

“Markets and Trade: How They Affect Food Security

Maximo Torero

m.torero@cgiar.org

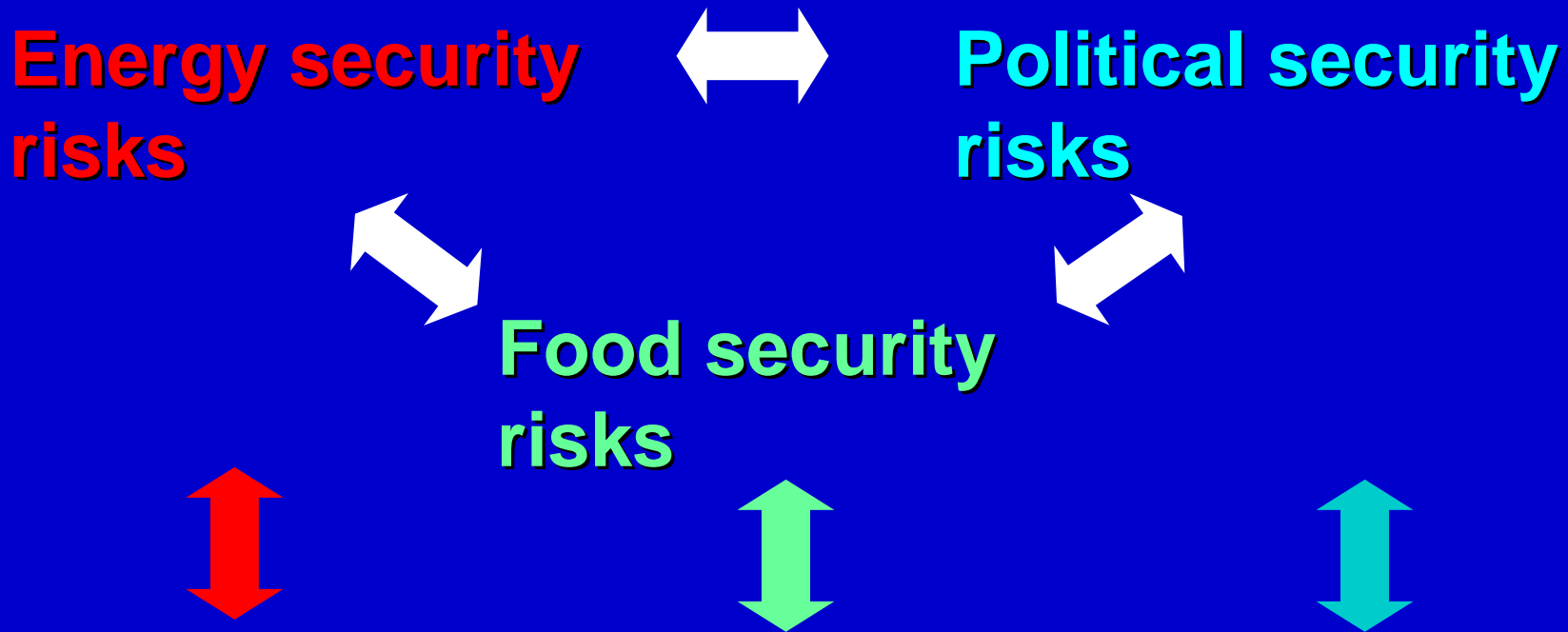
International Food Policy Research Institute (IFPRI)

Mc Gill Conference on Global Food Security, October 6-8, 2009

We have FOUR Crises

- **Food crisis** forced 200 million people into extreme poverty, half of them still there. 1.4 billions of people are still poor in developing countries
- **Fuel crises:** rise and fall of price of oil (variability), impact of food for fuel
- **Financial crisis:** Reduction in exports, commodity prices, remittances, tourism, FDI, aid, and food aid
- **Climate change!** More pressure over price variability

The food crisis and economic recession tradeoffs + price volatility



- + *Mass protests in more than 60 countries*
- + *The poor are the ones suffering the most and they do it silently*
- + *Inflation and macro-economic imbalances*
- + *Environmental sustainability consequences*

Severe impacts on poor

Purchasing power: 50-70% of income spent on food and wages do not adjust accordingly

Assets and human capital: distressed sale of productive assets, withdrawal of girls from school, etc.

- + Level of diet (low) and nutritional deficiencies (high)
- + Level of inequality below the poverty line (high)

**Crisis not over for the poor;
Nutrition is undermined for the long run**

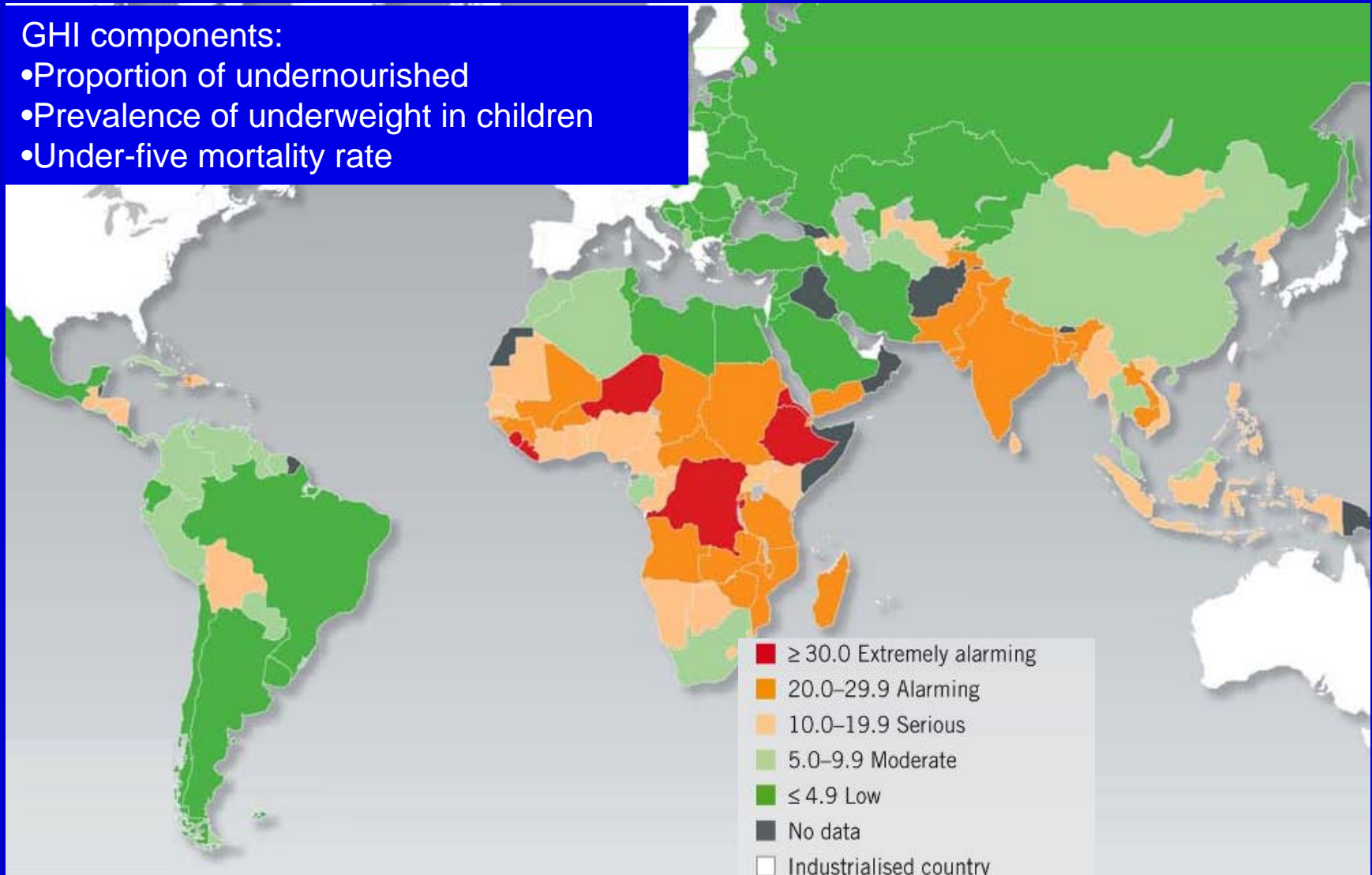
Rising number of hungry people in the developing world



