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How can trade improve food security in sub-Saharan Africa?

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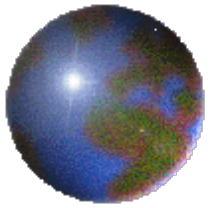

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Questions

- **Conceptual**: How can trade contribute to food security?
- **Empirical**: How fully has Sub-Saharan Africa (vs rest of world) taken advantage of trade opportunities?
- In light of findings, what trade (and complementary domestic) **policy options** are there for further reducing poverty & food insecurity in SSA?

Why focus on Sub-Saharan Africa?

1. SSA is very poor

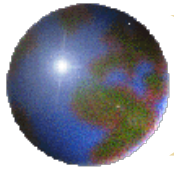
- Half of SSA's population lives on <$1.25/day

- One-fifth are **ultra-poor** (<$0.63/day), and SSA is now home to 70% of world's ultra-poor, up from just 12% in 1981

2. SSA governments are showing increasing interest in pro-poor growth initiatives

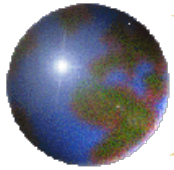
Key elements of food security

- **Availability:**
  - via markets unless self-production is cheaper
- **Access:** sufficient for healthy & active life at ***all*** times (including when prices spike)
  - Depends on capacity to purchase (incl. with credit), or entitlements/gifts
- **Utilization:** knowledge and willingness to ensure a healthy and nutritious diet for ***all*** household members
  - Improves with education, hence income/assets



Best way to enhance food security: efficiently raise spending power

- **Macro**/global: raise level and growth of national income of low-income countries
- **Micro**/household: raise real incomes & asset values of the poorest/most insecure
  - improves their **access** to food markets, and to education (hence better **utilization** of acquirable food)

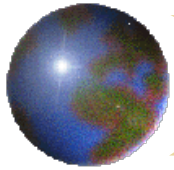


1. Conceptually, how can trade contribute to food security?

Trade policy reform can contribute to food security by:

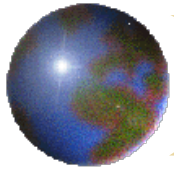
- **Raising real incomes**
  - static and dynamic national gains from trade
- Even if food-insecure households don't benefit *directly* from trade opening, some of trade gains can be redistributed to them

- [A lowering of trade costs, which are higher in SSA than any other region (Arvis et al. 2013), can have similar effect, but it's left aside in what follows since it requires investments, not just a stoke of the legislator's pen]



Sources of gains from trade

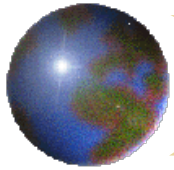
- via **exchange,** e.g. between households with same tastes but different endowments, or vice versa
- via **production specialization,** e.g. between h'holds or regions within a country
  - exploiting comparative cost advantages
- Same two gains can occur from trade **between countries**



Static gains from trade

- National gains from prod'n and trade specialization are greater if it leads to:
  - increased scope for exploiting **economies of scale**
  - greater **competitiveness** in domestic markets
  - expanded **variety** of goods and services available
  - higher **quality** of goods and services produced
    - e.g., because the quality of inputs, and of technologies used in production, are higher in more-open economies

- Hence smaller, less-technically advanced economies can gain most from opening up



Dynamic gains from trade

- Channels through which trade openness (+ good governance) **boosts economic growth:**
  - Creates a more-attractive **investment climate**
  - Brings **new ideas**/ways of producing, distributing, marketing and financing
  - Speeds **technological catch-up**
    - including when embodied in imported products
    - thus avoiding time-consuming knowledge creation

Household effects of liberalizing national food trade if no re-distribution of gains

- If a food-surplus developing country removed a restriction on food exports, net sellers of food would benefit (in prop'n to marketed surplus) at expense of net buyers in that DC
- and conversely in a food-deficit country if it reduced a restriction on food imports

A further consideration: an **indirect** *impact of a price-distorting policy*

- Removing a trade measure that had lowered the farmer's product price

  => raises demand for labor on farms

  => raise unskilled wages, including in nonfarm jobs, esp. in agrarian countries

  => net buyers of food may gain more from rise in wages than they lose from rise in food price (an empirical issue)

Household effects with re-distribution of gains from trade

- Reducing trade distortions could benefit all groups in a country, *provided* govt can and does **efficiently tax and redistribute** some of gains from trade opening
  - including to farmers who are net buyers of food via, e.g., public investments in rural educ'n, health and infrastructure, and in agric R&D
    - Which in turn may encourage the reverse migration of recent migrants to urban slums

National and household effects of rest-of-world *liberalizing its food trade*

- Empirical studies suggest it would raise int'l prices of some foods

  => some food-surplus DCs would benefit while some food-deficit DCs would lose, and

  => within DCs, net sellers of those foods benefit *directly* at expense of net buyers

- But recall: *indirect* effect on unskilled wages may be enough to ensure some net buyers in DCs are better off despite food price rise

  -- or could be with a bit of re-distribution

Why trade measures are n^{th}-best food security instruments

- They reduce overall efficiency of global resource use in agric, so undermine global food security
- May help some poor households, but at expense of other poor households
  - ... while unnecessarily helping some (many?) non-poor groups – and regressively

=> a **very blunt social protection instrument**

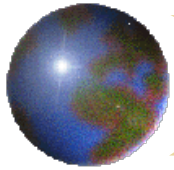
Key messages so far:

1. To improve food security requires increasing the spending power of society's most-vulnerable groups

   -- hence it's fundamentally a **consumption issue**

2. Trade policy reform potentially can boost spending power with the **stroke of a pen**

   -- especially if enough of gain can be redistributed domestically to any food-insecure losers from reform



2. How fully has Sub-Saharan Africa (vs rest of world) taken advantage of trade opportunities?

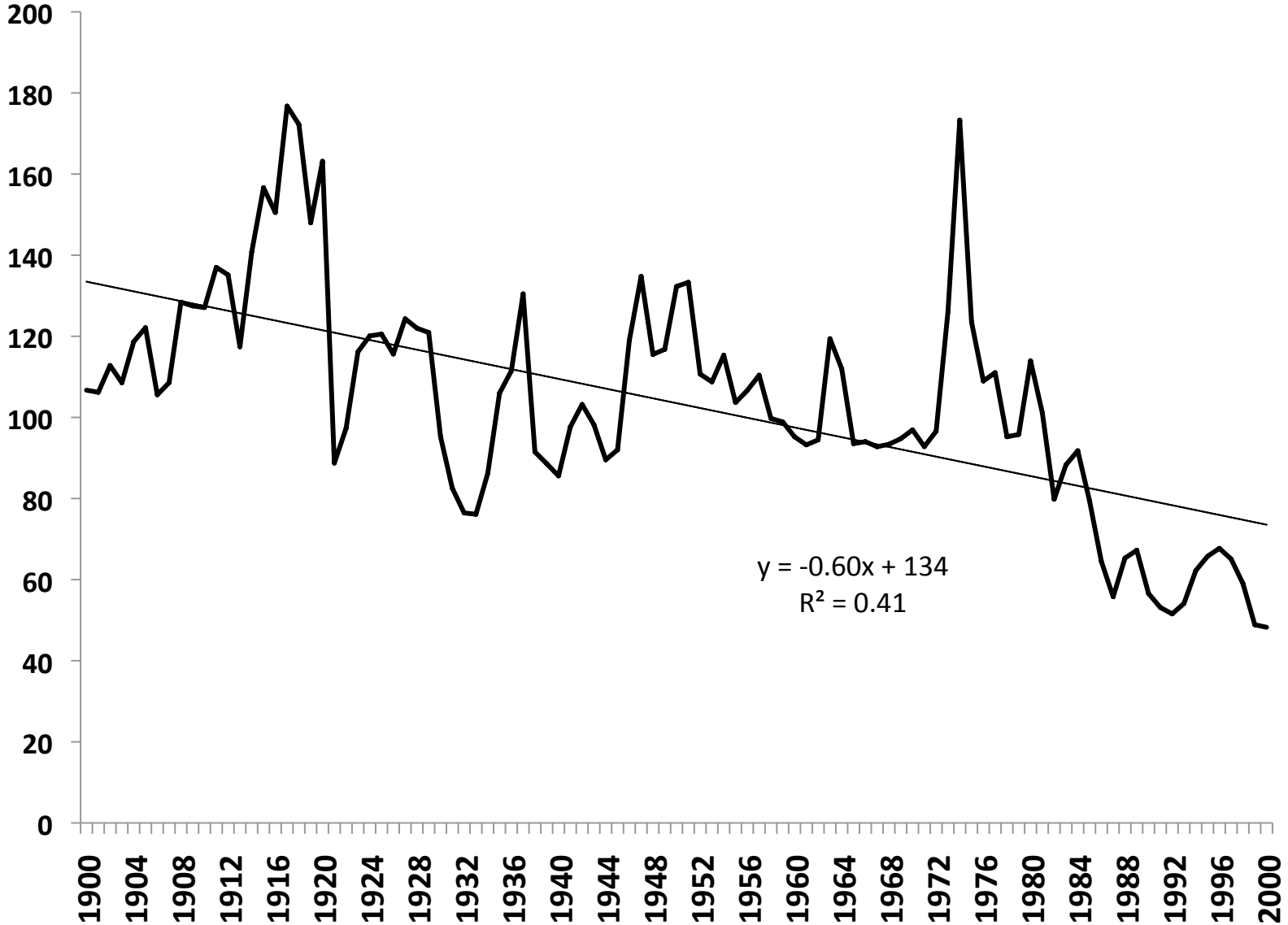
A look at historical data

Global long-run price trends

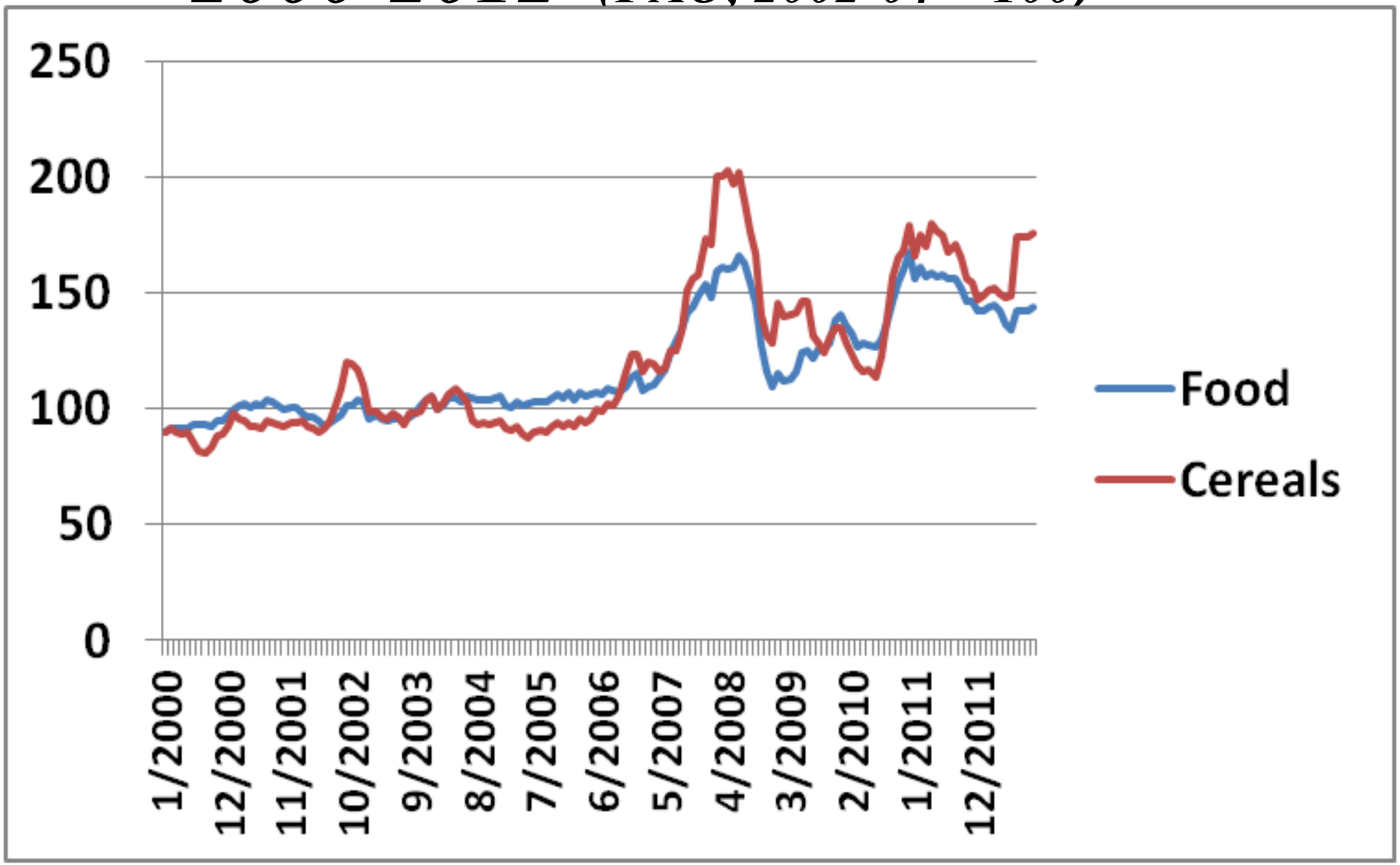
- In 20th century, real int'l food prices fluctuated around a trend that declined at 0.6%/yr
- But, over the past decade, food prices have been rising
- Those trends and fluctuations, and hence food security in SSA, were affected by govt policies in both rich and poor countries

Real int'l food prices, 1900-2000

(Source: World Bank, 1977-79 = 100)



Monthly real int'l food prices, 2000-2012 *(FAO, 2002-04 = 100)*



Global agric policy features up to 1980s

- High-income countries (HICs) used *variable* import restrictions and export subsidies to:
  - protect and insulate farmers from falling int'l prices
- Developing countries (DCs) used *variable* agric. export restrictions (plus overvalued exchange rates and manuf. tariffs) to:
  - raise govt revenue,
  - boost industrialization, and
  - placate urban demands for lower and less volatile food prices

Consequences for int'l food markets up to 1980s

- HIC policies depressed int'l food prices, while DC policies, post-independence, raised them
  - Roughly offsetting in 1980s (Tyers and Anderson 1992)

Plus:

- Anti-trade policy bias ***'thinned'*** int'l markets, making food prices fluctuate more
- Variable trade restrictions ***'insulated'*** domestic markets, which also made int'l food prices fluctuate more

