At this meeting Prof Roberts discussed his recommendations with stakeholders. In March 2009, Dr Geyser presented the findings of this report at the Annual Grain SA Congress, with specific emphasis on the issue of transport differentials. The recommendations of Prof Roberts report on the working of transport differentials in the South African grain market were also presented at the Annual Grain SA Congress. Congress then decided to accept the findings on the transport differential and agreed to remove the issue of the transport differential from their agenda.

The NAMC support the findings and recommendations by Prof Roberts. They are as follows: (Prof Robert's full report is attached in Annexure B).

- Retain the differential system as it is currently designed and constructed.
- Reiteration of NAMC 2008 Recommendations

Certain of the recommendations of the 2008 NAMC report also bear directly on the topics of transparency and market power, and therefore are highlighted here for additional emphasis. These changes would be, or facilitate, improvements in the operation of the South African grain industry:

- To look at ways in which information and access to information in the market are improved.
- The introduction of a commitment of traders report by the JSE.
- SAFEX explore the introduction of an electronic exchange for silo certificates
- Market Transparency must be increased

The report also found that price volatility on SAFEX is high, but corresponds with price volatility on the Chicago Board of Trade, having the same high and low phases during a marketing season and that the price volatility can be explained. The report further established that SAFEX prices are sensitive towards reports released by the Crop Estimates Committee as well as reports released by the US Department of Agriculture and other international reports of significance.

The following recommendations are suggested:

- To look at ways where information and access to information in the market are improved.
- The introduction of a 'commitment of traders' report issued by the Financial Services Board.
- Investigate speculative position limits on the various contracts and to determine whether these levels should be adapted and extended to cover other contracts than white maize.
- A study to determine 'moving average' price limits to ensure that the price limits imposed on the market represents a fair percentage of the underlying price.
- That the JSE should consider the introduction of 'mini size' contracts.
- That the JSE consider publishing a market commentary report.
- The NAMC should investigate the feasibility of a statutory measure to force market participants to report any intention of imports or exports 24 hours after the deals were concluded.

1. INTRODUCTION

This report is prepared following a request from GRAIN SA to the National Agricultural Marketing Council (NAMC) to investigate concerns regarding the proper functioning of the Agricultural Products Market division of the JSE (commonly referred to as SAFEX). These concerns were highlighted in a letter from GRAINSA to the NAMC included the following and reported under the following main headings:

- 1. The necessity of grain deliveries from foreign origin on SAFEX contracts, international prices and the influence thereof on SAFEX prices.
- 2. The functioning of the market, and in detail:
 - 2.1 SAFEX as price forming mechanism for grains and oilseeds in the South African agricultural context.
 - 2.2 The role of speculators in trading and the possible influence of speculators on price fluctuations.
 - 2.3 The volatility of grain prices.
 - 2.4 The influence of the location differential.
 - 2.5 Trading strategies or actions by traders (with specific reference to possible price manipulation).
 - 2.6 The effect of external factors, such as the publication of producer's intention to plant by the National Crop Estimate committee, on the volatility of SAFEX grain prices.
 - 2.7 Changes in prices as a result of changes in fundamental factors such as exchange rate and the Chicago Board of Trade prices.

The purpose of this report is to specifically look at the issues raised by GrainSA. The authors are aware of a similar study undertaken by the Competition Commission, but the authors would like to stress that the report do not have the same mandate than the Competition Commission. The report might cover aspects not part of the Competition Commission's mandate, or the report might not cover all the aspects of that of the Competition Commission.

Many producers voiced their concerns about SAFEX and believe that the exchange is to be blamed for the low prices relative to export parity (experienced during the beginning of 2007 when the SAFEX price traded close to export parity levels) or for the volatility in prices. Allegations of the manipulation of the market have been made and the transport differential listed has been debated at length.

Most of these claims were also raised by many parties at the time of the food price crisis of 2002/2003 which led to the appointment of the Food Price Monitoring Committee (FPMC). The Committee investigated the working of the SAFEX market for grains and also interviewed all the major grain traders and the JSE in a set of hearings during 2003. It seems that the finding and conclusions of the Committee – contained in its final report – was not fully appreciated and internalized by many of the role players in the industry. It was therefore considered to be an appropriate course of action to review and synthesize the findings of the FPMC and then

implement an additional investigation to determine the cause of the more recent concerns.

The report starts therefore by giving an overview of the views expressed during the interviews and highlighting the main findings and recommendations made by the FPMC. The report then reviews the fundamental factors that impacts on the market in an attempt to shed more light on the role of the futures exchange in trading grain in South Africa. Subsequently the report highlights other factors and/or actions that can influence the market and prevailing issues and concerns from market participants.

2. OVERVIEW OF FINDINGS AND RECOMMENDATIONS OF THE FPMC INVESTIGATION

During 2003 the Food Pricing Monitoring Committee received a number of complaints regarding trader behaviour on the agricultural derivatives market of the JSE. Complaints to the office of the Deputy-Minister also came to the Committee's attention. The tremendous fluctuations and volatility in the agricultural commodity markets also led to concerns expressed by many grain farmers at a recent GRAIN SA congress (2007).

In its 2003 investigation the Food Price Monitoring Committee was asked to determine what actually took place in the commodity markets between December 2001 and April 2003. Role players in the market were therefore requested to provide the Committee with their understanding of price trends in the markets for white and yellow maize, wheat and sunflower. Comments were invited on the following issues:

- An assessment of the main reasons (excepting commonly known factors such as world prices and the exchange rate) which led to the rapid increase in commodity prices during 2002 and the rapid decrease in prices during early 2003 (pinpointing any trader behaviour or practices that contributed to these extraordinary runs).
- An explanation of the factors (events, information) that determined trading positions in the aforementioned period.
- An indication of price trends and trades (mentioning of specific days) that were not in line with the fundamentals. (For example: all fundamentals indicated that prices should go up but prices went down!).
- Any information on import and export deals that were reported but never were realised.
- An interpretation of the effect that the monthly crop estimates and the information on stock holding in silos and on farms had on the price trends in the markets.
- Suggestions on regulations that should be put into place by the JSE to reduce unnecessary speculation and adverse trader behaviour on the agricultural derivatives market.
- Opinions on portfolio managers using the agricultural derivatives market as a way of balancing their portfolio and spreading their risk.

By the deadline of 30 May 2003, only 6 written submissions had been received in addition to a response from the General Manager (GM) of the Agricultural Products Division of SAFEX. This response is included in Box 1; it provides useful information about the events in the agricultural commodity market during the period in question and gave rise to the issues during that period, as well as the questions investigated. A subcommittee of the FPMC reviewed these submissions and then decided to invite certain traders to provide oral evidence in camera during the week of 17 - 20 June 2003. Fifteen representatives from institutions trading on SAFEX, or trading physical grain were interviewed.

Box 1: Useful information regarding the agricultural commodity market during the period 2001/02 (Submission to the Food Price Monitoring Committee by the Agricultural Products Division, JSE Securities Exchange South Africa)

Background

The fundamental objective of a commodity derivatives market is to provide participants in the market with an effective price determination mechanism and an efficient price risk management facility. In the absence of a derivatives market within a deregulated commodity market (where price is not controlled), participants in the market are subject to unscrupulous pricing behaviour and to massive price risk. A derivatives market sends out clear and transparent price signals to the whole market and enables market participants to hedge the risk inherent in commodities. The prices on a commodity derivatives market are determined by the interpretation of the information available to the market at any given point in time and are based on the principle of willing buyer, willing seller.

The price of grain, particularly that of white maize, on the South African commodity derivatives market is determined by the interpretation of the information related to the following factors:

- \circ the domestic supply and demand situation;
- the regional supply and demand situation;
- the international supply and demand situation and international prices;
- \circ the exchange rate.

Based on the information available at the time, and the interpretation thereof, the price of grains, particularly that of white maize, started to increase around June/July 2001. A brief synopsis of the most pertinent of the above noted fundamental factors would serve to substantiate price movements in the period mid 2001 to date.

Factor	June 2001 – Mar 2002: Price rise to maximum levels	April 2002 – Dec 2002: Continued high price off maximum levels	Jan 2003 to date: Fall off in prices
Domestic Supply	Reasonable supply	Crop estimate figures underestimated by 1mt. Reports of poor crop perspectives	Realizations that carry over stocks are in the region of 2m tons (SAGIS figures). Indications of 17% greater plantings of white maize and follow up increased NCEC crop estimates
Domestic Demand	Largely unchanged	Largely unchanged	Largely unchanged
Regional Supply	Reports of shortages as a result of drought and political unrest in Zimbabwe	Shortages as a result of poor harvests	Crop prospects looking better in certain countries
Regional Demand	Reports of extensive demand requirements in the upcoming	Continued reports of extensive demand requirements	Realization that regional demand was probably exaggerated and that

	season as a result of crop failures and political unrest		"aid" maize had taken the place of potential commercial exports	
International	Largely unchanged,	Increased from	Largely unchanged in the	
prices	Ranged between 200	around 200 to	region of 240c/bushel	
	and 205 c/bushel	240c/bushel		
Exchange Rate	Rand weakened	Rand strengthened	Rand strengthened	
	significantly to the	from 11.50 to 9.10,	significantly from 9.10 to	
	US\$ from 8.00 to	but most media	7.20	
	12.60 (in Dec) and	reports suggested the		
	then strengthened to	strengthening would		
	11.60	be short-lived		

It must also be noted that a market does not only trade on fundamental factors, but on perceptions and sometimes emotions. The situations during the specific time periods, as indicated above, created an atmosphere in which participants in the market took decisions which could easily have been motivated by the perceptions of those fundamental factors pertaining in the market. A derivatives market consists of various participants, notably hedgers (those wishing to manage price risk) and speculators (those prepared to take on risk with the objective of making a profit.) Speculators are necessary to the efficient functioning of a market in that they provide added liquidity to the market and added opportunity for hedgers to lay off risk.

2.1 Summary of the 'evidence' presented to the FPMC during the interviews held in 2003

Various market participants and industry leaders were interviewed by the FPMC. They represented:

- SAFEX,
- Large milling companies,
- Traders, and
- Stock held by silo-owners, farmers, grain pools, and stock kept as part of a strategy

The various opinions of the participants (taken from the FPMC report) are summarized below:

2.1.1 SAFEX opinion

The GM of the agricultural derivates division of the JSE (SAFEX) accepts that there were gaps in the SAFEX rules for trading (this is an important acknowledgement by the GM already in 2003 and should be seen in context of the concerns raised in the request to the NAMC in 2007 mentioned in the introduction of our report), specifically limitations on trading position limits. Rough estimates of the price increasing effect of the lack of position limits on the size of trades and their volume range from 2% to 10%. SAFEX maintains that position limits will resolve this problem in much the same way that speed limits aim to control speeding.

At that time the GM believed that SAFEX prices remained high for a long period because of sentiments in the market that was created by amongst other speculation on movements in the exchange rate and weather conditions. By implication, they feel that the lack of position limits did

not play a substantial role as the other factors that influence the SAFEX price indicated a higher SAFEX price. The GM recommended that greater investment needs to be made into the National Crop Estimates Committee (NCEC). The GM pointed out that if the State were to operate a strategic reserve on SAFEX, it would also be subject to position limits. He was not able to provide any guarantees that position limits would work effectively. SAFEX was aware of the risk that trading entities may be split up under the maximum ceilings, but the GM did not make any commitments to improved monitoring and reporting.

The JSE introduced position limits on speculative positions on 1 July 2003.

2.1.2 Large milling companies and their maize trading activities

According to traders acting on behalf of the grain millers, and also based on the normal market gossip, the concern was that millers instructed their traders to 'buy at all costs' during 2002 because they believed there was going to be a shortage of maize and, consequently, they feared losing their brand-based market share. To some extent this appears to have led to a situation where large mills locked part of their overall maize grain purchases at high SAFEX prices compared to prices available to smaller millers who only entered the milling industry once prices dropped in early 2003.

Large millers aimed to save on option premium costs and therefore got involved in 'exotic' options (e.g. barrier options). Possible losses experienced on barrier options are more likely as a result of a lack of experience in managing barrier options and not as a result of the market. Prices may have overshot on the futures market because of what was happening on the options market. There is a lack of trader skill and expertise in using exotic options.

2.1.3 Big trader dominance during 2001/2

Several traders reported on aspects of the trading activity of one large trading house that was described as 'the market leader' in 2002. This particular firm was well-known to the trading board and had adopted a controversially large position in support of the higher maize prices from May 2002 onwards, a position that most traders and market participants believed and followed. The firm's activities were supported by its ability to trade on behalf of the Joint Municipal Workers Pension Fund with backing from ABSA. The size of the position held by this firm led to a situation where it was improbable that other market participants would counter their position (Section 3 further discusses volumes traded on SAFEX.) There were no rules governing the positions members or clients held at that time. The JSE Ltd. introduced position limits on speculative positions on white maize contracts (the most liquid contract at that time) on 1 July 2003 to prevent market manipulation.

Box 2: An extract from the written response from one SAFEX trader

"There are essentially two points of departure when drafting a response to the request for submissions. One is to comment on the issues / questions from the perspective of each being a question simply asked to elicit a response and gain insight into the workings of the market. The other is a background which I do believe is relevant in this case, being that this is somewhat of a fishing expedition in the hope that a party (be it a market participant or an exchange member) will, or will not, be found holding a "smoking gun", enabling much of the blame for spiralling food price inflation to be laid before the door of an identified, or identifiable party, or parties.

I will to some extent comment from these perspectives separately as each has some value. Certainly there is certain activity that possibly resulted in **short term** price moves, which would otherwise not have resulted – but whether or not these moves were not justifiable is another question altogether. Ultimately the market both dictates and indicates whether a price move is justifiable and sustainable.

To a point the rallies of late 2001 / early 2002 were justifiable – after all the market continued to fuel the move. At a point, however the market move became unsustainable and the market "fell of its own weight" so to speak.

As with any "bubble" (boom or bust type activity) as evidenced throughout market histories (The South Sea Bubble, Tulip mania and even the Tech Stock Boom), moves become exaggerated as the market moves too far. Euphoria or gloom (greed or fear) sees exaggerated moves based on human emotion, which determines how far prices move. This may not be what a purist fundamentalist would be hoping to hear, but it is my firm view that price action is primarily a function of the emotional response of people (market participants, or representatives and decision makers working at market participants). Human involvement is the only constant factor of markets and is therefore the only determinable factor – one is assured of human nature, always. Accordingly, prices will always overshoot to both the upside and the downside.

Market activity is the end result of all factors <u>influencing all market participants</u> and their views at that time, such factors acting in concert to translate to certain price action / price levels. Accordingly, it is important to realise that any attempt to single out individual factors as the "cause" of a specific price move is in reality an exercise in futility. Various factors may have contrary effects and the price is a function of all of these factors. Nevertheless, and for fear of creating the impression that I view this information gathering exercise of the FPMC as "futile", I believe that this process is necessary and desirable, even if only to confirm what many actively involved in this market have known all along. It is necessary to determine that markets will run their course – and that it is necessary and desirable to permit the operation of free markets to achieve this. To realise also that the benefits involved in such activity are in balance with the negatives and in fact outweigh them.

The very existence of a market assumes that there are participants with opposing views - if all participants at any time expect prices to increase there will be no sellers and hence no trade, and similarly if a decline is expected, there will be no buyers. It is the opposing views that make trade possible. I will embellish upon this later.

It should also be realised that commodity markets are notoriously volatile and prone to extreme moves. This is readily verified by an examination of the international grain exchanges. That being said there are certain factors worthy of mentioning although an objective quantification of the effect of these factors on prices may be impossible. Rather there should be a realisation of the fact that these factors **MAY** have had an effect on prices and, **IF** deemed appropriate, regulation or action with regards thereto becomes possible, although the benefits of such regulation and their implications as a whole would require careful consideration. I will not delve deeper into this aspect herein.

The Food Pricing Monitoring Committee should not - it is respectfully submitted – be too concerned with the exact effect of each market factor historically, but rather in ensuring that market efficiency is not compromised by certain structural, or market issues and that potential for undesirable practices by market participants is avoided. It should also be considered that regulations already exist to limit and control the behaviour of members and market participants".

