

# Does Government Operations in Staple Food Markets Reduce or Exacerbate Food Price Volatility? Evidence from East and Southern Africa



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**Symposia on Trade shocks, Price Transmission and poverty linkages in African Countries**

**International Conference of Agricultural Economists**

Milan, Italy, August 8-14, 2015



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# What is the problem?

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- Food production fluctuations lead to price instability
- Food price instability is a major problem
  - For farmers
  - For consumers
  - For governments
- In response to food price instability, some governments implement policies to control trade flows and/or price levels

# Underlying question motivating our study

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- Do government actions meant to stabilize food reduce food price instability and unpredictability?

# Two main ways in which governments aim to stabilize food prices

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## 1. Restrictions on trade

- Export bans
- Import bans/tariffs
- Do not approve permits to import or export (a de facto ban)

## 2. Marketing board operations

- Fixed buying and/or selling prices
- Stock accumulation and release onto markets

# Why might government actions fail to succeed in reducing instability?

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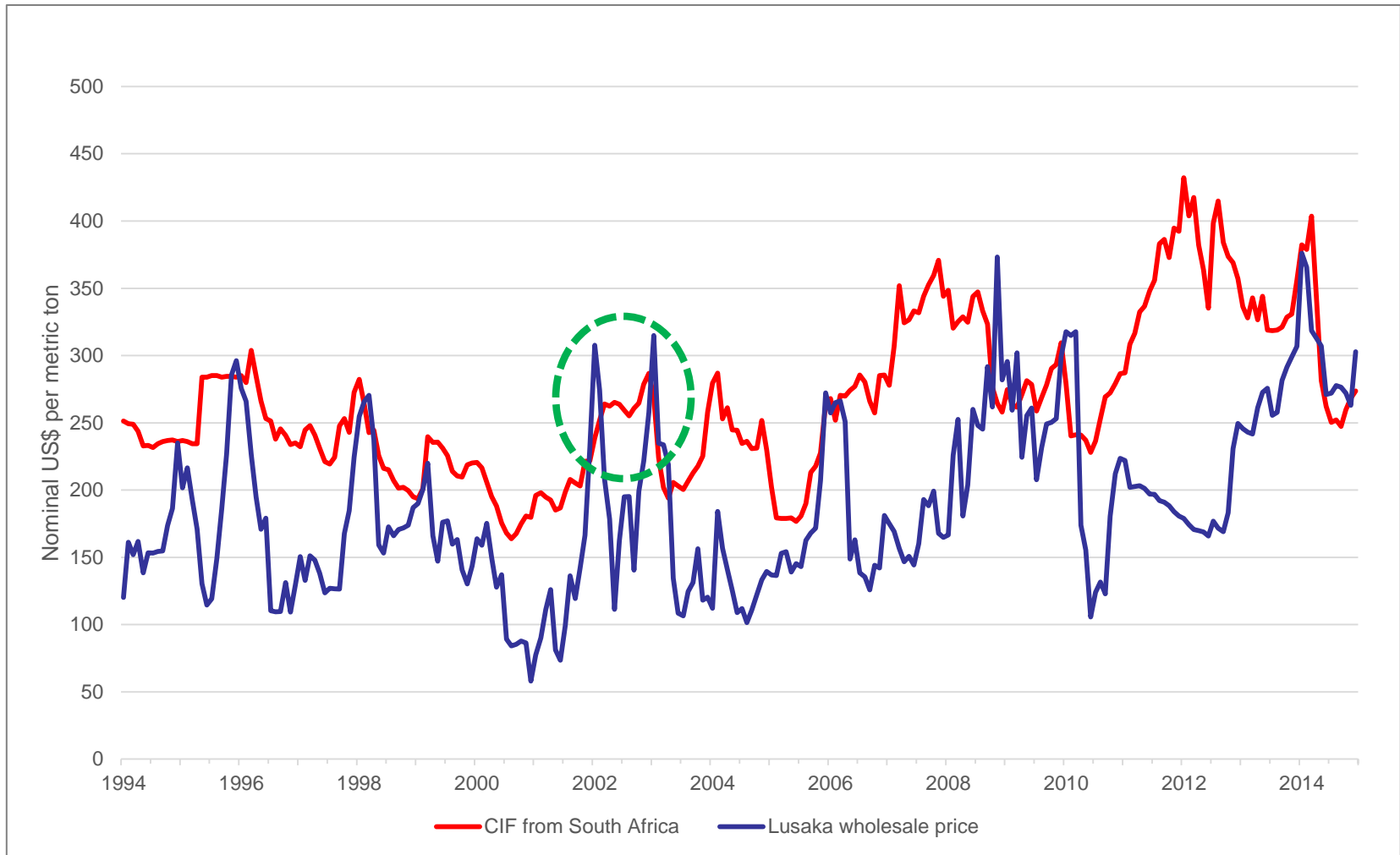
- Government may announce intention to import but do so late, causing prices to shoot over import parity
- Traders may desist from operating in certain smallholder areas out of uncertainty of government behavior (e.g., after government announces that it will buy at artificially high prices, but then runs out of funding to buy) → farmers lose access to markets that they otherwise would have had

