

# Exploring the Logic Behind Southern Africa's Food Crises

---

David Tschirley  
Michigan State University Food Security Group

Presented at University of Pretoria  
16 March 2009

## A Conundrum

---

- ❑ Maintaining affordable food staple prices would seem to be an important political objective
- ❑ Conditions for effective market response to food production shortfalls have improved
- ❑ Trade can and does work to keep prices within IPP/EPP bounds in some countries
- ❑ Yet in two countries of Southern Africa (Malawi and Zambia), government action routinely creates price spikes where none needed to occur

## A Conundrum (2)

---

### □ Questions

- Why does this happen?
- Can policy analysts make any contribution to reducing the frequency and severity with which it occurs?

## Improved Conditions for Trade

---

- Changed policy environment since early 1990s
  - Fewer government subsidies to maize sectors
  - Less government control of domestic trade
    - Small-scale maize milling and informal marketing systems
  - Much more informal border trade
- Many effects flow from this changed environment
  - More diversified production (cassava, groundnuts, sweet potato)
  - More diversified consumption

## Improved Conditions for Trade (2)

### Percentage of Total Food Expenditure Allocated to Food Items in Selected Areas of Mozambique and Zambia

Food Items		Mozambique			Zambia			
		Maputo Province	Gaza and Inhambane Provinces	Manica and Tete Provinces	Lusaka	Kitwe	Kasama	Mansa
<b>Urban</b>	Maize	2.4	14.5	39.9	8.9	10.6	9.8	11.5
	Rice	7.8	9.8	4.4	2.5	2.8	3.4	2.7
	Wheat	15.5	6	2.9	11.8	11.3	6.2	7.3
	Cassava	1.3	5.2	0.5	0.3	0.8	2.0	4.1
<b>Rural</b>	Maize	9.1	12.2	48	---	---	---	---
	Rice	11.4	9.5	2.5	---	---	---	---
	Wheat	7.4	3.2	1.4	---	---	---	---
	Cassava	4.7	8.4	0.5	---	---	---	---

Data Source: Mozambique: IAF 2002, according to their definition of rural and urban; Zambia: 2007 CSO/MSU Urban Consumption Survey, first round, as calculated by authors

## Improved Conditions for Trade (2)

### Percentage of Total Food Expenditure Allocated to Food Items in Selected Areas of Mozambique and Zambia

Food Items		Mozambique			Zambia			
		Maputo Province	Gaza and Inhambane Provinces	Manica and Tete Provinces	Lusaka	Kitwe	Kasama	Mansa
<b>Urban</b>	Maize	2.4	14.5	39.9	8.9	10.6	9.8	11.5
	Rice	7.8	9.8	4.4	2.5	2.8	3.4	2.7
	Wheat	15.5	6	2.9	11.8	11.3	6.2	7.3
	Cassava	1.3	5.2	0.5	0.3	0.8	2.0	4.1
<b>Rural</b>	Maize	9.1	12.2	48	---	---	---	---
	Rice	11.4	9.5	2.5	---	---	---	---
	Wheat	7.4	3.2	1.4	---	---	---	---
	Cassava	4.7	8.4	0.5	---	---	---	---

Data Source: Mozambique: IAF 2002, according to their definition of rural and urban; Zambia: 2007 CSO/MSU Urban Consumption Survey, first round, as calculated by authors

## Improved Conditions for Trade (2)

### Percentage of Total Food Expenditure Allocated to Food Items in Selected Areas of Mozambique and Zambia

Food Items	Mozambique			Zambia				
	Maputo Province	Gaza and Inhambane Provinces	Manica and Tete Provinces	Lusaka	Kitwe	Kasama	Mansa	
<b>Urban</b>	Maize	2.4	14.5	39.9	8.9	10.6	9.8	11.5
	Rice	7.8	9.8	4.4	2.5	2.8	3.4	2.7
	Wheat	15.5	6	2.9	11.8	11.3	6.2	7.3
	Cassava	1.3	5.2	0.5	0.3	0.8	2.0	4.1
<b>Rural</b>	Maize	9.1	12.2	48	---	---	---	---
	Rice	11.4	9.5	2.5	---	---	---	---
	Wheat	7.4	3.2	1.4	---	---	---	---
	Cassava	4.7	8.4	0.5	---	---	---	---

Data Source: Mozambique: IAF 2002, according to their definition of rural and urban; Zambia: 2007 CSO/MSU Urban Consumption Survey, first round, as calculated by authors

## Improved Conditions for Trade (2)

### Percentage of Total Food Expenditure Allocated to Food Items in Selected Areas of Mozambique and Zambia

Food Items	Mozambique			Zambia				
	Maputo Province	Gaza and Inhambane Provinces	Manica and Tete Provinces	Lusaka	Kitwe	Kasama	Mansa	
<b>Urban</b>	Maize	2.4	14.5	39.9	8.9	10.6	9.8	11.5
	Rice	7.8	9.8	4.4	2.5	2.8	3.4	2.7
	Wheat	15.5	6	2.9	11.8	11.3	6.2	7.3
	Cassava	1.3	5.2	0.5	0.3	0.8	2.0	4.1
<b>Rural</b>	Maize	9.1	12.2	48	---	---	---	---
	Rice	11.4	9.5	2.5	---	---	---	---
	Wheat	7.4	3.2	1.4	---	---	---	---
	Cassava	4.7	8.4	0.5	---	---	---	---

Data Source: Mozambique: IAF 2002, according to their definition of rural and urban; Zambia: 2007 CSO/MSU Urban Consumption Survey, first round, as calculated by authors

