Using SAFEX to Hedge Price Risk of Imports: Operational Issues & Implications for Governments

Case Study: Malawi and Zambia

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Outline

- Concerns of government in a shortage year
- Risks associated with import strategies
- Malawi & Zambia prices vs. SAFEX
- Physical vs. Financial Market
- Hedging with call options – an example
- Operational issues for government

Concerns of government in a shortage year

- Refining estimates & coming to agreement on the size of the food shortage
- Agreeing on the strategy to meet humanitarian & commercial needs
- Minimizing the costs & risks involved with Imports
- Maintaining stable prices at the retail level
  (i.e. for Malawi 25-28 MKwacha/Kg)

The Demand

A better operating mechanism that provides:

"Less expenditure for Treasury,
Less panic because maize will be secured,
Less distortion in the market"

- Songowayo Zyambo
Executive Director
Zambia National Farmer's Union

Risks associated with imports

- High prices (maize price + transport price)
- Importing too much
- Importing too little
- Unclear signals to public
- Unclear signals to private sector
- Performance failure

- Increase in price at the retail level

Could SAFEX price hedging help with these risks?

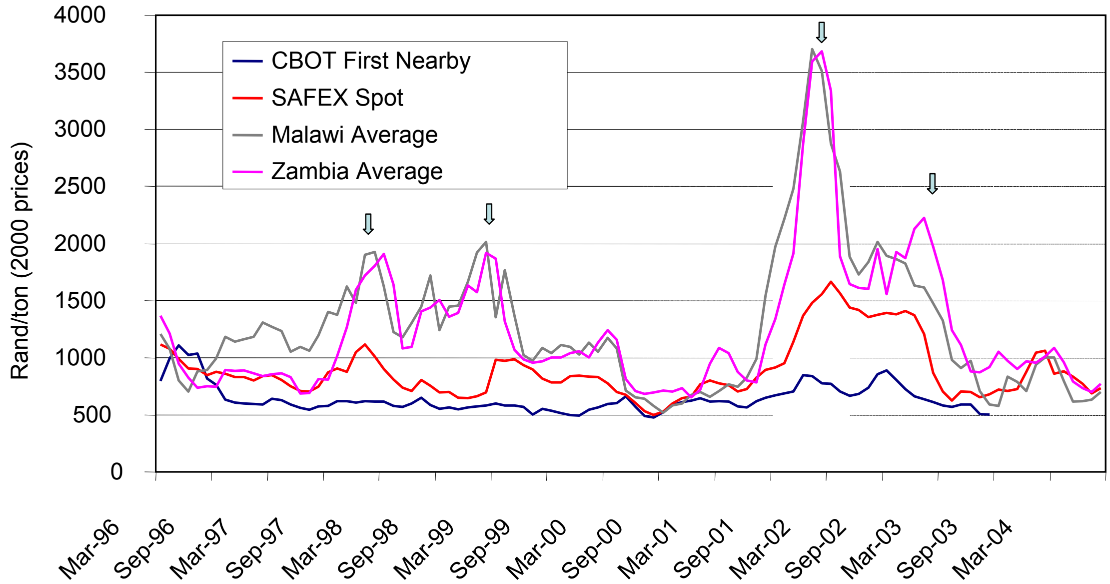
• High prices (maize price + transport price)	√ yes
• Importing too much	√ possibly
• Importing too little	√ possibly
• Unclear signals to public	√ possibly
• Unclear signals to private sector	√ possibly
• Failure to perform / deliver	√ possibly
• Increase in price at the retail level	√ yes

Caveats on SAFEX hedging:

- only makes sense when importing from South Africa
- only has a **direct** impact on minimizing risk of SAFEX price increases
- could have an **indirect** impact on the other risks

if hedging operation is integrated with the physical import strategy

Price Relationships



Volatilities and Correlations

	CBOT	SAFEX	Malawi	Zambia
Volatility	26.1%	32.8%	56.3%	54.5%
CBOT		0.497	0.311	0.306
SAFEX			0.784	0.756
Malawi				0.895
Zambia				

Volatilities of monthly averages of rand spot prices at annual rate.

Correlations of monthly average real rand price levels.

Data are April 1996 to August 2003.

What is a SAFEX hedge?

- A *financial* product designed to transfer price risk
- Two types: exchange-traded futures & options
- Manage risk of SAFEX price movements only
- Purchased & traded through SAFEX clearing and broking members
  - Clearing house guarantees performance of all of its members
- Not designed to be a tool for physical procurement

The Key to Successful Hedging: Thinking in 2 Markets

	Physical Market	Financial Market
Place	Lilongwe, Malawi	Johannesburg, South Africa
Activities	Importing, Commercial Milling, Retail Sales	Pricing, Risk Management
Product	White Maize	White Maize
Delivery Location	Lilongwe	SAFEX approved silos
Terms	FOT	FOT
Currency	Malawi Kwacha	SA Rand
Unit of Measurement	Kgs	MT

Why think in 2 markets?