Evidence since mid-1980s: much reform

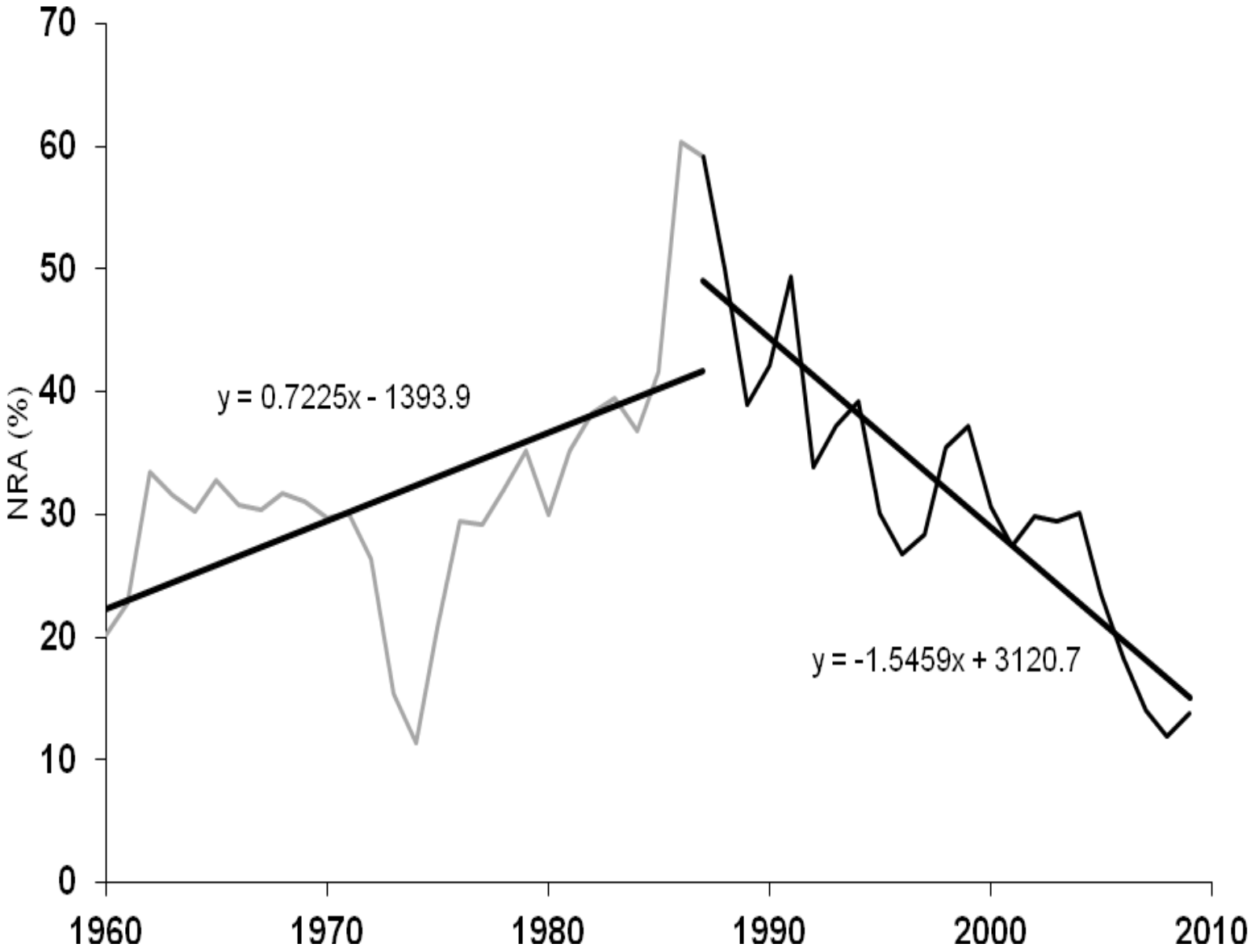
- Reduction in farm supports in many **HICs**, plus re-instrumentation away from directly price-distorting measures
  - Will that reversal prove to be permanent?
  - What about biofuel supports?
- Negative assistance to farmers in **DCs** has been reduced with econ devt
  - Will DCs stop at zero, or move into positive support (using what policy instruments)?

Agric price distortion indicators have traced those evolutions

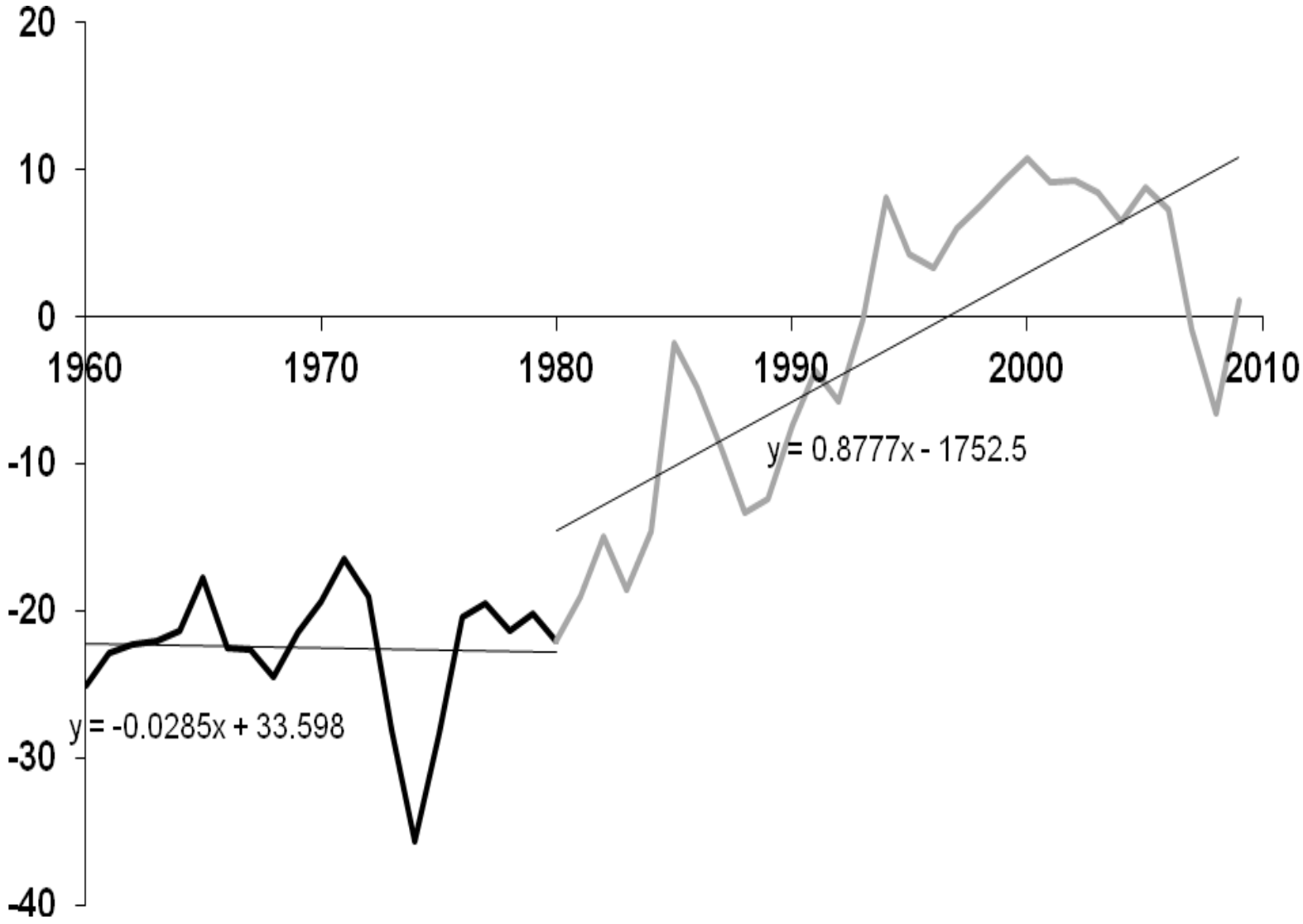
- World Bank's ***Distortions to Agric Incentives*** database covers 57 years (1955-2011), 75 products (ave. 11 per country & 70% of prodn), and 82 countries
  - Updated March 2012, at ***www.worldbank.org/agdistortions,*** and a further update will be uploaded in early 2013

- Provides national estimates of Nominal Rate of Assistance **(NRA)** to farmers
  - Think of as % by which domestic gross value of farm production exceeds what it would be without national govt interventions in the country's agric markets

Ups & downs of ag NRA for HICs



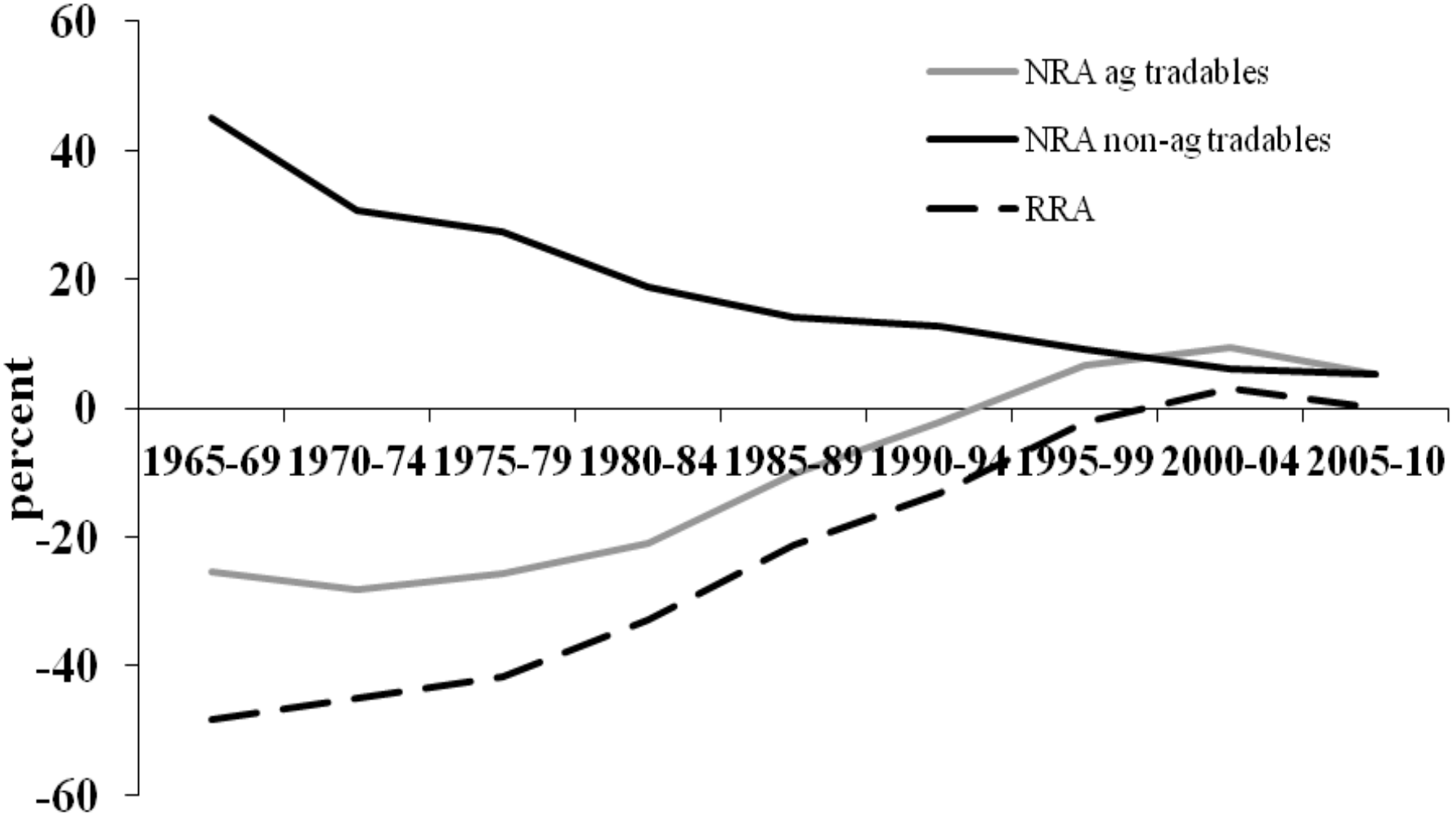
Agric NRA in developing countries



Ag. distortion indicators: the RRA

- Also estimated a Relative Rate of Assistance **(RRA)** to producers of agric relative to non-agric tradable goods
  - Think of as % by which domestic price of **all farm relative to nonfarm** tradable products exceeds what that ratio would be without national govt interventions in the country's markets for goods and foreign exchange
  - Defined as RRA = $[(1+NRAag^t)/(1+NRAnonag^t)] - 1$,
    So if $NRAag^t < NRAnonag^t$, then RRA < 0

RRA for DCs: moved from very negative to slightly positive (1965-2010, 5-yr averages)

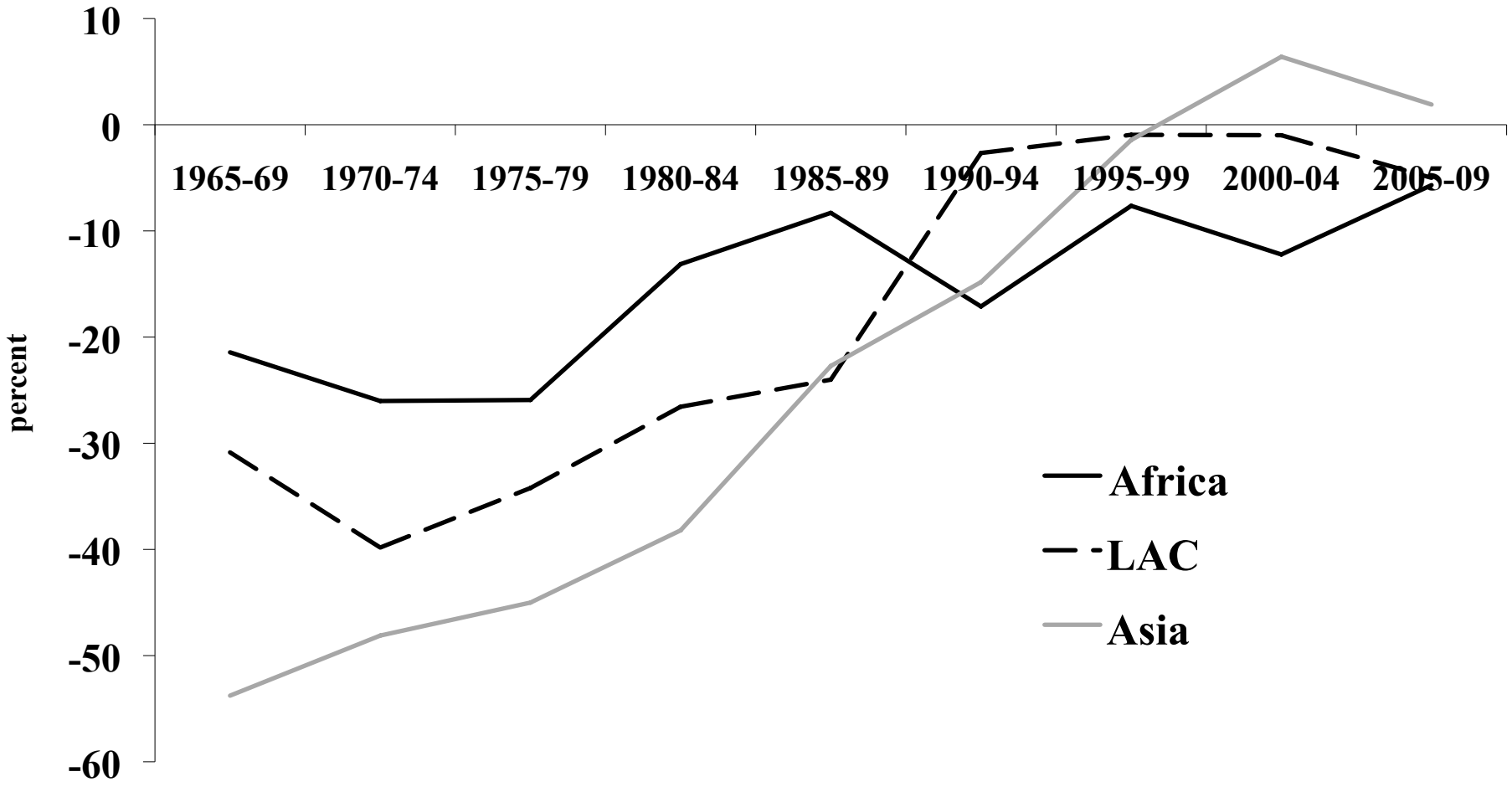


Agric vs non-ag policy reform in DCs

- Convergence of RRA toward zero since 1980
  - due equally to fall in NRA_{nonag} and rise in NRA_{agric}
- Means **DC govts have done a lot for their farmers** since mid-1980s, both
  - **indirectly**, via cuts to manuf. protection & phasing out of multiple exchange rates, and
  - **directly**, esp. via phasing out of export taxes