## Improved Conditions for Trade (2)

### Percentage of Total Food Expenditure Allocated to Food Items in Selected Areas of Mozambique and Zambia

Food Items		Mozambique			Zambia			
		Maputo Province	Gaza and Inhambane Provinces	Manica and Tete Provinces	Lusaka	Kitwe	Kasama	Mansa
<b>Urban</b>	Maize	2.4	14.5	39.9	8.9	10.6	9.8	11.5
	Rice	7.8	9.8	4.4	2.5	2.8	3.4	2.7
	Wheat	15.5	6	2.9	11.8	11.3	6.2	7.3
	Cassava	1.3	5.2	0.5	0.3	0.8	2.0	4.1
<b>Rural</b>	Maize	9.1	12.2	48	---	---	---	---
	Rice	11.4	9.5	2.5	---	---	---	---
	Wheat	7.4	3.2	1.4	---	---	---	---
	Cassava	4.7	8.4	0.5	---	---	---	---

Data Source: Mozambique: IAF 2002, according to their definition of rural and urban; Zambia: 2007 CSO/MSU Urban Consumption Survey, first round, as calculated by authors

## Improved Conditions for Trade (2)

### Percentage of Total Food Expenditure Allocated to Food Items in Selected Areas of Mozambique and Zambia

Food Items		Mozambique			Zambia			
		Maputo Province	Gaza and Inhambane Provinces	Manica and Tete Provinces	Lusaka	Kitwe	Kasama	Mansa
<b>Urban</b>	Maize	2.4	14.5	39.9	8.9	10.6	9.8	11.5
	Rice	7.8	9.8	4.4	2.5	2.8	3.4	2.7
	Wheat	15.5	6	2.9	11.8	11.3	6.2	7.3
	Cassava	1.3	5.2	0.5	0.3	0.8	2.0	4.1
<b>Rural</b>	Maize	9.1	12.2	48	---	---	---	---
	Rice	11.4	9.5	2.5	---	---	---	---
	Wheat	7.4	3.2	1.4	---	---	---	---
	Cassava	4.7	8.4	0.5	---	---	---	---

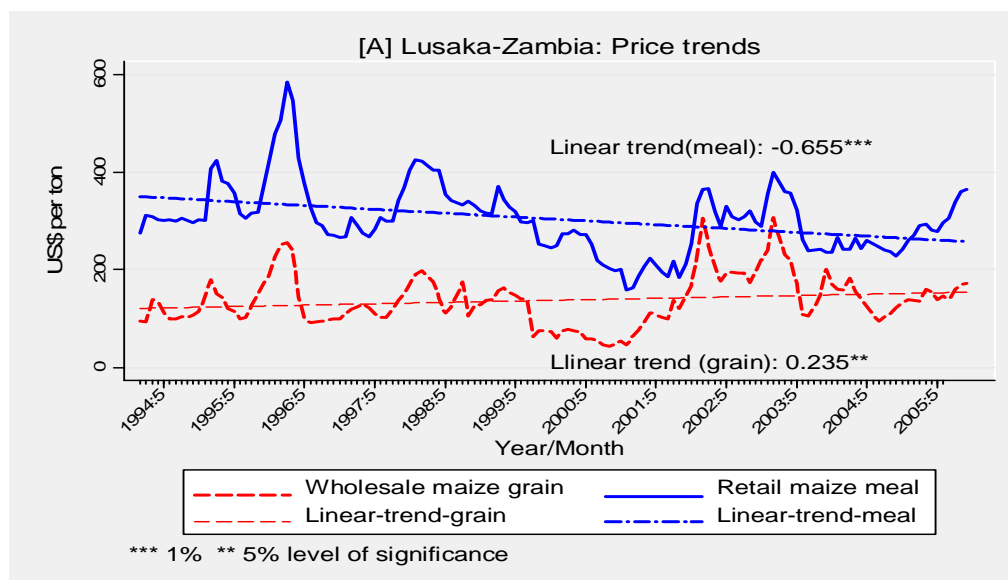
Data Source: Mozambique: IAF 2002, according to their definition of rural and urban; Zambia: 2007 CSO/MSU Urban Consumption Survey, first round, as calculated by authors

## Improved Conditions for Trade (3)

- Improved spatial market integration
  - Malawi, Mozambique, Zambia (Goletti and Babu, 1994; Chirwa, 1999; Tostau and Brorsen, 2005; Loy and Wichern, 2000; Awudu, 2007)
  - Broader region (Rashid, 2004; van Campenhout, 2008)
  - Broad conclusions: maize markets reasonably well integrated, becoming more efficient, marketing costs are declining