- SAFEX hedge does not, on its own, solve the problem of needing to have physical maize delivered in Lilongwe

- SAFEX hedge is not effective if not carefully integrated with purchases and physical movement of goods

Example – Option Contract when Prices go Up

Physical Market (Lilongwe)	Financial Market (SAFEX)
1) June 22 Shortage identified	2) June 22 SAFEX Dec price is 640 Rand/MT Purchase Call Option to protect this price level Cost = 60 Rand/MT

SAFEX Price increases to 800 Rand/MT

3) November 24 Import maize basis 800 Rand/MT	4) November 24 Exercise Call Option Gain 200 Rand/MT

Cost of 800 Rand/MT + Cost of 60 Rand / MT + Gain of 200Rand/MT = Total 660 Rand/MT or USD 100/MT

Example – Option Contract when Prices go Down

Physical Market (Lilongwe)	Financial Market (SAFEX)
1) June 22 Shortage identified Decision on imports made	2) June 22 SAFEX Dec price is 640 Rand/MT Purchase Call Option to protect this price level Cost = 60 Rand/MT

SAFEX Price decreases to 400 Rand/MT

3) November 24 Import maize basis 400 Rand/MT	4) November 24 Call Option has no value

Cost of 400 Rand/MT + Cost of 60 Rand / MT = Total 460 Rand/MT or USD 70/MT

Hedging with Options

- Advantages
  - Provides a price “ceiling”- protection against prices going up
  - Provides opportunity to take advantage of prices going down if they do so later in the season
  - Cost is limited and known in advance
  - No initial margin required (as with futures)
- Disadvantages
  - Costs (premiums) will change on a daily basis
  - Range for premiums is within 3-15% of underlying price protected depending on price level, timing, and market volatility

    Example : 60 Rand/MT Premium for Dec Call Option @ 640

  60 Rand/MT / 6.6 USD/Rand x 150,000 MT = USD 1.3 million

Implications of Call Option Used as a Financial Instrument

- What is impact on the physical market (imports)?
  - On traders?
  - On tender process?
  - On timing?
- Who purchases it?
  - Government or private sector?
  - If government, which ministries? What is selection process? What is decision process? Who manages it?
- What type?
  - Exchange traded – backed by clearing house guarantee
  - Over-the-counter – can be customized, not backed by clearing house guarantee
- Since SAFEX price is only 50% of cost, how do you control the remainder – transport?

Landed Lilongwe Price with Transport Costs at $120/MT

SAFEX white maize price in Rand/MT	= SAFEX white maize price in USD/MT	Plus Transport Costs in USD/MT	= Landed Lilongwe price in USD/MT	Landed Lilongwe Price in Kwacha/Kg
573	$87	$120	$207	22.13
600	$91	$120	$211	22.57
625	$95	$120	$215	22.97
650	$98	$120	$218	23.38
675	$102	$120	$222	23.78
700	$106	$120	$226	24.19
725	$110	$120	$230	24.59
750	$114	$120	$234	25.00
850	$129	$120	$249	26.62
950	$144	$120	$264	28.24
1000	$152	$120	$272	29.05

w/ Transport at $150 /MT

SAFEX white maize price in Rand/MT	= SAFEX white maize price in USD/MT	Plus Transport Costs in USD/MT	= Landed Lilongwe price in USD/MT	Landed Lilongwe Price in Kwacha/Kg
573	$87	$150	$237	25.34
600	$91	$150	$241	25.78
625	$95	$150	$245	26.18
650	$98	$150	$248	26.59
675	$102	$150	$252	26.99
700	$106	$150	$256	27.40
725	$110	$150	$260	27.80
750	$114	$150	$264	28.21
850	$129	$150	$279	29.83
950	$144	$150	$294	31.45
1000	$152	$150	$302	32.26

Potential Solution - Tender for a Physical Call Option

Advantages

1. Incorporates SAFEX price protection with transport price protection - both major elements of import cost are protected
2. Involves the local private sector, who will need to be managing physical supplies & logistics anyway
3. Private sector manages the price hedge on SAFEX
4. Is transparent and competitive – option premium prices can be checked against the SAFEX market online
5. Could help manage volume uncertainty – if maize isn't needed later in the season, don't declare the option

Potential Solution- Tender for a Physical Call Option

Advantages (continued)

6. Could help improve tender process - only serious bidders would be able to offer the option
7. Sends signal of demand to South Africa
8. Solves need for government to show a response (market-driven, market-oriented)
9. Potential to restructure financial response of food aid/donors/WFP?

Disadvantages

- Complicated
- Can be costly
- Requires trust & cooperation b/c should be structured jointly (public & private sector)
- Not a panacea