World map of hunger: 2008 Global Hunger Index (GHI) by severity

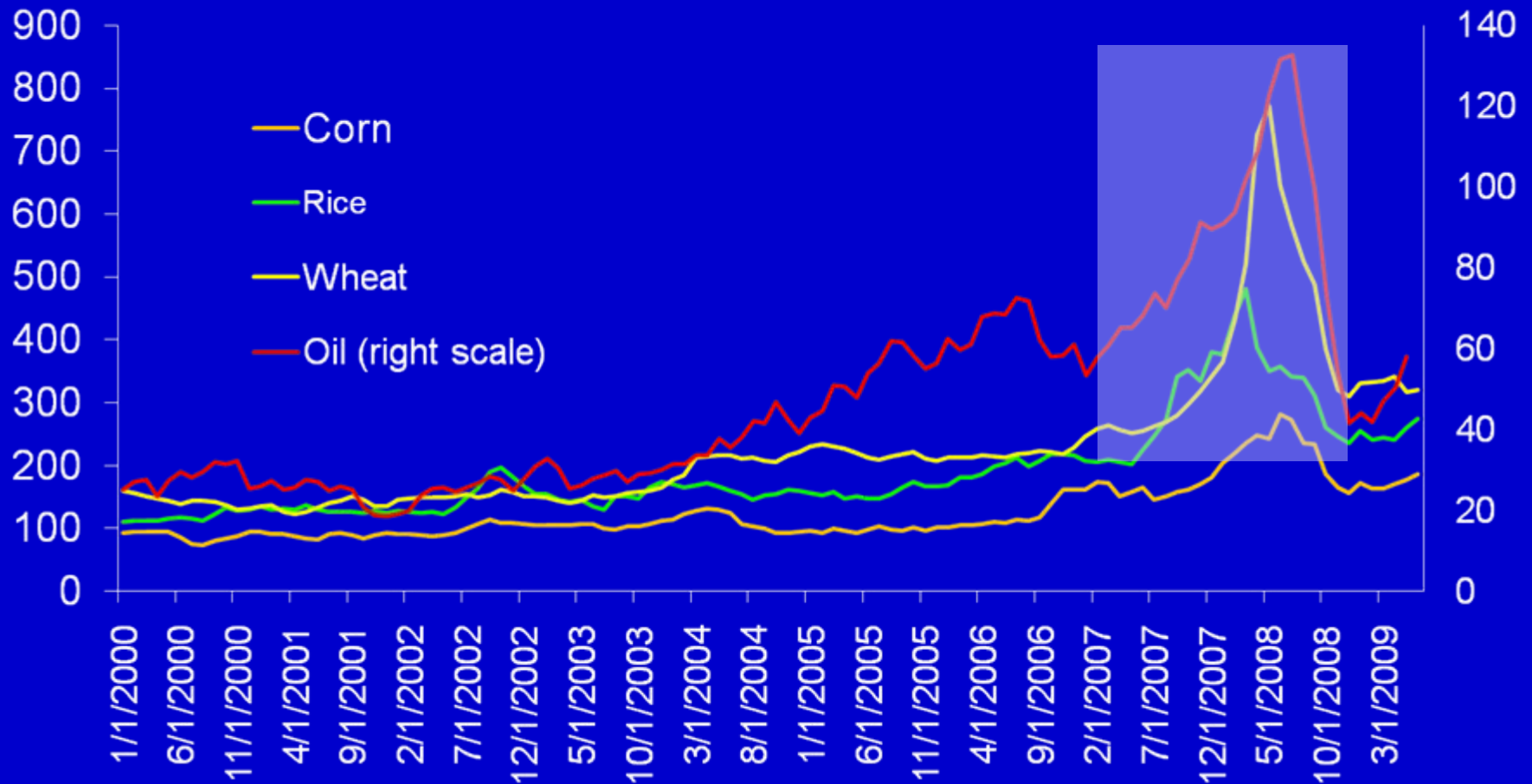
GHI components:

- Proportion of undernourished
- Prevalence of underweight in children
- Under-five mortality rate



Source: von Grebmer et al., IFPRI 2008.

Crises 1: Surge in cereal and oil prices



Source FAO 2009 and IMF 2009

Result 1: Transmission from international to national prices

1. We try if there was evidence of co-integration between domestic and international prices
2. We test the existence of co-integration vectors using the Johansen test using as the VAR base model one that includes the domestic price, the international price, the exchange rate, and two lags in all models
3. Finally we use moving averages in first differences to test if the rate of growth of the international prices have explanatory power with respect to the rate of growth of domestic prices

$$d \ln(P_t) = \alpha_0 + \beta_0 d \ln(P_t^*) + \dots + \beta_4 d \ln(P_{t-4}^*) + \gamma d \ln(e_t) + \varepsilon_t \quad \varepsilon_t \sim iid$$

Result 1: Transmission from international prices to domestic prices- in Latin America – demand side

international price in regression	Mexico		Guatemala		El Salvador		Honduras		Nicaragua	
ln_wheat_int	ln_sweet_bread	0	ln_bread	1	ln_bread	1	ln_bread_loaf	0	ln_bread	1
	ln_white_bread	0	ln_pasta	2	ln_macaroni	2	ln_spaghetti	1	ln_bread_loaf	1
	ln_bread_decaja	1	ln_pastry	1	ln_bread_sweet	1	ln_wheat_flour	1	ln_bread_loaf_sliced	1
	ln_cookies	0			ln_crackers	2	ln_crackers	2	ln_spaghetts	2
	ln_other_cookies	0					ln_bread_semitas	1	ln_wheat_flour	1
	ln_wheat_flour	0							ln_cookies	2
	ln_pastry	0							ln_crackers	1
									ln_candy_polvoron	1
ln_corn_int	ln_corn	0	ln_corn	1	ln_corn	2	ln_corn	0	ln_corn	0
	ln_tortillas	0	ln_tortillas	0	ln_tortillas	2	ln_tortillas	0	ln_tortillas	0
	ln_corn_flour	0	ln_corn_flour	1			ln_corn_flour	0	ln_corn_flour	1
			ln_corn_milling	0			ln_cornflakes	0	ln_cornflakes	1
ln_rice_int	ln_rice	1	ln_rice	2	ln_rice	2	ln_rice	0	ln_rice	2
We report "." when the null is rejected for maximum rank equal to 1,2,...,N-1										
international price in VECM	Costa Rica		Panama		Dominican Republic		Ecuador		Peru	
ln_wheat_int	ln_bread	1	ln_bread	0	ln_bread1	1	dln_bread	1	ln_bread_cereals	2
	ln_bread_square	0	ln_flour	1	ln_bread2	1	dln_bread_baguette	2		
	ln_bread_sweet	2	ln_pasta	2	ln_spaghetti	1	dln_flour	2		
	ln_cookies	0	ln_crackers	1	ln_pasta	1	dln_cookies	0		
	ln_crackers	2	ln_cereals	0			dln_pasta	0		
	ln_wheat_flour	2					dln_spaghetti	0		
ln_corn_int	ln_tortillas	0	ln_cereals	0			dln_corn	2	ln_bread_cereals	1
	ln_corn_flour	0								
ln_rice_int	ln_rice	1	ln_rice	0	ln_rice	0	dln_rice	1	ln_bread_cereals	1
					ln_rice_selected	0				
					ln_rice_premium	0				