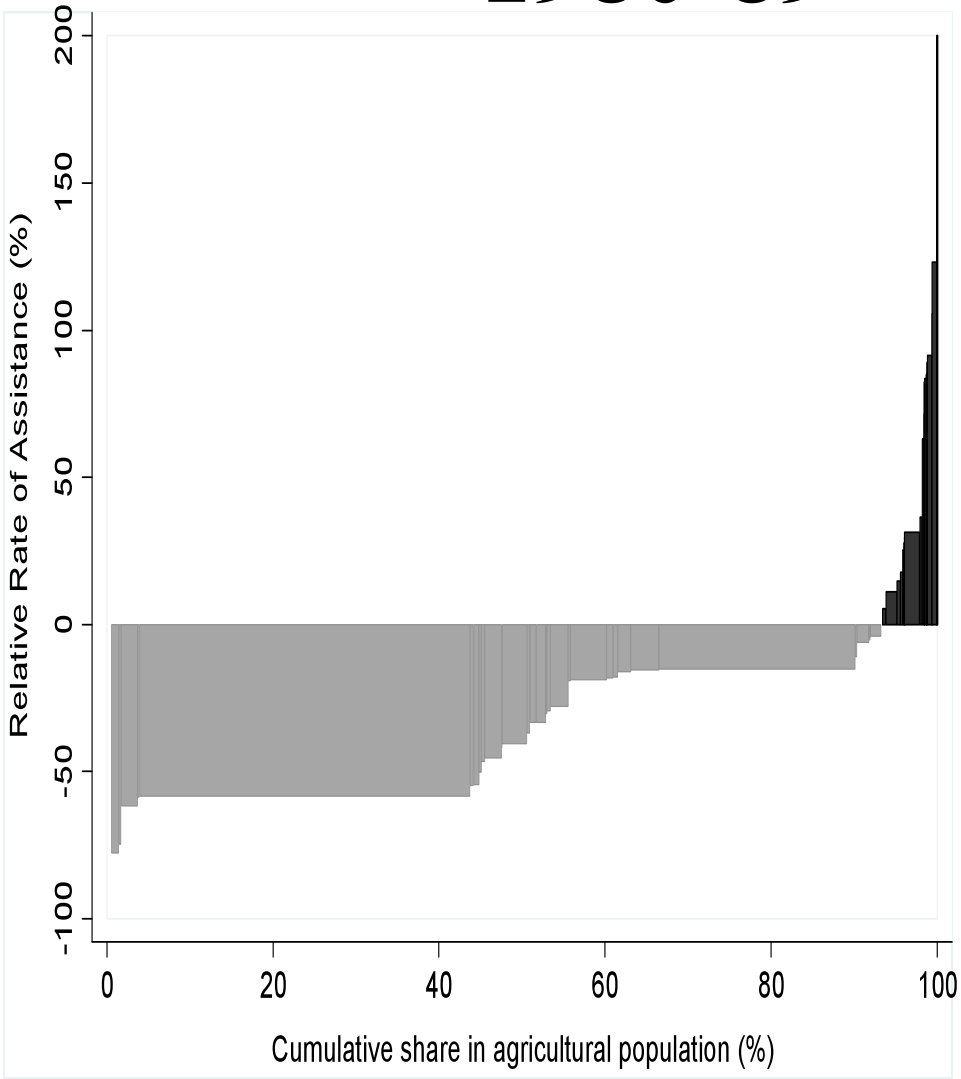
[This message gets less attention than decline in investment and ODA for agric since mid-1980s]

RRA was less negative pre-1990 but now is more negative in Africa than in other regions

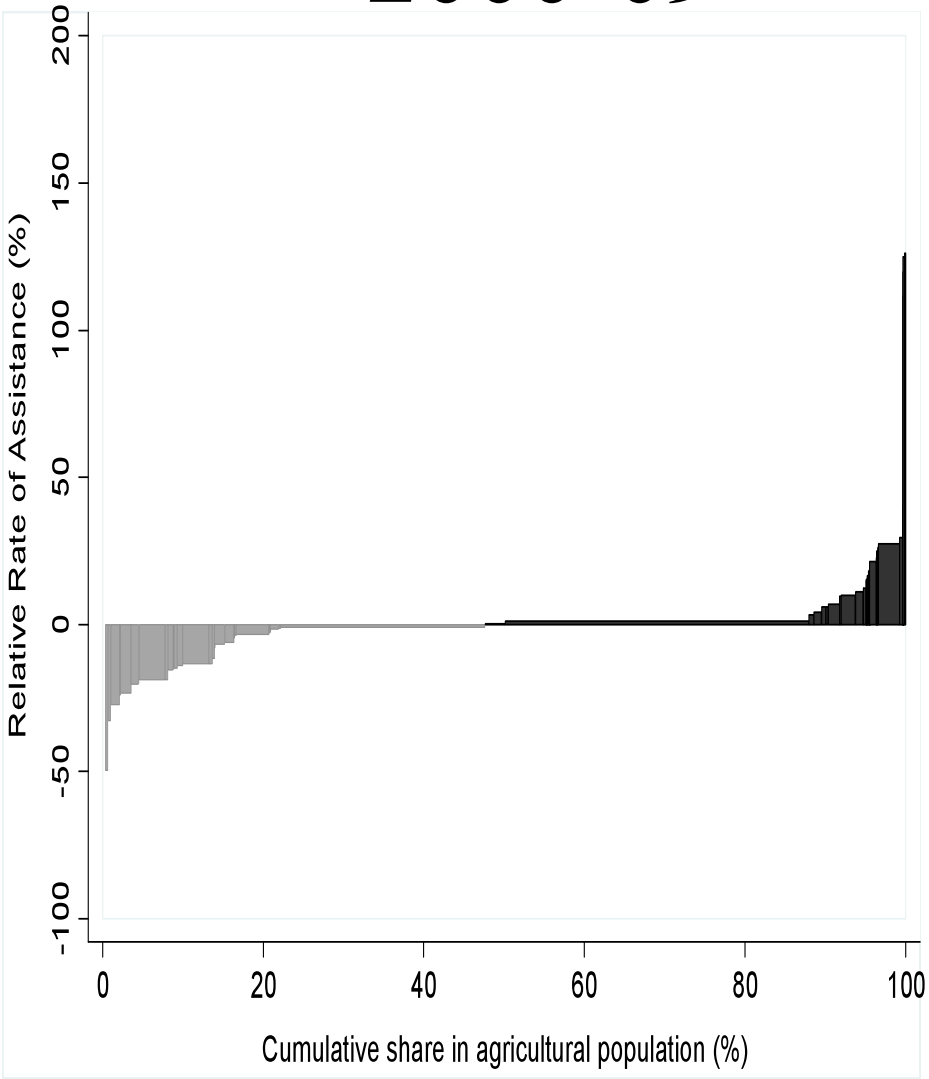


Proportions of global farm population *facing various RRAs:*

1980-89



2000-09



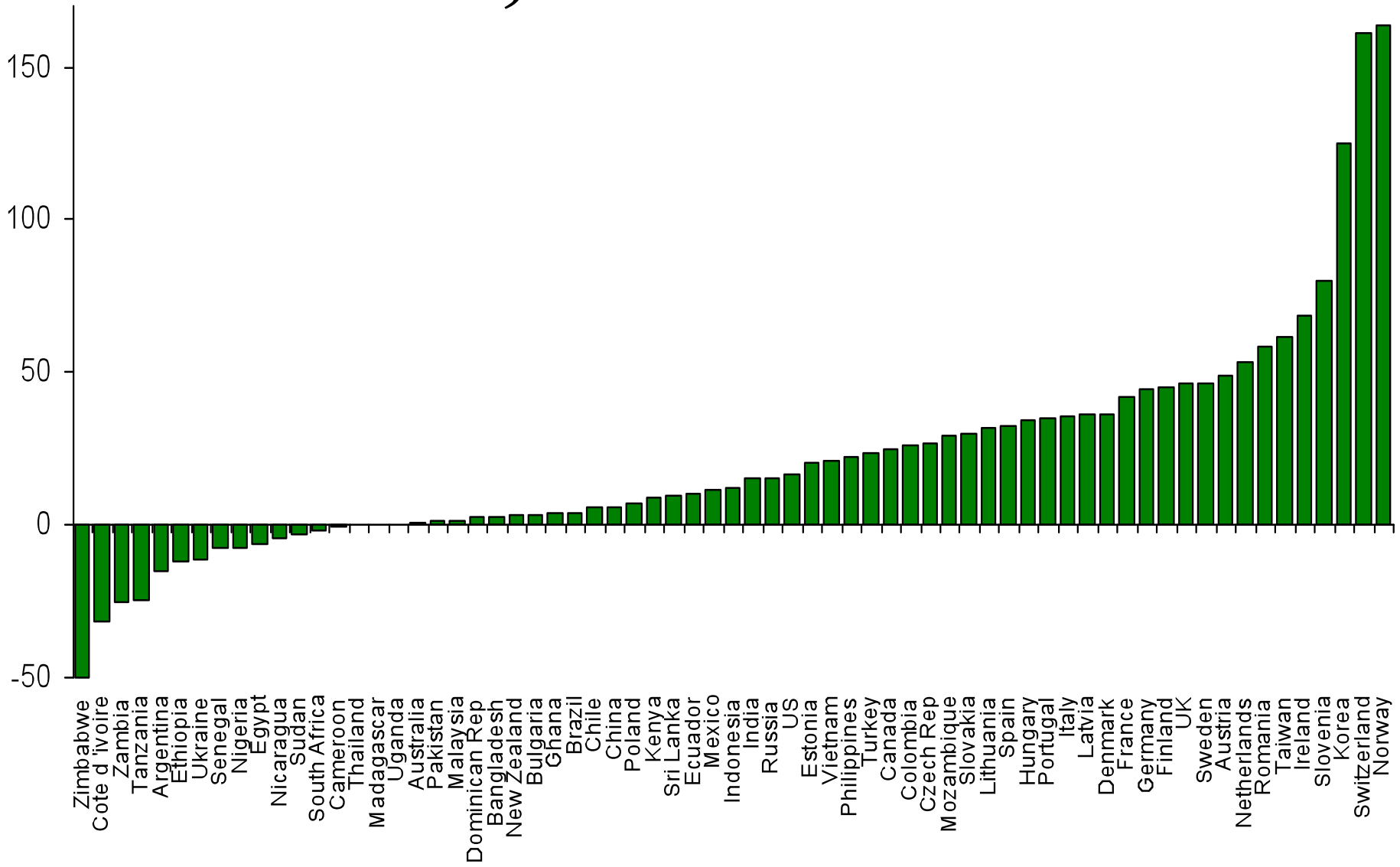
Implications for SSA food security

- Fast rise of RRA in Asia helps explain its relatively fast agric growth, and ability of China and India to retain agric self sufficiency
  - means int'l food prices have risen less since 1980s than would have in absence of Asian reforms
    - Good for SSA's net buyers of food
    - But it's reduced int'l competitiveness of SSA farmers

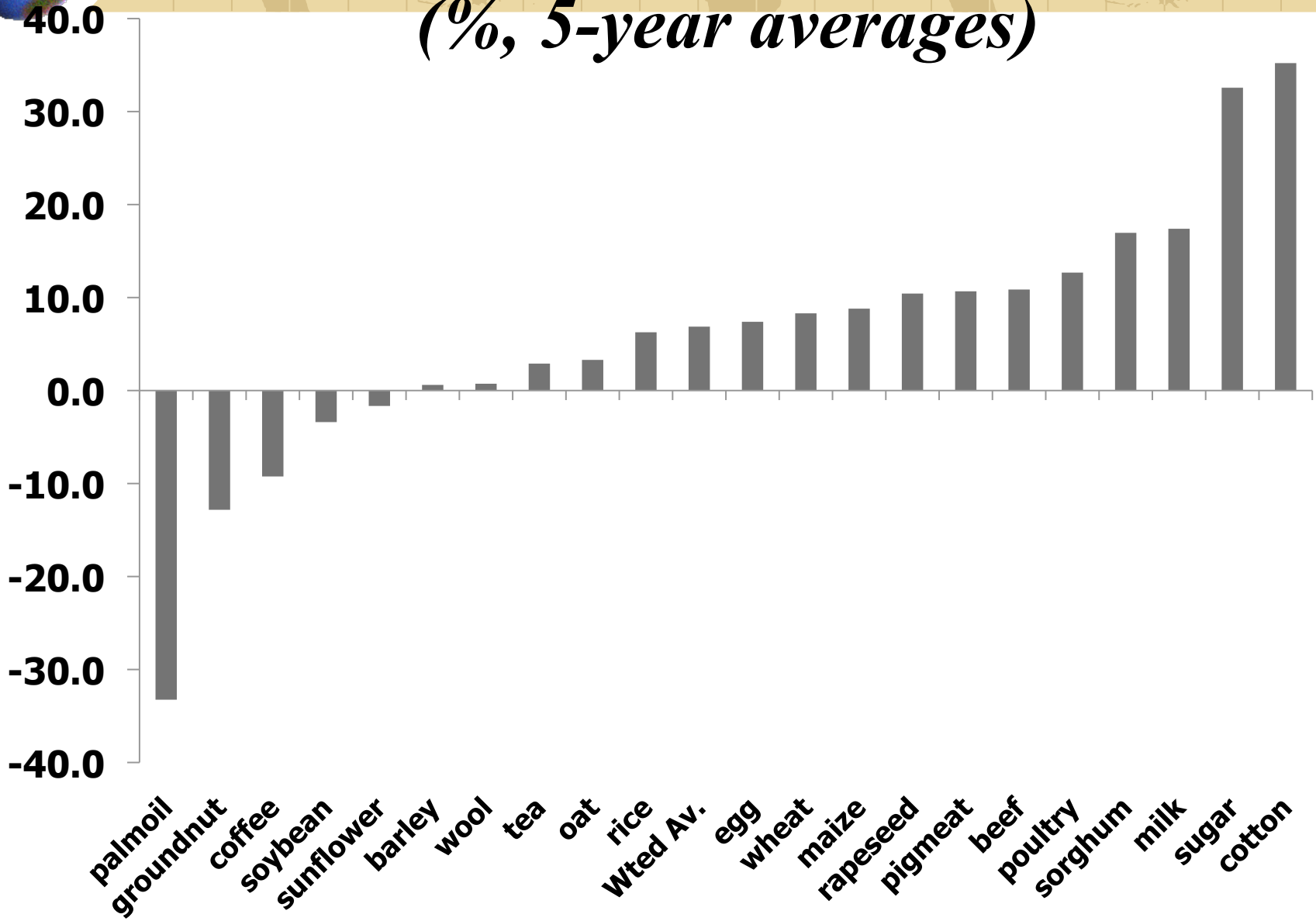
Is world nearly free of price distortions now?

- May look like most of past distortions have been removed, but **NOT SO**, because:
  - Still very ***wide cross-country dispersion of NRAs*** within HIC and DC groups
  - Still very ***wide cross-product dispersion of NRAs*** within each country's agric sector
  - As well, some distortions don't show up as a wedge between domestic and border ag prices, so aren't included in these indicators
    - e.g. ***biofuel*** subsidies & mandates, ***water*** subsidies

Dispersion in NRAagric across countries, 2000-04



Global NRA averages by product, 2005-09 (%, 5-year averages)



How far has the world come to being free of goods trade distortions?