Box 3: Why could prices on SAFEX overshoot or fluctuations is exaggerated? A trader's perspective

Price overshooting is usually created when arbitrage is not possible – i.e. if trade is constrained. Factors, which inhibit the functioning of the principles of arbitrage, could, theoretically, contribute to unusual, extreme, or extraordinary price moves – either up or down. Structural issues in both government regulation and SAFEX rules **MAY** have had the effect of limiting arbitrage opportunities during the price run of early 2002, with the former (government regulation) more so than the latter.

During this period, domestic prices on the SAFEX derivatives exchange traded above theoretical import parity prices and accordingly the local grain prices in the physical market (as an alternative to the prices on the board) followed. This was because imports were not feasible due to the non-approval of the importation of genetically modified grain (this immediately moves one to GM free markets which generally carry a premium). Levels of BT11 "contamination" permitted, together with the certification required for imported corn was originally a limiting factor and saw many argue that importation of white corn would never be possible.

In theory, arbitrage opportunities mean that domestic consumers (or traders) who are long of physical stock will sell this grain into the domestic (or another market) and replace these stocks with cheaper grain from elsewhere. The above situation hampered the free application of the principles of arbitrage by market participants who were unable to import cheaper grain, and sell domestic grain, thereby forcing domestic prices down. Arbitrage opportunities would therefore operate (and eventually did so) via the physical grains market irrespective of the SAFEX Rules.

The SAFEX rules (recently revised with effect from the September 2003 Futures Contract) initially permitted delivery of only 100 mt (or multiples thereof) of grain, as reflected on a silo receipt issued by a recognised silo-operator in respect of stocks of **AFRICAN ORIGIN held at a SAFEX registered silo** on a SAFEX short position. This meant that utilisation of the principle of arbitrage in this regard (i.e. on SAFEX positions) was also removed – i.e. you could not for example purchase US white corn and deliver this on a SAFEX position.

In fact, even with the current revision of the SAFEX Rules one would in all probability struggle to deliver US corn (particularly white corn) to a SAFEX registered silo and have the silo operator segregate this stock as required (i.e. separate storage from other origins). Limited storage capacity and the very limited demand for such segregation would in theory make such storage prohibitively expensive to operate and detrimental to capacity. In theory, however, arbitrage of international origins against local origins in the SAFEX market is now possible and larger market participants with storage capacity, such as larger silo operators (e.g. Senwes, Afgri, etc.), are likely to make use of these opportunities in the future.

Another factor, which has an effect on price moves, and always will, is a given in derivatives markets. The gearing present in derivative instruments tends to result in an "overshoot" in price activity. Unlike markets where the instrument / subject matter is purchased and paid for in full, the purchaser of a March 2002 white maize futures contract during March 2002 would have obtained exposure to a commodity valued at as much as R 2000 / mt, by simply putting up a margin of R 100 / mt. Accordingly, positions **MAY** be taken far in excess of the financial means of the party compared to the situation were the party required to pay for the commodity in full. As a result, the market is capable of moving below the full value of the client's monetary investment (without the price of the commodity in the case of a purchase, for example, going below zero).

2.1.4 Stock owners

This FPMC also investigated the possibility that stock held by various owners/institutions could affect the price.

The ability of silo-owners to influence commodity prices

This section aimed to verify whether it is possible for co-operatives/agribusiness or silo owners to influence the market price for agricultural commodities through hoarding - one of the major concerns with the functioning of market.

Theoretically the actual level of the domestic price lying between the minimum and maximum level will depend on local (SA) supply as well as on demand in the local market, albeit we need to recognise that the latter is relatively stable in the short to medium term. In Figure 1 below, the SAFEX spot prices of white and yellow maize are plotted against the monthly deliveries from May 2000 until May 2007. From the graph it can be seen that trend in spot prices is declining at the time of the harvest. Even during the 2002 harvest season when extremely high producer prices were the reality, a declining trend can be identified. The same is also true for the last two marketing seasons with prices declining as deliveries increase. The price trend confirms the law of supply and demand – larger supply will suppress prices (as can be seen during the harvesting periods).



Figure 1: SA white and yellow maize monthly deliveries versus maize prices (an illustration of deliveries between May 2000 and November 2007)

Source: SAGIS & SAFEX

According to the Grain Silo Industry (2002), the total grain silo storage capacity in South Africa is estimated at 17.5 million tons, which comprises 14.5 million tons in the northern provinces, 970 000 tons in the south and 2.1 million tons at the harbours and with private owners. Most if not all of the silos were constructed during the era of regulation and the cooperatives that had managed the silos had precisely demarcated areas of operation. As such ownership of silo operations is regionally dominated by specific companies. Afgri (the former OTK co-operative),

Senwes and Noordwes, are the main providers of silo facilities and are estimated to account for a significant share of grain storage facilities. Senwes' key area is the Free State, Afgri's is Mpumulanga and NWK's is North West. There exists quite a high amount of concentration with three silo owners owning 70.3% of all the domestic storage facilities. Farmers are also limited in their storing choices by:

- the availability of silos and silo space;
- the various transport ways (it is not ideal to use a tractor for example to take the harvested crop to a silo a long distance away. This mode of transport is time consuming); and
- some silos are not registered SAFEX silos, thus limiting the farmer in his marketing alternatives by excluding delivery on a SAFEX contract. This can also limit the farmer's ability to effectively hedge his/her crop against price risk by making use of SAFEX instruments.

Silo owners store the following grain stocks: farmer's stocks, grain pools, back-to-back contracts, and hedge stocks. These are discussed in detail below.

Farmer's Stock

The producer is the owner of the maize. The maize can either be stored on the farm or in the silo. When the maize is delivered to the silo a silo certificate is issued and the producer can decide when to sell this certificate. The producer is exposed to the price risk and can hedge against this risk. The silo owner merely supplies the services of storage and handling at a specific cost per month. The delivery (i.e. the movement out of the silo bin) of the physical stock of grain will only take place through an instruction from the farmer/owner of the silo certificate.

There was recently a court case between a group of farmers and a commercial bank, dealing with the rights of silo certificates and when these documents can be used as a tradable commodity. Judgement was given during December 2007 on the matter between ABSA bank and 48 farmers in the North West province. Judge Brian Southwood said in his judgement that ABSA failed to safeguard the silo certificates of the farmers and used these silo certificates in their normal operation without the farmer's consent. This judgement confirms that ownership of silo certificates can only be transferred through consent of the party involved.

Grain Pools

A group of producers delivers their maize in a pool. An organisation appointed by the group of producers will do the marketing and sale of the grain stock. A silo-owner can be appointed by the group of producers to administer the pool, and he provides services in terms of handling and storage. The stock belongs to the producers participating in this pool. The pool is exposed to price risk and, therefore, has to hedge itself. All price risks and hedging costs are for the account of the specific pool.

Grain stocks related to 'back-to-back contracts'

The silo-owner can also acts as the agent between the buyer of maize (millers/processors) and the producer. The buyer determines the price and the quality of the grain. The stock belongs to the buyer (the milling company/processor and <u>NOT</u> the silo-owner). The buyer will also determine where and when this stock will be utilized. After the maize has been purchased, the silo owner acts as the supplier of storage and handling services.

Hedged Stock

The silo-owner purchases the maize from the producer. The silo owner is now exposed to price risk, which might be hedged on the futures market. Any market participant on SAFEX can now buy this stock from the silo-owner. As soon as the silo-owner has hedged the stock on the futures market, he is no longer exposed to the fluctuation of prices and, therefore, can earn the amount that is charged for handling and storage. The risk of any price movement is through the SAFEX hedge transferred to another player on SAFEX.

The deliveries received by all silo-owners during 2000 to 2003 can be grouped according to the classifications above. The first 3 classifications can be considered as deliveries/stock for other people's accounts, while purchases by the silo-owners for their own account make up the balance. As indicated in Table 1 (below), the latter is, generally, the smallest component of all stocks and deliveries (during the period when the Food Price Monitoring Committee investigated the high commodity prices). Most silo owners have their own trading desk where they participate in the market either as hedger or speculator. If they participate as speculator, their objective changes and any price move can be to their benefit. If they have their own trading desk, it can happen that the silo owner can enter into a trade/strategy where they trade for their own account and not always to the benefit of the farmer who store the commodity with them.

Table 1.	Ula									
		2000/01		2001/02			2002/03			
	Total deliveries (t)	Own account (%)	Other accounts (%)	Total deliveries (t)	Own account (%)	Other accounts (%)	Total deliveries (t)	Own account (%)	Other accounts (%)	
White maize	4 281 951	1.3	98.7	3 934 741	2.1	97.9	4 245 747	0.6	99.4	
Yellow maize	2 382 224	2.0	98.0	2 721 341	1.6	98.4	3 082 797	0.9	99.1	
Sunflower	539 405	0.05	99.95	573 739	0.35	99.65	572 758	0.2	99.8	
Wheat	1 893 301	2.5	97.5	1 944 699	2.9	97.1	2 046 272	2.2	97.8	
Sorghum	203 311	0.23	99.77	111 821	0.45	99.55	112 746	2.05	97.95	

Table 1:Grain deliveries to silos

Many silo owners could benefit from a longer supply chain whereby they not only store the commodity, but they also become users of the commodity, either for their own mills, feedlots, or broilers, or in some instances, silo owners have a preferential delivery right to large mills.

The purpose of our study was not to determine whether silo owners were unfairly advantaged by their ownership since the Competition Commission is already busy to investigate such claims. The purpose of our study is furthermore not to determine whether oligopoly behaviour by silo owners impacts on the market negatively, since this falls outside the terms of reference requested by GRAINSA.

Appendix A shows the working of a 'trading book'. The appendix shows that it is unlikely that a silo owner will hold back stock to influence the market. But it is based on the assumption that silo owners will only enter into SAFEX positions simultaneously with the purchase of the grain from the farmer.

Large players in the market can also influence the price to a certain degree. If they represent, for example, a large portion of the offers on a given day, they can push the price up by not willing to sell at lower price levels. They can for example, also push the price down by not bidding on the

market. This will result in lower demand on a given day and thus can push the price down. Emotions, or financial pressures, can force the sellers to sell at the lower bids on the screen.

2.2 Findings and recommendations from the FPMC investigation

The FPMC made the following concluding remarks during their investigation:

"Although this investigation has highlighted some specific trader behaviour that potentially could have caused SAFEX prices to overshoot, it was not possible and probably never will be possible to link specific price trends to specific actions by individual companies in the market. There was enough evidence, however, that points towards the market or the market sentiment being manipulated, which caused the market to overshoot or to overreact. It is, however, also likely that the initial underestimation of the June 2002 harvest, and the various statements by industry leaders about a negative outlook for the coming 2002/2003 season created a negative market sentiment. Apart from this, there was much disinformation about the extent of imports, exports and the situation in Zimbabwe and rest of the SADC region. Clearly, the conditions were such that the 'stage' was literally set for somebody to 'orchestrate' the direction of the market and cause what somebody called a 'buffalo run'.

The Committee is however satisfied that the broader concern by society, Government, in conjunction with the attention given by the Committee as well as the Financial Services Board (FSB) did convince the JSE to introduce new rules to prevent the possibility that traders hoard the market. The fines and suspension issued by the JSE, and the investigation by the FSB is an indication that they are serious about dealing with traders behaving badly, which could result in 'unjust' price increases. Despite these reported irregularities, the Committee is of the opinion that lack of proper market information played a much greater role in creating the situation where manipulation was possible. To allow the proper functioning of this market, this aspect needs to be addressed. The Committee is also satisfied that there is sufficient evidence that much of the producer price trends accurately reflected the market fundamentals for most of the period under review, which suggests that, apart from certain periods, manipulation had minimal effect on the broader price trends. The Committee is also satisfied that the necessary regulations are now in place to prevent abuse of the futures market."

3. THE PURPOSE OF A COMMODITIES FUTURES MARKET

Futures trading are a natural corollary to the problems associated with maintaining a year-round supply of seasonal products such as agricultural crops. Futures markets exist to make the cash commodity markets, and the overall economy, operate more efficiently. The two ways in which futures achieve this are price discovery and risk transfer. In this sense, they are financial instruments, rarely used for actual transfer of the underlying physical commodity.

Price discovery is the process in which the myriad actions of buyers and sellers determine the price for a commodity at which the amount produced equals the amount consumed. Futures prices are discovered through a continuous worldwide flow of information that influences both the current and future supply and demand expectations of the buyer and seller. By being linked to the cash (spot) market the price discovery process in the futures markets serves to determine prices in both markets. Futures markets facilitate this price discovery function by offering a standardized contract on the commodity to trade. Futures contracts are standardized in quantity, location, grade, and maturity. This standardization, when combined with the existence of a clearinghouse

to eliminate counter-party risk, means that parties from around the world can participate in the futures market for purchase and sale, bringing more liquidity into the market, and allowing more market players to participate in the price discovery process.

Futures markets increase economic efficiency by facilitating the transfer of risk from one party to another. Farmers are the original owners of price risk in agricultural production; they grow the crops that are later marketed. If they want to reduce their risk, or if intermediaries want to reduce their risk, a mechanism must exist for the inexpensive transfer of price risk from those who want to reduce risk to those who are willing to take on more risk for (the possibility of) profit.

Trading liquidity is very important to ensure that a futures market can perform its functions of price risk management and transfer. Liquid contracts (high volumes traded on the contract) ensure that the price truly reflect the consensus of a large number of buyers and sellers. It also gives market participants the opportunity to easily enter into or close a derivatives position. The essential characteristic of a liquid market is that there are ready and willing buyers and sellers at all times. But there is no assurance that a liquid market may exist for offsetting a commodity contract at all times. Some futures contracts and specific delivery months tend to have increasingly more trading activity and have higher liquidity than others. Speculators are key contributors to the liquidity of a market, or asset. Speculators are individuals or institutions that seek to profit from anticipated increases or decreases in a particular market price. By doing this, they provide the capital needed to facilitate the liquidity. Figure 2 shows the total number of contracts traded on SAFEX between 1998 and 2008.



Source: SAFEX, 2008

The average monthly volumes traded in 1998 was 7 119 contracts and increased to 219 411 contracts (representing an average monthly value of R29,98 million) during 2008. The current size of the market and the number of participants makes it impossible for a single market participant to push prices into a certain direction or to hoard the market on a long term basis.

Section 2 and Section 3 confirmed that the price behaviour of grains traded on SAFEX is determined by supply and demand and that emotions and sentiment does influence the market (short term). These sections also showed that it is difficult for players to 'corner the market'. The JSE introduced position limits on speculative positions on 1 July 2003 (and as discussed by Section 5 of this report). These sections therefore attempted to answer questions 2.2 and 2.5.

4. THE LONGER TERM FUNCTIONING OF THE MARKET FOR GRAINS

Given the abovementioned, this section attempts to further explore the fundamental factors that impact on the market and to answer the following questions:

- a) SAFEX as price forming mechanism for grains and oilseeds in the South African agricultural context.
- b) Changes in prices as a result of changes in fundamental factors such as exchange rate and the Chicago Board of Trade prices.
- c) The necessity of grain deliveries from foreign origin on SAFEX contracts, international prices and the influence thereof on SAFEX prices.
- d) Determination of spot prices and the role of location differentials.

The passing of the Marketing of Agricultural Products Act of 1996 paved the way for a new marketing order in the South African grain industry. Grain producers, traders and processors are now able to trade in a 'free' market; they can respond to the forces of supply and demand in setting prices. In practice, they all look to the prices generated through the formal commodities market that was established following the deregulation, namely the Agricultural Markets Division of the South African Futures Exchange (SAFEX) as the benchmark for the prices they will ask or offer in the 'spot' market of daily trading in maize. The spot price refers to the price paid for a commodity at Randfontein (ex silo prices) and transportation cost are deducted from the SAFEX price to determine the spot price at every registered silo. This is true for white and yellow maize, wheat and sunflower seeds, but not for soybeans, as no transport cost is deducted to derive at the local spot price.

The agricultural division of SAFEX was formed in 1995/1996, and introduced the trading of derivatives (futures and options) for white maize, yellow maize, wheat, sunflower, beef and potatoes (the beef and potato contracts were later cancelled due to inactivity). The price for futures and options contracts are generated on the exchange market through 'bids' and 'offers' and reflect the views of market participants on the prices of the specific products at different dates in the future. These instruments are also used to hedge price risk. By using the SAFEX market effectively, market participants can manage their price risk, which, in turn, could result in improved financial positions.