Source: Robles & Torero (2009)

Result 1: Transmission from international prices to domestic prices- in Sub Saharan Africa – supply side

Result of test of long-run relationship		
		Johansen test
Yes		13
No		41
Stationary		8
Total		62

Results of test of long-run relationship by crop				
		Prices with	Total nbr.	Perce-
		relationship	of prices	tage
Maize		4	40	10%
Rice		8	17	47%
Sorghum		1	4	25%
Wheat		0	1	0%
Total		13	62	21%

Results of test of long-run relationship by country				
		Prices with	Total nbr.	Perce-
		relationship	of prices	tage
Ethiopia		1	3	33%
Ghana		1	7	14%
Kenya		0	2	0%
Malawi		3	8	38%
Mozambique		4	11	36%
South Africa		0	4	0%
Tanzania		4	16	25%
Uganda		0	2	0%
Zambia		0	9	0%
Total		13	62	21%

Source: Minot (2009)

Result 2: Distributional impacts of the food crisis

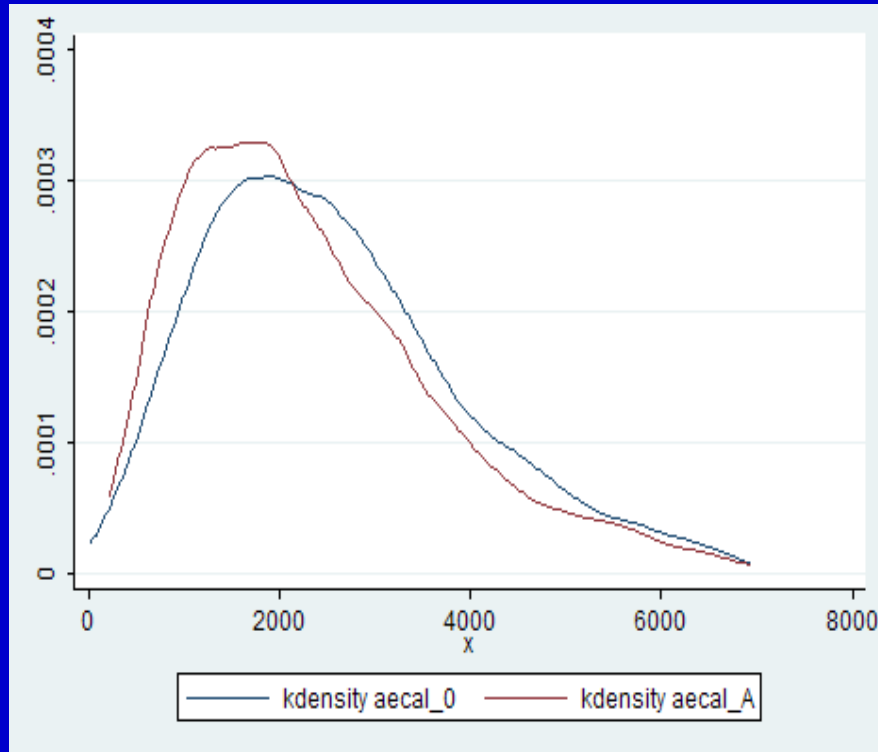
	<u>Guatemala</u>		<u>Honduras</u>		<u>Nicaragua</u>		<u>Peru</u>	
Poverty (%)	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Deepening	64.1	43.7	67.8	23.4	58.0	22.8	70.6	39.8
Exit	0.1	0.0	0.2	0.0	0.7	0.1	0.0	0.0
Entry	2.2	2.3	1.3	1.8	2.3	3.0	2.3	1.8
Change	2.1	2.3	1.1	1.8	1.5	2.9	2.3	1.7

Source: Robles & Torero (2009)

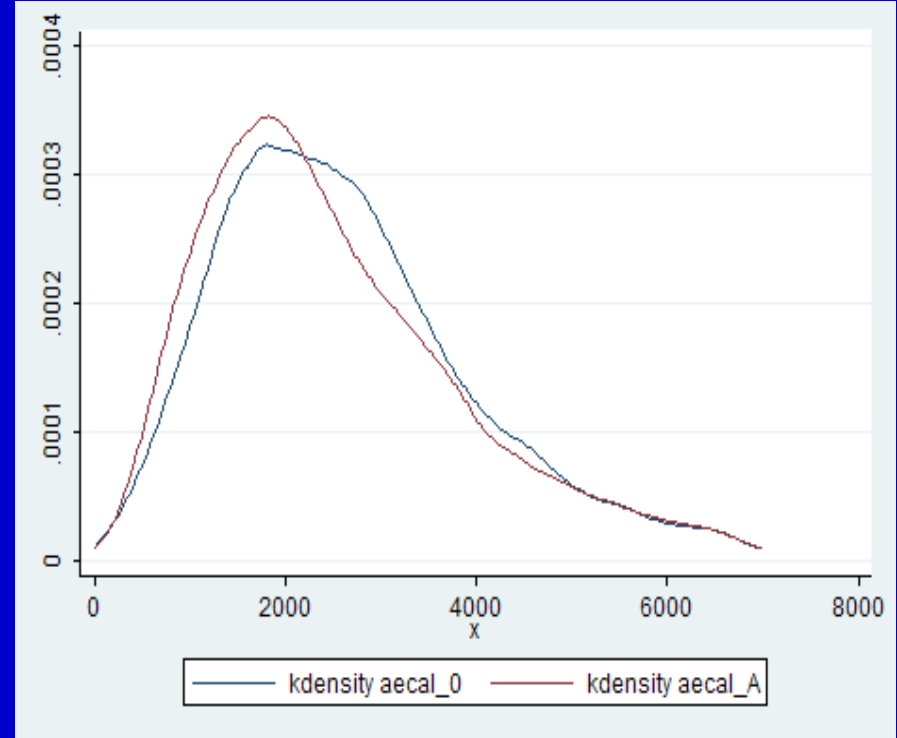
Result 3: Calorie consumption - Nicaragua