- Adverse global welfare & trade effects of trade policies & agric subsidies were reduced ***by nearly 3/5^{ths}*** between 1980-84 and 2004, according to global CGE Linkage model back-casting results
  - see Ch. 12 in Anderson, K. (ed.), *Distortions to Agricultural Incentives: A Global Perspective, 1955-2007*. Palgrave Macmillan, 2009

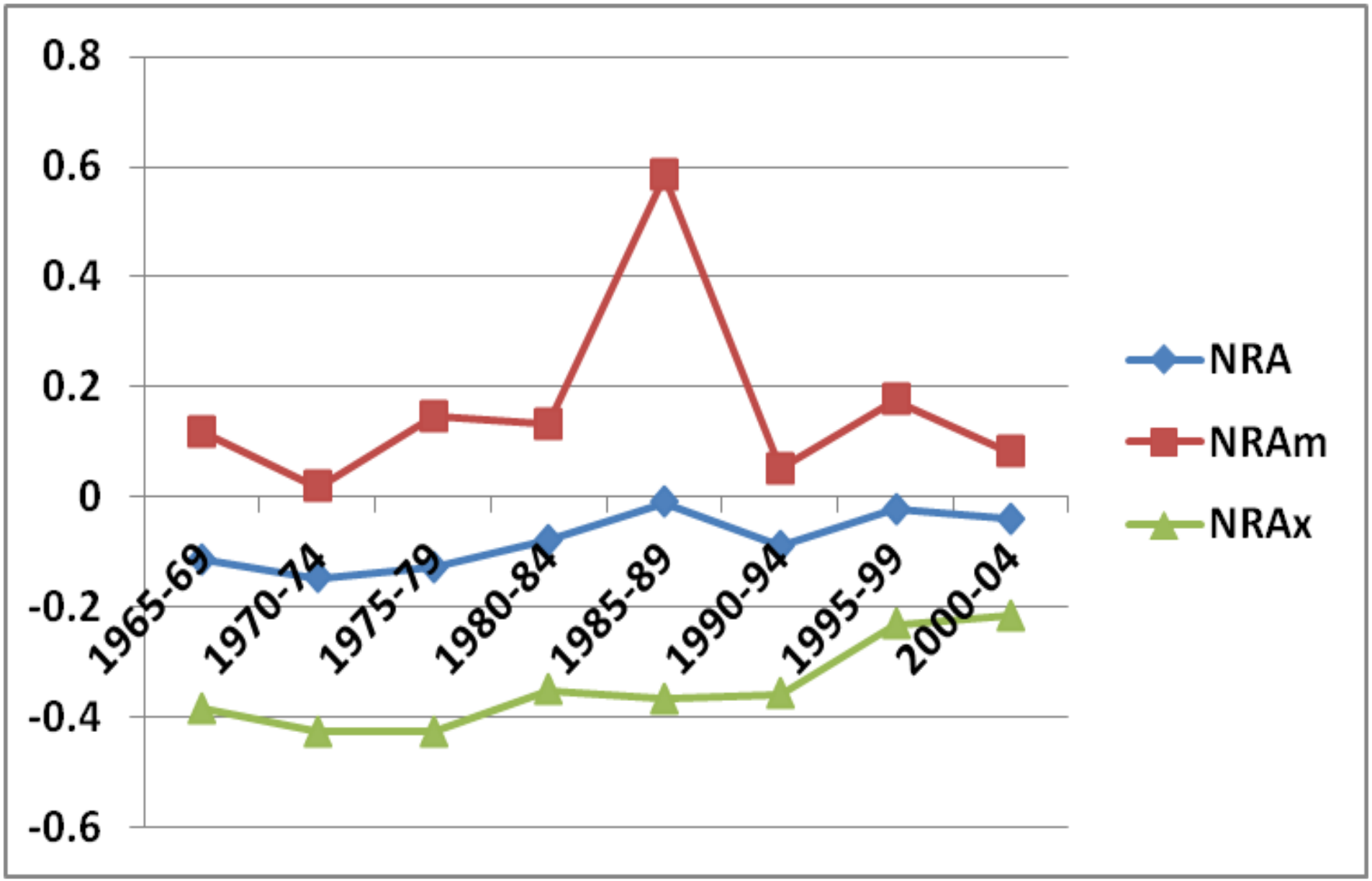
Would removal of remaining distortions (as of 2004) benefit DCs, reduce poverty, and reduce inequality?

- Answers: **Yes, yes, and yes**, according to CGE model results that, *inter alia*, include effects on wages
  - About half DC benefit would come from national unilateral lib'n, other half from rest-of-world lib'n
    - based on global and national GCE analyses, calibrated with DAI project's 2004 agric distortions estimates
  - Provides more reasons to resuscitate the WTO's Doha round
    - Anderson, K., J. Cockburn and W. Martin (eds.), *Agricultural Price Distortions, Inequality and Poverty.* World Bank, 2010

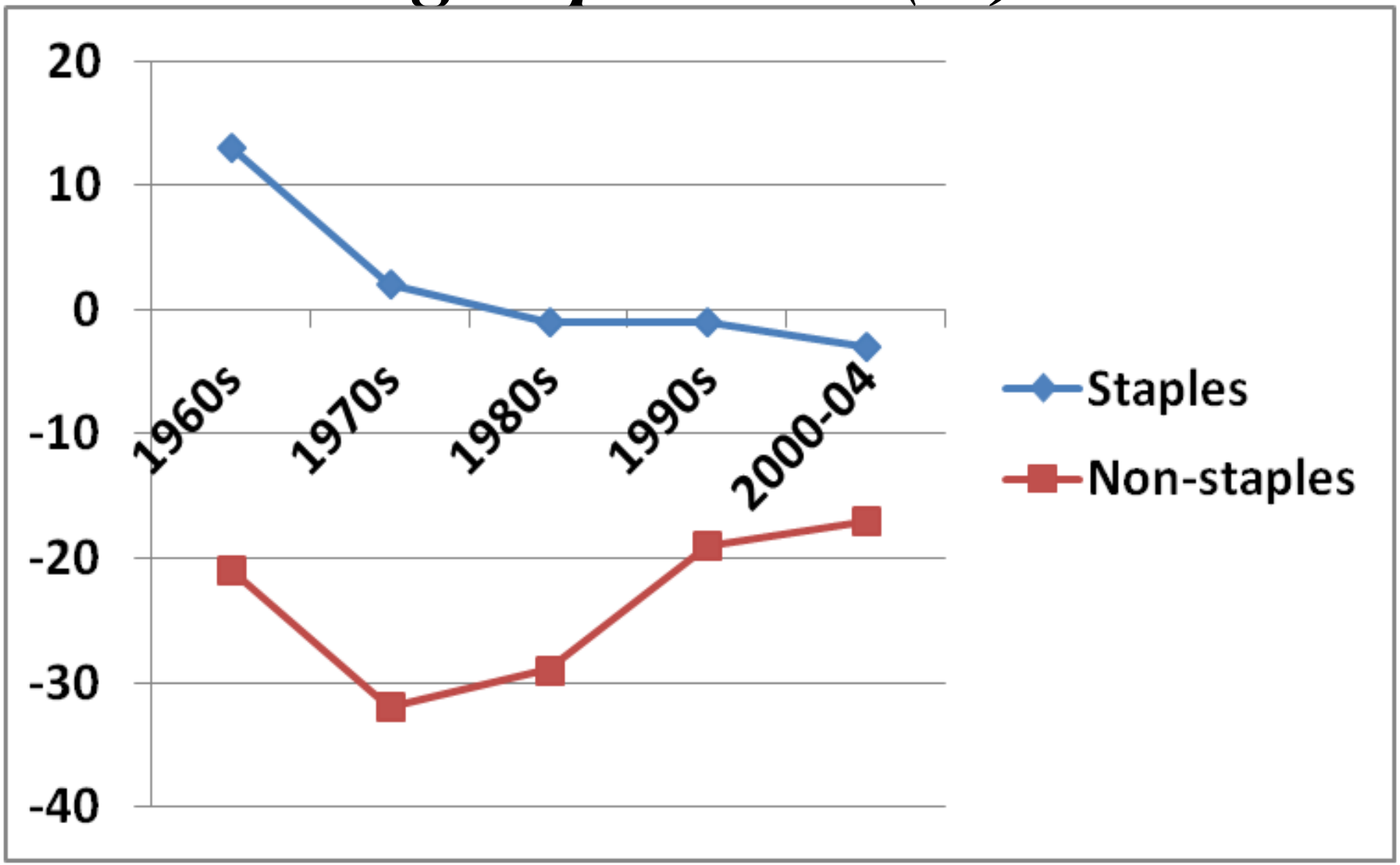
How have agric distortions evolved within Sub-Saharan Africa?

- Strong anti-trade bias persists
- NRAs are higher for food staples than for non-staple farm products
  - e.g., NRAs have been close to zero for grains, but very negative for export crops

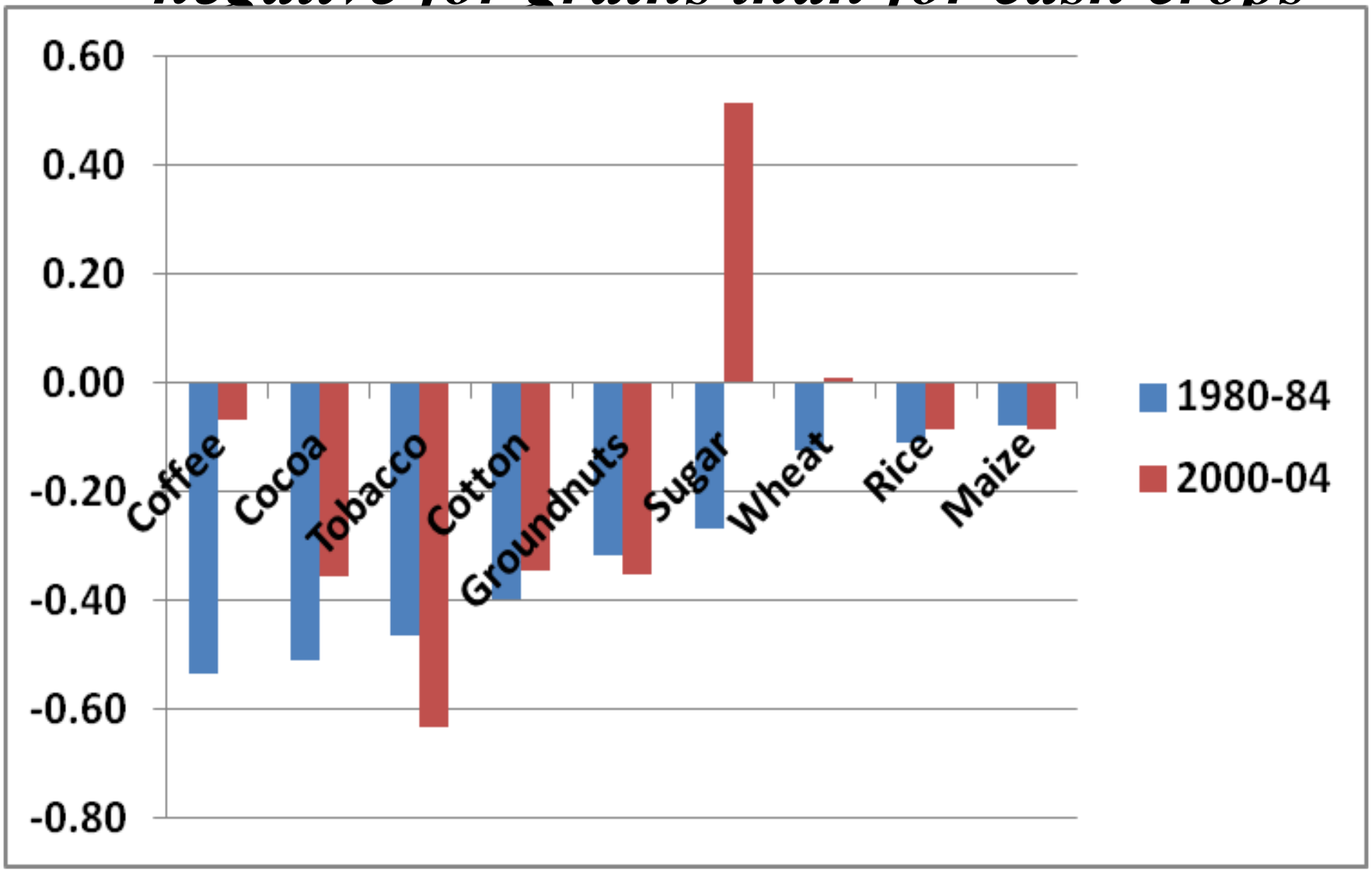
Anti-trade agric policy bias in SSA



SSAfrican NRAs, food staples and other agric products (%)



SSAfrican NRAs by product: less negative for grains than for cash crops



Did the reduction in farmer disincentives since 1980s raise econ growth in SSAfrica?

- **Yes,** according to a recent econometric study
  - Anderson, K. and M. Brueckner, "Distortions to Agriculture and Economic Growth in Sub-Saharan Africa", World Bank Policy Research Working Paper 6206, September 2012
- Therefore it's unfortunate that more reform hasn't occurred in SSA, to slow the decline in int'l competitiveness of African farmers

2nd set of key messages

3. Trade reforms since 1980s have gone a long way toward liberalizing food markets

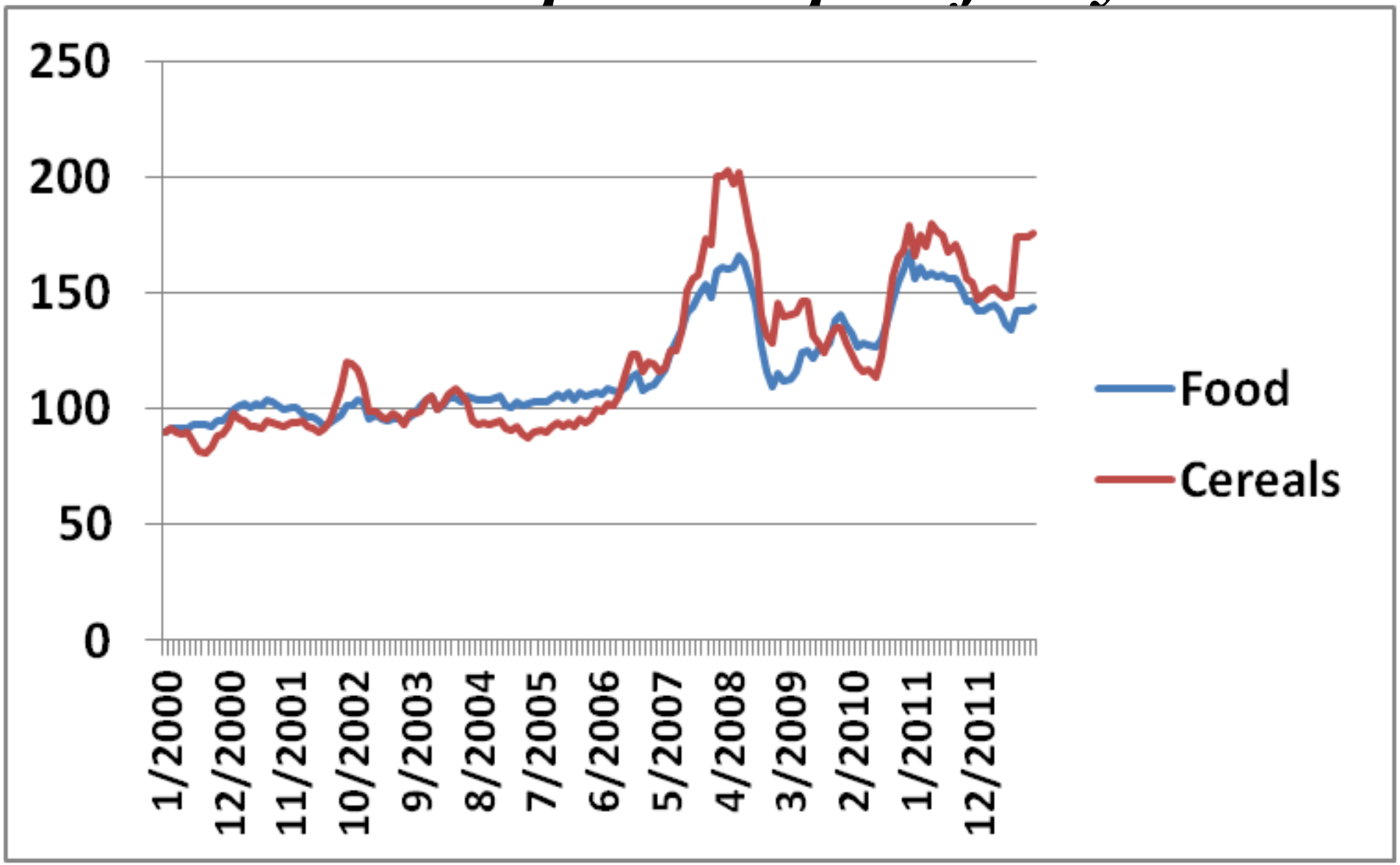
4. But many policies continue to cause inefficient use of agric resources in Africa and elsewhere

   -- hence still undermining African food security

How have governments used trade to deal with int'l food price *fluctuations*?