## Improved Conditions for Trade (4)

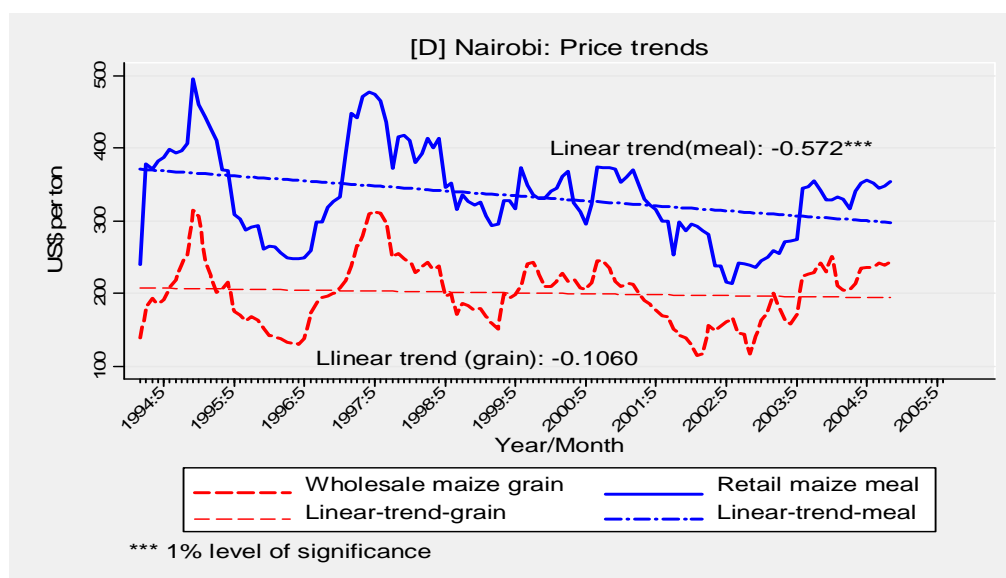
- Declining marketing costs



□ Source: Jayne and Chapoto 2006

## Improved Conditions for Trade (5)

### □ Declining marketing costs



□ Source: Jayne and Chapoto 2006

## Improved Conditions for Trade (6)

### □ Less Covariant Prod'n (Correlation Coef's, White Maize Prodn)

		South Africa	Zambia	Zimbabwe	Mozambique	Malawi
South Africa	1990-1999		0.66**	0.93***	0.18	0.12
	1996-2005				0.04	-0.18
Zambia	1990-1999	0.66**		0.77***	-0.04	0.36
	1996-2005				-0.08	0.06
Zimbabwe	1990-1999	0.93***	0.77***		0.30	0.22
	1996-2005				-0.88***	0.21
Mozambique	1990-1999					0.65**
	1996-2005					-0.20
Malawi	1990-1999				0.65**	
	1996-2005				-0.20	

## Improved Conditions for Trade (6)

### □ Less Covariant Prod'n (Correlation Coef's, White Maize Prodn)

		South Africa	Zambia	Zimbabwe	Mozambique	Malawi
South Africa	1990-1999		0.66**	0.93***	0.18	0.12
	1996-2005				0.04	-0.18
Zambia	1990-1999	0.66**		0.77***	-0.04	0.36
	1996-2005				-0.08	0.06
Zimbabwe	1990-1999	0.93***	0.77***		0.30	0.22
	1996-2005				-0.88***	0.21
Mozambique	1990-1999					0.65**
	1996-2005					-0.20
Malawi	1990-1999				0.65**	
	1996-2005				-0.20	

## Improved Conditions for Trade (6)

### □ Less Covariant Prod'n (Correlation Coef's, White Maize Prodn)

		South Africa	Zambia	Zimbabwe	Mozambique	Malawi
South Africa	1990-1999		0.66**	0.93***	0.18	0.12
	1996-2005		0.36	0.51	0.04	-0.18
Zambia	1990-1999	0.66**		0.77***	-0.04	0.36
	1996-2005	0.36		0.27	-0.08	0.06
Zimbabwe	1990-1999	0.93***	0.77***		0.30	0.22
	1996-2005	0.05	0.27		-0.88***	0.21
Mozambique	1990-1999					0.65**
	1996-2005					-0.20
Malawi	1990-1999				0.65**	
	1996-2005				-0.20	



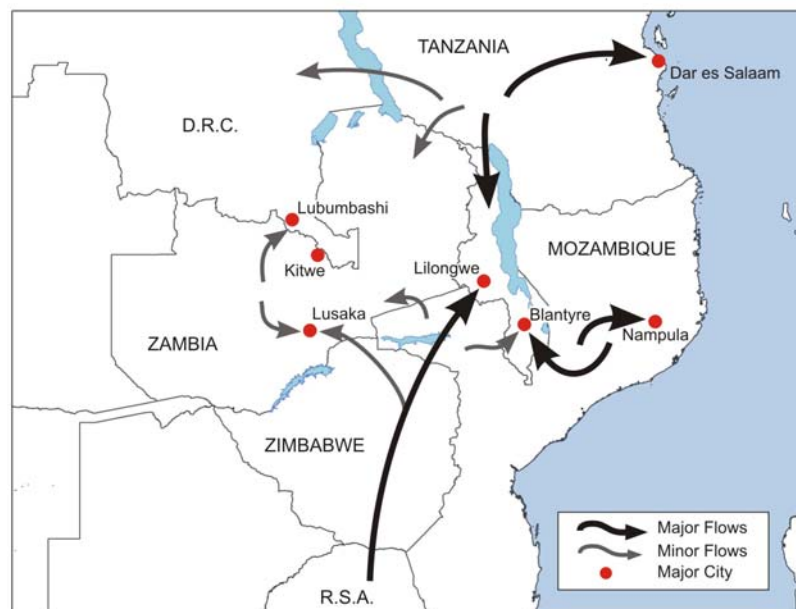
## Improved Conditions for Trade (6)

### □ Less Covariant Prod'n (Correlation Coef's, White Maize Prodn)

		South Africa	Zambia	Zimbabwe	Mozambique	Malawi
South Africa	1990-1999		0.66**	0.93***	0.18	0.12
	1996-2005		0.36	0.51	0.04	-0.18
Zambia	1990-1999	0.66**		0.77***	-0.04	0.36
	1996-2005	0.36		0.27	-0.08	0.06
Zimbabwe	1990-1999	0.93***	0.77***		0.30	0.22
	1996-2005	0.05	0.27		-0.88***	0.21
Mozambique	1990-1999	0.18	-0.04	-0.30		0.65**
	1996-2005	0.04	-0.08	-0.88***		-0.20
Malawi	1990-1999	0.12	0.36	0.22	0.65**	
	1996-2005	-0.18	0.06	0.21	-0.20	