Futures markets provide the facilities and platform where buyers and sellers can meet in a transparent way and trade freely among themselves, thereby providing an effective price discovery mechanism. It is the free and unimpeded trading among all buyers and all sellers that determines prices. In providing the facilities for buyers and sellers to meet and conduct their

business, futures exchanges are somewhat like neutral playing sites in an athletic contest. Everyone who buys or sells either the futures contracts or the underlying commodity contributes to the process of price determination. The prices that emerge in futures markets represent the sum total of all the supply and demand pressures that determine prices. The high volumes traded on SAFEX ensure that even the largest single participant usually has little more than a fleeting, momentary impact on prices. Prices on futures markets find their level as a result of the cumulative action of thousands of buyers and sellers, including producers, processors, handlers, exporters, importers and speculators. The market price will rise, fall or hold steady, as a result of the sum total of all of those individual decisions to buy or sell.

The futures price reflects the price at which buyers and sellers are prepared to buy and sell the commodity contract for a future month. The futures price therefore reflects a consensus of market opinion. For instance, it combines the opinion of a producer, in the Free State who expects his crop to be smaller because of damage caused by wind and heavy rains, with the opinion of an Mpumalanga producer who expects a bumper crop, with the opinion of a feed manufacturer who expects demand for maize (as an example) to be higher because of herd expansion after good rain, and the opinion of a grain trader who expects a good USA crop and a strengthening of the Rand against the US Dollar to cause a decrease in the SAFEX price. The futures prices is therefore a forecast of what the cash price of the commodity will be for a given future month, based on currently available information.

Supply and demand factors (local, regional and international), weather conditions, consumer preferences, government policy, trade agreements, changes in living standards, and technology affect the prices of products in the future. Long term price trends are normally reflected by supply and demand factors, whereas breaking news, the exchange rate and emotions influence the market on a daily basis.

4.1 Determinants of the domestic price for maize and sunflower seeds

The main influences on the price of maize for a South African buyer is, normally, determined by the world price for maize, the exchange rate², stock levels and the relative size of the domestic maize crop. Maize that is physically located in the United States does not have the same value to a South African buyer, as does maize that is physically located in South Africa. Hence, the price of maize on different markets must be adjusted to take account of the differences in transport costs, exchange rates, etc., in order to make comparisons possible. Such an adjusted price is called a reference price; it is calculated with respect to a reference point. In the case of grains in South Africa the commonly used reference point for commodities trading on SAFEX (excluding soybeans) is Randfontein.

In order to adjust prices to this reference price, the international commodity price ('free on board' or FOB Gulf price³) has to be adjusted to take account of all the costs incurred in bringing the maize to Durban. This price, called the CIF price⁴, is adjusted to local currency using the current exchange rate. Once this is done, all local Rand based costs (off-loading, losses, interest, local

² The other costs (foreign currency costs of freight, insurance, etc, as well as the domestic costs) are important, too. Evidence shows, however, that they are more stable than the world price and the exchange rate.

³ This means that the supplier delivers the maize at a price that is equivalent to loading the maize onto a ship in the Gulf, i.e. the buyer will pay for the transport, insurance, etc. to get it to where they need it. The world price for maize is conventionally quoted as fob Gulf.

⁴ Cost, insurance, freight.

transport costs, and tariff if applicable) can be added resulting in a final landed (local) price per ton at the point of consumption, or the reference point.

Prices fluctuate between 2 "extreme" points – import and export parity levels. For example, if grain millers can buy imported maize (including the cost of transport, insurance, the tariff, the exchange rate, etc.) cheaper than locally produced maize, they will do so until local producers are able to supply maize as cheaply. This is called the import parity price. The reverse situation is also true: if South African maize producers can sell their maize to foreign millers at a better price than local millers are prepared to pay, South African maize will be exported until local prices have decreased to the level of the export price. This is the export parity price.

The result is that, in theory, the price of maize on the domestic market can go no higher (for long periods) than the import parity price, as millers will merely increase imports at this point. Thus, the import parity price is a ceiling price. In the same manner, the export parity price is the lowest possible price (but the price can trade lower than the export parity price for short periods), i.e. it is a floor price. It follows that the domestic price of maize will fluctuate between these two levels. This is illustrated in Figure 3.



Figure 3:An illustration of how SAFEX yellow maize spot prices fluctuate between
import parity and export parity (Jan 2000 to Dec 2007)Source:Sagis, 2007 and SAFEX, 2007

If the import parity price increase (due to international supply and demand conditions and/or a depreciation of the Rand against the US Dollar), import parity prices will move higher, as indicated by boxes 1 and 3. The actual level of the domestic price between this floor and ceiling price levels will depend on local (Southern African) supply as well as on demand in the local market, recognising that the latter is relatively stable in the short to medium term. The spot price will trend towards the floor price if there are high stock levels and will trade closer towards import parity levels when the stock levels are low and/or a smaller crop is expected, as indicated in Box 2. There was just over 360 000 tons of yellow maize imported during the 2005/06 marketing year which therefore confirms why yellow maize was trading close to export parity

levels. Over a million tons of yellow maize was imported from May 2007 to January 2008, explaining why yellow maize traded close to or at import parity levels until September 2007, but fails to explain why the SAFEX price traded lower over the last few months. A possible reason is the good early rain received over much of the maize producing area that suggested a good harvest, thus pushing prices down.

The net result of an increase in world prices will be an increase in the export parity price. This can result in higher domestic prices of maize if the current and/or anticipated stock levels are low. Maize buyers in South Africa, e.g. millers, will have to buy maize from producers who can sell their produce overseas at the higher world price and with a more favourable exchange rate. Hence, they will bid up the domestic price of maize if maize needs to be imported.

Whether the domestic price of maize, as a result, goes up to the maximum level of the import parity price depends on the relative anticipated scarcity of maize in the domestic market. If there is a domestic shortage, for example caused by drought, prices will move to import parity, but if there is an excess of produce, supply prices will trade closer to export parity price levels. To illustrate, in 2000 the import parity price of white maize was R1239/ton but producers only received R519/ton, largely due to the good harvests in South Africa and in the neighbouring countries. This caused a drop in the area planted with white maize (from 3.227m ha in 2000 to 2.708m ha in 2001) as producers switched to more profitable agri-enterprises. This caused a decline in output (from 8.97m tons in 2000 to 7.225m ton in 2001). It should be noted that there can be short periods when the market can trade above import parity levels or below export parity levels. This is normally a result of emotions and the hording effect of the market. Arbitrage opportunities will ensure that the market adjust itself to the right levels.

An additional factor that has to be taken into account during the 2001/02-period was the effect of the political turmoil in Zimbabwe, which resulted in a large drop in area planted with food grains such as maize. Within two years, Zimbabwe changed from a surplus producer and exporter of maize to a deficit producer and importer. The combination of these two factors plus reports of crop failures in Zambia and Malawi changed the market sentiments from the surplus in 2000 to a predicted deficit in the whole SADC region in 2001/2002 (It should be noted that this shortage did not materialise mainly due to food aid from non-African sources). The predictable result was that the domestic price increased to the level of the import parity price within a year. Parallel to this, import parity prices increased by 73% for white maize and 75% for yellow maize from September 2000 to February 2002.

Thus, the rapid increase in the price of maize was the result of the effect that the weakening in the exchange rate and the increase in the world price had on the price band within which the domestic price moves. Because of the perceived shortage on the domestic market, fuelled by negative perceptions about Zimbabwe, the domestic price then increased within this band.

Import and export parity price levels gives a true account of seasonal price changes, but does not give enough information to explain daily price volatility. Daily price volatility will be discussed in detail in section 4.

In Figures 4, 5 and 6 the recent trends in the SAFEX spot prices of maize, wheat and sunflower seed are compared with the trends in the exchange rate and the world prices. Figure 4 shows how white (54%) and yellow (38%) maize prices have decreased sharply between December 2002 and May 2003 despite the fact that the Chicago Board of Trade (CBOT) price increased by 3% over the same period (box 4). The main contributing factors for this sharp decline in prices were the appreciation of the exchange rate (14% over the same period) as well as regional demand and

supply factors. The anticipated exports to neighbouring countries did not realise and suddenly the domestic market had to cope with very high stocks levels of maize, that is, more than 2.5 million tons.

Figure 4 further shows a 150% increase in the CBOT price since November 2005 to January 2008, with a subsequent 99% increase in white maize prices and a 139% increase in yellow maize prices during the same period (box 5). The Rand depreciated 2% against the US Dollar over the same period. The higher world prices are a reflection of the increased demand for maize, mainly due to the increase in ethanol plants in the US and less favourable growing conditions in many areas worldwide. Although the South African maize prices also increased, it increased to a lesser extend compared to US prices. A reason for this is the fact that the 2006/07 marketing season in South Africa started with high carry over stock levels. The expected crop and the carry over stock levels and regional demand ensured sufficient maize for the South African market.



Figure 4: Recent trends in white and yellow maize spot prices and the world price of maize

(Source: Sharefriend, 2008)

SAFEX decided during May 2007 that the WOPT contract will be traded on a continuous basis and not just periodically as previously. The contract would be made available regardless of any crop quality issues in the future and therefore ensure the white grade discounts are traded in a transparent manner. The WOPT contract would be further defined to read "white maize of any origin, of the grade **WM2 or better**, as defined in the South African grading regulations, that meets all phytosanitary requirements and import regulations, but is not subject to the containment conditions for the importation of genetically modified organisms." The above definition would make allowance for grade 1 maize to be delivered on the WOPT contract however at a zero premium, note the inverse is NOT possible, no grade 2 maize may be delivered onto the WMAZ contract.

This WOPT contract replaces the Grade 2 maize contract that was introduced for short periods onto the market when necessary. It is therefore not anticipated that this contract will in any means influence the price of grade 1 white maize negatively.

Similar to the trends in maize prices, the price of sunflower seed also decreased by 48% in the period December 2002 to April 2003, as indicated by Figure 5. The sunflower seed prices have increased 98% in the period November 2005 to January 2008, with a Rand that depreciated slightly and traded in a sideways band. The high level of world crude oil prices was the main driving force for the high sunflower spot prices and a reflection of increased world demand and low national and international stock levels. South Africa is a net importer of sunflower oil and, therefore, international prices have a direct impact on local price levels.



Figure 5: Recent trends in sunflower seed spot prices and the exchange rate (*Source: SAFEX, 2007*)

4.2 Determinants of the domestic price for wheat

The wheat contract was first introduced to SAFEX in November 1997 when 5 contracts were traded. Over time, however, the volumes increased, as they did for all other contracts on SAFEX. During 2006, 334 584 contracts were traded (since October 2004, more wheat contracts than yellow maize contracts have been traded consistently). SAFEX introduced a "Cape wheat contract" (SEC) to the market in February 1999 (delivery in the Cape and not Randfontein). However, this contract was discontinued at the end of 1999 due to the small volumes traded (119 Cape wheat contracts traded during 1999, as opposed to 5207 wheat contracts for delivery at Randfontein). Wheat SEC was again offered to the market in July 2000 but again discontinued in November 2002. The total number of Wheat SEC contracts traded during that period was 3 872 contracts as opposed to 116 937 normal wheat contracts traded. During 2003 an investigation was launched by SAFEX to determine whether the SEC contract should again be offered to the market. On 7 May 2003 they found that the market was **not in favour** of the SEC contract.

All bread milling wheat originating in South Africa, Argentina, No 2 US Dark Northern Spring wheat, No 2 Hard Red Winter wheat, No 3 Canadian Red Western Spring wheat, Australian Hard wheat, Australian Prime Hard wheat and Australian Premium White wheat of sound, fair and merchantable quality which is fit for human consumption and which complies with the listed criteria and the requirements and methodology as contained in the South African rules for the classification and grading of wheat, can be delivered to SAFEX. Discounts will apply to grades

B2 and B3 and <u>an additional discount of R100 will apply to all wheat of imported from</u> Argentina, US (Hard Red Winter Wheat) and Germany (Type A or B).

The Technical Committee of the Winter Cereal Trust was requested by SAFEX during 2005 to determine a workable specification to ensure that the milling characteristics of wheat deliverable onto the exchange can be measured and therefore ensuring standardization of the futures contract. A notice was circulated during October 2005 by SAFEX to their members who indicated that the Trust had not found a better method of standardizing the wheat contract other than making use of the proposed origin discount of R100. The actual origin discount value would be finalized at the start of each marketing season by SAFEX after considering industry feedback.

The proportion of physical deliveries on wheat shows the same declining pattern as for maize (as is expected in a more maturing market). Deliveries decreased from 100% of total contracts in December 1997 to 1.8% in December 2004.

The question is often asked whether SAFEX price levels are a true reflection of the domestic wheat market. Figures 6, 7 and 8 indicate the function of the SAFEX wheat price formation mechanism.



Figure 6: USA actual import parity prices versus the SAFEX wheat price *Source: SAFEX, 2007*

Import parity prices and the wheat spot price increased with 114% since November 2005 to January 2007. Figure 6 shows that the SAFEX wheat price traded at a slight discount to the import parity price of US HRW delivered in Randfontein, except between October and November 2003 (indicated by box 6) and again between July 2007 and September 2007 (as showed in box 7) when the wheat spot price traded above import parity levels. Possible reasons for the higher spot prices (above import parity levels) during July and August 2007 were the relative scarcity of wheat available for imports, widespread droughts in the wheat producing areas in South Africa

and extremely low international stock levels (the lowest stock levels experienced in 30 years). Coupled with that, CBOT recorded record prices on wheat, reaching \$7.54 a bushel and the International Grains Council was predicted a seven million ton shortfall in wheat supply to meet demand in 2007/07.

Many local producers downscaled or discontinued their wheat production. In 2001/02 local producers planted 973 500 ha of wheat while only 632 000 ha were planted the past season, which represents a decline of 35%. Decreases in the local harvest from 2.45 million tons to 1.77 million tons followed. As a result – and in order to meet the local demand – imports increased from about 500 000 tons to 1.3 million tons.

Figure 7 shows that the SAFEX wheat price traded at a premium over the import parity price of Argentinean wheat (both delivered in Randfontein or in Durban harbour) from October 2003 to October 2006 and again between June 2007 and August 2007. This was due to the discounts applicable to wheat imported from Argentina. SAFEX tend to trade below import parity levels during harvest time. Local supply ease the demand for imports and that can cause the market to trade just below import parity levels.



Figure 7: Argentinean actual import parity prices versus the SAFEX wheat price *Source: SAFEX, 2008 and Grain SA, 2008*

If the import parity prices over the period July 2004 to January 2008 are weighted according to the amount of imports, then the weighted import parity price is close to equal to the SAFEX price (Figure 8). There are several instances where the SAFEX near contract price traded lower than the Randfontein import parity price (see for instance the period July to September 2005, November 2005, June 2006, November 2006 and then from September 2007). All these point coincide with a period where more wheat was imported from the US.



Figure 8: Weighted import parity prices (US and Argentinean wheat) versus the SAFEX wheat price between July 2004 and January 2008

There were four instances over this period where the SAFEX near price contract traded also below the Durban import parity price level. This occurred during November 2005, June 2006, October 2006 and November 2007. In all these instances, except November 2007, the majority of wheat imports also occurred from the US. Wheat buyers will consider importing wheat when they are worried that they would not be able to obtain local stock with the right grading and baking qualities. Some buyers with limited storage capacity will start importing earlier than others with adequate storage capacity. Although the wheat price might seem to trade below import parity, it is not the case if the coastal import parity price levels are taken into consideration. The wheat price followed a predictable level for most of the months and one can therefore assume that taking into account that South Africa is a net importing nation of wheat, these results prove that the SAFEX wheat price is a true reflection of the combination of wheat ("grist") available on the domestic market.

A further important point to keep in mind is that importation of agricultural commodities from foreign locations falls under the function of the Department of Agriculture. The APD provides a pricing mechanism for the market where the traded price is agreed by a willing buyer and a willing seller using the APD. The buyer of the futures contract at that point has no idea if the seller is offering local or foreign wheat, but the buyer accepts that the wheat will meet the standards as defined by the APD contract specifications, which are based on the National Department of Agricultural standards. Trading on the futures market is based on pre-trade anonymity and thus the price determined on the exchange is not linked to the particular parties, but is based solely on the conformance to the contract specifications.