-- again globally, and then in SSAfrica

Monthly real int'l grain prices – three spikes in past five years



Household effects of temporarily altering trade restrictions to stabilize domestic food price

- Developing countries tend to impose or increase export restrictions, or to lower or suspend import restrictions, when international food prices spike up – and conversely when prices slump

- Benefits net buyers of food at the expense of net sellers in both food-surplus and food-deficit countries during upward price spike

Household effects of temporarily altering trade restrictions (continued)

- When **many** countries temporarily impose or increase export restrictions or lower import restrictions when int'l food prices spike up, it:
  - exacerbates the int'l price change and hence the domestic price change in open economies
  - harms even more the latter's net buyers of food, and helps net sellers
  - and it reduces the adjustment by producers and consumers and so prolongs the spike period

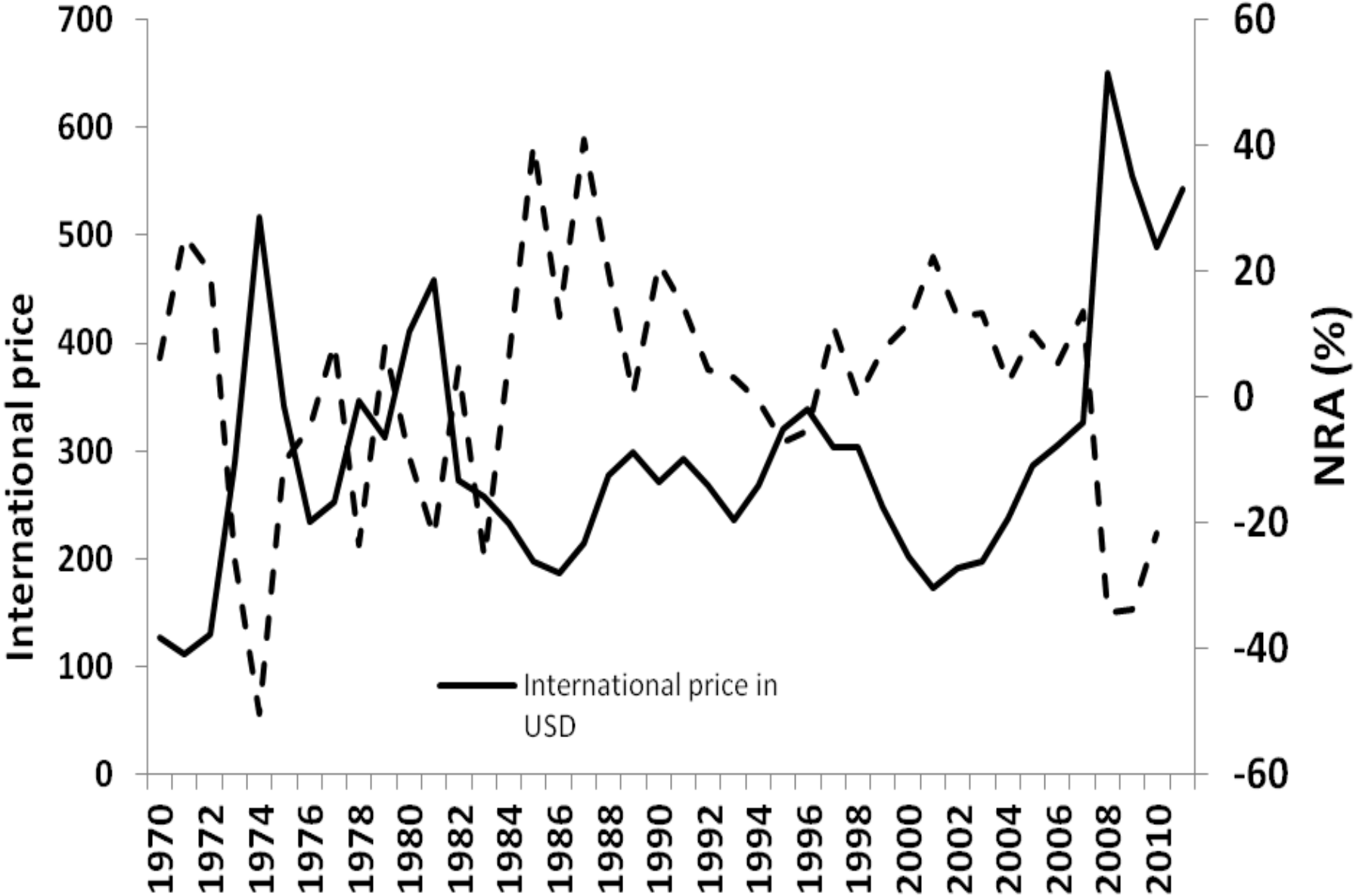
National and household effects of rest-of-world using trade to stabilize domestic food prices (cont.)

- What if a similar proportion of the world's exporting and importing countries so alter their border barriers?
  - Their impacts on global trade volume are **offsetting,** & their domestic food price is no different than if neither country group altered their trade restrictions
- ***It's similar to the futility of many people standing up in a stadium to see better***

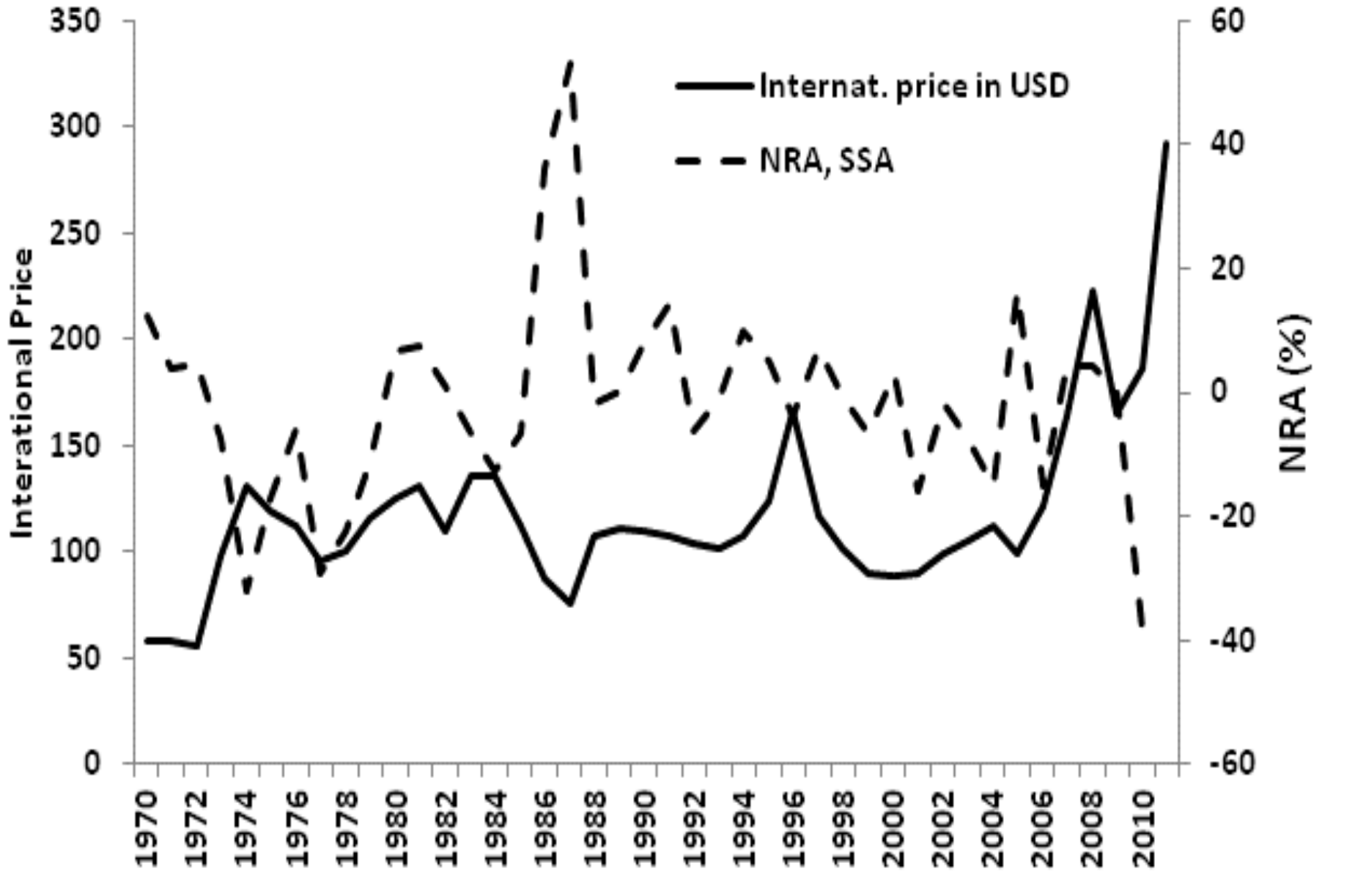
Evidence of domestic mkt. insulation

- 1. Most farm product NRAs tend to be negatively correlated with movements in int'l product price, both up and down

Rice NRA, SSAfrican average, 1970-2010



Maize NRA, SSAfrican average, 1970-2010



Evidence of domestic mkt. insulation

- 1. Most farm product NRAs (and CTEs) tend to be negatively correlated with movements in int'l product price, both up and down

- 2. On average for 82 countries in DAI database, for top dozen traded farm products, **barely half** the change in an int'l price is transmitted to domestic markets within first year
  - Partly due to trade costs, but also govt. barriers

Short-run price transmission elasticities

Globally (82 countries), 1985-2010	
Rice	0.49
Wheat	0.55
Maize	0.63
Top 12 foods	**0.56**

How much did changes in trade barriers contribute to the int'l price spike in 2006-08?

- If we assume supply cannot respond in short term, & national demand elasticities are equal, then back-of-envelope contrib'n of altered trade restrictions to int'l price rise is simply a function of consumption-weighted global average of changes in trade tax equivalent of trade barriers

  - Martin, W. and K. Anderson "Export Restrictions and Price Insulation During Commodity Price Booms", *American Journal of Agricultural Economics* 94(2): 422-27, January 2012

Int'l price rises (cumulative, nominal, %)

	2006-08
Rice	**113**
Wheat	**70**
Maize	**83**

Proportional contribution of changes in trade restrictions to int'l price spikes

	2006-08
Rice	**0.40**
Wheat	**0.19**
Maize	**0.10**

How much would int'l prices have risen in 2006-08 **without** *altered trade restrictions (%)?*

	International price rise:		**Domestic price rise in:**	
	including contribution of changed trade restrictions	***net of contribution of changed trade restrictions***	**All developing countries**	**Africa**
Rice	113	***68***	48	49
Wheat	70	***56***	65	91
Maize	83	***75***	62	62

Bottom line for SSA:

- Even if its insulation from the int'l price spike prevented some people from becoming more food-insecure, the number was made far smaller because many other countries also insulated
  - And net sellers of food were denied much of the price rise

Domestic policy implications

- SSA countries could agree regionally to desist from using export restrictions when int'l prices spike, & instead assist losers by using a consumption subsidy
  - Avoids beggaring-thy-neighbor, and prod'n distortion component of a trade measure
  - **and,** thanks to ICT revolution, such assistance can be targeted to just the most needy households, & for just the weeks of high prices
    - e.g., by using conditional cash e-transfers as part of broad-based social protection policy

Domestic policy implications (cont.)

- In many SSA countries, food import dependence is politically sensitive
- It's likely to grow with climate change, and China-driven mining boom
- Since lowering it with import restrictions is welfare-reducing, better to lower it by reducing under-investment in agric R&D
  - & removing ban on GMO technology would encourage private agric R&D too

Domestic policy implications (cont.)

- In past decade, SSAfrica's spending on agric R&D has been only 0.5% of agric GDP (c.f. >1% in rest of world, and 0.75% in SSA in 1960s and 1970s)
  - Pardey, P.G., J.M. Alston and C. Chan-Kang (2012), 'Agricultural Production, Productivity and R&D over the Past Half Century', Staff Paper P12-7, Dept of Applied Economics, University of Minnesota, St Paul MN, September
- ... which helps explain low agric productivity growth in SSA

Domestic policy implications (cont.)

- If trade reform generates little extra trade because of high trade costs, invest in infrastructure to lower them
  - in rural areas as well as at national border
  - in communications as well as transport

Implications for WTO's DDA

- What can be done to:
  - (i) lower remaining agric protection in HICs
  - (ii) reduce the risk of agric protection growth in rapidly industrializing DCs
  - (iii) encourage less insulation of domestic markets by both HICs and DCs?
- WTO's Doha Devt Agenda aims at reducing bound tariffs and subsidies
- If resurrected, DDA could add similar bindings to export restrictions, to reduce int'l public 'bad' of beggar-thy-neighbor insulation

Thanks!

- All Agric Distortions Research Project working papers, regional and poverty e-books, and global distortions database are freely available at: ***www.worldbank.org/agdistortions***

- Anderson, K. (ed.), *Distortions to Agricultural Incentives: A Global Perspective, 1955-2007*. Palgrave Macmillan, 2009
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Trade and Food Security in Africa:
Some Reflections

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Global Food Policy and Food Security Symposium
Stanford University, January 23, 2013

Issues

- Heterogeneity of impacts
- Institutions and trade policy reform
- Trade & global supply chains
- Spillovers & general equilibrium effects

The Right Price of Food

- Pre- 2007: dominant concern was that low food prices were causing poverty (and food insecurity) by harming poor farmers
  - Trade policy : emphasis on removal of rich country subsidies/ tariffs to increase agri/food prices
- Post-2008 : dominant concern is that high food prices are causing poverty (and food insecurity) by harming poor consumers
  - Trade policy : focus on reducing export constraints to reduce food prices

The Right Price of Food

- Various definitions …

"*The Right Price of Food is the Undistorted Price*"
Stefan Tangermann (ex-OECD)