Before (blue) and after (red) of the increase in prices

Households with 0-2 years old kids



National level

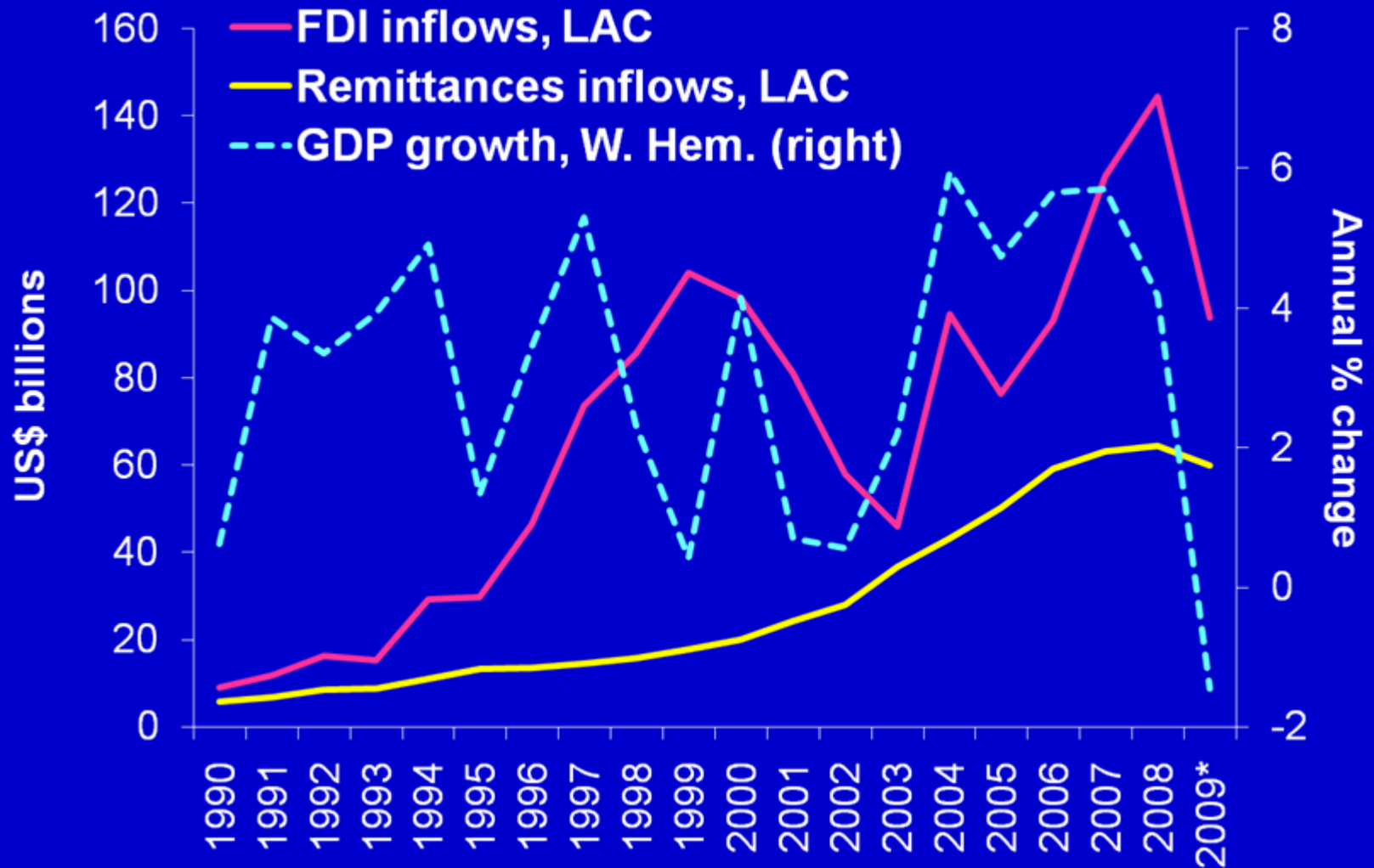


Source: Robles & Torero (2009)

Crises 2: The financial crisis and the recession complicates even more the food situation: risks

- **Less capital available today and in the future for the agriculture**
- **More debt specially for small holders which had already invested in the expansion of their production**
- **Shift of attention of policies for agriculture and reduction of public investment**
- **Reduction of employment and wages of low skill workers**
- **Reduction of remittances**

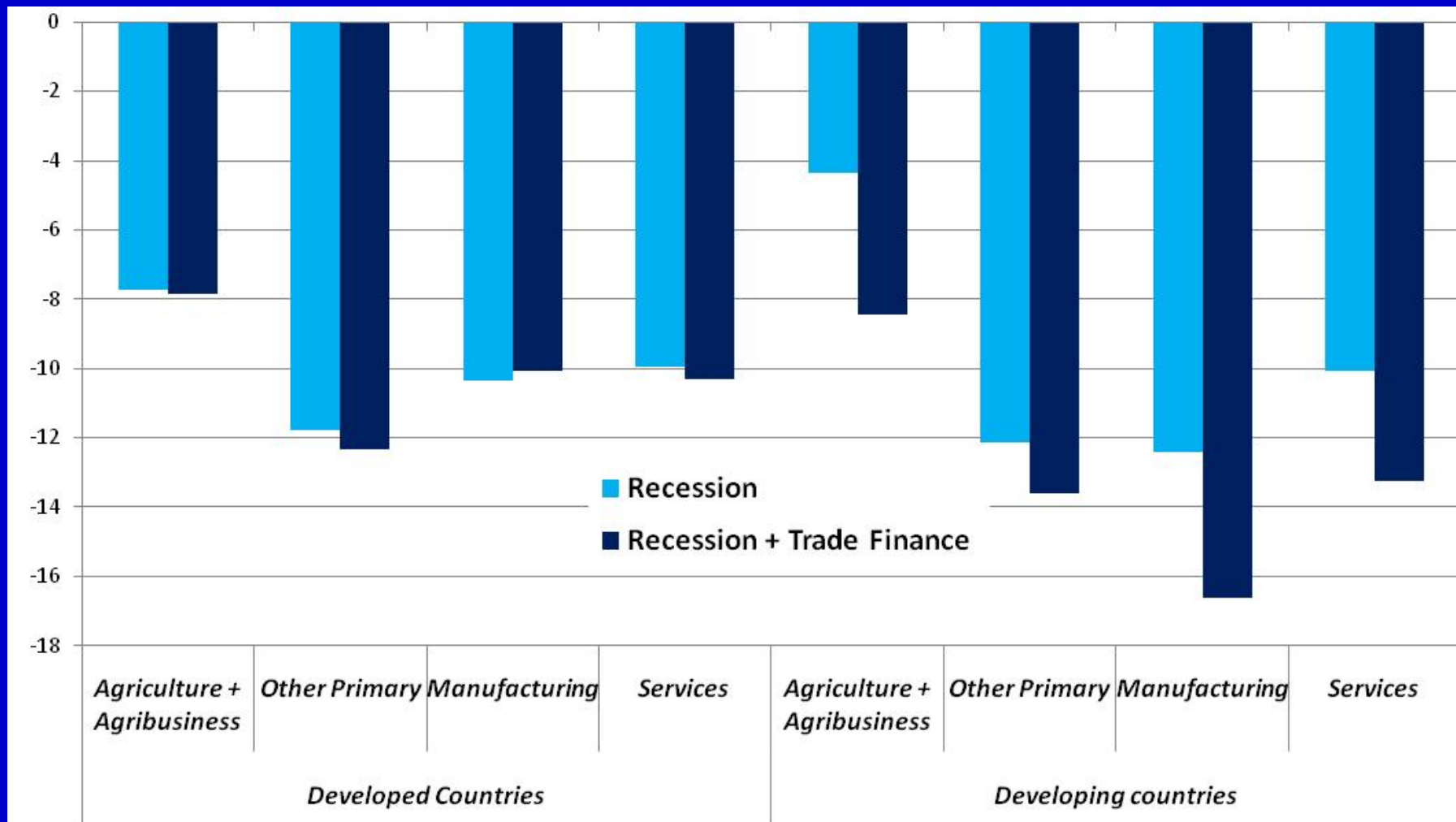
C2: Food system now also affected by financial volatility and recession



Source: Data from IMF 2009; Ratha, Mohapatra, and Silwal. 2009; UNCTAD 2009, and World Bank 2009.