# Discretionary (“ad hoc”) trade policies

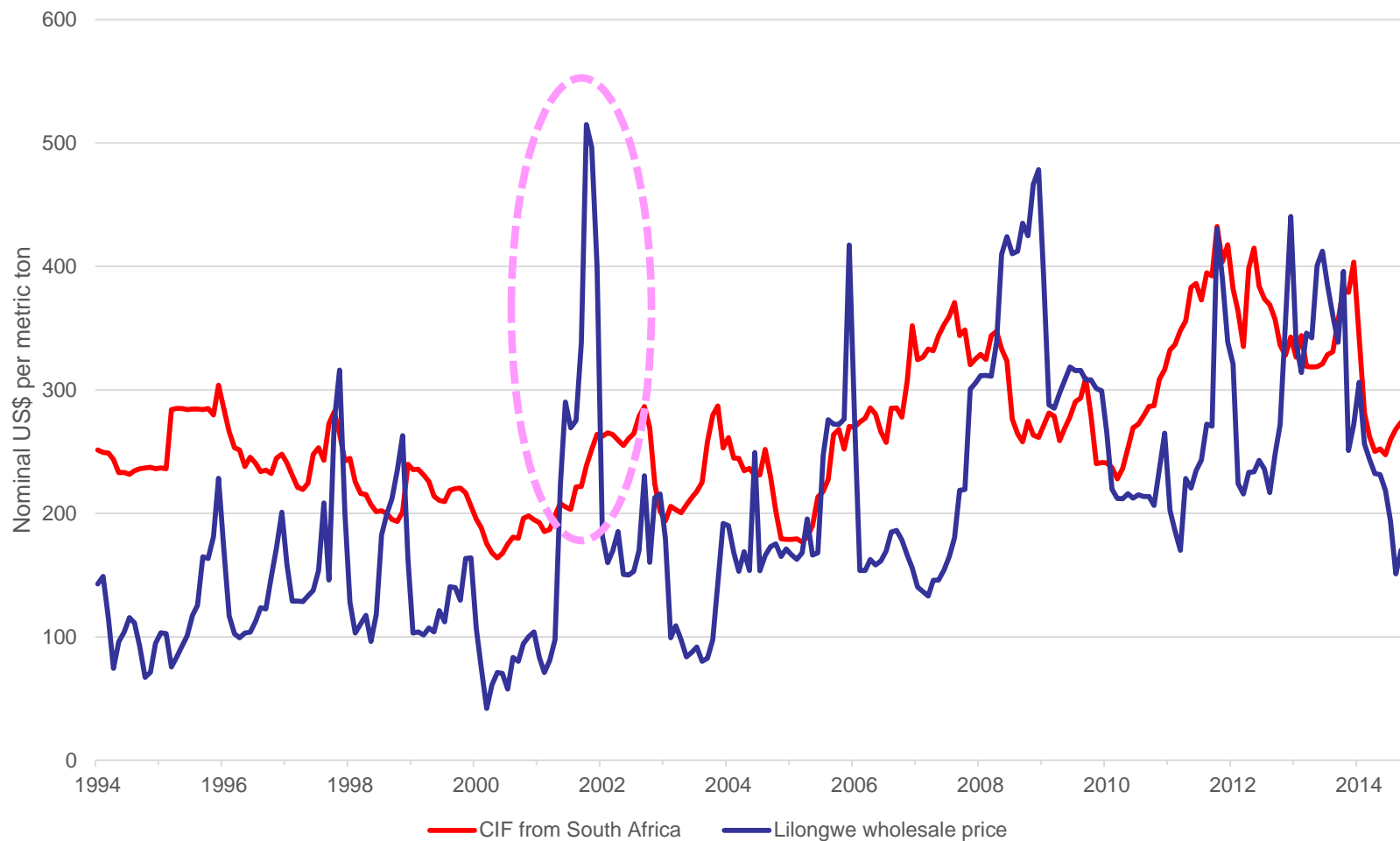
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- If government actions in markets are unpredictable, this tends to deter private sector from participating in the market
- Strategic interaction between govt and traders can lead to unintended consequences (Abbink et al., 2011)
- Examples of discretionary government unpredictability: not announcing in advance
  - timing of export/import bans
  - timing of change in import tariff rates
  - when and where will marketing boards enter the market, at what price?
  - when will the Board stop buying, and what will the price be after that?