According to the GM of the agricultural products division of the JSE Ltd the main reason for SAFEX to allow foreign delivery of wheat on the market is to prevent the cornering of the wheat market. To corner the market is to purchase enough of a particular commodity to allow the price

to be manipulated. The cornerer hopes to gain control of enough of the supply of the commodity to be able to set the price for it. An example of cornering the market is the Hunt brothers who attempted to corner the silver market in the late 1970's early 1980's. In the early 1970's the family decided to buy silver as a hedge against inflation. In the fall of 1979, the Hunt Brothers, along with some wealthy Arabs, formed a silver buying pool and bought up 200 million ouncesthe equivalent of half the world's deliverable supply. They took delivery of the silver on their derivatives position and the short position holder was forced to buy the silver from them. The price of silver had moved from \$2 per ounce in 1973 to \$5 per ounce in early 1979 and then rocketed as high as \$54 in early 1980. By allowing foreign wheat to be delivered on the market, SAFEX enlarges the possible pool of wheat and as such prevents that the local wheat market can be cornered.

Any imported wheat can be represented by a futures position and is treated no different at the time of hedging since the contract is standardized. Only once the futures contract goes into physical delivery are there specific requirements for foreign wheat. Should foreign wheat from agreed upon origins be delivered, as cash discount from the specific foreign origin (if applicable) is deducted from the ultimate settlement value that the buyer will have to pay to the seller. This is to compensate for the intrinsic baking quality differences.

It was agreed by the advisory committee for the marketing season 1 October 2008 to 30 September 2009 to have two categories of origin discounts. The defined origins were agreed at zero origin discount since the milling and baking characteristics of the origins defined were very close or even better than SA quality wheat whilst Argentina, and German Type A or B wheat was not a close fit and therefore a discount of R100 would apply to reflect these baking quality differences.

The NAMC is however concerned about the unscientific way the discount amount of R100 was determined. In order to ensure future transparency in the market the criteria on which this amount is based should be substantiated. The NAMC therefore recommends that a study is undertaken to determine a sound and scientific basis on which such a discount is based and adjusted from time to time.

The wheat price follows similar trends than the Rand Dollar exchange rate, but the exchange rate is not the only factor impacting on the wheat price (see Figure 9). Local and international supply and demand and the price of wheat on major international exchanges (CBOT, Kansas, Argentina, France) and export policies from wheat exporting countries also influence the local price of wheat.



Figure 9: Recent trends in wheat spot prices and the exchange rate *Source: SAFEX*, 2008

If the Rand appreciates, the wheat price trades lower (as was the case during 2002/03). The wheat price increased since 2006 even in cases when the Rand appreciated against the Dollar. This is due to the fact that the international wheat prices trades higher because of very low world ending stock levels and indications that world yields are lower.

The argument thus far has been based on a comparison of the international price with the SAFEX price. However, the latter is a price based on a promise of future delivery. Hence, the next logical issue is to determine the extent to which the SAFEX price is an indication of the actual market price or spot price for a particular commodity. The above section confirmed that the working of SAFEX as a price forming mechanism is correct and that price changes can be explained by changes in supply and demand and exchange rates. It also looked at the necessity of grain deliveries from foreign origin on SAFEX contracts. This section proves that the concerns voiced in questions 1, 2.1 and 2.7 are not necessary and that fundamental factors are factored into the price traded on SAFEX. It is important to note that the primary objective of a derivative market is **price** risk management and not **physical** delivery. In fact, in line with commodity derivative markets around the world, less than 5% of the contracts traded on SAFEX are settled by way of physical delivery. One can therefore assume that delivery of commodities of foreign origin onto the market cannot influence the price negatively and prevent that a market can be cornered. The delivery mechanism is in place to ensure that the closing prices of a futures contract <u>on expiry</u> correctly reflects the actual underlying value of the physical product on that expiry day.

The discussion so far suggests strong arguments and evidence for showing that there is a close

correlation between farm gate prices and the R/\$ exchange rate in the case of every commodity analyzed and traded on SAFEX. Based on various econometric analyses, Vink and Kirsten (2002) concluded in their report to the National Treasury that the domestic price of maize reacted in a predictable fashion to the change in the exchange rate and the international price of maize, also to market perceptions of the relative scarcity of maize in Southern Africa and to the food crisis in Zimbabwe at the end of 2001. According to their findings, there was no evidence of price manipulation or of unfair price policies in determining the price of the basic commodity. A study conducted by *Meyer et al* during 2006 confirms the study of Vink and Kirsten.

4.3 Futures prices and spot prices

At any given point in time there will be more than one contract listed on SAFEX for the same commodity. The only difference between the various contracts is the date of expiry. For example, an April 2008 contract expires on 18 April 2008 and a March 2008 contract expires on 18 March 2008. The contracts will trade at different price levels with the contract with the latest expiry date trading at the highest price. It must be noted that this applies only to the current crops. With the new season commencing, contract prices for the new season crop might differ completely.

The difference in the price levels should theoretically equate to all costs (storing and financing costs) from one period to the next. For example, the September 2007 contract will trade at R1900/ton and the December 2007 at R1960/ton, the difference being R60 per ton. The amount of R60/ton will roughly be equal to the costs involved in storing maize from September to December 2007. This calculation is not true when one moves from one crop-year to the next. The March price is normally higher than the July maize price, because of the relative scarcity of the commodity during March and the expected abundant supply in July. The cost of carry principle should theoretically therefore hold for the same crop-year months.

One of the contracts being traded on SAFEX will always have an expiry date equal to the current month. For example, if the present month is September 2006 there will be a contract with an expiry date of 20 September 2006. This continued existence of a contract about to expire creates the constant delivery month contract. In other words, there will always be a contract that is ready for delivery, which implies that a producer can always find a contract on SAFEX against which he can deliver immediately. If producers happen to have maize ready for delivery in September 2007 they can take a September 2007 contract position on SAFEX, and delivery can proceed within a matter of days. For all practical purposes, the price of the deliverable contract (or delivery month contract) thus represents the current market price or spot price for SAFEX.

Contrary to the past days of the Marketing Boards, there is no longer any pan-seasonal or panterritorial pricing⁵, or one single spot (producer) price for the country as a whole. There are as many different spot prices as there are points of delivery.

In order to standardize the "place" from where the contract is priced or traded there are basically two internationally accepted methods. Either all products traded on the exchange is traded at par, that is, all delivery points are treated as equal or a system of transport or location differentials is applied to the different delivery points based off a central point. SAFEX operates on the basis of

⁵ The Maize and Wheat Boards set a buying price for the product regardless of when or where it was delivered. The result was that the transport cost of farmers further away from the market was subsidized by those closer to the market, while no producer had an incentive to store the product. This had an enormous impact on liquidity management by the monetary authorities when the entire crop was purchased within a couple of weeks every year.

location differentials off a predetermined point namely Randfontein. Since all SAFEX prices are Randfontein-based (except soybeans), this means that if a producer can deliver or a miller can accept delivery at Randfontein, they will receive or pay the SAFEX price for the delivery month contract (the spot price). Since delivery usually takes place at points across the various producing regions, spot prices are largely based on a SAFEX adjusted price. For example, if the transport costs between Randfontein and the silo where a producer chooses to deliver is R80/ton, the delivery price for the producer will be equal to the Randfontein price (the delivery month contract price) minus the R80/ton transport cost. The buyer will now collect the maize from the relevant silo at the SAFEX price minus the R80/ton. These transport cost differentials are calculated every year and are available from SAFEX. **SAFEX determine the area differentials based on a weighted average transport cost by road and rail.** The areas that make more use of road transport will have a larger road transport cost proportion in the calculation.

SAFEX received a formal request from Grain South Africa, on behalf of its members, to remove the use of location differentials in exchange trading during July 2006. This would mean no longer trading Randfontein as par on the exchange, but that all registered delivery points would represent the exchange par price. The agricultural advisory committee of SAFEX has requested feedback from all active members and their clients on the above request to remove location differentials for the white and yellow maize, wheat and sunflower seed contracts.

The overwhelming response from the market, as provided by the trading members and organizations represented on the Advisory Committee, after consultation with market participants and clients, was to maintain the status quo and the system of location differentials. Major factors listed in motivating the retention of the system included:

- no fundamental reason to change an efficient and successful system that was operating well that could create more uncertainty as to the real and true value of the underlying commodity
- the system provided a valuable degree of transparency to the market that if done away with would lead to a reduction of liquidity in the market place
- the system assists the process of "basis trading" and facilitates both forward contracting and financing arrangements in the market.

The JSE Agricultural Products Advisory Committee agreed on 28 September 2006 that, in the light of the response obtained from the market survey, the system of location differential would be maintained at this stage.

The basis (transport differential cost and handling fees) is an indication of spot price levels at the various registered SAFEX silos. The farmer can use it in his attempts to sell his maize. He is not forced to sell his maize for a price under SAFEX less basis. If he cannot find a buyer willing to buy at that price levels, he can deliver his maize to the registered SAFEX silo, obtain a silo certificate and present it to SAFEX for payment. As a result, it could be argued that the removal of transport differentials will not necessarily count in the favour of farmers. Furthermore, the answer lies in basis trading. The problem with basis trading is farmer's access to this level of information. This very important function can be fulfilled by the local co-ops or local maize buyers. SAFEX provide farmers an opportunity to hedge their crop and at the same time to use the opportunity to bargain for a guaranteed minimum price in the local market.

Many Western Cape wheat farmers believe the location differential has disadvantaged them; again it is important to understand the purpose of the differential. The differentials are fixed for each marketing season in order to facilitate trading on the futures contract, but supply and demand at each and every silo in South Africa changes if not daily, then certainly on a weekly

basis. Producers are encouraged to familiarize themselves with the supply and demand situation in their own production area to realize additional premiums for their product. These premiums are not standardized and are negotiated between the seller and buyer on each transaction. Due to the distance of the 'Cape' silos to Randfontein, it was agreed that all the registered Cape silos would be subject to the same location differential. This principle was investigated during 2007 and market feedback preferred to leave the process unchanged as it was indicated the basis trading in the market was better served with a single differential for all the Cape silos. The location differential or the 2008/09 marketing season will be R420/t for all registered Cape wheat silos.

The differentials are simply used to standardize the pricing of a futures contract back to one reference point. In cases where local demand exceeds local supply, whether due to a crop shortfall or a nearby processing plant, the difference between the basis and the SAFEX price may be less than the transport margin or even exceed the futures market price. For example, local maize demand may be bolstered by the existence of an ethanol plant or a major livestock feeding operation. If local supply exceeds local demand, the basis gives farmers a clear indication of what a representative spot price of the selected commodity, at a specific location, should be.

In the situation where no location differentials are applied and the exchange trades at a par price, in other words all delivery points are at the same price, the seller of futures contracts, should he/she <u>decides</u> to make delivery, will only be responsible for loading/storage cost (and not also transport cost). In such a case, the buyer of the futures contract has no idea where delivery would take place and thus would factor in possible transport costs into the price traded on SAFEX. According to the GM of SAFEX (Mr Rod Gravelet-Blondin), the general experience on international markets is that such a discount would represent 75% of the anticipated delivery cost of the delivery point that is furthest from the market. In other words, SAFEX prices would be much lower than levels with location differentials.

It should further be noted that the seller obviously can decide on whether to deliver through the exchange in both delivery methodologies employed, either a specified standardized point with location differentials or a par pricing model with no location differentials. In the case of location differentials as employed by JSE/SAFEX at present, the farmer has a reference point of what transport will cost and therefore can more clearly determine whether to sell the product in the physical market or deliver through the exchange. In the case where no differentials are applied, the farmer is pretty much on his own when evaluating the physical price offered as against the exchange price.

The JSE further offered the Cape wheat farmers an alternative reference point, but the contract was cancelled due to low liquidity. The JSE further gave the market the opportunity to change the current standardized point with location differentials to a par pricing model system which the market rejected. Referring to question 2.4, it is therefore the conclusion of this report that in theory area differentials should not influence prices negatively and that there should exist many other alternatives to farmers to market their product (in possible other geographical areas) to obtain a better price.

Obviously, the argument about the number of buyers in a particular region – thus the competitive nature of the market has to be considered. When there are no alternative buyers in a region it is rather difficult for farmers to bargain and negotiate price with different buyers and as a result farmers have little choice but to accept the price being offered (SAFEX minus location differential). The situation in the Western Cape specifically is further complicated by the fact that the major farmer cooperatives/agribusiness are shareholders in milling companies buying the

major share of the Western Cape wheat crop.

In addition to the above, cognisance should also be taken that claims have emerged to suggest that the Chicago Mercantile Exchange (CBOT) should consider the introduction of more location differential points and a better method of determining the differentials.

During 2008 it became clear that more inclusive dialogue is required to address the discomfort and emotion around the transport differential. As an interim the NAMC also recommended:

- i) that the transport differential is maintained for the interim
- ii) that an investigation is launched into how it is determined and whether it actually serves its purpose
- iii) that the state of competition of the wheat market in the Western Cape is investigated by the Competition Commission

In terms of recommendation ii) above the NAMC recommended reference group meetings with grain traders, millers, producers, the JSE and agribusinesses. The goal of the reference group meetings was to get inclusive input, provide a platform for discussions and lastly to establish some form of a decision on the future of the transport differential. In addition, Prof Matthew Roberts, Associate Professor in the Department of Agricultural, Environmental, and Development Economics at The Ohio State University, USA, was contracted to compile an independent opinion about the working of the transport differential in South Africa. He attended all reference group meetings with stakeholders. A final reference group meeting was held in February 2009 where all stakeholders that were interviewed were present. At this meeting Prof Roberts discussed his recommendations with stakeholders. In March 2009, Dr Geyser presented the findings of this report at the Annual Grain SA Congress, with specific emphasis on the issue of transport differentials. The recommendations of Prof Robert's report on the working of transport differentials in the South African grain market were also presented at the Annual Grain SA Congress. Congress then decided to accept the findings on the transport differential and agreed to remove the issue of the transport differential from their agenda. The full report of Prof. Roberts is reflected in Annexure B and a summary of his findings and recommendations are given below:

"Conclusions:

It is the opinion of this report that elimination of the location differential system will, at best, provide very few benefits to farmers, silos, or millers in South Africa, and may in fact cause significant harm to farmers, especially those in low differential areas, by reducing their ability to obtain input financing. Therefore, the current location differential system should be maintained for wheat and maize, and if the JSE believes it necessary, introduced for soya.

The opposition to the location differential system is based upon either a faulty understanding of the economics of commodity markets, or an unnecessary intermixing of the location differential system with the very real issues presented by the lack of transparency and market power in the South African cash grain market. When these issues are separated, the decision becomes quite clear. The elimination of location differentials will not improve either transparency or market power, and therefore, will not increase the efficiency of the cash grains market.

This report also recommends against more frequent updating of the location differentials. While years such as 2008 and 2009 present challenging environments in which to estimate the differentials, and the change in oil, and transport prices means that differentials may frequently become out of date, to change the differentials on a quarterly or semi-annual basis would be to change the value of a futures contract after that contract has begun trading. This would reduce the

value of the futures for risk management, and should not be done. If the differentials are markedly different than the actual cash market transportation cost, then the market will adjust as different delivery points become the worst case scenario based upon the location differentials.

Recommendations:

Based upon the study of the South African market and the SAFEX futures contract, a number of possible recommendations were considered. After much consideration and discussion, the following recommendations to the South African grain industry are made. One recommendation that is not made deserves special mention. The reintroduction of the Cape Wheat futures contract was specifically discussed and considered, however, after evaluation of the amount of wheat produced in South Africa compared to the Western Cape, and examination of other markets, it is not clear that such a futures contract could offer enough benefits to the market to justify splitting the liquidity of the current SAFEX futures contract. Therefore, this final report does not recommend reintroduction of a Cape Wheat contract.

Retain the differential system as it is currently designed and constructed.

The current SAFEX location differential system provides benefits to the operation of the futures and cash market, and should be maintained. Location differentials are, in any event, relatively common in other commodity futures exchanges, for reasons of maximizing the potential for physical delivery. One very instructive exercise is to compare location differentials to quality differentials; in economic terms, there is no distinction between them, they are simply systems in place to increase the applicability of the futures contracts to grain of different values.

Other Recommendations

These are recommendations that do not directly bear on the topic at hand, location differentials, but would likely improve the functioning of the South African grain market.

Reiteration of NAMC 2008 Recommendations

Certain of the recommendations of the 2008 NAMC report also bear directly on the topics of transparency and market power, and therefore are highlighted here for additional emphasis. These changes would be, or facilitate, improvements in the operation of the South African grain industry:

- To look at ways in which information and access to information in the market are improved.
- The introduction of a commitment of traders report by the JSE.