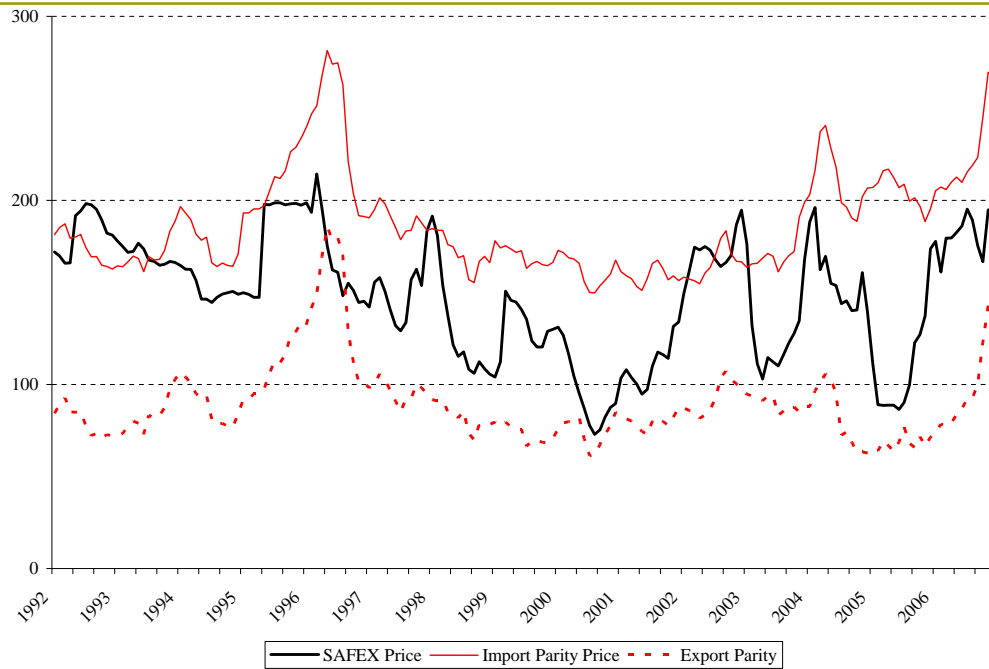
## Improved Conditions for Trade (7)