- Logic/coherent, but heterogenous effects are important

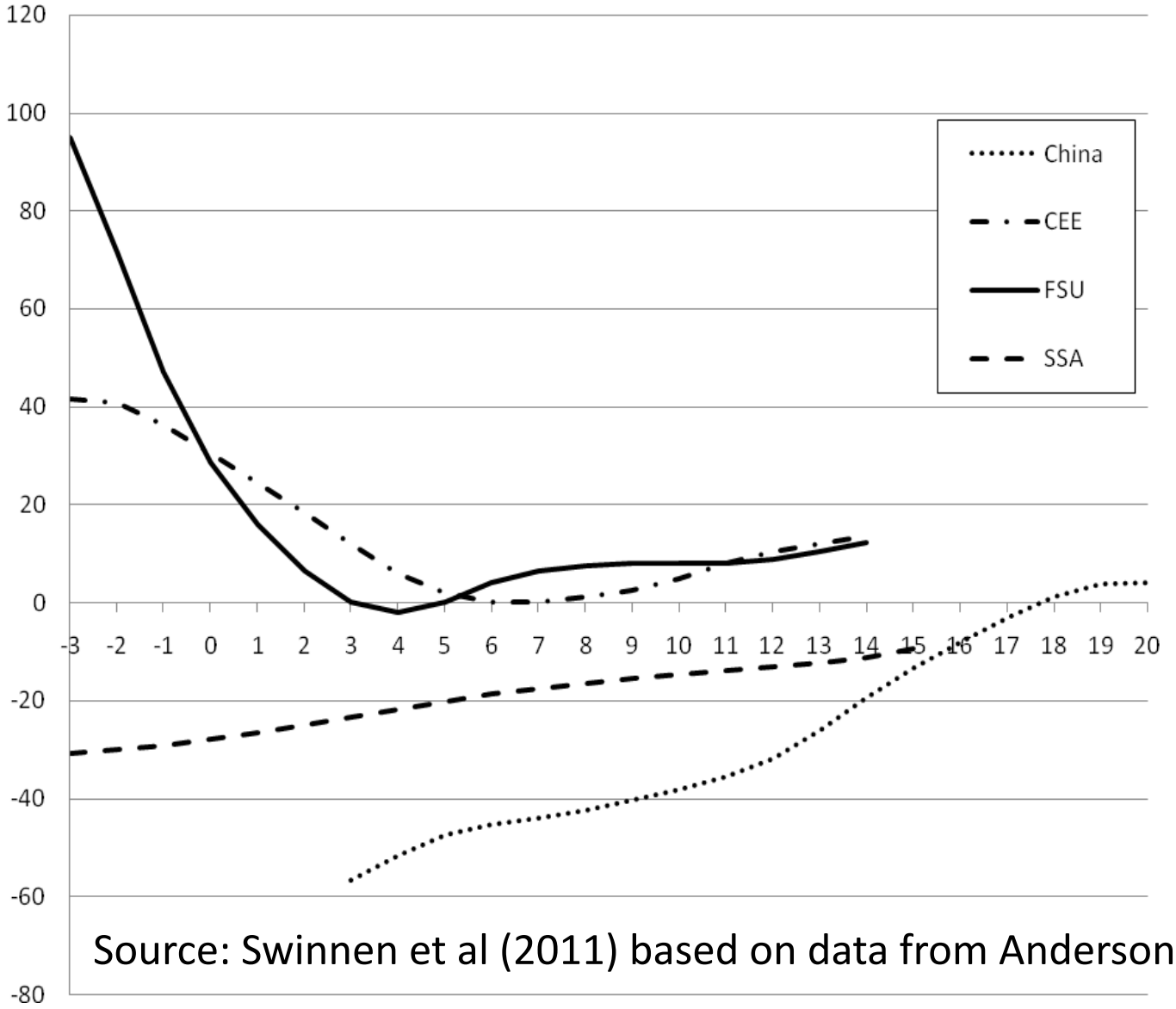
Heterogeneity

- Price changes or trade policy changes: Some gain, some lose

- Impact depends on
  - Prod/Cons status of the household/country
  - Nature of the price change
  - Nature of the policy change*

* simultaneous removal of biofuel and irrigation subsidies could be like everybody sitting down in stadium

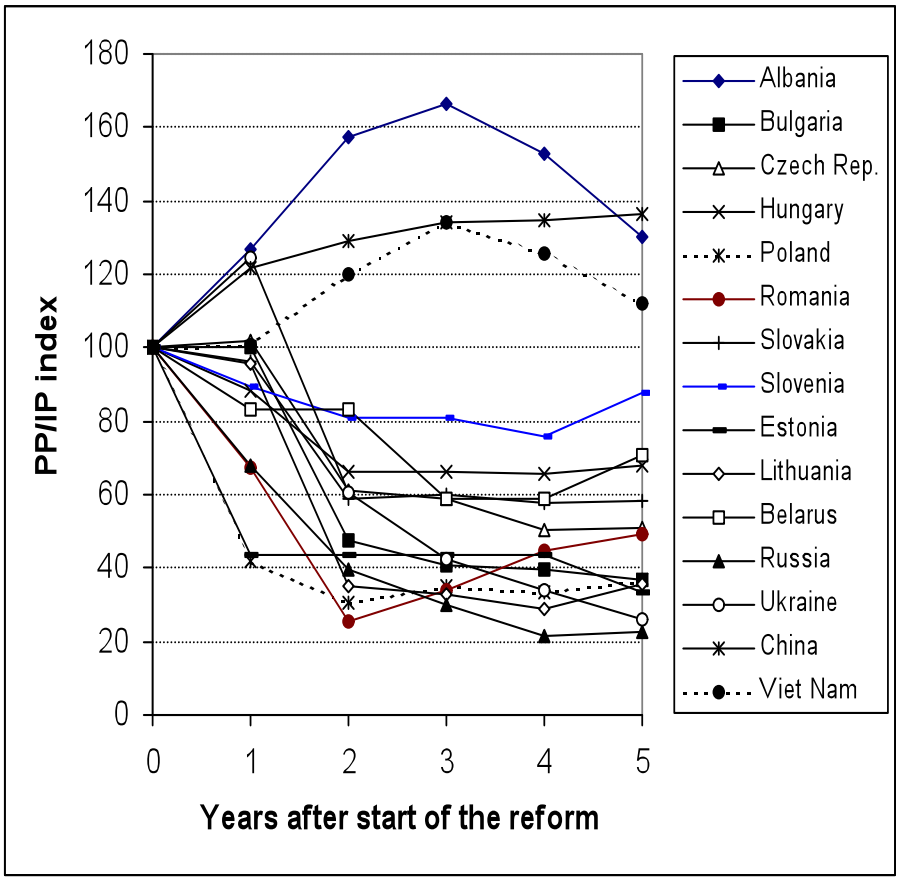
Policy Change: Liberalization & NRAs



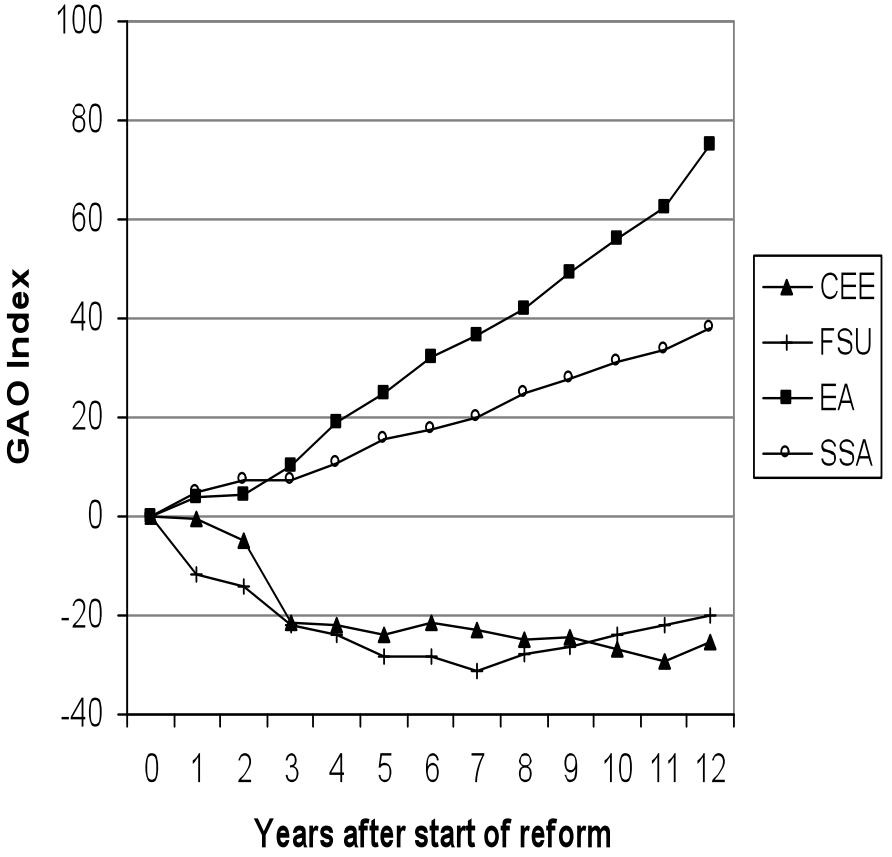
Source: Swinnen et al (2011) based on data from Anderson & OECD

Effects of Liberalization

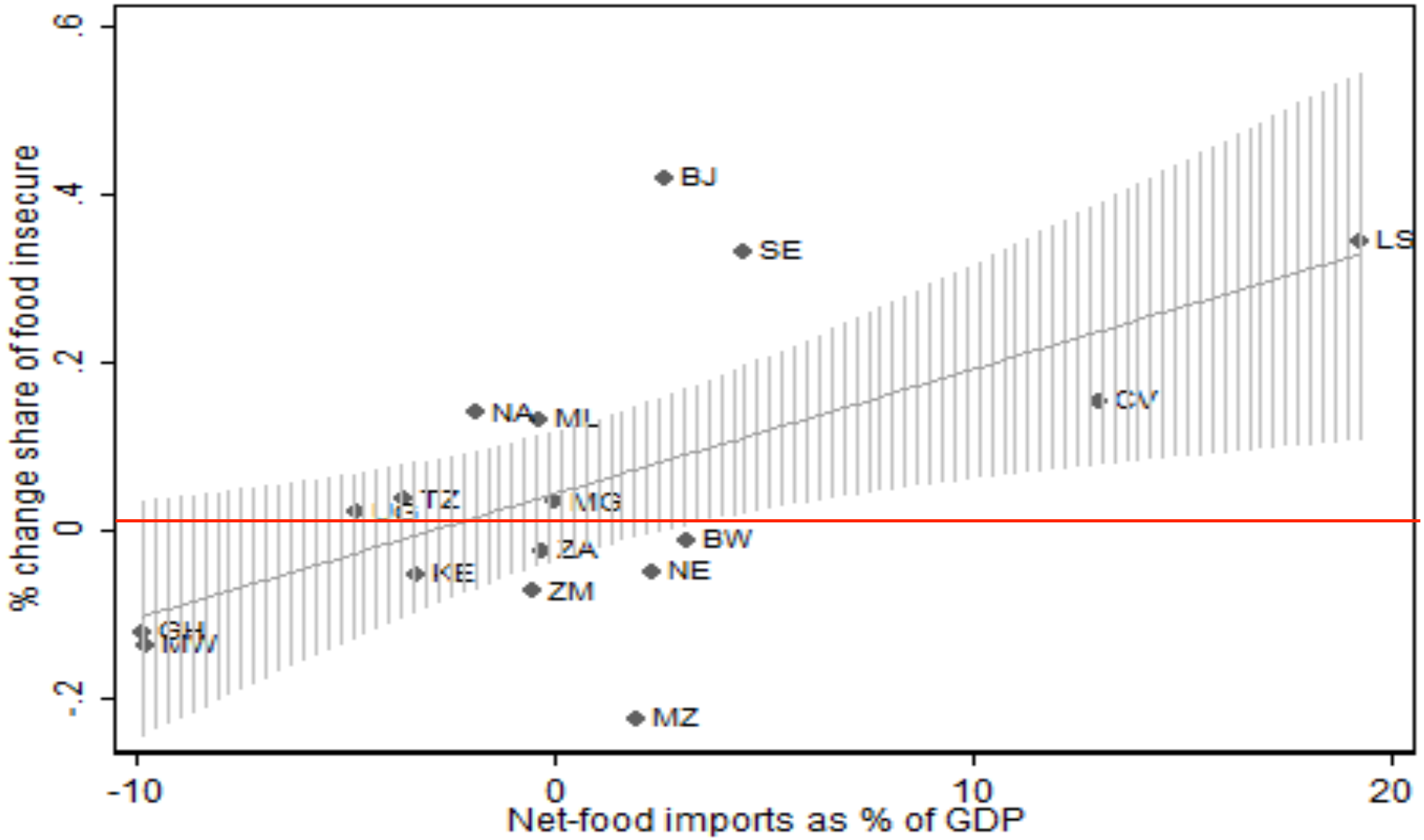
Prices (ToT)