SAFEX explore the introduction of an electronic exchange for silo certificates

The lack of transparency and competition for cash grain are the major flaws in the South African market. The existing infrastructure means that competition will likely remain somewhat limited, but an electronic market, especially one backed with by the clearinghouse of the JSE, could help to improve transparency in the South African grains market.

Market Transparency must be increased

The lack of clear cash market signals distort the price incentives offered to those in the grain industry. In order to clarify those signals and provide farmers the opportunity to sell their grain in a competitive market, there must first be more transparent pricing. There are a number of ways in which this transparency could occur. The electronic exchange proposed above would provide a great deal of transparency if sufficient transactions pass through it. Other avenues to consider are legislative, in Canada, as a condition of becoming a licensed merchandiser, all silos must post daily prices. In the US market, the Department of Agriculture, through its Agricultural Marketing Service, has weekly price reports for numerous locations for grains, oilseeds, and livestock. The mandatory livestock price reports were enacted precisely to increase transparency in the US

livestock markets. Increased transparency would not guarantee the formation of a competitive cash grains market, but it would at least make data available that could be used to evaluate the extent and effect of market power in the cash markets, as well as finally answer whether premiums were already being paid in the SA cash grain market, and with what frequency."

5. OTHER NEW OR PREVAILING ISSUES

The rest of the report aims to answer the outstanding concerns regarding price volatility and the effect of external factors, such as the publication of producer's intention to plant on price.

5.1 Potential problems regarding price formation on SAFEX

Interpreting the evidence and comments from the various market participants it seems that the SAFEX price formation system could, in the abstract, combine the following problems:

Hypothesis: The SAFEX market potentially exaggerates price fluctuations (prices could potentially overshoot)

- In an environment where a credible and <u>reliable public information service on the</u> <u>weather as well as maize supply and demand do not exist</u>, it is possible that market participants can:
 - \circ exaggerate prices in a certain direction by releasing biased or misleading information;
 - $\circ\,$ exaggerate prices in a particular direction by ignoring or underemphasizing information.
- Regardless of whether there is a credible and reliable public information service on agricultural commodity supply and demand and on the weather, there may <u>still exist</u> <u>serious information asymmetries</u> between large market participants involved in input supply (seeds, chemicals and loans)/grain trading (import/export orders) and others who are not in a position to collect detailed information from their grain and/or oilseed producing clients or who influence their hedging behaviour through loan repayment conditions.
- In an environment where there are limited restrictions on the size of trading positions, it may be possible for larger market participants to 'corner' the SAFEX market and lead/herd it in a particular direction by making use of access to massive funds (in particular pension funds and overseas hedge funds). Market participants might further influence the market by bidding, or offering, a large number of contracts at a price much higher (or lower) and then by pulling them from the market before a sale can take place. Position limits on SAFEX are discussed in section 6.

Information on fundamental factors is freely available in the market. Some sources might be more credible than others. It is therefore important that the users of this information make sure that the sources that they rely on are credible. The impact that certain reports have on the price are discussed in section 5.2. It is further also important to note that emotion influence price discovery on a daily basis and that emotion can cause a price to react differently from what it is expected to do.

Hypothesis: Exaggerating prices on SAFEX has knock-on effects

SAFEX maize futures and options may contribute to financial and currency market volatility.⁶ The recent limit trading days on CBOT (during January 2008) can be as a result of fund managers closing their commodity positions to obtain the necessary cash flow for margin calls in their financial derivative positions. CBOT fell by \$0.20 per bushel when the financial markets in the US came under pressure during January 2008, just to trade again up by \$0.20 per bushel after the latest crop reports were released and the low stock levels indicated higher prices.

The Agricultural Products Division **does not influence the currency market, but are influenced by it**. SAFEX are used by many participants, not only hedgers, but also speculators and arbitrage traders. It can therefore happen that the market can be influenced by spill-overs from the financial and currency markets.

Hypothesis: Equitable participation on the SAFEX market could be problematic

- It could create entry barriers for small-scale producers or millers of maize, thereby promoting concentration of ownership in the medium to long-term.
- In an environment where activities on the SAFEX market are not properly monitored and some self-regulation is not implemented in addition to the normal surveillance procedures of the JSE not being implemented, problems of fair adjudication could occur when a member of SAFEX lodges a complaint against another member.

The report wishes to highlight that the industry at large are represented at the SAFEX Advisory Committee Meetings. The members include SAFEX, the Grain Silo Industry, the National Chamber of Milling, the Animal Feed Manufacturers Association, the Financial Services Board, SA Cereals and Oilseed Traders Association, traders, clearing members, the NAMC, GrainSA, NAFU, agribusinesses, private producers, the South African Oil Processors Association and representatives of the JSE.

The Surveillance Department of the JSE have the power to set up and maintain systems for-

- monitoring compliance by members with the provisions of the Act, the derivatives rules and directives and any arrangements made with a clearing house for the provision of services and facilities;
- the surveillance of any matter relevant for the purposes of the Act and these derivatives rules; and
- supervising compliance by members with the Financial Intelligence Centre Act, 2001 (Act No. 38 of 2001).

Trades between market participants were queried and were reported to the management of SAFEX. Management reported the matter to the Surveillance Department who investigated the matter and took it to disciplinary. The Disciplinary Tribunal of the JSE is independent of the JSE.

Details regarding the disciplinary hearing and judgement in this matter are given below:

⁶ See Edward Chancellor – '*Mania, panics and crashes*' where the collapse of equity markets in 1987 was linked to futures trading, or Roger Lowenstein – '*When genius fails*' on liquidity gaps or Edwards – *Financial Analysts Journal* for info on futures markets and stock market volatility.

The Disciplinary Tribunal, chaired by the retired Judge President of the Transvaal Provincial Division of the High Court, the Honourable Mr Justice CF Eloff, found as follows:

- The Firm, WJ Morgan (Senior) and WJ Morgan (Junior) were found guilty on the following counts of: contravening Rule 16.10 of the Derivatives Rules of the JSE, by committing an act or engaging in conduct likely to bring the JSE into disrepute, in that they:
- 1.1.1 cheated, defrauded and deceived a client ("the Client");
- 1.1.2 engaged in manipulation or misleading acts or practices regarding the price of an exchange contract or trading in that contract;
- 1.1.3 behaved in a manner prejudicial to the interest of the public, derivatives members and the Client;
- 1.1.4 committed acts which were considered to be dishonest, fraudulent or dishonourable; and
- 1.1.5 were parties to or facilitated or entered into trades which had dishonest or unlawful motives;
- 1.2 contravening Rule 15.30.2 of the Derivatives Rules of the JSE, in that they bought or sold investments for or from their own account to or from the Client;
- 1.3 contravening Rule 15.50.4 of the Derivatives Rules of the JSE, in that they failed to avoid any conflict between their interests and those of the Client;
- 1.4 contravening Rule 15.50.2 of the Derivatives Rules of the JSE, in that they failed to observe high standards of integrity and did not place the interests of the Client above their own; and
- 1.5 contravening Rule 15.50.3 of the Derivatives Rules of the JSE, in that they did not act with due skill, care, diligence and good faith; and The Firm was found guilty of contravening Rule 5.10.3, in that it allowed unauthorised persons to trade on a dealer's password.

In consequence of the above findings, the Disciplinary Tribunal imposed the following penalties:

- * The Firm, WJ Morgan (Senior) and WJ Morgan (Junior) were ordered, jointly and severally, to pay a fine to the JSE in the aggregate amount of R3 000 000;
- * The Firm was ordered to pay a fine of R50 000 to the JSE and its membership of the JSE was terminated;
- * The Firm was directed to terminate the position of WJ Morgan (Senior) as a director and/or employee and/or affiliated officer by virtue of the Tribunal's finding that WJ Morgan (Senior) is not a fit and proper person to hold such a position;
- * The Firm was directed to terminate the position of WJ Morgan (Junior) as a director and/or employee and/or affiliated officer by virtue of the tribunal's finding that WJ Morgan (Junior) is not a fit and proper person to hold such a position;
- * The Firm, WJ Morgan (Senior) and WJ Morgan (Junior) were ordered, jointly and severally, to pay to the JSE the sum of R300 000 in respects of costs.

The Firm, WJ Morgan (Senior) and WJ Morgan (Junior) ("the appellants") lodged an appeal in terms of section 19 of the Act against the conviction and the sanctions imposed on them by the Disciplinary Tribunal. The Chairman of the Appeal Board was the retired Judge President of the

Cape Provincial Division, The Honourable Mr. Justice G. Friedman. The appeal was heard on 7 and 8 September 2004.

The Appeal Board handed down its decision on 4 October 2004 and ordered as follows:

- 1. The appeal is dismissed and all the orders made by the Tribunal are confirmed.
- 2. The Appellants are ordered to pay, jointly and severally, the one paying the others to be absolved, the total sum of R 175 000 to the JSE in respect of costs.

The necessary monitoring and controlling bodies are in place. It is difficult to provide a formal mechanism where formal procedures and <u>feedback</u> mechanisms are available, since legal actions can happen on unfounded allegations. Any market participant is not guilty until proven guilty.

Hypothesis: Perceptions that SAFEX prices are not an accurate reflection of average grain prices

SAFEX prices may give a misleading picture of actual average maize grain prices because of the existence of forward contracts entered into between larger farmers and millers. This is substantiated by millers' comments that their raw material prices could be substantially below the SAFEX maize spot price (depending on where the miller is situated).

It must be noted that emotions drive the market. Emotions and the herding effect can cause prices to overshoot. Option writers aim to maintain a delta neutral option book. This is done by buying or selling futures contracts on the options that they wrote. Option writers are therefore less interested in price direction, since their focus is to maintain a delta neutral position. To ensure a delta neutral position, the option writer must buy/sell futures contracts on a daily basis, irrespective of his opinion of the market. This can result in prices to trade even higher/lower, away from fundamental indicators in the short run.

5.2 Perceived high volatility of SAFEX prices

Many feel that SAFEX maize futures prices are too volatile, pushing up option premium prices and as a result limit the use of derivatives to hedge against price risk.

Price variability is an important component of the grain farmers' planning because of its impact on farm profitability. Knowledge about price volatility and the factors affecting it will benefit derivative instrument users and will aid in price risk management. South Africa shows high levels of both implied option volatility and price volatility. Meyer *et al* (2006) state that the equilibrium price in the smaller market can be estimated as a function of the equilibrium price in the dominant market, the exchange rate and the transaction costs. Thus when trade occurs between markets, the difference in price is equal to the transaction costs. Meyer *et al* (2006) divide trade into three market regimes: near-autarky, import parity, and export parity. Within these regimes Meyer tested the effect of a 10% increase in the world price on the South African producer price of yellow maize. The results reported indicate a 3.4% increase in producer price in the case of a near-autarky regime and an 11.2% increase in the case of an import parity regime. The average percentage change between these two regimes is 7.3% indicating a strong link between the world price and the domestic producer price.

In light of the above, one therefore expects the SAFEX price to follow similar volatility patterns as CBOT and the exchange rate. Geyser and Cutts conducted a study in 2007 into <u>price volatility</u>

of SAFEX. Figure 10 shows the 10 day annualised volatilities of the CBOT price in Rand terms and the SAFEX yellow maize price since 2001. The Chicago Board of Trade states that volatility is a measurement of the change in price over a given period of time. It is often expressed as a percentage and computed as the annualized standard deviation of the percentage change in daily price. (CBOT 2006)



Figure 10: 10 Day Annualized Price volatility of CBOT maize price in Rand Terms and the SAFEX yellow maize price

From the above figure, it is clear that the SAFEX yellow maize spot price is generally more volatile than the CBOT price even in Rand terms. For the time period investigated, the SAFEX price was more volatile 61% of the time. It is clear from the above that SAFEX shows consistent higher price volatility than the CBOT market.

When the monthly volatility of the markets is plotted, the similarities and differences are easier to spot, as indicated by Figure 11.



Figure 11: Monthly price volatility on CBOT, SAFEX and exchange rate

CBOT (in Rand terms) and the exchange rate follow more or less the same up and down trends. The same is true for white and yellow maize on SAFEX. CBOT and SAFEX have periods where the same up and down trends occur, but there are also periods when the up and down trends do not correspond. Fundamental factors, supply in particular, influence the price volatility of SAFEX maize prices, as indicated by Figure 12.



Figure 12: Price volatility on SAFEX and ending stock levels

From Figure 12 one can see that price volatility tends to be higher in periods with low stock (SAGIS total) levels and vice versa. The differences in volatility between SAFEX and CBOT still need to be explained.

The price volatility shows strong seasonalities, as shown in Figure 13. At the beginning of the season, when maize is scarce, the domestic market price for maize moves closer to the import parity price. Later in the season, however, when the surplus of maize might be exported the domestic price trends towards the export parity price (as previously highlighted in the report).



Figure 13: Price volatility during marketing season *Source: Geyser & Cutts, 2007*

The price is normally more volatile during the weather months when the crop is most sensitive towards a lack of rain and high temperatures. The figure above shows that both our local market and the CBOT market show higher volatility during the typical weather months. The WMAZ futures price shows strong variability in December to February when there is a great deal of uncertainty surrounding the likely yield outcomes. This high price variability corresponds with the typical "weather market" period when SAFEX is sensitive towards weather due to the possible impact on maize production. YMAZ follows the same pattern, but the period of uncertainty extends into March. This suggests that YMAZ might not pose the same sensitivity towards weather as WMAZ, but rather sensitivity towards world supply, and thus, the exchange rate. CBOT also has a typical "weather market" starting in June continuing until the beginning of August. This can be seen by the higher volatility periods between planting and harvest time for CBOT.

Figure 13 shows that price volatility can be explained based on seasonality and the weather. Although the South African maize prices show higher levels of price volatility than CBOT, is it not unexpected. The South African maize price is also sensitive towards exchange rates; hence the higher levels of price volatility compared to CBOT. A study conducted by Jordaan, Grove, Jooste and Alemu (2007) confirmed that SAFEX prices shows strong seasonality's that can be explained.

Another study conducted by Monk, Grove and Jordaan (2007) aimed to quantify and explain SAFEX July futures price volatilities for white and yellow maize. They also found that volatility has increased for both the white- and yellow maize market in latter years. They found that information plays a major role in price changes on futures contracts. Traders and speculators are very sensitive towards new information releases as has been proven be the significance of the Crop Estimates Committee's reports as well as the Word Agricultural Supply and Demand reports issued by the US Department of Agriculture. Local information as well as international information plays an important role in trader decision making in the South African maize futures market. This effect can be seen with significant volatility changes in the futures market prior to the report dates for the respective local and international reports. This information phenomena can be backed by the fact that expected rainfall is also a significant role player in the market. The study found that white maize is more sensitive towards CEC reports than yellow maize, confirming the fact that South Africa rely more in yellow maize imports, thus being more sensitive towards world conditions and world reports.

This section answered questions 1 and 2.3 and confirms that there does indeed exist high price volatility on SAFEX, but that the volatility can be explained. It further found that both local and international information plays a major role in price changes on futures contracts.

6. DEBATING POSSIBLE RECOMMENDATIONS

The Food Price Monitoring Committee already in 2003 raised the following options for improving the functioning and working of the futures market for grains and debated it with the traders that were interviewed during 2003. The detailed discussion of recommendations following the current concerns clearly reflect some of these initial recommendations

6.1 Improving information and access to information

There are several areas where improvements in information may result in a lower volatility on SAFEX that can benefit short term market participant behaviour. Some information strategies, such as reporting on import and export orders are already being implemented by SAGIS. Others information needs, however, for example, relating to the weather and rainfall patterns are not being addressed.

One way to prevent weather or crop predictions from Grain South Africa or other organisations from unduly influencing prices in the future would be to improve official regular reporting on actual rainfall in the grain producing areas. It is also important to ensure that weather reports specifically tailored to grain and oilseed production are produced independently and are subject to greater scrutiny and technical criticism from a range of independent experts.