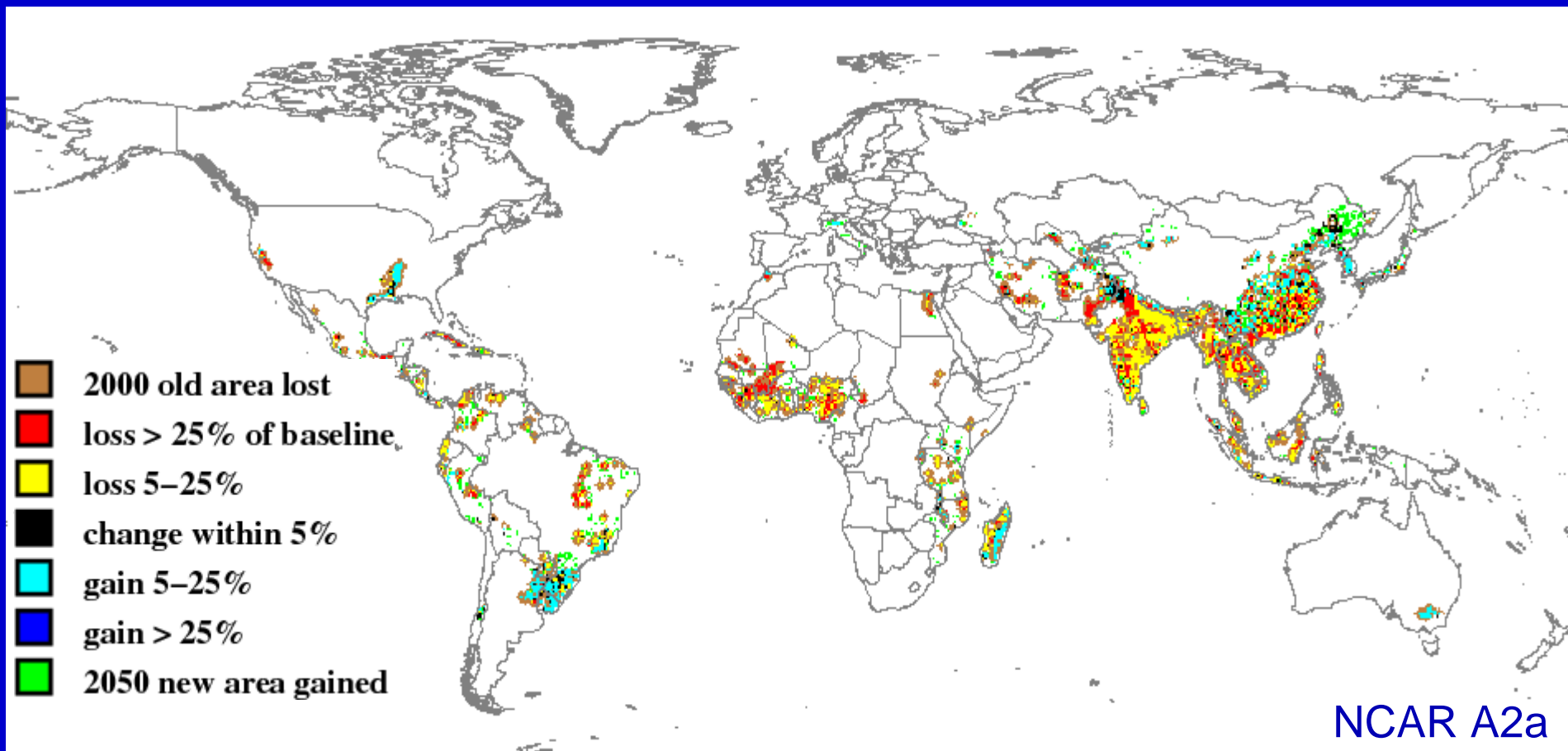
C2: Export volumes

Looking at 2012 with respect to the Baseline



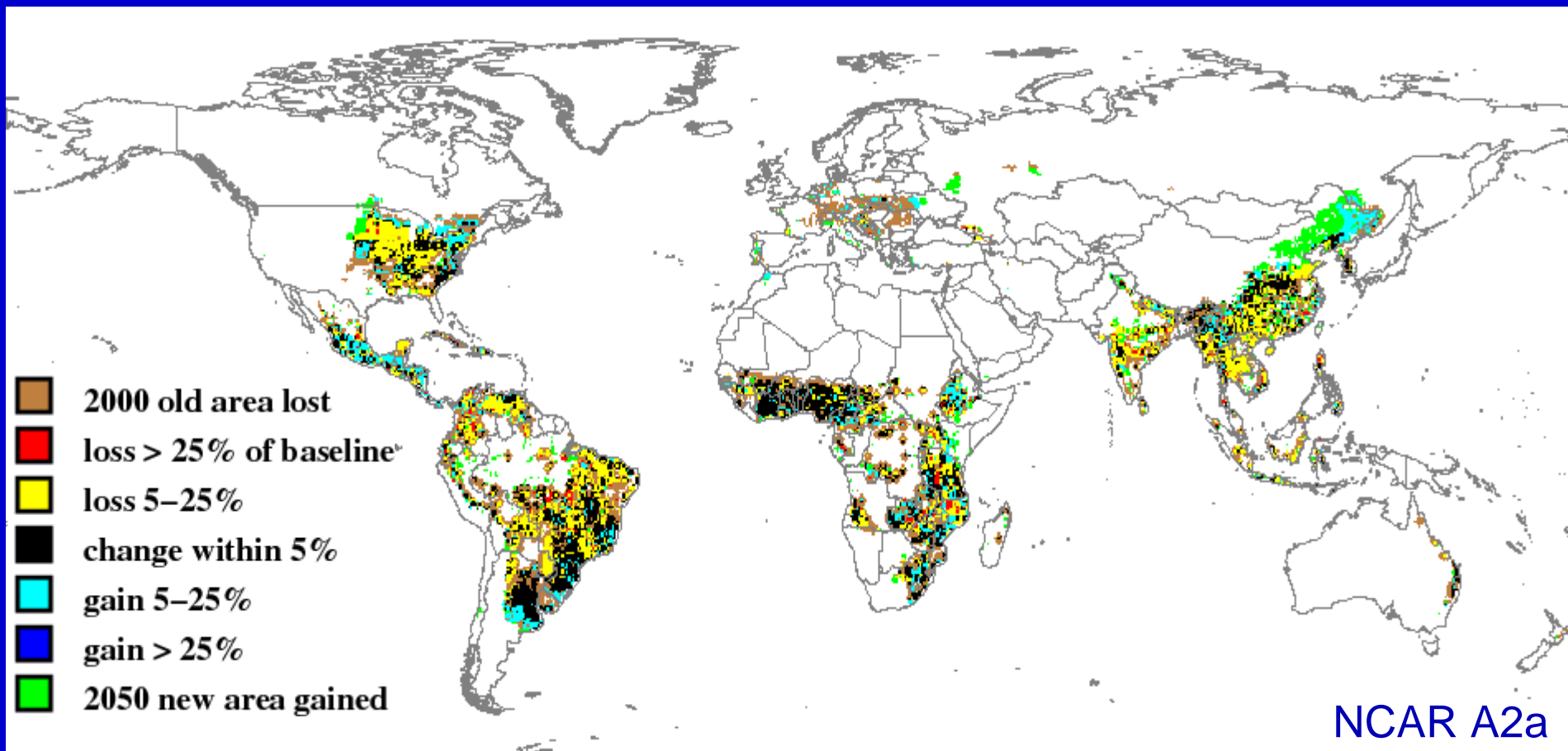
Source: MIRAGE simulations, Laborde and Torero (2009)

Crises 3: Climate induced percentage change in production in 2050: Irrigated rice