# Fig 1: Maize prices vs. Import Parity Lusaka, Zambia

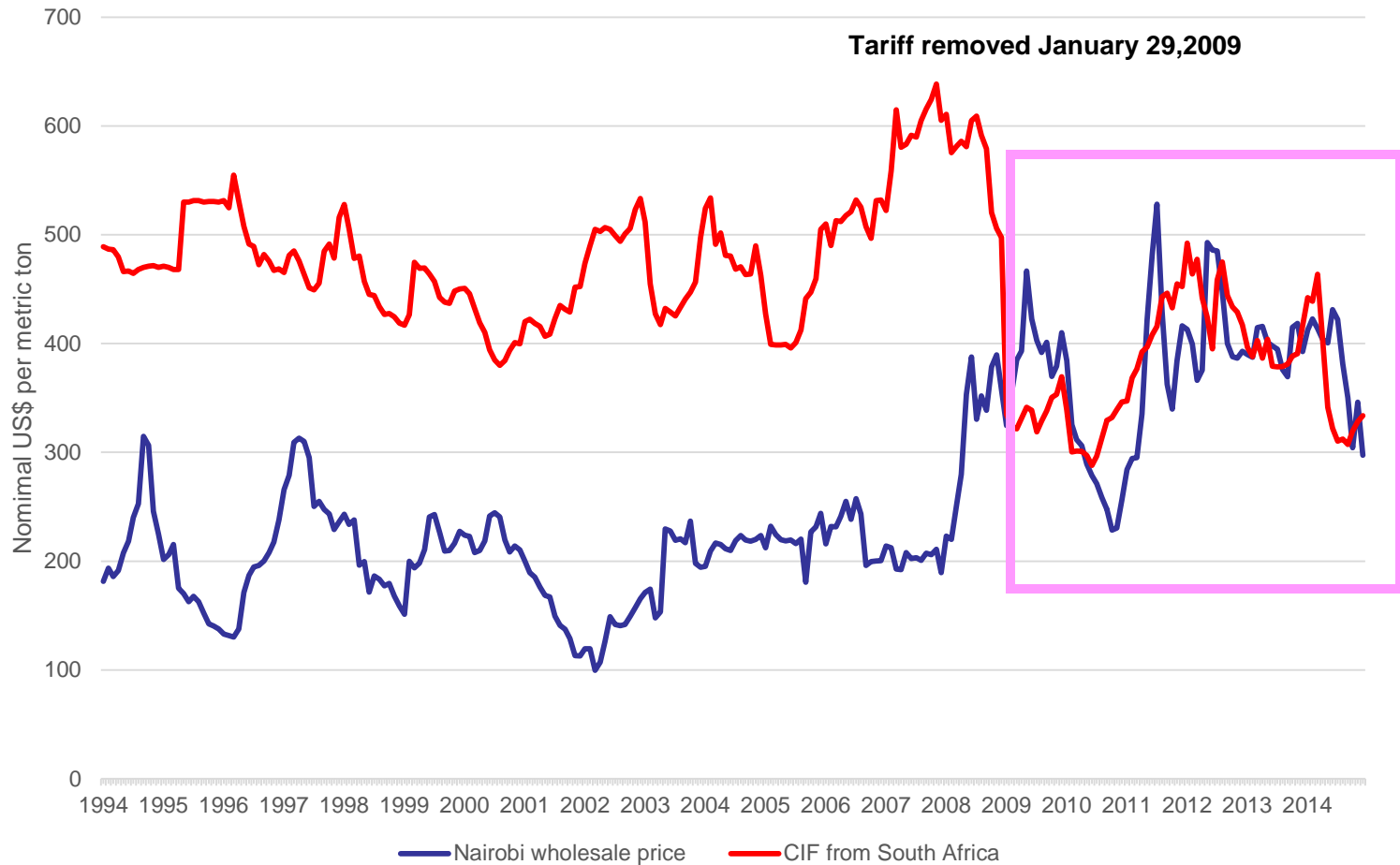


# Fig 2: Maize Prices vs. Import parity Lilongwe, Malawi





# Fig 3: Maize Prices vs. Import parity Nairobi, Kenya



# Data and Methods

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- *Price Volatility/Instability*- the unconditional variance in food prices over time, measured by the Coefficient of Variation
- *Price unpredictability*-the unanticipated component of price instability, i.e., the conditional variance from a price forecast model.
  - Eg. A measure of unpredictability for the price in month  $t+1$  could be represented by the forecast error between predicted and actual price.

$$P_{t+1} - E_t(P_{t+1}) = e_{t+1}$$

$e_{t+1}$ , the forecast error, is the measure of unpredictability

## .....Data and Methods

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- Conditional CV: the magnitude of one-month ahead forecast error, given known information on:
  - last month's local & international maize price
  - local maize production index a proxy for rainfall index
  - normal seasonal price movements
  - Last month exchange rates
  - Interest rates (not included due to data problems)
- Estimated ARCH-M models (Tests and results-updated paper)

# .....Data and Methods

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- Monthly retail/wholesale maize grain prices from 7 countries -January 1994 to December 2014
- Countries
  - Group A: Mozambique, Uganda, South Africa (open border policy)
  - Group B: Malawi, Zambia, Tanzania (heavy restriction of trade)
  - Borderline case: Kenya (initially restricting trade, progressively open border policy, especially since January 2005)