Although the FPMC investigation has highlighted some specific market participant behaviour that potentially could have caused SAFEX prices to overshoot, it was not possible and probably never will be possible to link specific price trends to specific actions by individual companies in the market. It is, however, also likely that the initial underestimation of the June 2002 harvest, and the various statements by industry leaders about a negative outlook for the 2002/2003 season created a negative market sentiment. Apart from this, there was much disinformation about the extent of imports, exports and the situation in Zimbabwe and rest of the SADC region. Clearly, the conditions were such that the 'stage' was literally set for somebody to 'orchestrate' the direction of the market and cause what somebody called a 'buffalo run', which caused many emotional trades in the market.

The FPMC was strongly emphasising that the lack of <u>proper market information</u> played a much greater role in creating the situation where manipulation was possible. To allow the proper functioning of this market, this aspect needs to be addressed. The FPMC therefore made specific recommendation to this effect which is something the NAMC would like to emphasise again and recommend certain measures. Such possible measures are discussed below.

6.2 The need for improved reporting requirements

The working of a derivatives market assumes a perfect competitive market implying that all players have the same information and the same ability to trade. A critical aspect here is perfect information and equal access by all participants to the same information. The reality is that the fundamentals and trends related to the fundamentals are generally available. Information that is not available however is:

- Information on trades and deals on the physical deliveries, imports and exports
- Information on positions by market participants on the market
- Speculative limits held by market participants in the market

It is obvious that this is not available in South Africa. To illustrate the shortcomings of the South Africa market we briefly refer to the reporting requirements and position reporting in the USA. An example of the US Commitment of Traders Report is given in Annexure C.

Recommendation: The Financial Services Board (FSB) to consider implementing a "Commitment of Traders" report. Such a report has useful information to participants, since it can indicate the possible direction the market can take.

6.3 Speculative limits hold by market participants in the market

SAFEX developed speculative position limits on commodities traded. The Derivative Directive⁷ indicates the following speculative position limit on white maize:

DERIVATIVES DIRECTIVE - AGRICULTURAL PRODUCTS MARKET SPECULATIVE POSITION LIMITS

Contract	Speculative position limits involving the futures equivalent positions						
	Spot month limit	Single limit	All months combined limit)				
White Maize	300	1500	3000				

AGRICULTURAL PRODUCTS MARKET SPECULATIVE POSITION LIMITS

The CFTC in USA holds the following view⁸:

⁷ http://www.safex.co.za/manuals

"To protect futures markets from excessive speculation that can cause unreasonable or unwarranted price fluctuations, the Commodity Exchange Act (CEA) authorizes the CFTC to impose limits on the size of speculative positions in futures markets. All agricultural and natural resource and many financial futures and option contracts are subject to speculative position limits. For several markets (corn, oats, wheat, soybeans, soybean oil, soybean meal, and cotton), the limits are determined by the CFTC and set out in Federal regulations. For existing markets, reasonable single-month and all-months-combined limits are generally no larger than 10 percent of the open interest up to a level of 25,000 contracts, with a marginal increase of 2.5 percent after that".

Speculative limits in physical-delivery markets are generally set at a lower level during the spot month (the month when the futures contract matures and becomes deliverable). Lower limits in the spot month are important because that is when physical delivery may be required and when the contract may be more vulnerable to price fluctuation caused by abnormally large positions or disorderly trading practices.

The Commission and exchanges grant exemptions to their position limits for bona fide hedging (as defined in Commission Rule 1.3(z)). A hedge is a futures or option transaction or position that normally represents a substitute for transactions to be made or positions to be taken at a later time in a physical marketing channel. Hedges must be economically appropriate to the reduction of risk for a commercial enterprise and must arise from a change in the value of hedger's (current or anticipated) assets or liabilities. Exchanges may also grant exemptions for spreads, straddles, or arbitrage, or other exemptions that are consistent with the purposes of position-limit rules.

Market	Net All Months Combined	Net Single Month (Other Than Spot)	Spot Month
Chicago Board of Trad	le:		
Wheat (plus mini Wheat)	6,500	5,000	220 to 600 based on month and certified stocks (exchange); 600 (CFTC)
Corn (plus mini Corn)	22,000	13,500	600

Guide to Speculative Position Limits

Recommendation: The NAMC should do a study to determine the right speculative limit levels on SAFEX and measures of introducing speculative limits on physical-delivery markets.

6.4 **Price limits and its implications**

SAFEX introduced price limits on all agricultural contracts traded. These price limits were changed on 8 November 2007 and implemented in the market on 30 November 2007. SAFEX agreed in principal that price limits should represent approximately 2.5% of the value of the underlying commodity. The price limit on maize will increase on 26 August 2008 to R50 per ton (with extended limits of R75 per ton). If the maize price is at R600/ton, the price limit represents

⁸ <u>http://www.cftc.gov</u>

an 8.3% change in price, which is rather large if compared to other hard commodities. If the SAFEX price is at R2000/ton, the price limit represents only a 2.5% price change. The price limit on CBOT corn contracts are 30 cents per bushel. It represents a price change of 6% at the current CBOT price of 485c/bushel, which is much more than SAFEX.

SAFEX will increase the wheat price limits on 26 August 2008 from R65/ton to R75/ton per day (extended limits is R110/ton per day). This results in an increase of the initial margin from R7000/contract to R8500/contract on normal trading days and an initial margin of R11500/contract from the first notice day to the last trading day. The initial margin increases to R23000 per contract from the last trading day to the last delivery day.

Sunflower seeds price limits increased from R50/ton to R90/ton per day (extended limits is R135/day). The initial margin increased from R5000/contract to R9500/contract on normal trading days. The initial margin required on extended trading days is R12500/contract. Soya beans price limits increased from R50/ton to R70/ton per day (extended limits is R105/ton per day). The initial margin increased from R2500/contract to R3750/contract on normal trading days and to R5000/contract on extended limit days. The JSE decided to maintain the current price limits and no adjustments will be made on August 26, 2008.

Fewer contracts normally trade during a limits day. Traders sometimes enter into option positions to synthetically limit their losses on the futures positions at volatility levels much higher than the previous day. These higher volatility trade levels results in a dramatic increase in volatility. The consequence thereof is that option writers need to adjust their positions to maintain a delta neutral position. These adjustments can push the market further, even beyond fundamental levels. Large volatility jumps are normally experienced during limit trading days.

The NAMC acknowledges the changes in price limits introduced **Recommendation:** recently, but recommends that the JSE should consider the possibility of a 'moving price limit' based on a percentage price change, or to look at higher price limits per commodity. Price limits on CBOT is \$0.50/bushel for soy beans (which represents 5% of the value of the underlying commodity), wheat price limits is \$0.30/bushel (which represents 3,75%) of the value of the underlying commodity) and corn price limits is \$0.30/bushel (which represents 6% of the value of the underlying commodity). The NAMC further recommends that the JSE should consider introducing 'mini contracts'. The margin requirements of mini contracts are much smaller than the current margin requirements and the lower initial margin and total variation margins can make SAFEX more accessible to small/emerging farmers. Mini contracts will also soften the impact of the increased initial margins on wheat, sunflower seed and soy beans due to the increases in price limits.

6.5 Reports published by CBOT and USDA

The USDA plays a critical role in monitoring and disseminating agricultural market information. Commodity markets rely heavily on USDA reports for guidance on U.S. and international supply and demand conditions.

The USDA releases the following reports:

• Crop Production Reports: Estimates, Forecasts, and Projections, Crop Area, Yield and Production Forecasts, Growing Conditions, and Year-End Estimates

- Market Demand Information
- Domestic Use, including stocks, feed use, seed use and food and industrial demand use
- Export Demand
 - The weekly *Export Sales* report published by USDA's Foreign Agricultural Service (FAS). The *Export Sales* report indicates the amounts of major U.S. agricultural commodities that have been exported, as well as outstanding sales which have been contracted for but not delivered, during the current marketing year compared with the same period from the previous marketing year.
 - The weekly *Grains Inspected for Export* report issued by USDA's Agricultural Marketing Service and based on inspections undertaken by the Federal Grain Inspection Service of USDA's Grain Inspection, Packers, and Stockyards Administration.
 - The Census Bureau (Department of Commerce) which issues a monthly export report that indicates not only grain exports, but also product exports including soybean meal and oil, and wheat flour. This report are released with nearly a twomonth lag
- U.S. Government Program Activity
- Market Price Information
- Ending Stocks as a Summary of Market Conditions

CBOT publishes the following reports on its website:

- Market commentary. These reports even mention the size held by hedge funds and reasons for large movements by them
 - A recap of the previous day's activities
 - A mid-morning report
 - And a pre-opening report
- Ag fundamental reports
 - USDA monthly demand and supply
 - Weekly export sales
 - Various other reports reflecting the world situation

Most of this type of information in South Africa is obtainable from SAGIS. These include:

- Local supply and demand reports.
- Weekly imports/exports. A statutory regulation obligates that all import and export detail are send through. The report is published on a Tuesday and reflects the previous week (to Saturday) imports and exports
- Weekly producer delivery reports
- CEC reports reflecting intentions to plant, hectares planted, anticipated yield and final yield. Normally published every month during the marketing season.
- **Recommendation:** The JSE should consider publishing a market commentary report. This report should include the size of positions held by hedge funds and any large changes in it should be reflected. The NAMC should investigate the feasibility of a statutory measure to force market participants to report any intention of imports or exports 24 hours after the deals were concluded. This investigation should also consider the publication of a weekly basis export demands report especially grains inspected for exports, grain products exported, grains imported from SADC countries and supply and demand of SADC counties.

Appendix A: The working of a 'trading book'

There exists a wide range of marketing options for all the role players in the maize market, which depends on factors such as the time of marketing, the trends in futures prices, the cash flow position, and quite a few others. In this Section, some of these marketing strategies will be illustrated through explaining the basic functioning of a "trading book", which role players have to maintain in the market. A "trading book" contains all the open positions that a role player has in the market. These positions can either turn out in a profit or a loss, depending on the trend in the futures market. It follows that these positions need to be managed with skill and discipline. This discussion of the trading book also shows that it is unlikely that a silo-owner can, or wants, to use his trading book to influence the futures market.

It is assumed that the spot price for white maize on SAFEX (nearby contract) trades at R900/ton, 4 months ahead of the harvest period (see Table 2). Two scenarios are used as an example to depict the possible functioning of the market. For the first scenario, it is assumed that the SAFEX spot price increases by R200/ton, and for the second scenario it is assumed that the SAFEX spot price decreases by R200/ton. The term "spot price" refers to the price of the nearby contract, which is traded on the futures market on the selected trading day.

Four months before the harvest time the silo owner buys maize from the farmer. The contract price, or the farm gate price (realisation price), is R800/ton (R900/ton minus R60/ton transport differential minus R25/ton handling fee and R15/ton commission). The silo-owner immediately hedges his downside price risk by selling a future contract on SAFEX. All major role players have taken a position in the market and, therefore, have "opened their trading book". Now they need to manage their risk on these open positions in their trading book.

Scenario 1: The SAFEX price increases by R200/ton

At the time of delivery/sale to a maize miller or processor, the SAFEX spot price has increased to R1100 per ton. The miller buys at an actual price of R1015 when transport and the handling fee are accounted for. The silo-owner gains R215/ton on the physical trade of maize because he bought it at a lower price (of R800), but loses R200/ton on the futures market by means of buying back the future contract. The net gain of the silo-owner is R15/ton; the initial commission that was charged when the maize was bought from the farmer. The miller's call option is "in the money". He can either exercise or sell this call option. For simplicity's sake, it is assumed that the call option is sold at a profit of R200/ton and he buys the physical maize from the silo-owner at R1100. Hence, the miller loses only the R30/ton premium he initially paid for the call option.

	TRANSACTION	SAFEX Price	Transport Differential	Handling	Commission	Premium	Realisation Price		
1) 4	MONTHS AHEAD OF HARVEST								
	The Farmer								
	Farmer sells physical maize to silo	900	60	25	15		800		
	Farmer buys future contract on SAFEX	900							
	The Silo-owner								
	Silo-owner buys from farmer	900	60	25	15		800		
	Silo-owner sells future contract on SAFEX	900							
	The Miller								
	Miller buys call option on SAFEX	900				30			
2) A	AT HARVEST TIME								
a) S	cenario <u>1</u> : SAFEX price increases by R200/ton								
	Farmer sells future contract on SAFEX	1100							
	Silo-owner sells physical maize to miller	1100	60	25			1015		
	Silo-owner buys back future contract	1100							
	Miller sells call option on SAFEX	1100					1070		
	Profits and Losses								
	Farmer	R200/ton loss on physical maize. R200/ton profit on futures market.							
	Silo-owner	R200/ton prof. on futures mar	it on physica ket.	1 maize +	R15/ton com	mission. R2	00/ton loss		
	Miller	R200/ton loss	on physical	maize. R1'	70/ton profit	on call optio	on.		
b) <u>S</u>	<u>cenario 2</u> : SAFEX price decreases by R200/ton								
	Farmer sells future contract on SAFEX	700							
	Silo-owner sells physical maize to miller	700	60	25			615		
	Silo-owner buys back future contract	700							
	Miller's call option expires	700							
	Profits and Losses								
	Farmer	R200/ton prof	it on physica	l maize. R	200/ton loss	on futures n	narket		
	Silo-owner	R200/ton loss R15/ton comm	on physical n	maize. R2	00/ton profit	on futures n	narket+		
	Miller	R200/ton prof	it on physica	Miller R200/ton profit on physical maize. R30/ton costs of call option					

Table 2: Trading book of various roll players in the maize market

Scenario 2: The SAFEX price decreases by R200/ton

Under this scenario, the silo-owner sells/delivers to the maize miller at a lower price of R700/ton (an actual price of R615/ton when transport and handling fee is accounted for). The loss on the physical trade is R185/ton (R800-R615). Through buying back the futures contract a profit on SAFEX trade of R200/ton is made. The net gain from running the trading book is once again R15/ton.

From this explanation and from the information presented it is evident that it would not be in a silo owner's interest to hold back stock and so influence the market price. From the evidence provided here, it is also unlikely that the silo-owner will actually be able to do that since the grain in the silos belongs to different role players. The above examples assumed that silo owners will enter into SAFEX positions simultaneously with the purchase of the grain from the farmer. This might not always be the case. They are then not hedged against price risk and will profit from

higher maize prices (and loose with lower maize prices). It therefore can be to their interest to withhold maize from the market if fundamental factors show higher price trends.

The Existence and Use of Location Differentials in SAFEX Cash Market Settlement

Final Report to the National Agricultural Marketing Council

> Matthew C. Roberts, Ph.D. 2/23/2009

Dr. Roberts is Associate Professor in the Department of Agricultural, Environmental, and Development Economics at The Ohio State University. Corresponding address: AA103, 2120 Fyffe Road, Columbus, OH, 43210, USA. Email: Roberts.628@osu.edu. http://aede.osu.edu/people/roberts.628. The author would like to thank all of the stakeholder participants in this process for their time, feedback, discussion and insights into the working of the South African grain industry. Any remaining errors, omissions, or imperfections are the sole responsibility of the author.

1 Introduction

In 2008, the National Agricultural Marketing Council (NAMC) released its findings into the operation of the Agricultural Products Division of the Johannesburg Stock Exchange. The 2008 study was prepared at the request of Grain SA. One of the issues that Grain SA requested be examined was the location differential system implemented by the JSE in settling the white and yellow maize and wheat futures contracts. The 2008 report concluded, with regards to the location differential system,

"As an interim the NAMC also recommends:

- i. that the transport differential is maintained for the interim
- that an investigation is launched into how it is determined and whether it actually serves its purpose
- iii. that the state of competition of the wheat market in the Western Cape is investigated by the Competition Commission" (p. 26)

This report was commissioned in February of 2009 to fulfill item (ii), namely that the views of market stakeholders be collected and the advantages and disadvantages of the location differential system be evaluated with the goal of recommending an ultimate decision.

Between 9 February and 12 February, interviews were conducted with representatives of Grain SA, the Chamber of Milling, the JSE, former Agricultural Cooperatives, and grain traders on the subject of location differentials and the grain market in South Africa. On 13 February, the workshop referenced in the 2008 report was held at NAMC, with a broad cross-section of stake holders. During that presentation, observations of the South African grain market's structure and operation were discussed, as well as the assumptions to be used in evaluation of the location differential system. Following the final meeting, a number of participants have offered additional comments, clarifications, and questions via email; these, too, have been used to inform this report.

Whilst the terms of reference of this report are quite narrow, the 2008 report specifies that 'an investigation is launched into how [the transport differential] is determined and whether it actually serves its purpose,' the lack of transparency and the perception of market power in the South African grain market so influenced this study that they cannot go without mention and some discussion.