### □ Informal trade: South East Africa market shed



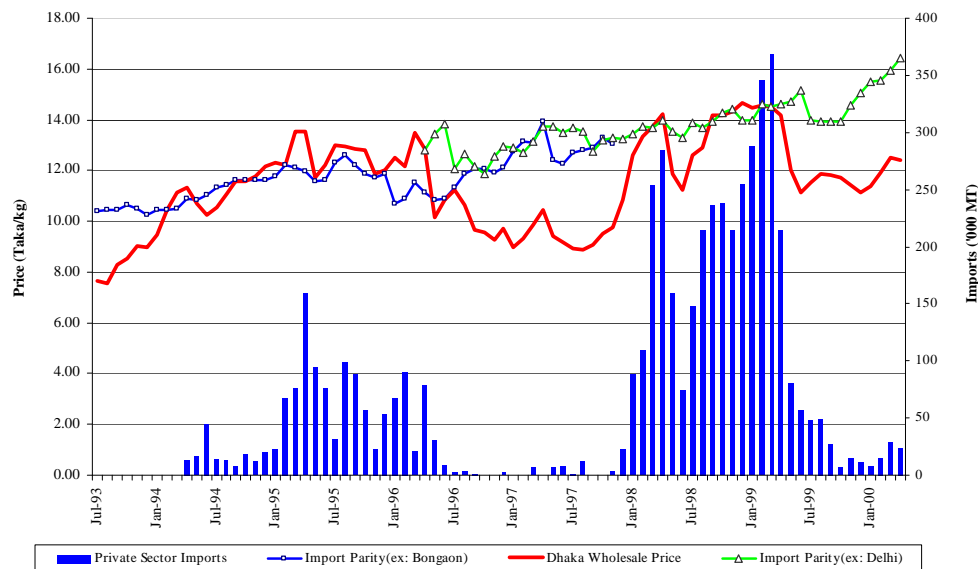
Source: Haggblade

## Trade can and does work in some cases (South Africa)



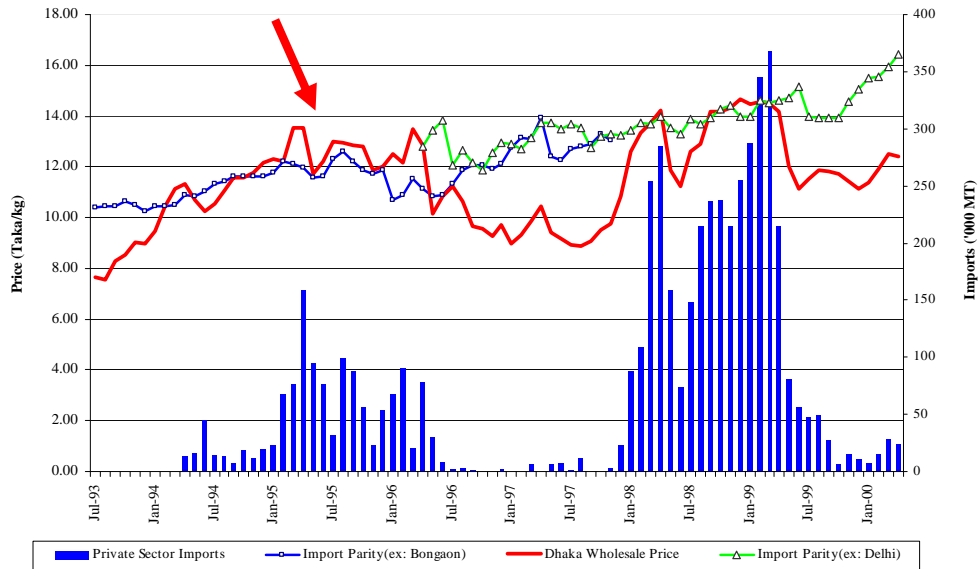
□ Source: Haggblade

## Trade can and does work in some cases (Bangladesh)



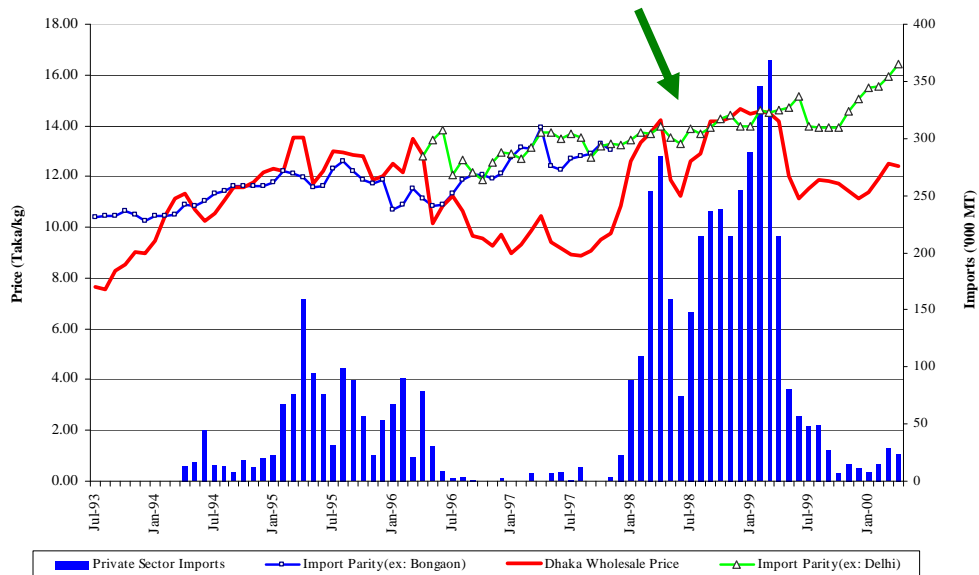
Source : Dorosh (2001).

# Trade can and does work in some cases (Bangladesh)



Source : Dorosh (2001).

# Trade can and does work in some cases



Source : Dorosh (2001).

## And trade could have played a major role in each crisis this decade

### *Southern African Food Crises this Decade*

Marketing year	Regional Situation			Scope for trade
	Prod'n Outcome	Beg. Stocks	Overall Supply	
2001/02	-9%	About average, > 2mmt	Small deficit, ~ 1mmt	High. Exports from RSA and some from northern Mozambique.
2002/03	-1%	Historically low, <500,00 mt	Deficit up to 3mmt	High. Exports from RSA and some from northern Mozambique; also from Tanzania.
2005/06	+15%	Above average, ~ 3 mmt	Surplus up to 2 mmt	High. Exports from RSA and some from northern Mozambique

Note: Production outcomes are relative to the 1990-2005 mean. Source: FAOSTAT for production data; FEWSNET for stocks; INTERFAIS for food aid.

## And trade could have played a major role in each crisis this decade

### *Southern African Food Crises this Decade*

Marketing year	Regional Situation			Scope for trade
	Prod'n Outcome	Beg. Stocks	Overall Supply	
2001/02	-9%	About average, > 2mmt	Small deficit, ~ 1mmt	High. Exports from RSA and some from northern Mozambique.
2002/03	-1%	Historically low, <500,00 mt	Deficit up to 3mmt	High. Exports from RSA and some from northern Mozambique; also from Tanzania.
2005/06	+15%	Above average, ~ 3 mmt	Surplus up to 2 mmt	High. Exports from RSA and some from northern Mozambique

Note: Production outcomes are relative to the 1990-2005 mean. Source: FAOSTAT for production data; FEWSNET for stocks; INTERFAIS for food aid.

## And trade could have played a major role in each crisis this decade

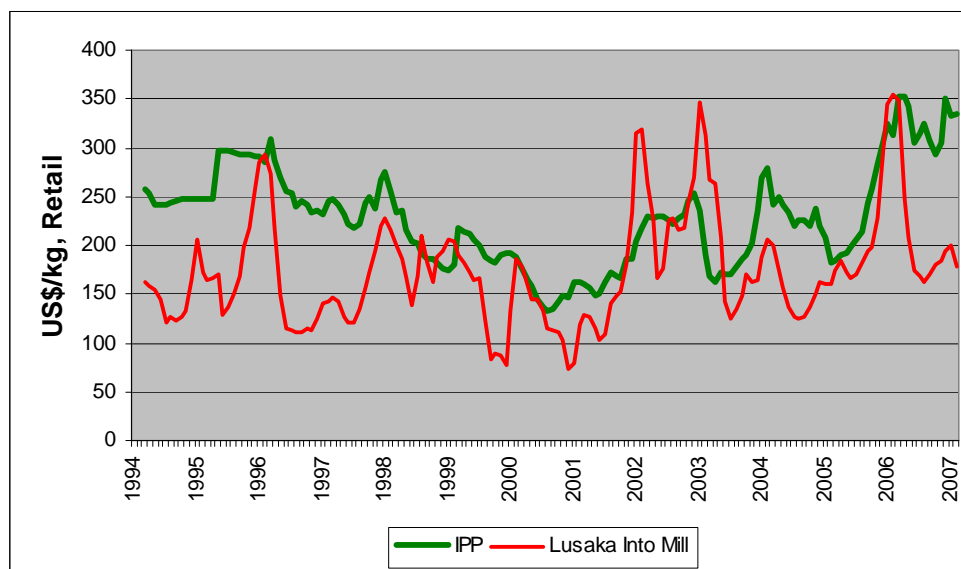
### *Southern African Food Crises this Decade*