# Table 1: Timing of major different policy regimes

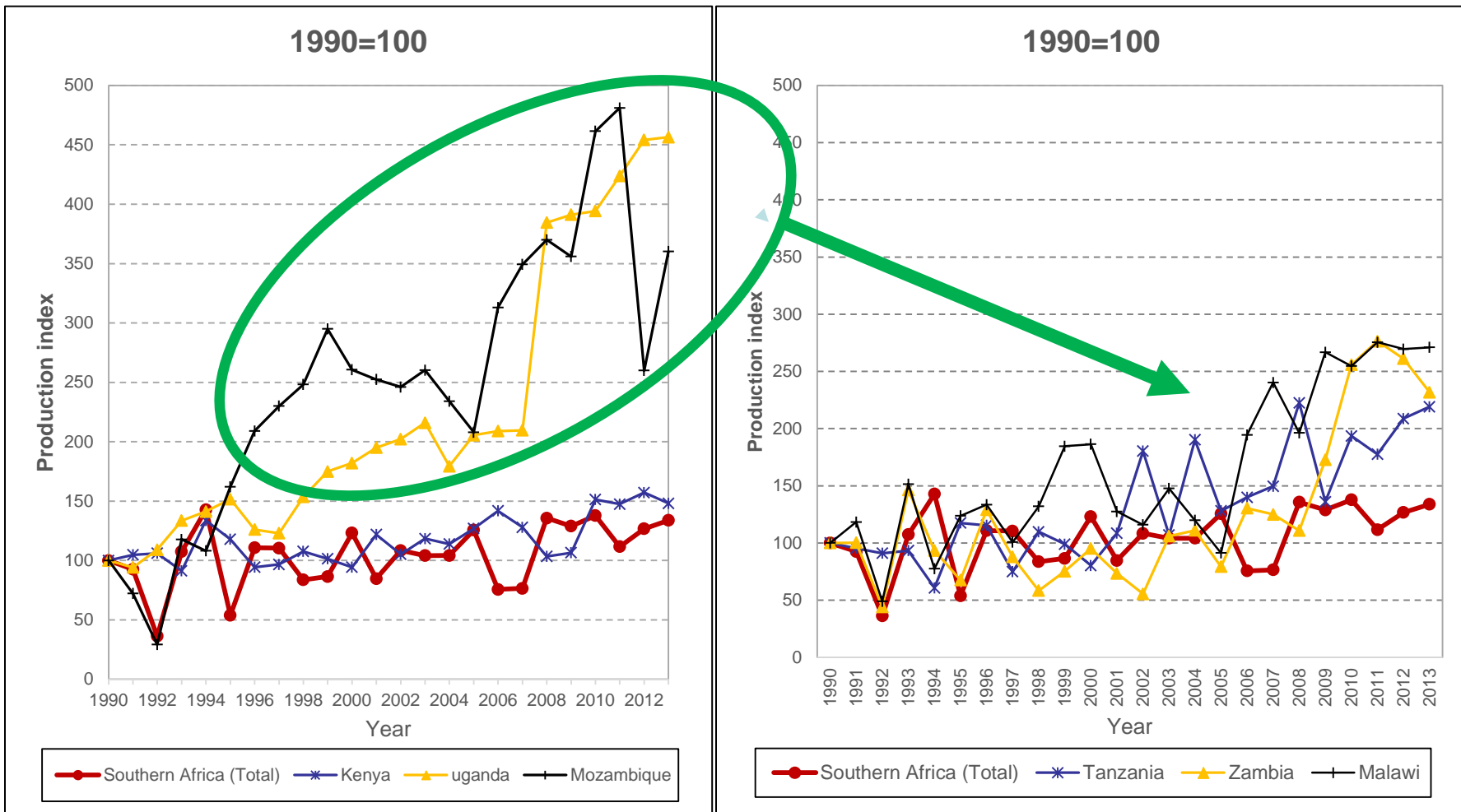
Country	Phase 1	Phase 2	Phase 3
Tanzania	Jan 1994 to Dec 2004 (Reform phase)	Jan 2005 to current (Beginning of on/off Export bans)	-
Zambia	Jan 1994 to Apr 2000 (Reform phase)	May 2001-Apr 2005 (FRA became one of the major players in the maize market)	May 2005- current (FRA ramping up its activities prior to an election)
Malawi	Jan 1994 to Mar 2005 (Reform phase)	April 2005 to current (ASIP Ag Input Subsidy Program)	-
Kenya	Jan 1994 to Nov 2000 (Reform phase)	Dec 2000-Dec 2004 (NCPB provided with more fund to ramp up activities)	Jan 2005-current (start of EAC – lower tariff rates)
South Africa, Mozambique and Uganda	-----Constant policy regime over period -----		

# Finding 1: Maize production growth

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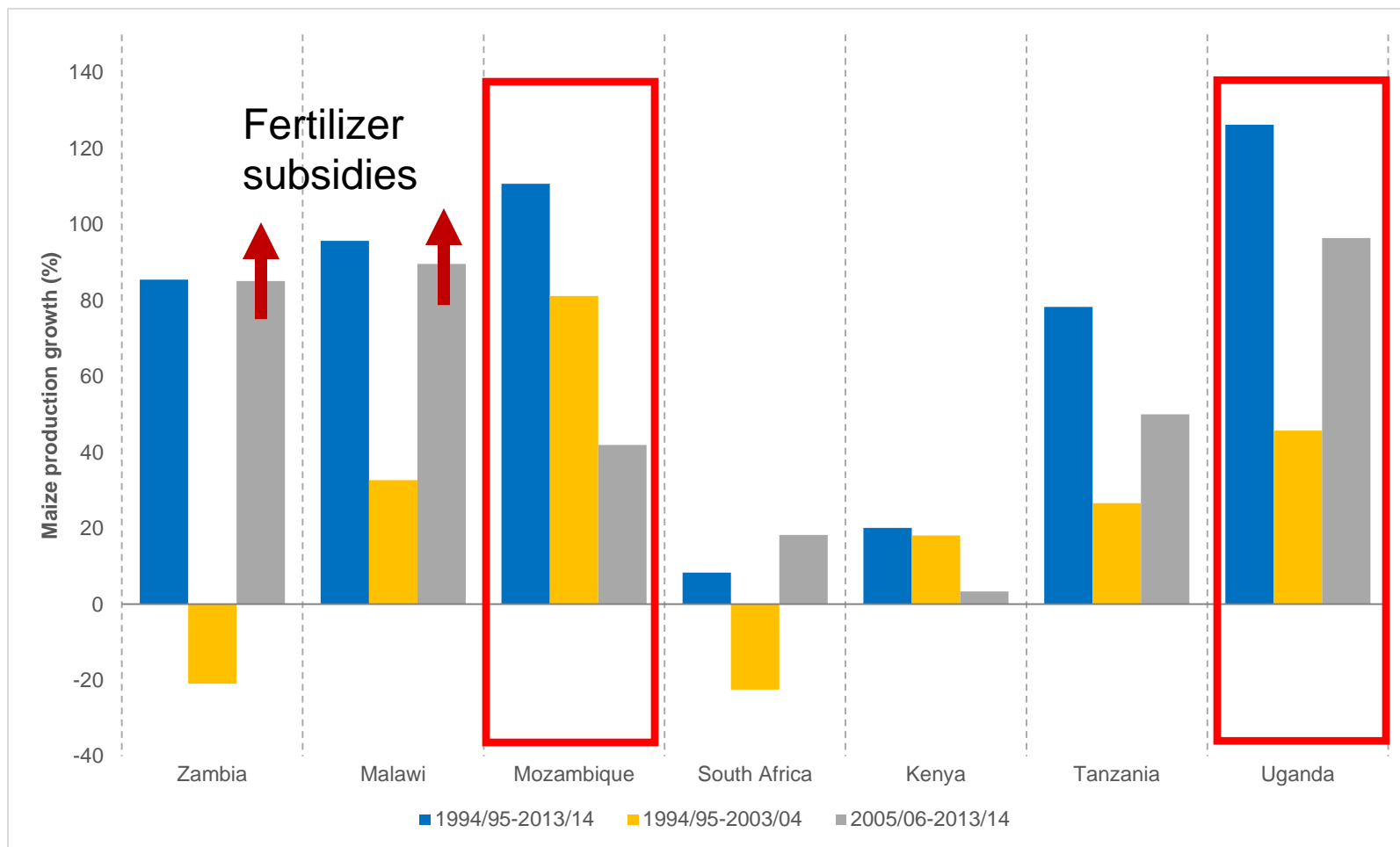
- Countries pursuing food price stabilization policies and food security objectives through direct state operations and fertilizer subsidies have failed to match maize production growth of countries with relatively stable maize marketing and trade policies (an exception – South Africa)