It is obvious to all that there is limited transparency in the South African cash grain trade. Bids for grain are made on a 'custom' basis by telephone, and are neither released nor reported in any manner. Farmers are left unaware of the prevailing price for their production without the expenditure of considerable effort. This lack of transparency clouds the economic signals that cash grain prices should transmit to farmers, which reduces agricultural efficiency. This lack of transparency prevents perceptions of unfair pricing or non-existent premiums to SAFEX from being dispelled, which may be even more damaging to the health of the grain trade in South Africa. Concentration among grain users and silos is another factor that came up in every discussion, often without prompting. An important dimension to reaching a long-term understanding and solution of the location differential issue is helping all of the stake-holders to understand the difference between location differentials, market transparency, and market concentration, and understanding how these three issues do, and do not, interact. **Much of the antipathy toward the location**

differential system is misguided. Market participants blame the location differential system for preventing transparency and the formation of a more robust cash market. This report will address those criticisms in a later section. The central point to be made regarding the interplay of these three issues is that without transparency, the effects of market concentration are nearly impossible to assess. But for the long-term health of the South African grain industry, the effects of market concentration and the lack of transparency are an order of magnitude greater than any that can reasonably be ascribed to the existence of location differentials.

In summary, this report finds that in grain market whose futures markets are well functioning (as this report believes SAFEX to be) and whose cash markets are highly transparent and competitive, the existence of location differentials is largely irrelevant. Basis levels in the cash market will adjust to their existence or elimination. However, all parties agree that the South African cash grain market is neither highly transparent nor competitive.¹ Under these circumstances, any benefits to the elimination of the differential would be greatly outweighed by the costs. Therefore, *this report unambiguously recommends that SAFEX maintain the current differential system in the maize and wheat futures contracts, and continues to calculate the differential in the current manner*. Additionally, this report recommends:

- That the remaining recommendations of the NAMC(2008) report be carried out.
- That SAFEX explore the creation of an electronic exchange to permit the trading of silo certificates, in the hopes of facilitating a more robust and transparent cash market,
- That the South African industry recognize the benefits to a transparent cash market, and work towards increasing transparency, whether through
 - mandatory weekly cash market reporting, similar to the Agricultural Marketing Service reports of the United States Department of Agriculture,
 - o legislation requiring public bids.

2 Procedure for this report

As recommended in the NAMC 2008 report, input from stakeholders on the topic of location differentials was sought. During the week of 9 February, interviews with major stakeholders in the grains industry were conducted throughout South Africa. Each of the interviews were conducted to gather facts and opinions on the operation of the location differential and the benefits and costs of its elimination. No formal agenda or question list was used. Meetings were held with Brisen Commodities, the Chamber of Milling, Grain SA, the JSE, KAAP AGRI, Sasko, and University of the Free State Agricultural Economics Faculty. On 13 February, a final meeting was held at NAMC in Pretoria to discuss the results of the interviews, the basis for final recommendations, and comments and questions about the writing of this report. All participants were invited to take part in the final meeting, representatives of Brisen Commodities, the Chamber of Milling, Grain SA, the JSE, the Chamber of Milling, Grain SA, the JSE, the Chamber of Milling, Grain SA, the JSE, were also sent further comments and questions via email that were used in the drafting of this final report.

¹ See section 4.3 for a formal definition of 'competitive market.'

3 Structure of South African grain industry

3.1 Silo capacity and placement

The Marketing Act of 1937 put in place the system of marketing boards that ruled South African agriculture until the passage of the Agricultural Marketing of Products Act in 1996. It was during this period that the majority of the modern infrastructure of South Africa's grain industry was built. In a centrally-planned, single-marketer grain industry, infrastructure would naturally be built to maximize efficiency for that system. Silos were sited to minimize the overlap of grain catchments, and cooperatives were geographically organized. Milling capacity was sited and sized to match local demand.

With the repeal of the marketing board system, this existing infrastructure results in a severe dearth of competition in the local cash grain market. Any given farmer might have at most two or three silos nearby, and they are likely all owned by the same cooperative, which is now no longer a cooperative, but a for-profit business. Those silos likely have only one or two major millers nearby to which they can sell grain without incurring large transport costs. The net result is that there is very little competition for grain in the cash market; farmers have only a few options for selling their grain. Further, over time, the capacity of the rail system has decreased, greatly reducing the amount of grain shipped by rail, increasing the amount shipped by truck, and therefore increasing the average cost of grain transport.

4 The SAFEX location differential controversy

4.1 SAFEX location differentials

When the SAFEX introduced the maize and wheat contracts, Randfontein was chosen as the reference delivery point as it contains a concentration of milling capacity as well as very good rail links to the rest of South Africa. The use of a reference location in futures market design is well-accepted and understood. In order to facilitate trade between all market participants, the futures contract must be standardized as to grade, quantity, and location. However, in order to increase the attractiveness of the SAFEX grains futures contracts and to increase the areas that can deliver through the SAFEX contract (the 'grain catchment' of the exchange), any silo in South Africa can become 'listed,' i.e. capable of being used to initiate delivery against a SAFEX contract. SAFEX instituted a location delivery system in the design of the contract. When a holder of a maize or wheat contract declares his intent to deliver against the contract, the amount that the holder receives is adjusted by the location differential. This differential is an estimate of the transportation cost from the delivery silo to Randfontein. Just as the seller receives SAFEX-LD (SAFEX futures price minus the location differential) for delivering his grain, the buyer pays SAFEX-LD.

4.2 The Location Differential Controversy

Since 2002, the existence of the location differential system for SAFEX contracts has been repeatedly discussed in the Agricultural Products Division of the SAFEX. The NAMC 2008 report was itself the result of a request by Grain SA to study the operation of the SAFEX APD, including the location differential. According to a memorandum written to the APD advisory committee by Grain SA for the 21 August 2008 meeting, Grain SA requests the discontinuation of the location differential system for two reasons:

- 1) Maturity of the cash market, trading of the basis and premiums needs to be prioritized.
- 2) Unnecessary intervention in the free market and fair competition.

As pointed out by the Chamber of Milling in the interview for this study, the Agricultural Products Division has considered the matter of the location differential system seven times since May 2003. It is widely acknowledged that much of the controversy stems from farmers in the Western Cape and the North-West that feel disadvantaged by the system. It is unlikely to be a coincidence that these areas have the largest wheat and maize differentials, respectively.

4.3 Differentials, Market Power, and Market Transparency

According to Mankiw, a perfectly competitive market for a good or service has three characteristics: 1) There are many buyers and sellers in the market, 2) the goods or services offered by the sellers are largely the same, and 3) firms can freely enter and exit the market. These three assumptions result in a market in which all buyers and sellers are price-takers, i.e. they cannot influence the price individually, there exists a market price at which each participant chooses whether to buy, sell, or do nothing, but their actions do not affect the market.

A firm has market power when it can directly influence prices or quantities in a market, i.e. it is not a price-taker. This can occur because there is only one seller in a market (monopoly) or if there are only a small number of sellers in a market (oligopoly). Likewise, market power can exist for buyers, a monopsony is a market with only one buyer, and an oligopsony is a market with a small number of buyers. It is critical to understand that market power does not mean collusion. When an oligopoly or oligopsony exists in a market, the very fact that there are so few players means that each player will attempt to anticipate the actions of other players in the market before making their own decisions, as each participants' decisions affects the decision of other participants. In particular, the SA grain milling market is an oligopsony, in which a very small number of firms controls a very large proportion of the milling capacity. Likewise, the silo industry is a oligopoly at the national level, in which a small number of firms controls all of the storage space, and is likely a monopoly in most regions, as all silo space is controlled by one firm in that region. During interviews with the Chamber of Millers and SASKO, when attendees were asked why they do not post grain bids publicly, or post prices that have been paid, they each responded that to do so would reveal their needs and their positions to their competitors, who could use that information against them, by, for example, increasing cash bid prices in their area if they are in need of grain. This very statement speaks to the notion that the cash grain market in South Africa is not perfect—the buyers must be aware of the signals that their actions send to competitors. In a perfectly competitive market, buyers and sellers do not care that their competitors know their needs or actions, because there exist so many buyers and sellers that the needs of any one player don't matter to the market. Please note once again that market power does not mean collusion.

But this market power also contributes to a vicious circle in the South African cash grain market. Namely, the oligopsonistic structure of the market means that buyers do not want to reveal any information to their competitors, such as prices being paid for grain, as those are indications of the firms' relative need for cash grain. But without any information on the cash prices being paid for grain, it is impossible to accurately estimate the impact of either the location differential system, or of the market power itself. In repeated conversations with stake-holders, it is clear that the real concerns actually center around market power. Even the discussions of the location differential system, many saw it as a tool of market power, an excuse for grain buyers to unfairly discount grain. But it must be again reiterated that the location differential system is almost entirely separate from issues of transparency and market power. The only way in which the location differential discussion is related to market transparency is that the lack of transparency makes it much more difficult to evaluate the true effects of location differentials.

5 Economics of Commodity Markets

In order to fully understand the effects of the location differential system, and to draw conclusions about its continued existence, some review of the economics of commodity markets is in order. Besides the definition of a competitive market (above), a clear understanding of five other issues is required: 1) that 'free market' is not the same as 'competitive market', 2) the difference between market price and economic value, 3) the value of location in commodity pricing, 4) the role of futures markets, and 5) that futures prices reflect the worst case delivery scenario. Without a clear understanding of these five concepts, it is impossible to understand the effects of location differentials.

5.1 The difference between a free market and competitive market

The term 'free market' is often used as an ideal, implying markets free of outside, especially government, interference. The implication is that markets that are less distorted will operate more efficiently, and so to reduce or eliminate interference will improve the functioning of markets. This use of free markets demonstrates a fundamental misunderstanding of economics. The reduction of regulation in markets only improves efficiency under very specific circumstances, namely, that the markets are perfectly competitive and that all costs of production (such as pollution, for example) are accounted for. If the markets are imperfect, a reduction in regulation may actually make the markets less efficient, not more. This is clearly seen in regulation of pollution and anti-trust, in which government intervention can actually improve economic functioning.

5.2 Market Price vs. Economic Value

For this report, market price will be used to refer to the price at which transactions in a market actually occur. However, in imperfect markets, the market price may be different than the price that would be transacted in a perfectly competitive market. In economic parlance, that price is typically known as the 'socially optimal equilibrium price.' For this report, the price at which grain would be bought or sold if the market were perfect will be referred to as the economic value of the grain. In a market in which buyers have market power, the market price will be lower than the economic value. Again, note that market power does not mean collusion.

5.3 The value of location in commodity pricing

The picture below was taken from <u>www.dtn.com</u> on 21 February 2009. It is a map of the continental United States with an overlay of cash bids for yellow maize, as collected by DTN. Notice that in the US, the value of yellow maize varies quite a lot. At New Orleans, LA, the current cash bid price is \$4.01/bu (~R1560/t), while in Omaha, NE, the price is \$3.25/bu. (~R1270/t), hence a R390/t difference. The distance between these two cities is 1,312km. Note also that while the US is a large net exporter of maize, and most of that maize is exported through New Orleans, that the pattern of prices do not systematically move lower as one move away from New Orleans. Notably, prices in the Texas Pan Handle and in Ohio are quite high, due to high levels of demand in those areas, though

there is very little maize production in the Pan Handle, but quite a lot in Ohio. This graphic is meant to demonstrate that the value of a commodity is intimately linked to its location. The identical commodity placed in two different locations can have vastly different values. Many economists who study commodity markets treat locations in the exact same manner as quality, or level of processing: a fundamental characteristic of the commodity that can have a significant impact on its price.



In general, commodity prices are highest where the demand is largest and supply is smallest, such as in the Texas Pan Handle, or in New Orleans at the port. Conversely, commodity prices are lowest where the demand is smallest and supply is weakest, such as North Dakota, where current cash bids for yellow maize are \$1.40/bu (R546/t) lower than at New Orleans. In the context of South Africa, wheat produced in the Western Cape is located in an area in which supply substantially exceeds demand, whereas wheat produced in northeastern Free State is in the opposite situation: demand substantially exceeds supply. This results in the economic value of wheat being higher in the Free State compared to the Western Cape, and this has nothing to do with grade or quality, this difference in economic value is simply a reflection of the value of location in commodity pricing.

5.4 The Role of Futures Markets

Futures markets exist to make the cash commodity markets, and the overall economy, operate more efficiently. The two ways in which futures achieve this are price discovery and risk transfer. Price discovery is the process in which the myriad actions of buyers and sellers determine the price for a commodity at which the amount produced equals the amount consumed. Futures markets facilitate this by offering a standardized contract on the commodity to trade. Futures contracts are standardized in quantity, location, grade, and maturity. This standardization, when combined with the existence of a clearinghouse to eliminate counter-party risk, means that parties from around the

world can participate in the futures market for purchase and sale, bringing more liquidity into the market, and allowing more market players to participate in the price discovery process.

Futures markets increase economic efficiency by facilitating the transfer of risk from one party to another. Farmers are the original owners of price risk in agricultural production; they grow the crops that are later marketed. If they want to reduce their risk, or if intermediaries want to reduce their risk, a mechanism must exist for the inexpensive transfer of price risk from those who want to reduce risk to those who are willing to take on more risk for (the possibility of) profit. Because futures markets are leveraged, i.e. buyers and sellers of futures need only a small fraction of the value of the commodity as a performance bond (margin), futures greatly reduce the cost of transferring risk. Further, because the markets are standardized, buyers and sellers know precisely what it is that they are buying or selling.

Both of these roles require convergence—that cash market prices and futures market prices converge to equality as the futures contract expires. Convergence is crucial to the functioning of futures markets, as it demonstrates the link between futures prices and cash market prices. In a physically settled market such as SAFEX, convergence is guaranteed by arbitrage. If, as a futures contract expires, cash market prices are significantly less than the futures price, then traders can purchase cash commodity, sell futures, and deliver the cash commodity against the futures contract, earning a risk-free (arbitrage) profit. This selling of futures and buying of cash will continue until the sales drive the futures prices low enough, and the purchases drive the cash prices high enough, that arbitrage profits are no longer available. Without convergence, there is no guaranteed link between the cash and futures market, and futures lose their usefulness for both price discovery and risk transfer. But to ensure convergence, the exchange and the design of the contract must permit sufficient quantities of commodity to be delivered when necessary, in order that enough arbitrage can occur to force convergence. For SAFEX, and any exchange, part of this design must be to make sure that there are enough delivery points, and enough grain near those delivery points, and that all of those delivery points can be economically engaged in the delivery process, so that sufficient arbitrage can occur to ensure convergence.

5.5 Futures Prices Reflect the Worst Case Delivery Scenario

For a physically delivered futures contract, such as SAFEX maize and wheat contracts, the price of the futures, at expiration, ultimately converges to the 'worst case delivery scenario.' The reasoning behind this is quite clear, for those who have bought a futures contract, the most that they will be willing to pay for that contract is the value to them of the worst case delivery, because they do not know, in advance, from which silo they will have grain assigned to them. For any price above that 'worst case scenario,' the elevator could purchase grain more cheaply directly from the silo itself. If there were but one buyer in a market, the worst case scenario would likely be easy to determine; when there are more than one, then the futures price will converge to the highest-valued worst case scenario of all participants. This is a fundamental point to understand, as it demonstrates that the cash and futures markets do not exist separately.

6 Economics and the SAFEX location differential

Based upon the organization of the South African grains industry and the economics of futures markets introduced in previous sections, some inferences can be drawn about the operation of futures in South Africa.

6.1 SAFEX futures must be physically delivered

Because there is no competitive and transparent cash market from which to draw transactions prices, SAFEX cannot become a cash-settled market in which futures positions that are held to maturity are settled through an exchange of currency. These types of markets need a price against which to settle, which is typically based upon some average commodity price over a prespecified region and time period. But no such average could at present be calculated in South Africa.