Marketing year	Regional Situation			Scope for trade
	Prod'n Outcome	Beg. Stocks	Overall Supply	
2001/02	-9%	About average, > 2mmt	Small deficit, ~ 1mmt	High. Exports from RSA and some from northern Mozambique.
2002/03	-1%	Historically low, <500,00 mt	Deficit up to 3mmt	High. Exports from RSA and some from northern Mozambique; also from Tanzania.
2005/06	+15%	Above average, ~ 3 mmt	Surplus up to 2 mmt	High. Exports from RSA and some from northern Mozambique

Note: Production outcomes are relative to the 1990-2005 mean. Source: FAOSTAT for production data; FEWSNET for stocks; INTERFAIS for food aid.

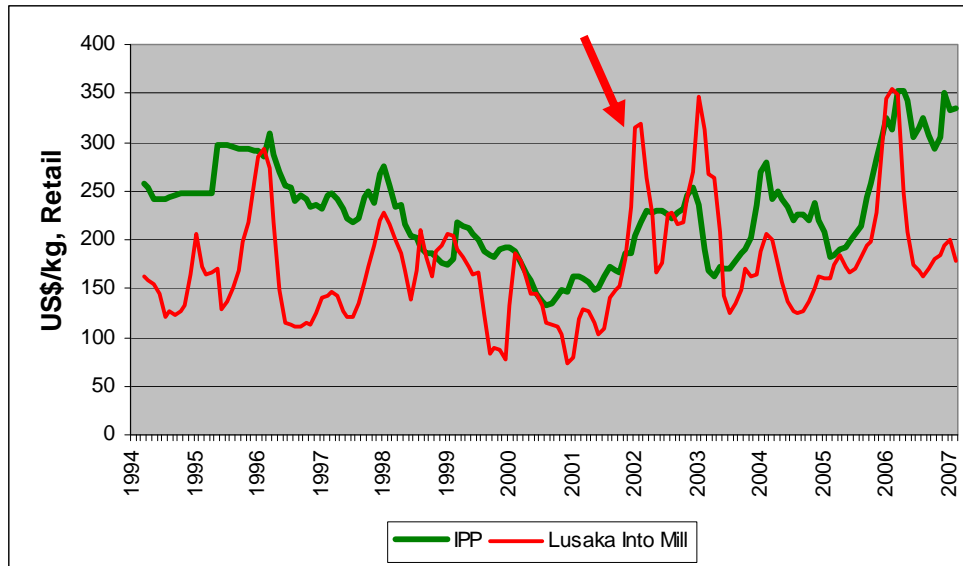
## But played much less than it could have

### □ Zambia



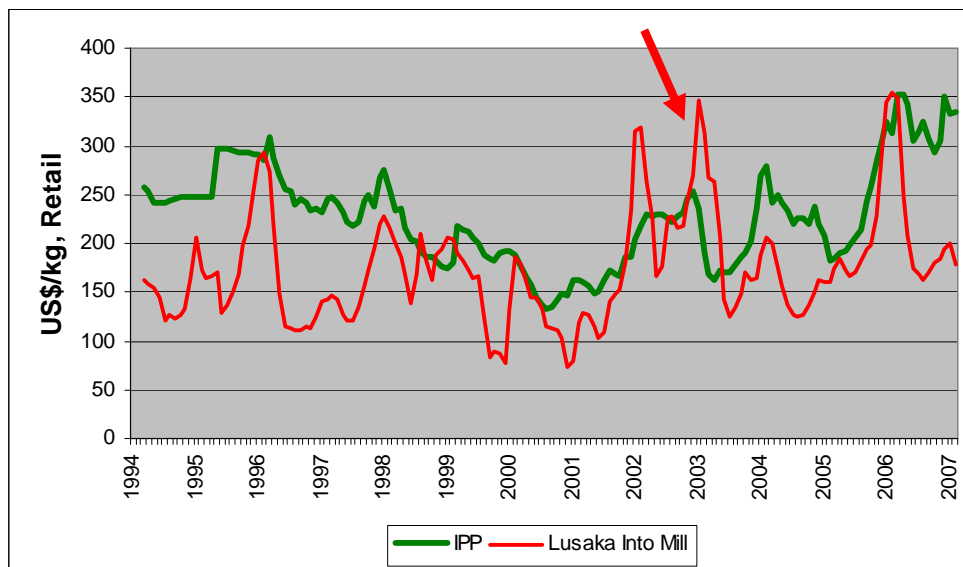
## But played much less than it could have