# Fig 4: Maize Production Index, 1990-2013



Source: Data from FAOStat, 2015

# Fig 5: Overall Maize Production Growth, 1993/94-2013/14



Source: Data from FAOStat, 2015

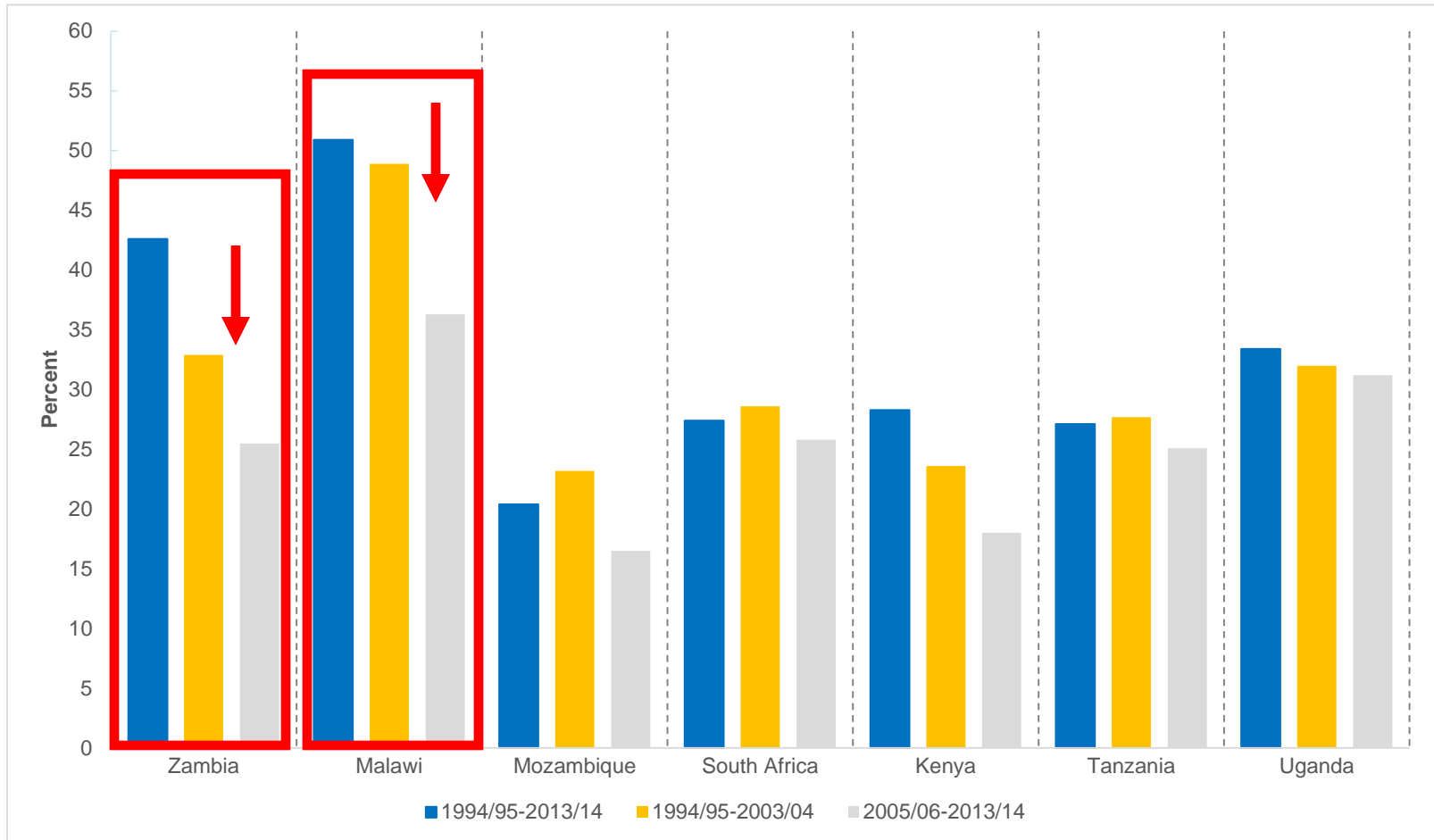


## Finding 2: Price volatility and Predictability

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- To some extent, maize grain prices are generally **more volatile** and **less predictable** in countries that pursue food price stabilization policies through direct state operations and restrict grain trade via ad-hoc domestic and trade policies compared to those with relatively stable and open border policies
  - Malawi and Zambia have the highest degree of price volatility and uncertainty