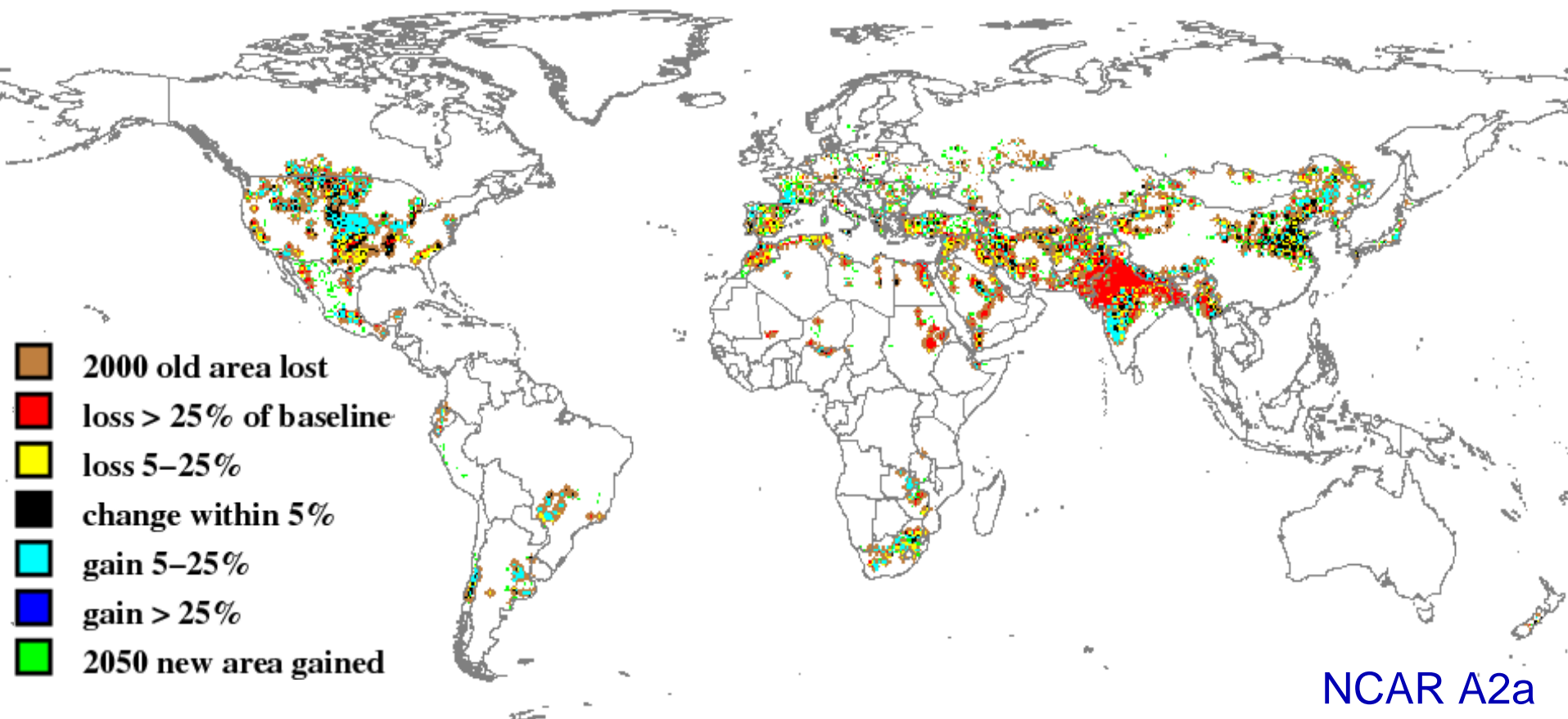
Global production = -27%

C3: Climate induced percentage change in production in 2050: Rainfed maize



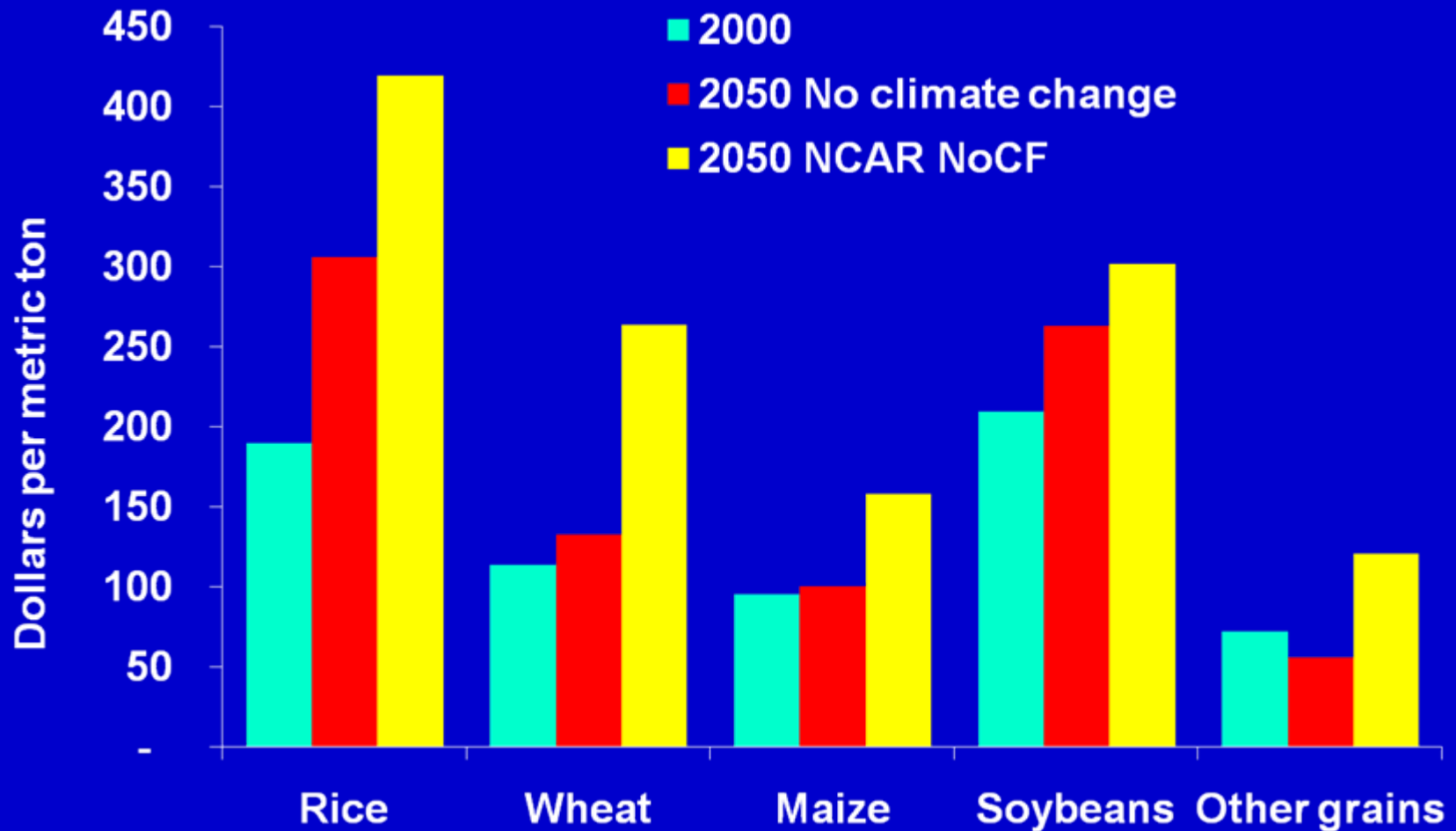
Global production = -16%

C3: Climate induced percentage change in production in 2050: Irrigated wheat



Global production = -42%

C3: Climate change impact: Global food prices



Four priority for policy action needed

At the global level

- 1. Reduce trade barriers**
- 2. Reduce market volatility and speculation**

At the country level

- 3. Expand social protection and child nutrition action**
- 4. Increase efficiency in linking producers to markets, specially small holders**

Action 1: Reduce Trade barriers

Export restrictions in 2008 were serious!