### □ Zambia



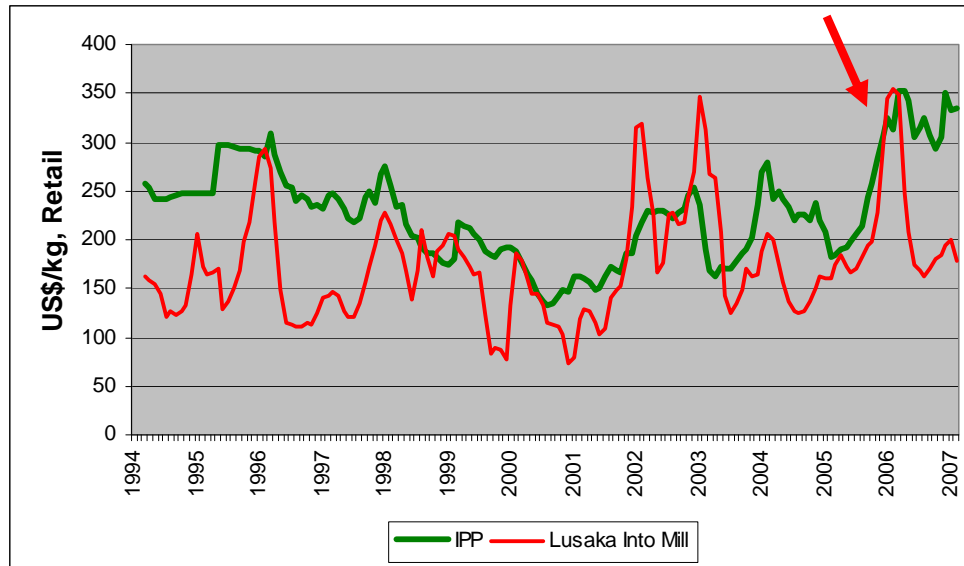
## But played much less than it could have

### □ Zambia



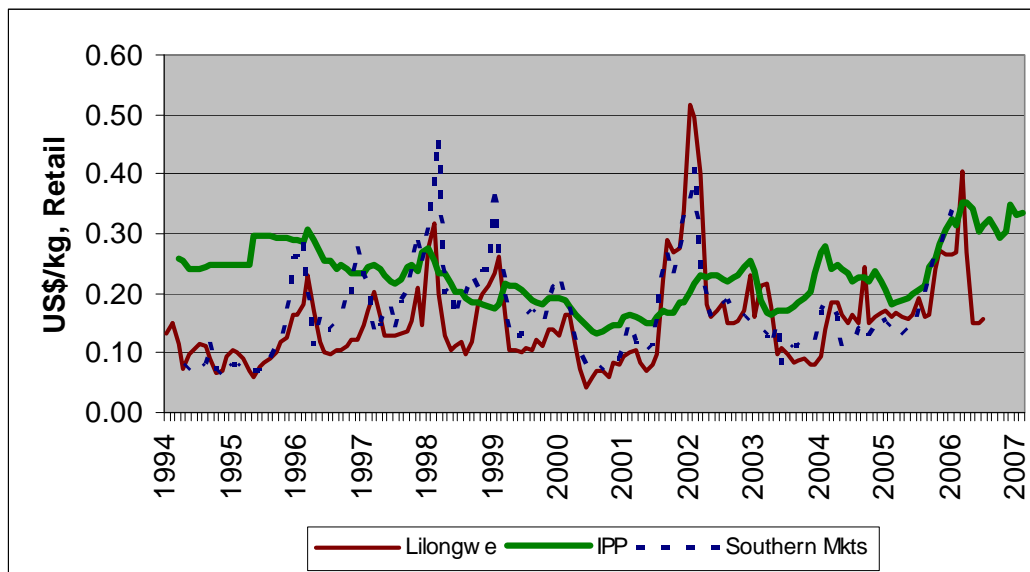
## But played much less than it could have

### □ Zambia



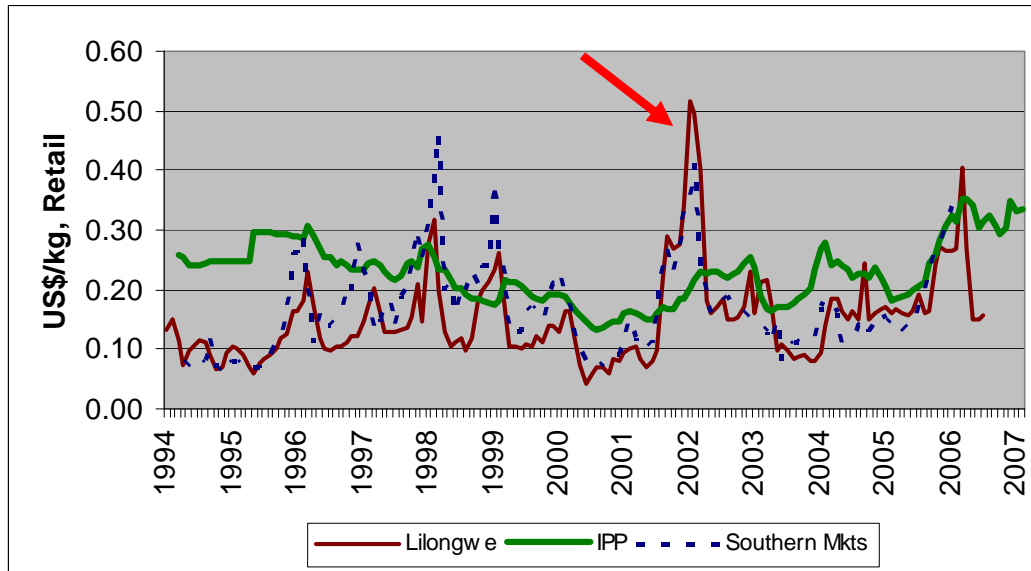
## But played much less than it could have