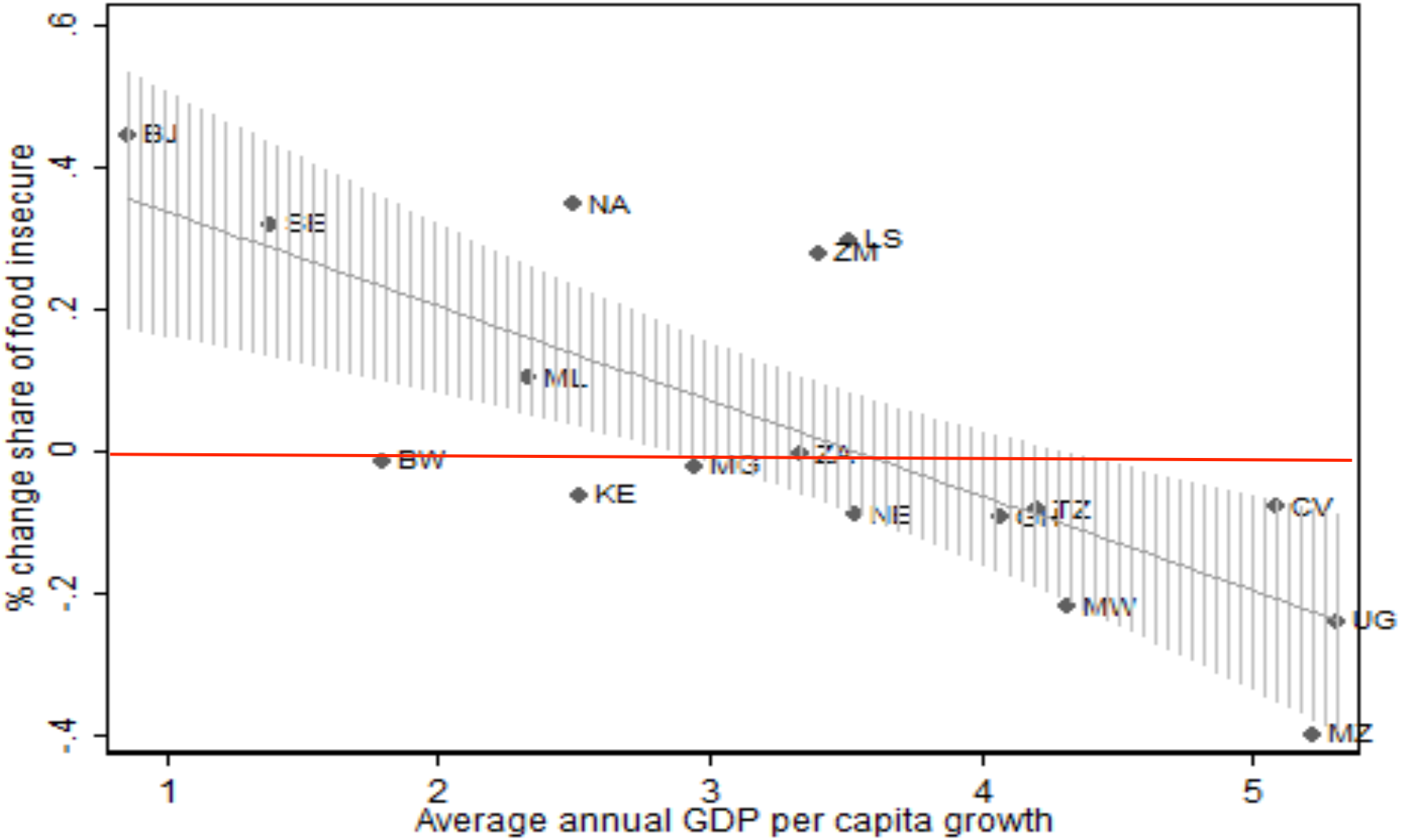
Agric Production



Price Change 2005-08: Food Security and Trade Status



Price Change 2005-08: Food Security and Growth

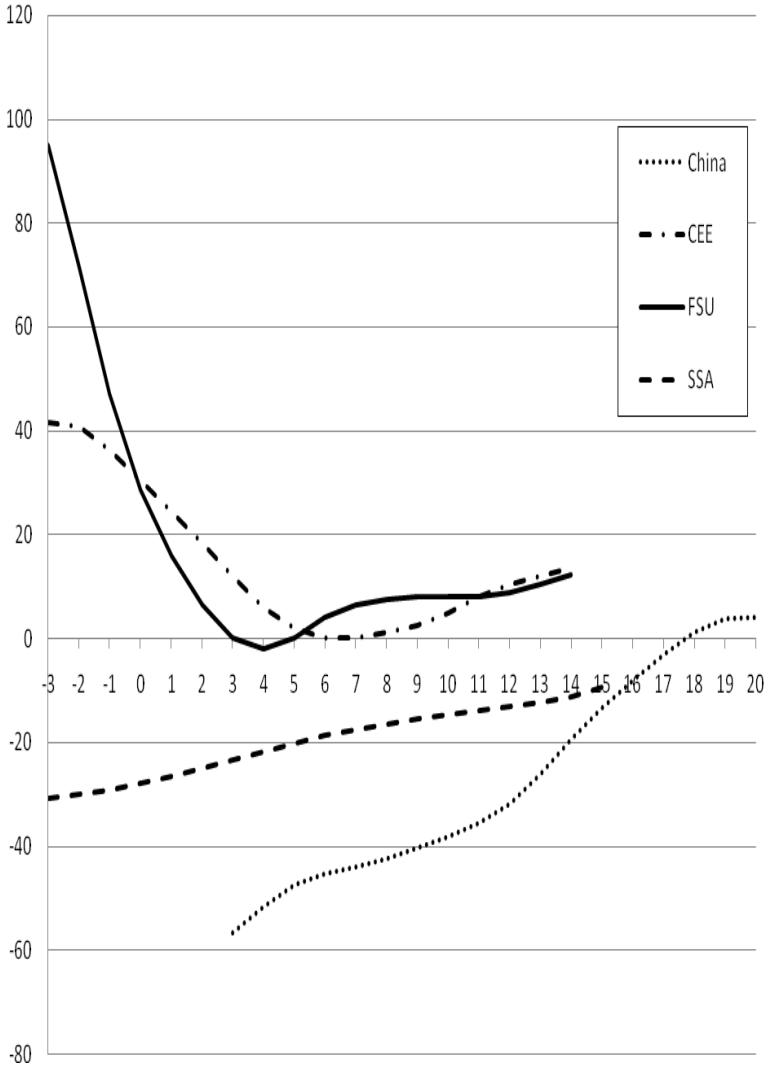


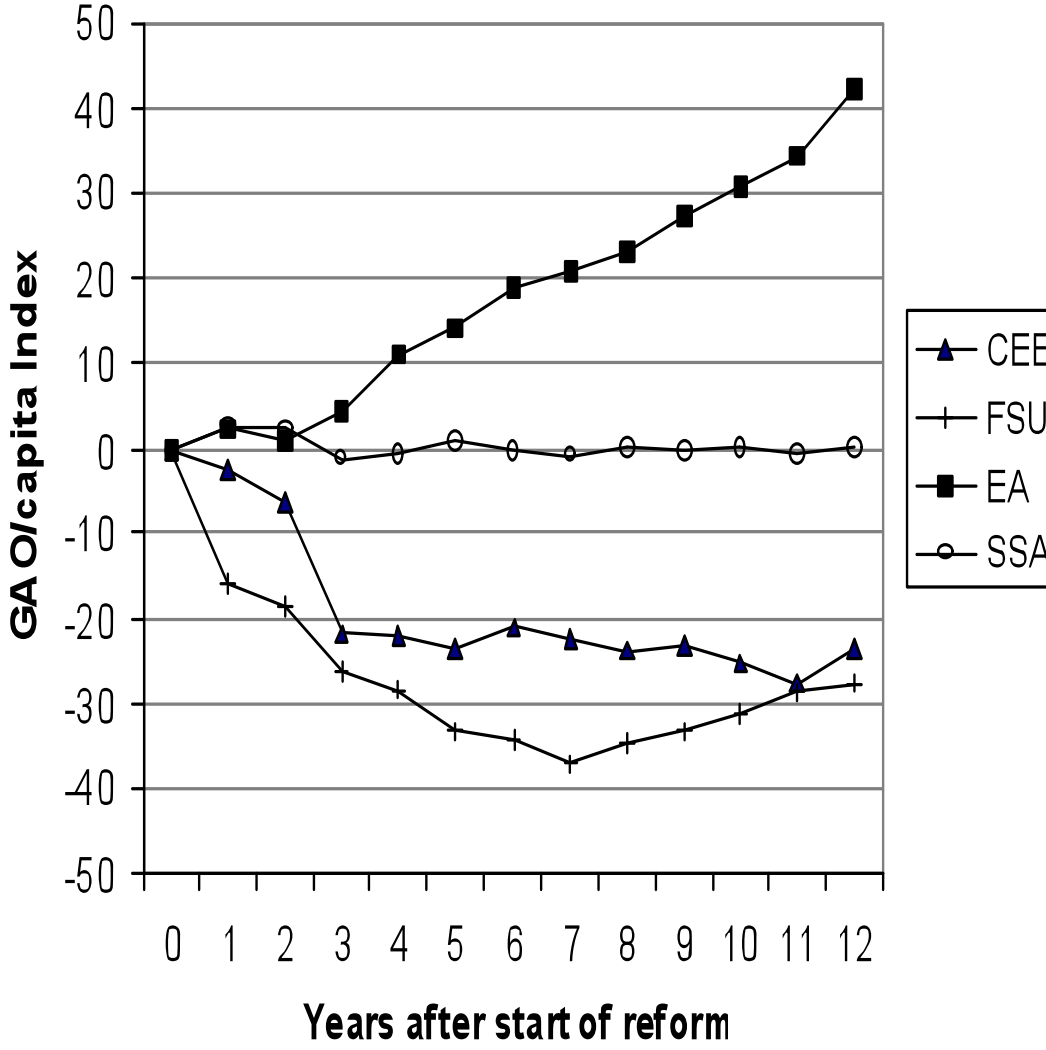
Urban vs Rural Food Security & Heterogenous Price Effects

	(1)	(2)	(3)
Dependent variable:	foodins1	foodins2	foodins3
Panel A: using international price data			
Mean log price past year	0.137***	-0.102**	-0.322***
	(0.0488)	(0.0478)	(0.0526)
Urban	-0.611**	-0.992***	-1.652***
	(0.2950)	(0.3070)	(0.3770)
Urban X log price past year	0.0737	0.150**	0.284***
	(0.0607)	(0.0632)	(0.0776)
Country fixed effects	yes	yes	yes
Observations	50,470	50,470	50,470

Institutions

Liberalization Effects in Africa: NRAs & Agric Production (per Capita)

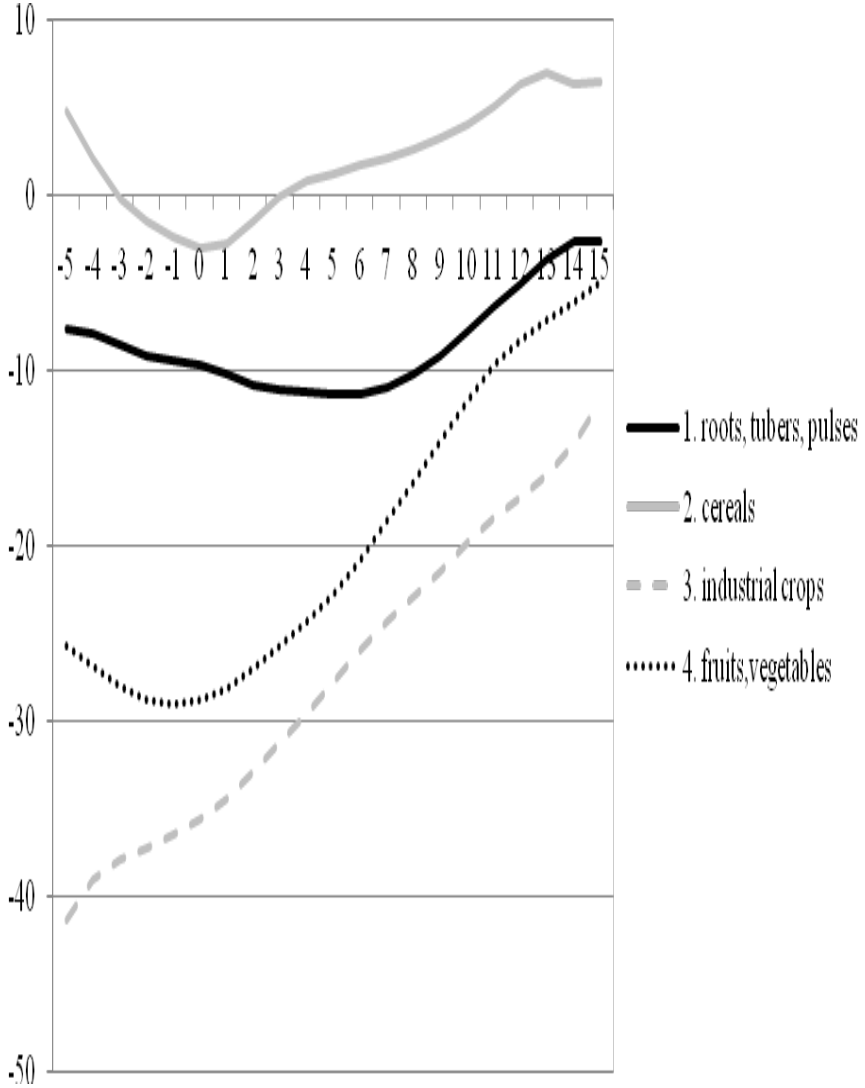


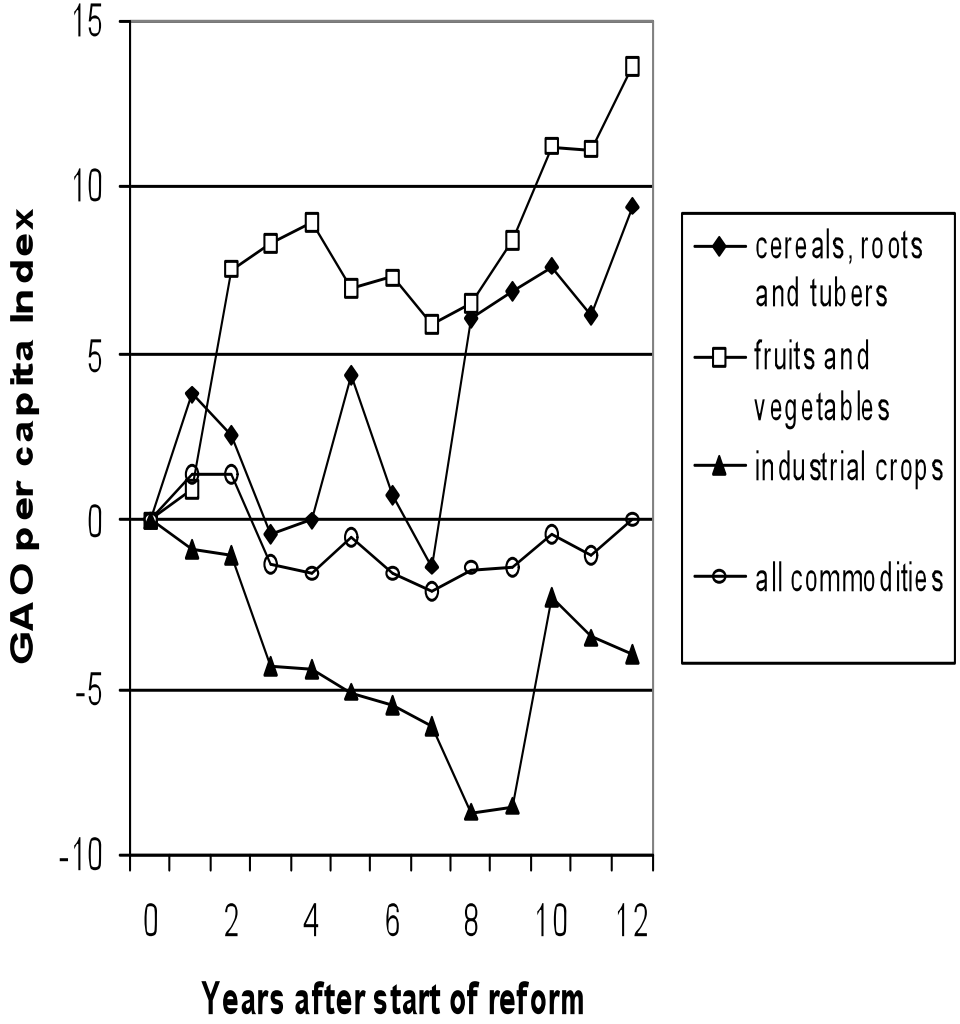


Agricultural Productivity (TFP)

- China
  - First 5 years : + 5% annually
  - Later: + 2% annually
- Eastern Europe
  - First 3 years : - 2.5%
  - Afterwards : + 4.5 %
- SSA
  - Declined in 1960s & 1970s
  - Since 1980s : + 1% annually over 20 years

Liberalization Effects in SSA
by Ag-Food Commodity Type:
NRAs & Agric Production (per Capita)





A Theory of Liberalization

- The simple model: “Getting prices right”

- In reality: institutions matter !
  - One should take into account a broader set of exchange institutions than “simple (spot) markets”
  - In particular: vertical coordination was very important both BEFORE and AFTER liberalization

"69% of 35 billion $ credit in the Brazilian agri-food system is supply-chain credit"

Banco do Brasil (2004)

"Private agricultural marketing companies are … in practice the sole providers of seasonal input advances to the small-scale farming community."

IFAD (2003, p.5)

Theory: Some implications

- "Value" will affect
  - the governance structure of the chain
  - (directly and indirectly) the supply reaction to liberalization

=> Private VC unsustainable at low(er) value in competitive markets

=> Major differences to be expected among countries and commodities:

  - Richer countries & higher value chains : faster/more private response to liberalization
  - Poorer countries & lower value in chains : slower/less private response to liberalization

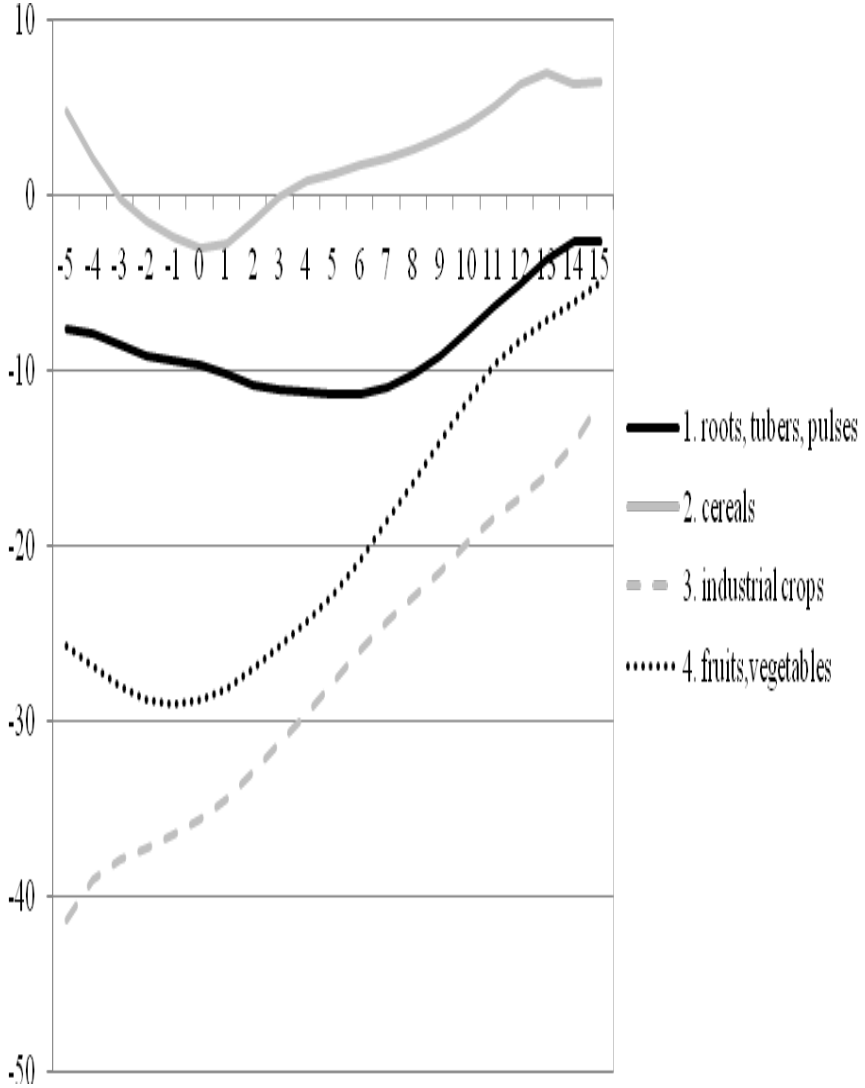
Heterogenous commodity responses to liberalization in SSA