# Fig 6: Unconditional Coefficient of Variation for Capital City Markets/major Consumption Centers



# Fig 7: Conditional Coefficient of Variation for Capital City Markets/major Consumption Centers

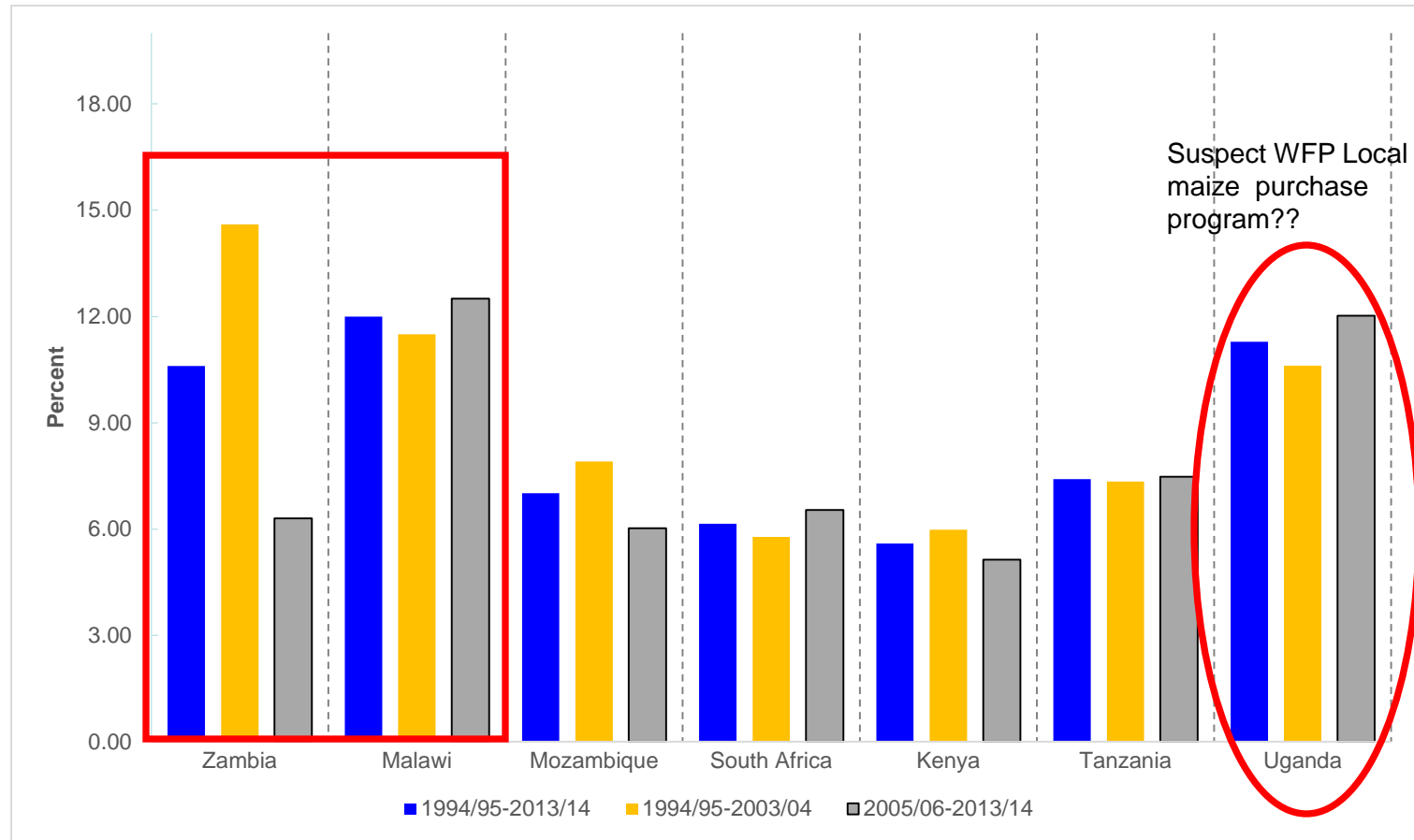


Fig 8: Conditional Coefficient of Variation  
Comparison: Lilongwe (Malawi) Vs. Maputo,  
Mozambique