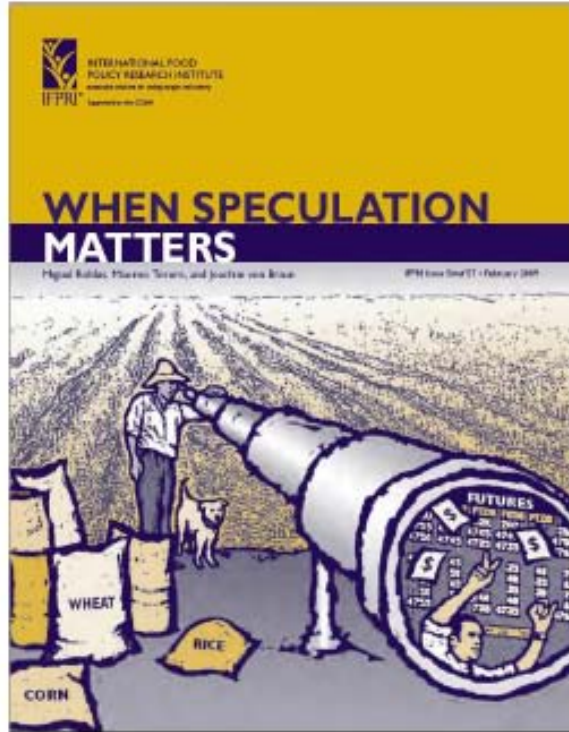
Potential costs of rising protectionism are high!

- Failed Doha round, if tariffs increase to their current WTO limits (bound level):
 - 11.5% in developing country exports
 - US\$353 billion in world welfare

Action 2. Reduce Price volatility

- 1. Poor can not afford speculation**
- 2. Governments can't afford speculation**
- 3. There is clearly a need to regulate the basic grains futures commodity market**
- 4. A virtual reserve is an option which is mostly a signal which could avoid speculators coming in to this market**
- 5. If speculators get the signal this would become real regulation - minimizing the costs to the poor**

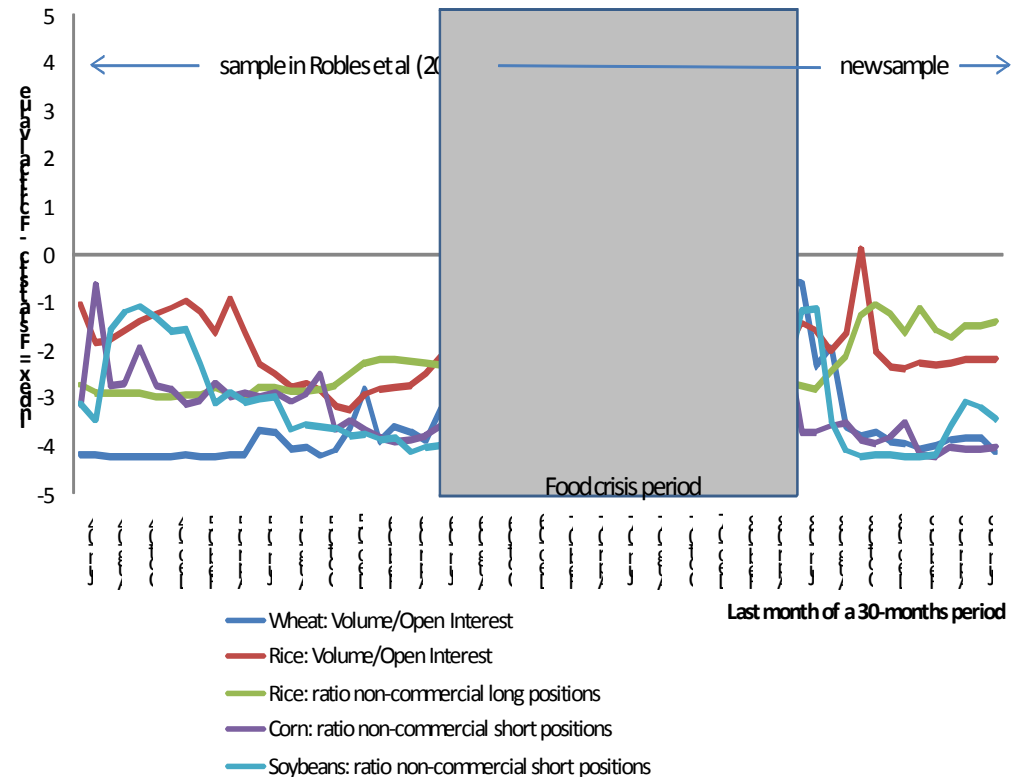
Action 2: Evidence of causality



"Changes in supply and demand fundamentals cannot fully explain the recent drastic increase in food prices."

Evidence of speculation influencing commodity prices

(positive numbers on vertical axis shows evidence of influence)



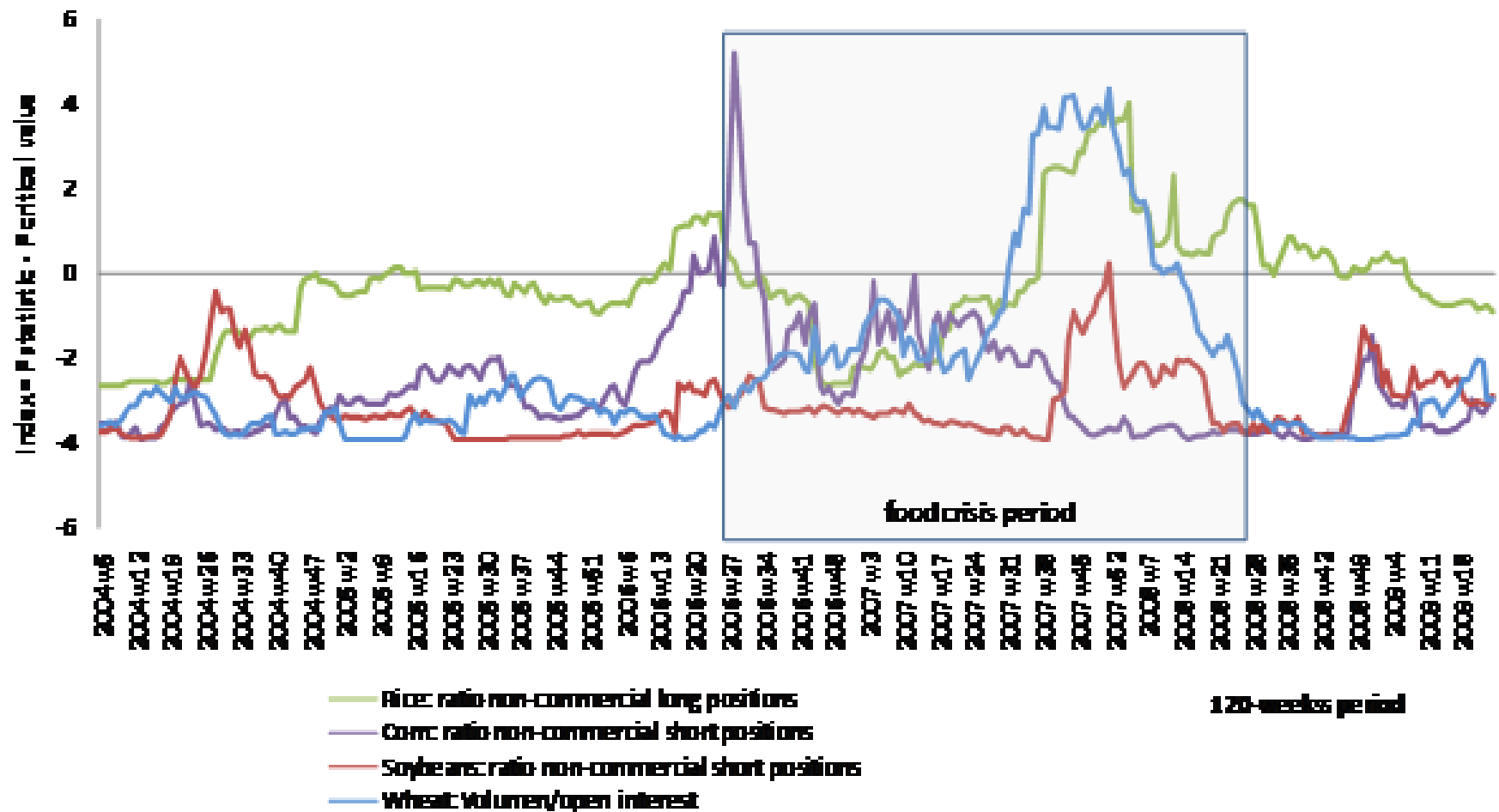
Note: Positive numbers on vertical axis show evidence of influence.