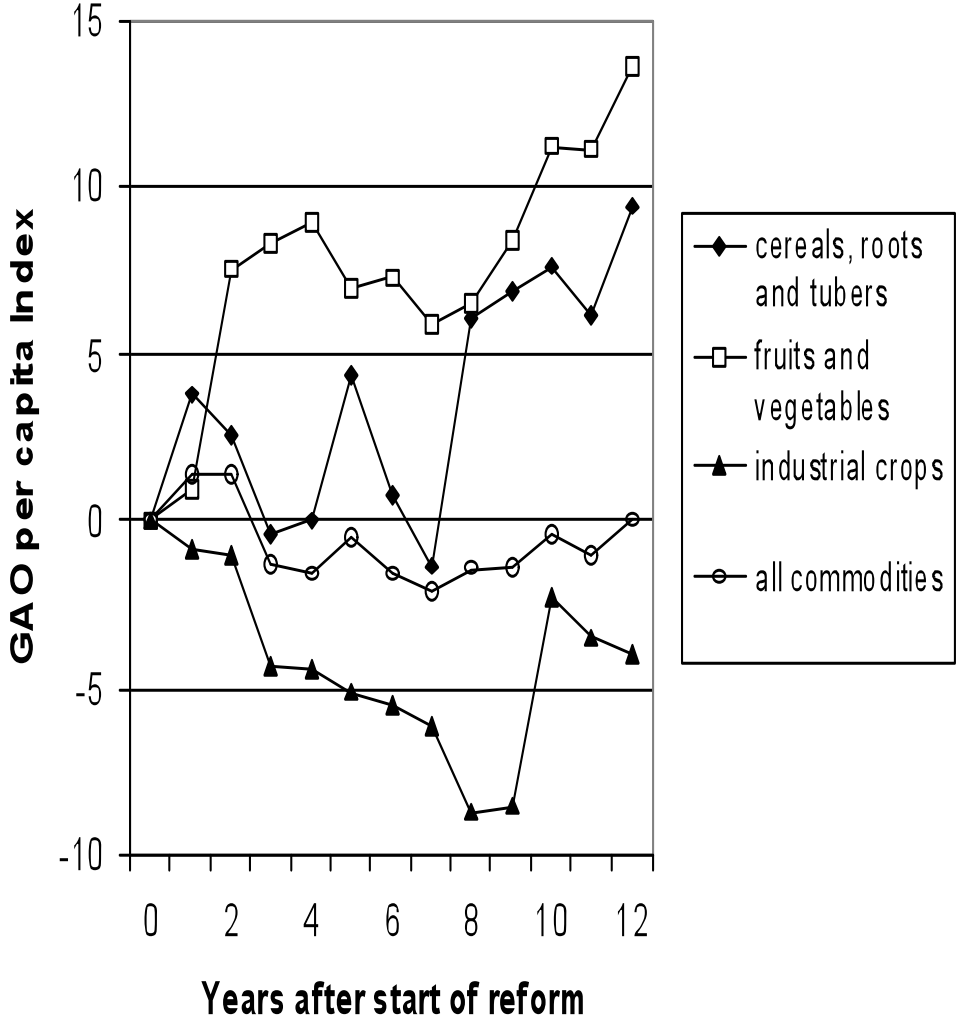
- Industrial crops :
  - Medium value traditional export commodities
  - Heavily dependent on external inputs
  - Shift from public to private VC
  - Major contract enforcement problems with competition
- Fruits & vegetables: Mixture of

  A. Low value for local market, low input

  B. High value, high input non-traditional exports
  - Spectacular growth; entirely private sector; intensive VC organized

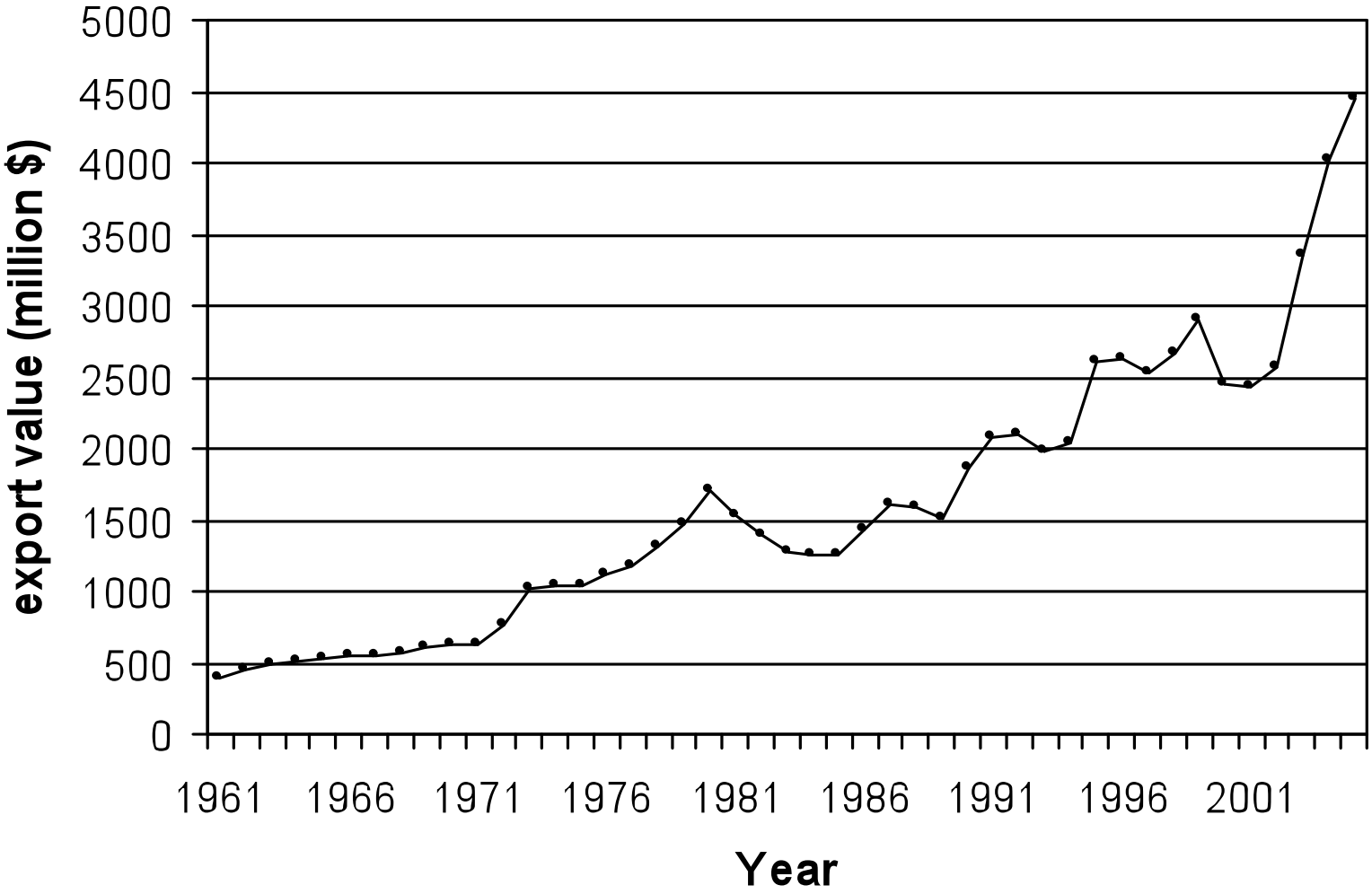
Liberalization Effects in SSA
by Ag-Food Commodity Type:
NRAs & Agric Production (per Capita)



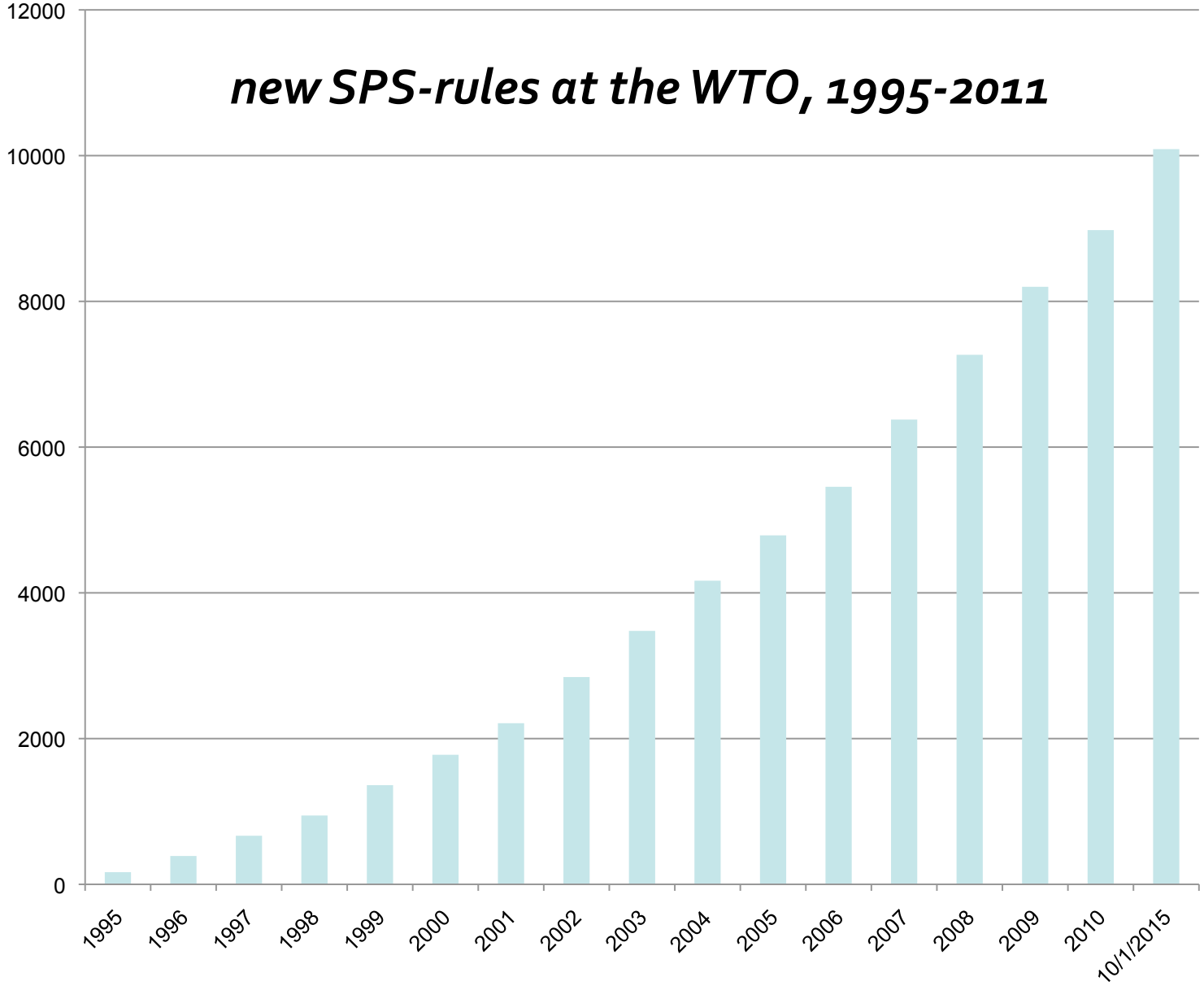


Trade, Standards, and Global Supply Chains

Growth in Fruit and Vegetable Exports in Africa, 1961 - 2005



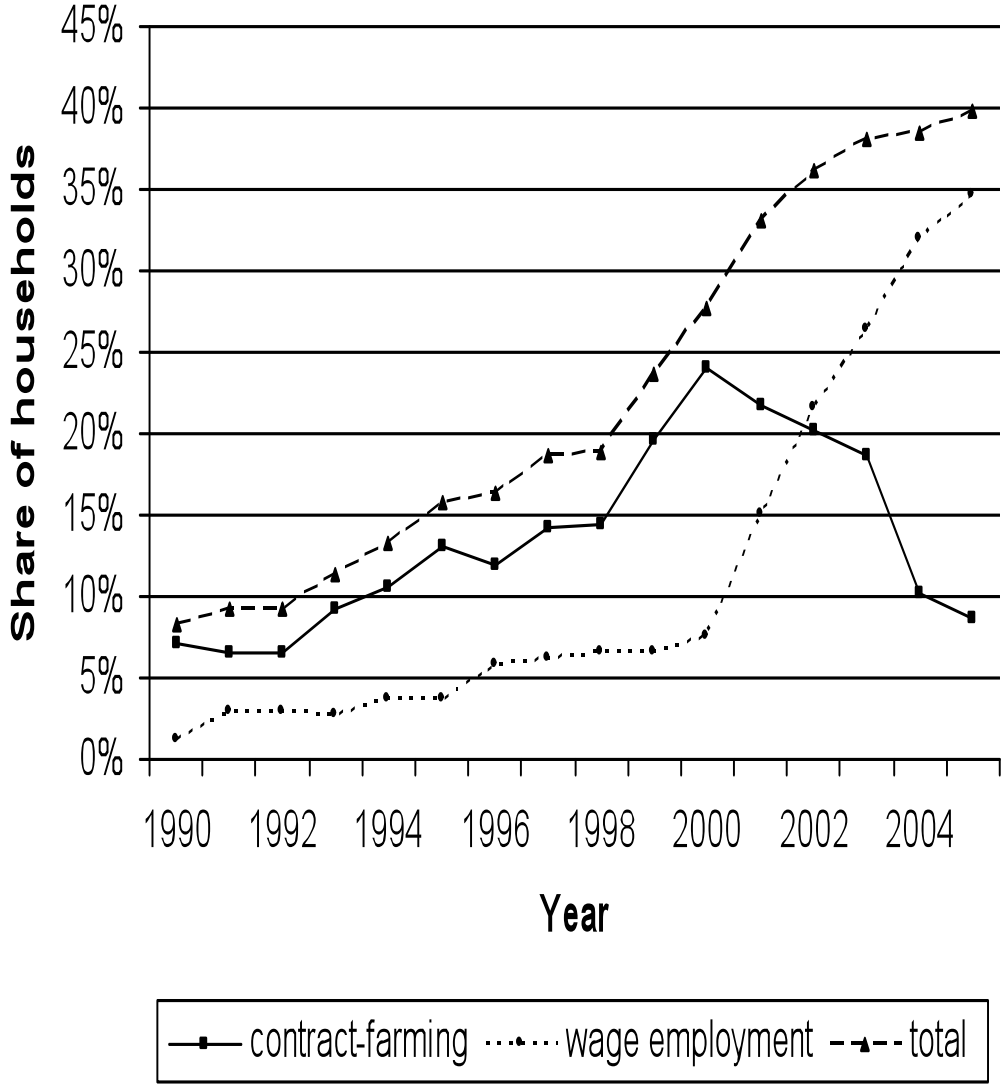
Food Safety and Trade (Policy)



Spillover & Gen Eqm Effects

- General equilibrium effects :
  - Newest WB estimates : taking into account rural wage effects of food price increases dramatically changes the food security impact
  - Labor markets are crucial for the poorest
  - Labor market effects may have significant gender implications

Wage Effects in F&V Exports
(Senegal)



Technology & other spillovers on food security

- Supply chains imply
  - transfer of management, technology, inputs, …
  - Income in other seasons and in cash …
- Various spill-overs on household food security

- Our export supply chain studies (Madagascar F&V and Ethiopia bio-energy crop) show :
  - **Staple crop productivity** increased significantly (technology spillovers)
  - **Length of lean periods** falls significantly with alternative income source

More info

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