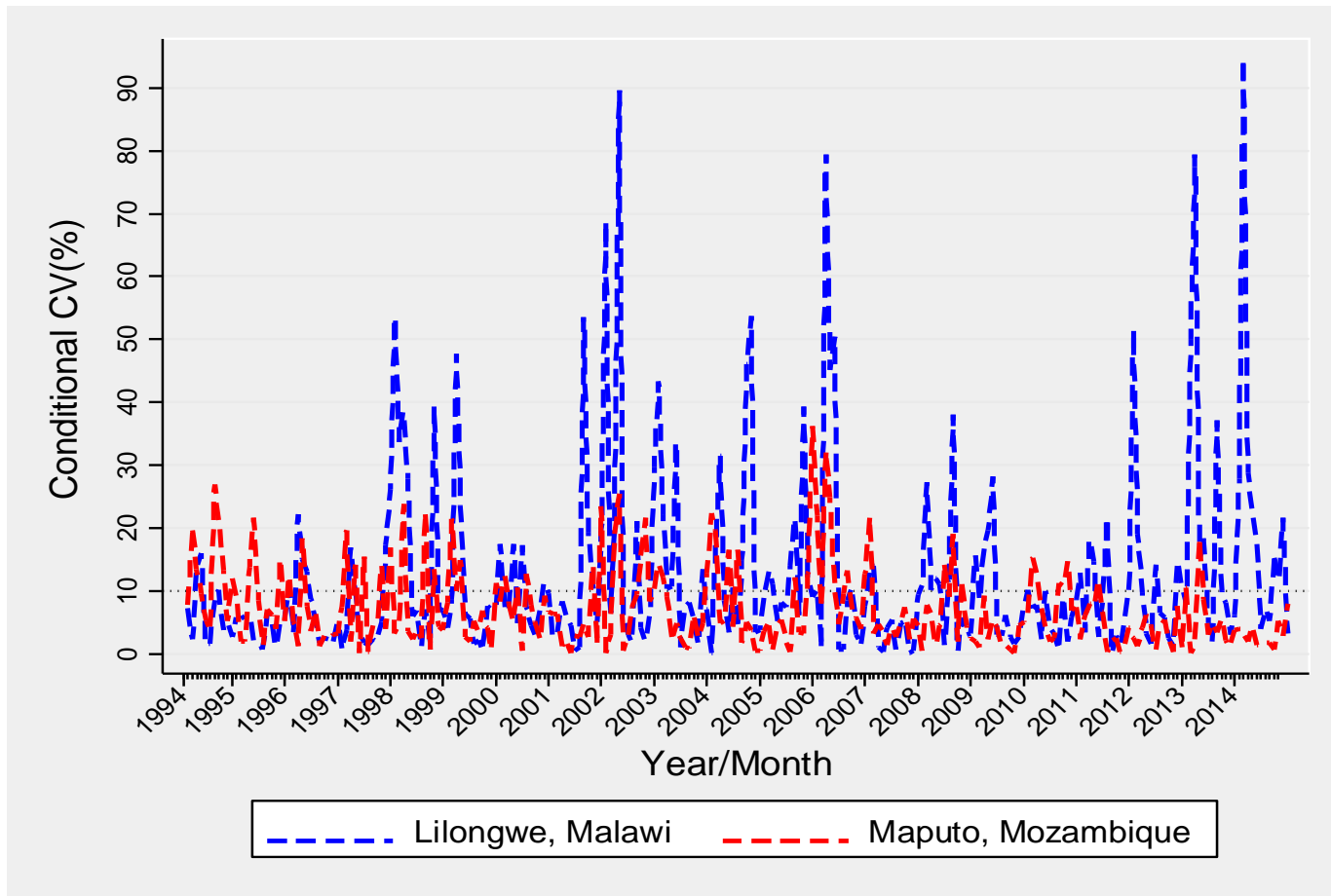
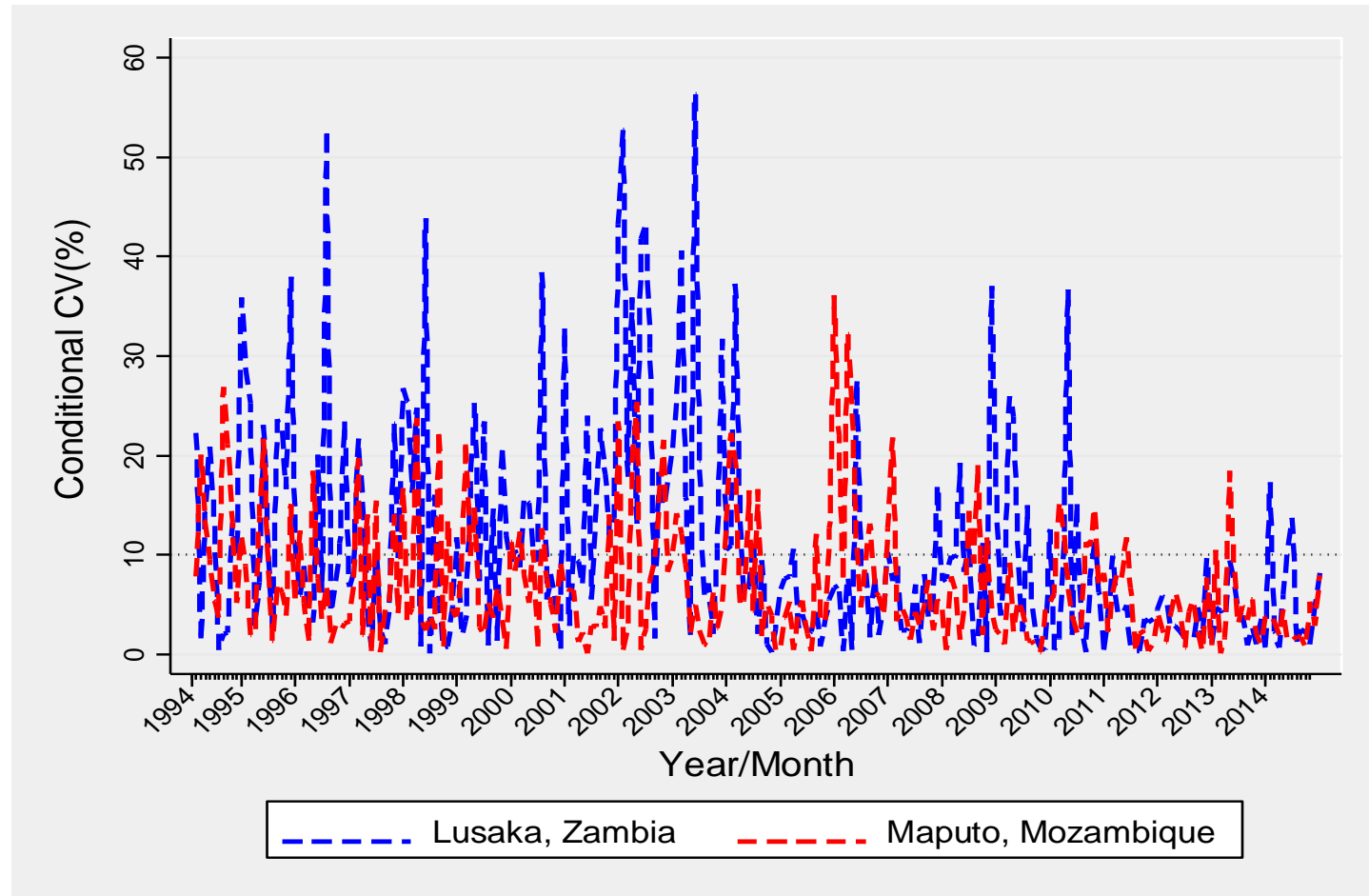