### □ Malawi



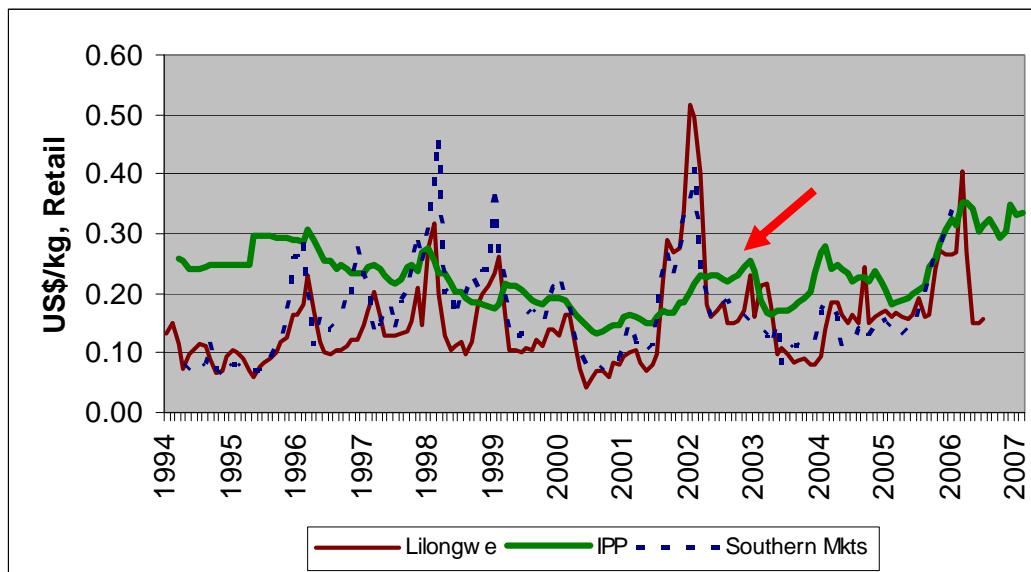
## But played much less than it could have

### Malawi



## But played much less than it could have

### Malawi





## *How does this happen?*

---

- Inaccurate crop forecasts (biased upwards)
  - Especially in Malawi and Mozambique
- Underestimated maize demand
  - Animal feed industry
- Frequent control of import licenses
- Government announces import plans (typically late)
  - Typically plan to distribute grain to millers (Zambia) or ADMARC (Malawi) at subsidized rate
- Private trading sector is sidelined
- Government imports are delayed
- Prices skyrocket

## *How does this happen? (2)*

---

- Poor information is a problem
- But the central problem is government's repeated recourse to control of trade
  - Exacerbates the information problem, since private sector could react more quickly to clear price signals that contradict physical estimates

## Why does this happen?

---

- Rent seeking is always an issue
- But in a democracy, the first objective is to remain in power
  - You or your party
- So how does the desire to remain in power result in behavior that could be expected to endanger that objective?

## Why does this happen? (2)

---

- Four premises
  - Government and traders interact in the same political and economic space but with differing objective functions;
    - Government: remain in power; staple food price stability becomes in *instrumental goal*
    - Traders: maximize profit over some time horizon
  - The two are dependent on each other in that the behavior of each affects the outcome of the other;
    - Govt export bans or subsidized sales
    - Trader collusive behavior threatens govt objectives

## Why does this happen? (3)

---

- Four premises (cont'd)
  - Information about the other's behavior is imperfect, and effects of some behavior seen only with time lag
    - Lag between government statements, decisions, and implementation regarding food imports
    - Private sector stocks, pricing decisions, informal imports exports
  - As a result, each must base their own behavior in part on expectations about the behavior of the other
- Implication: Trust matters
  - But trust is hard to develop

## Why does this happen? (3)

---

- The “wicked problem”
  - “... beliefs are grounded in competing cultural norms and resolution resists factual analysis”
  - “... it is the *social complexity* of these problems, not their technical complexity, that overwhelms most current problem solving ... approaches”
  - “Because of social complexity, solving a wicked problem is fundamentally a social process”

## Why does this happen? (4)

---

- The “commitment problem”
  - The inability of parties to make a *credible commitment* to a course of action that would resolve a conflict
  - Traders need a commitment from government not to take sudden, unanticipated actions that affect traders’ bottom line
  - Government can’t make a credible commitment to this effect
    - Rent seeking by individuals in government
    - Lack of trust that traders will import sufficient quantities

## Why does this happen? (5)

---

- The “commitment problem” (cont’d)
  - Government needs commitment from traders that they will import sufficient quantities
  - A competitive market would provide a *third party guarantee*
    - Key concept in literature on social trust and commitment problems
  - But here the wicked problem interferes
    - Government may neither understand nor trust that “the market” can provide such a guarantee
    - Especially when the interests of individual traders are probably antithetical to government’s preferred outcome

## Tentative Implications

---

- The problem is not going to go away soon
  - Poor economies lead to public sector rent seeking
  - Differences in worldview (basic assumptions) are real, and undermine trust
  - Both are central to the commitment problem
- Problem should diminish with economic growth
  - More money to be made outside government
- Anti-corruption efforts a crucial complement
  - Provide the third party guarantee that removes one contributor to the commitment problem

## Tentative Implications (2)

---

- Resolution resists factual analysis but typically is not immune to it
  - Quality, timeliness, persistence of analysis and outreach
    - Credible and timely market information is crucial
  - Continue stressing need for clear and transparent rules and behavior by government
  - Providing examples of how markets do work to stabilize supplies and prices

## Tentative Implications (3)

---

- Moving government towards a belief that competitive markets can provide a *third party guarantee*
  - Solves a large part of the commitment problem
    - Makes the trade's commitment to import sufficient quantities credible
    - Makes it easier for government to credibly commit to avoiding unexpected actions
  - Need supply chain studies that pay serious attention to how competitive the chains are, at all points

*Thank You*

---