6.2 Where is the worst case delivery scenario?

If the location differential system were removed, most market participants agree that for the SAFEX wheat contract, the worst case delivery scenario would be Graafwater—a silo in the far northern Western Cape. While this location might not be worst for every participant, the majority of participants believed that it would generally represent the worst case delivery scenario for the industry as a whole for wheat. For yellow maize, Sannieshof is a likely candidate for the worst case delivery scenario. For the remainder of this report, these two locations will be assumed to be the worst case scenarios—the analysis of the market is not affected if these are not the worst case scenarios, but to simply decide on two will make the explanation clearer. In any event, the important point to understand is that in the absence of location differentials, the SAFEX contract will represent the worst case delivery scenario—for the sake of argument, the SAFEX maize contract will become a Sannieshof contract, and the SAFEX wheat contract will become a Graafwater contract.

With the location differential in place, the worst possible case delivery scenario is no longer clear. No consensus emerged as to what location is currently the worst case delivery scenario. A careful analysis of SAFEX deliveries could shed much light on which location is the worst case scenario for South Africa with the differential system in place, as that location should represent a disproportionate number of deliveries. However, that there is no clear answer indicates that the location differential system 'evens the playing field' as the system of discounts changes the relative value of deliveries at different points. With a R420 discount, Graafwater may no longer be the worst case delivery scenario. With the R240 discount at Sannieshof, it too may no longer be the worst case scenario.

6.3 In Perfectly Competitive Markets, Differentials Would Not Matter

If the SA cash grain market were perfectly competitive, then the level of location differentials would not matter, as the basis levels at each location would adjust to the location differentials (or lack thereof), and cash market price levels would remain unchanged. What would change is the level at which SAFEX trades—as discussed above, SAFEX prices reflect the worst possible delivery scenario. As location differential levels, so will that worst case scenario, so that the price at which SAFEX trades will change. Again, with a perfectly competitive cash market, there would be no net change in the actual level at which cash transactions occur, only a change in the level of SAFEX and the basis levels. In a perfectly competitive market, the removal of the location differential system wouldn't adversely affect the prices received by farmers in Graafwater and Sannieshof, or in any other location in South Africa. The greater the imperfections in the market, the more that farmers in Graafwater and Sannieshof, are helped and the more that farmers in other regions are harmed. If the SAFEX wheat and maize contracts reflect Graafwater and Sannieshof after differentials are removed, then those locations will have futures contracts effectively trading on their local market. This would benefit farmers in those cities as all of the price discovery and risk transfer benefits of futures contracts would be centered on those cities. However, the greater the imperfections in the cash market, the worse off the rest of the country would be, as the relationship between other cash prices and SAFEX prices would decline, reducing the usefulness of SAFEX for hedging for the great majority of farmers in South Africa.

7 Evaluation of Differential System

In this section, the arguments against and in support of the differential system will be individually discussed in light of the structural and economic observations already presented.

7.1 Arguments Against Differential System

7.1.1 Location Differentials Impede Development of a Free Market

This argument asserts that location differentials are an artificial impediment to the South African grain market, especially the cash grain market, and their removal would lead to a more efficient, better cash grain market in South Africa. This argument overlooks the fact that less-regulated markets are not always better markets. There is no argument that the South African grain market is oligopsonistic and lacks transparency, and is therefore definitely not perfect. For this reason, from an economist's point of view, there is no reason to expect that a less-regulated market is better than a more regulated market.

In fact, the Chicago Mercantile Exchange is preparing to introduce a location differential system for the Chicago Wheat contract, beginning with the July 2009 contract. For the past three years, convergence has been very inconsistent in the Chicago wheat futures contract. Three new delivery regions are being added to the contract to increase the amount of wheat that can flow through the exchange delivery system, and increase the amount of arbitrage possible. One of these regions is being added at a premium of \$0.20/bu (R72/t) and another is being added at a \$0.20/bu (R72/t) discount to the CME wheat futures price.

7.1.2 Location differentials Impede the Development of Cash Markets

This argument asserts that as long as the location differential remains in place, the South African cash grain market cannot develop. The differential system provides a crutch that the market can use in place of developing a robust basis-trading system. This argument can be evaluated by examining other markets in South Africa in which there are no differentials to see whether they have more fully functioning cash markets.² The SAFEX soya market has no location differential system, as when it was originated, soya was only grown in a relatively small region in South Africa. As soya growing has

² Note that this is yet another point at which the existence of a transparent cash market would greatly assist the analysis. Without such a market, there is no data premiums offered to sellers in those markets. Instead, only the opinions of market participants can be used.

spread geographically, the economic value of production in different areas should become great enough to see basis premiums arise in the cash market. However, the opinion of all interviewed for this study was that basis premiums were no more prevalent in soya than maize or wheat. Within the Western Cape, the location differentials are all the same, even though wheat in Graafwater clearly has a lower economic value, due to its location, than wheat near Cape Town. Therefore, within the Western Cape, effectively, there is no location differential. Yet once again, market participants do not commonly see basis premiums any more or less frequently than in any other market.

These two counter examples lead me to believe that the real impediment to realizing a competitive and transparent cash market is not the location differential system, though the observations in this section are hardly conclusive in the absence of actual price data.

7.1.3 Tool of market power

The final argument against the location differential system is that location differentials are a tool for the exercise of market power. That silos and mills use the differentials in setting their bids, and due to the oligopsony in the grain market, they do not have to compete for grain. Therefore, if the location differentials were eliminated, this tool for the exercise of market power would disappear, and the cash grain market would become more competitive. This argument overlooks the source of market power in the cash grain market: heavy concentration among buyers. This concentration will not be affected in the least by the elimination of the differentials. If market participants currently have market power in the presence of the differential system such that they can unilaterally dictate prices³ then they would also have such power in the absence of differentials.

7.2 Arguments for Differential System

7.2.1 Adequacy and Continuity

Throughout the meetings with stakeholders, none asserted that the fundamental structure of the futures market was broken, or that SAFEX did a poor job of providing risk management. SAFEX provides a valuable tool to the SA grain industry. However, the constant discussion of elimination of or change to the differential system is a source of uncertainty to the market, which reduces the market's ability to facilitate risk transfer.

7.2.2 Operational financing

The ability to obtain operational financing, i.e. loans for seed, fertilizer, etc., is crucial for all agricultural enterprise, in which most or all of the costs are paid in advance. If the differential system is eliminated, the SAFEX futures price will fall to the new worst case scenario, for example Graafwater wheat and Sannieshof maize. In other words, the SAFEX prices themselves will actually fall by the differential to these two points, R420 for wheat and R106 for Sannieshof. To obtain input financing, lenders demand that farmers have minimum prices guaranteed for at least part of their crop to insure repayment. If SAFEX falls to a lower level, as it will in the absence of the location differential system, then the price level at which farmers can guarantee a market for their production will also fall, which will limit their ability to obtain input financing.

³ Note that the author is not asserting that market power exists to the extent that buyers can unilaterally dictate prices, but many of those opposed to the differential system do assert this.

That lenders demand that farmers have guaranteed minimum levels of price and/or revenue is clear from the input finance markets in the US. In the US, banks will not lend to farmers unless those farmers have purchased crop insurance in amounts large enough to guarantee repayment of the loan. Even though the US has a rich history of local basis patterns, banks will not lend on that basis, only on guarantees of production revenue.

The discussion of this point has elicited some very strong responses, with some market participants very adamant that the reduction in SAFEX prices will have a real and significant impact on the ability of farmers, especially those growing wheat in the Free State, to obtain production financing. Other stake-holders believe that while these effects are real, they will not significantly affect grain production, and should therefore be ignored. Unfortunately, a more precise estimation of these effects is beyond the scope of this study⁴ but this author believe that, especially to wheat producers outside of the Western Cape, they will be quite significant.

7.2.3 Increased Grain Catchment for SAFEX delivery

The discussion of what location is currently the 'worst case delivery scenario' made it clear that, with the location differential in place, there is no obvious answer for maize, and even in wheat, it is not always clear. However, once the location differential is removed, the worst case scenarios become much easier to identify. This indicates that if the location differentials are removed the catchment, or area from which SAFEX physical delivery will draw grain, will become much smaller, centered at these worst case scenarios. This would be a detriment to the entire market, as a reduced grain flow through physical delivery will mean a reduced ability of arbitrage to force convergence, decreasing the ability of SAFEX to efficiently discover prices and transfer risk. Further, a reduced grain catchment makes manipulation of the market easier, as fewer locations will be actively involved in the physical delivery process.

To reiterate, the primary reason that the Chicago Mercantile Exchange is increasing the regions in which silos may list for delivery for the wheat futures contract is to increase the size of the wheat catchment—to increase the amount of wheat that can be drawn through the physical delivery and arbitrage process, thereby improving convergence. In order to increase these regions, location differentials were required to prevent one location from dominating the delivery process, thereby undermining the primary rationale for expanding the delivery eligible areas.

7.2.4 This is the only transparency in the cash market

The current structure of the SAFEX provides the only (though admittedly quite limited) transparency that exists in the South African cash grain market. Assuming that he is located near a listed silo, every farmer in South Africa has the option to sell his grain on SAFEX at the prevailing price minus the location differential. If the differential system is eliminated, SAFEX prices will decline to the 'worst possible delivery scenario' and farmers in low differential (high economic value) areas will lose this option, without any real gain in prices for farmers in the high differential (low economic value) regions. While this level of transparency certainly falls well short of what is desirable, it does provide a 'floor' to the level of transparency in the market, and a guaranteed price for farmers who can deliver to a listed silo.

⁴ A more precise evaluation is again hampered by the lack of a transparent cash market; making it difficult to estimate where the worst case delivery scenario is, as well as what premiums are currently being paid in different areas.

8 Conclusions

It is the opinion of this report that elimination of the location differential system will, at best, provide very few benefits to farmers, silos, or millers in South Africa, and may in fact cause significant harm to farmers, especially those in low differential areas, by reducing their ability to obtain input financing. Therefore, the current location differential system should be maintained for wheat and maize, and if the JSE believes it necessary, introduced for soya.

The opposition to the location differential system is based upon either a faulty understanding of the economics of commodity markets, or an unnecessary intermixing of the location differential system with the very real issues presented by the lack of transparency and market power in the South African cash grain market. When these issues are separated, the decision becomes quite clear. The elimination of location differentials will not improve either transparency or market power, and therefore, will not increase the efficiency of the cash grains market.

This report also recommends against more frequent updating of the location differentials. While years such as 2008 and 2009 present challenging environments in which to estimate the differentials, and the change in oil, and transport prices means that differentials may frequently become out of date, to change the differentials on a quarterly or semi-annual basis would be to change the value of a futures contract after that contract has begun trading. This would reduce the value of the futures for risk management, and should not be done. If the differentials are markedly different than the actual cash market transportation cost, then the market will adjust as different delivery points become the worst case scenario based upon the location differentials.

9 Recommendations

Based upon the study of the South African market and the SAFEX futures contract, a number of possible recommendations were considered. After much consideration and discussion, the following recommendations to the South African grain industry are made. One recommendation that is not made deserves special mention. The reintroduction of the Cape Wheat futures contract was specifically discussed and considered, however, after evaluation of the amount of wheat produced in South Africa compared to the Western Cape, and examination of other markets, it is not clear that such a futures contract could offer enough benefits to the market to justify splitting the liquidity of the current SAFEX futures contract. Therefore, this final report does not recommend reintroduction of a Cape Wheat contract.

9.1 Retain the differential system as it is currently designed and constructed.

The current SAFEX location differential system provides benefits to the operation of the futures and cash market, and should be maintained. Location differentials are, in any event, relatively common in other commodity futures exchanges, for reasons of maximizing the potential for physical delivery. One very instructive exercise is to compare location differentials to quality differentials; in economic terms, there is no distinction between them, they are simply systems in place to increase the applicability of the futures contracts to grain of different values.

9.2 Other Recommendations

These are recommendations that do not directly bear on the topic at hand, location differentials, but would likely improve the functioning of the South African grain market.

9.2.1 Reiteration of NAMC 2008 Recommendations

Certain of the recommendations of the 2008 NAMC report also bear directly on the topics of transparency and market power, and therefore are highlighted here for additional emphasis. These changes would be, or facilitate, improvements in the operation of the South African grain industry:

- To look at ways in which information and access to information in the market are improved.
- The introduction of a commitment of traders report by the JSE.

9.2.2 SAFEX explore the introduction of an electronic exchange for silo certificates

The lack of transparency and competition for cash grain are the major flaws in the South African market. The existing infrastructure means that competition will likely remain somewhat limited, but an electronic market, especially one backed with by the clearinghouse of the JSE, could help to improve transparency in the South African grains market.

9.2.3 Market Transparency Must be Increased

The lack of clear cash market signals distort the price incentives offered to those in the grain industry. In order to clarify those signals and provide farmers the opportunity to sell their grain in a competitive market, there must first be more transparent pricing. There are a number of ways in which this transparency could occur. The electronic exchange proposed above would provide a great deal of transparency if sufficient transactions pass through it. Other avenues to consider are legislative, in Canada, as a condition of becoming a licensed merchandiser, all silos must post daily prices. In the US market, the Department of Agriculture, through its Agricultural Marketing Service, has weekly price reports for numerous locations for grains, oilseeds, and livestock. The mandatory livestock price reports were enacted precisely to increase transparency in the US livestock markets. Increased transparency would not guarantee the formation of a competitive cash grains market, but it would at least make data available that could be used to evaluate the extent and effect of market power in the cash markets, as well as finally answer whether premiums were already being paid in the SA cash grain market, and with what frequency.

References

Mankiw, N. Gregory, "Principles of Microeconomics." Thompson-Southwestern Publishers, 4th ed. 2006.

National Agricultural Marketing Council, "Agricultural Futures Markets as a Price Forming Mechanism for Grains and Oilseeds." August 2008.

Annexure C: The Commitments of Traders Report

The *Commitments of Traders* (COT) reports were developed in 1924. In that year, the U.S. Department of Agriculture's (USDA) Grain Futures Administration published its first comprehensive annual report of hedging and speculation in regulated futures markets. In 1962 they began to publish the COT report monthly. The COT report is now published weekly and more quickly—moving the publication to the 3rd business day after the "as of" date.

The COT reports provide a breakdown of each Tuesday's open interest for markets in which 20 or more traders hold positions equal to or above the reporting levels established by the CFTC. The weekly reports for *Futures-Only Commitments of Traders* and for *Futures-and-Options-Combined Commitments of Traders* are released every Friday at 3:30 p.m. Eastern time.

A page from the December 12, 2006, COT report (short format) showing data for the Chicago Board of Trade's wheat futures contract is depicted below. Explanatory notes follow the table.

WHEAT CHICAGO BOARD OF TRADE										
FUTURES-C	FUTURES-ONLY POSITIONS AS OF 12/12/06									
							NONREPO	ORTABLE		
N	ONCOMMERC	AL	COMM	ERCIAL	TOTA	NL	POSIT	IONS		
LONG	SHORT	SPREADS	LONG	SHORT	LONG	SHORT	LONG	SHORT		
(CONTR/	ACTS OF 5,00	0 BUSHELS)	OPEN IN	NTEREST: 41	17,081					
COMMITMEN	NTS									
73,598	56,045	69,448	237,539	232,901	380,585	358,394	36,496	58,687		
CHANGES F	ROM 05/25/2	004 CHANGE	IN OPEN INT	TEREST: -7,0)43					
-10,463	-1,186	126	3,462	-6,610	-6,875	-7,670	-168	627		
PERCENT O	F OPEN INTE	REST FOR EAC	H CATEGOR	Y OF TRADE	RS					
17.6	13.4	16.7	57.0	55.8	91.2	85.9	8.8	14.1		
NUMBER OF TRADERS IN EACH CATEGORY (TOTAL TRADERS: 317)										
102	102 89 92 67 96 233 226									

Explanatory Notes

<u>Open Interest</u> - Open interest is the total of all futures and/or option contracts entered into and not yet offset by a transaction, by delivery, by exercise, *etc.* For the *COT Futures & Options Combined* report, option open interest and traders' option positions are computed on a futures-equivalent basis using delta factors supplied by the exchanges. Open interest, as reported to the Commission and as used in the COT report, does not include open futures contracts against which notices of deliveries have been stopped by a trader or issued by the clearing organization of an exchange.

<u>Reportable Positions</u> - Clearing members, futures commission merchants, and foreign brokers file daily reports with the CFTC. Those reports show the futures and option positions of traders that hold positions above specific reporting levels set by CFTC regulations.

<u>Commercial and Non-commercial Traders</u> –A trading entity generally gets classified as a "commercial" by filing a statement with the Commission (on CFTC Form 40) that it is commercially "...engaged in business activities hedged by the use of the futures or option markets."