Fig 9: Conditional Coefficient of Variation  
Comparison: Lusaka (Zambia) Vs. Maputo,  
Mozambique

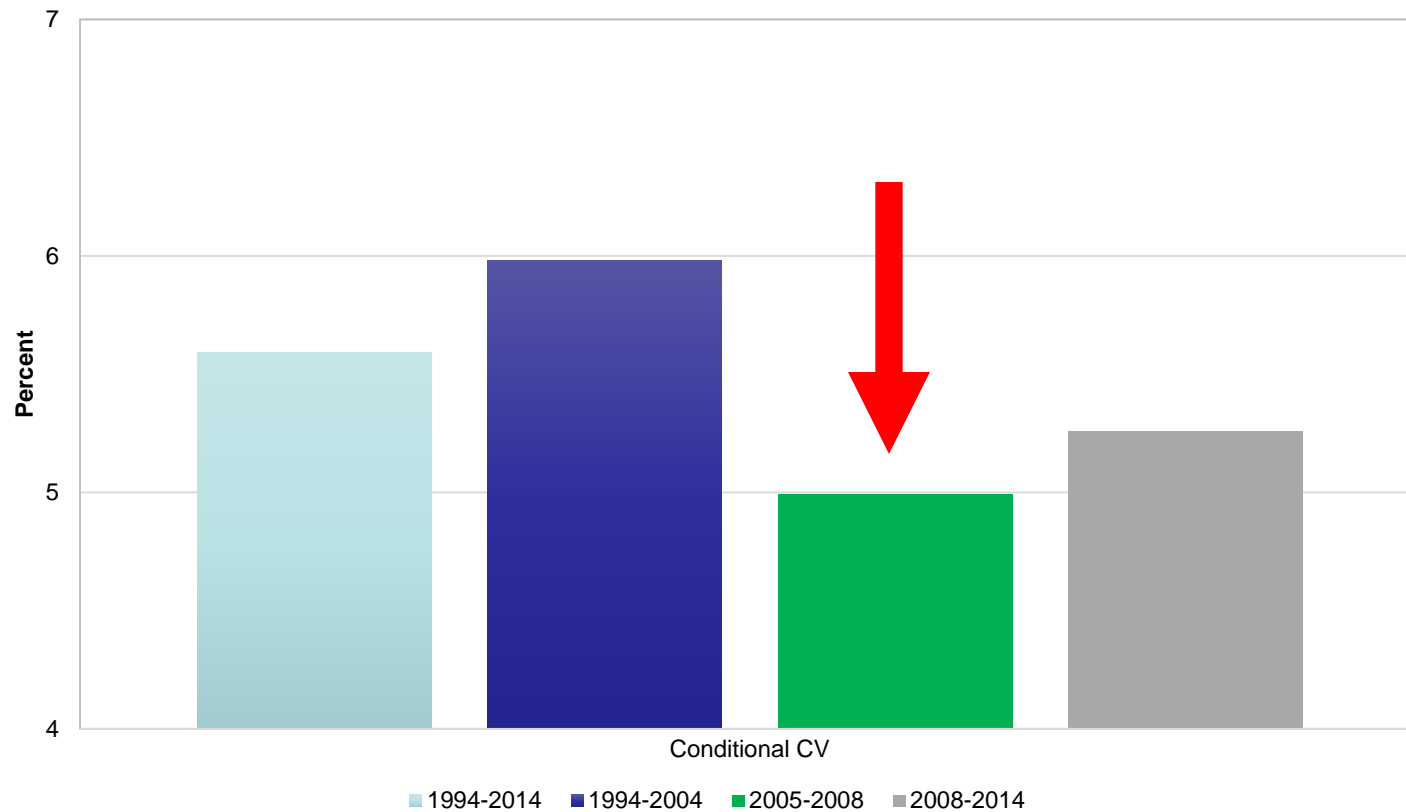


## Finding 3

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- The more stable trade policy environment in Kenya between 2005 and 2008 appears to have contributed to the decline of both price volatility and market uncertainty.
  - Historical unconditional and conditional Coefficient of Variations (CVs) declined when Kenya entered into the East African Commission trading agreement in January 2005.
  - Kenya eliminated the variable maize import tariffs from Uganda and Tanzania (except for a 2.75% inspection fee).

# Fig 10: Conditional Coefficient of Variation Comparison: Nairobi, Kenya



# Conclusion

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- Despite theoretical rationale for price stabilization and controlling trade to stabilize food supplies, countries that rely on “maize without borders” generally have
  - more stable prices
  - higher cereal production growththan countries actively intervening to stabilize prices
- While private trading systems will always result in some price variability, they tend not to cause the frequent food crises caused by ad hoc government actions that are commonly seen in the region



THANK YOU