Source: Robles, Torero, and von Braun (2009)

Action 2: Evidence of causality

Evidence of speculation influencing commodity prices

(positive numbers on vertical axis shows evidence of influence)



Action 2: More on financial activity and/or speculation in futures markets... Inventories?

- Paul Krugman...

The Conscience of a Liberal

Paul Krugman



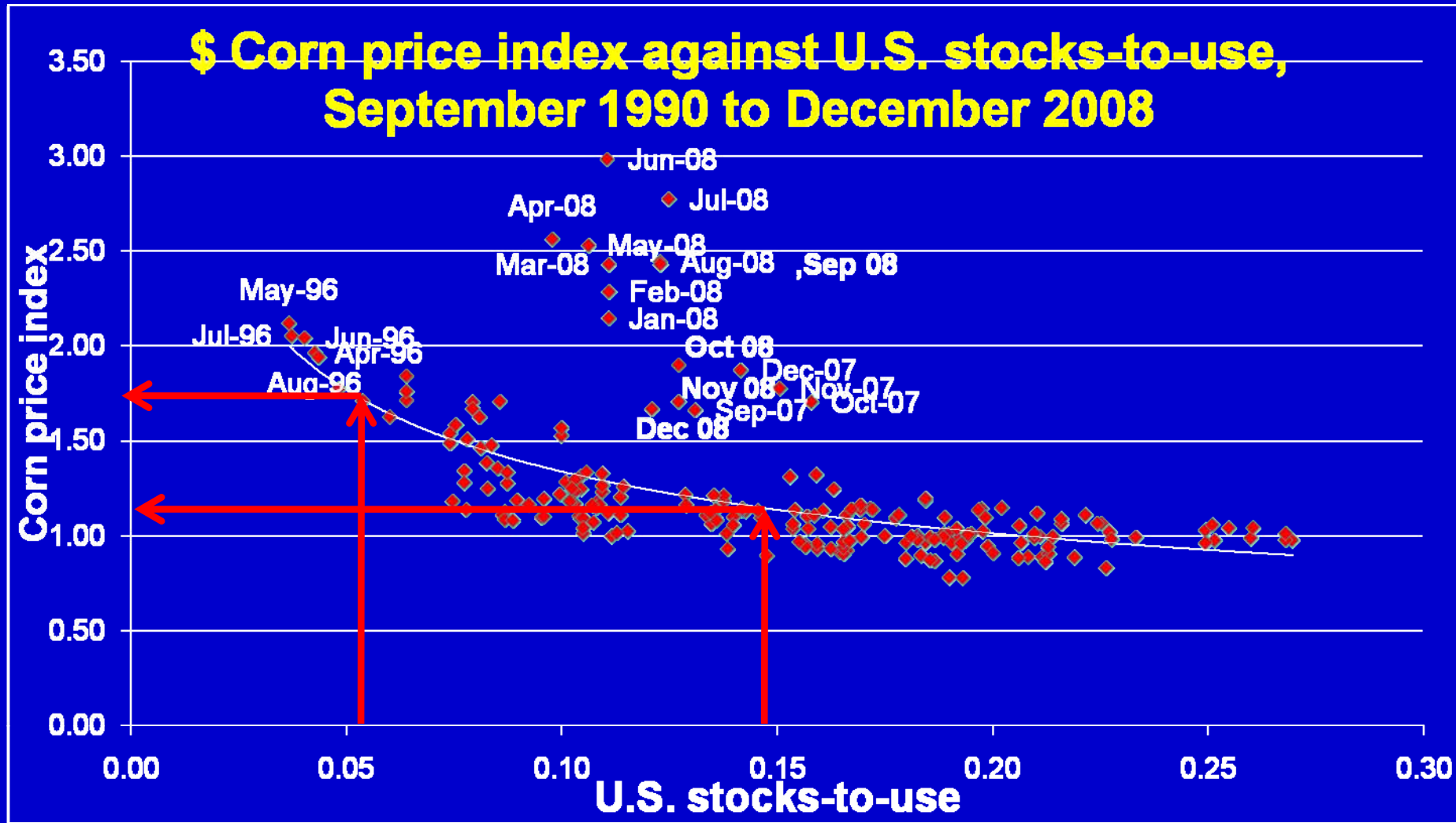
July 8, 2009, 9:01 am

Oil speculation

Oil speculation is [back in the news](#). Last year [I was skeptical](#) about claims that speculation was central to the price rise, because what I considered the essential signature of a speculative price rise — physical withholding of oil from the market, in the form of high inventories — just wasn't showing.

This time, however, [oil inventories are bulging](#), with huge amounts held in offshore tankers as well as in conventional storage. So this time there's no question: speculation has been driving prices up.

Action 2: More on financial activity and/or speculation in futures markets...



Source: Phillip Abbott (2009)

View on Regulation must change!

In a report in The New York Times, Greenspan is quoted speaking to a Senate Banking Committee in 2003:



“What we have found over the years in the marketplace is that derivatives have been an extraordinarily useful vehicle to transfer risk from those who shouldn’t be taking it to those who are willing to and are capable of doing so.”

The New York Times

Greenspan Concedes Error on Regulation



Alan Greenspan, former Federal Reserve Chairman, with John Snow, former Secretary of the Treasury, at a hearing on Capitol Hill on Thursday.

<http://www.washingtonpost.com/wp-dyn/content/article/2008/10/23/AR2008102300193.html>

Greenspan Says he was wrong on regulation Lawmakers Blast Former Fed Chairman

"You found that your view of the world, **your ideology** was not right, it was not working?" said Rep. Henry A. Waxman (D-Calif.), the committee chairman.

"Absolutely, precisely," Greenspan said. "You know, that's precisely the reason I was shocked, because I have been going for 40 years or more with very considerable evidence that it was working exceptionally well."

Action 3: Invest in social protection and child nutrition action

Protective actions e.g.:

- Cash transfers
- Employment-based food security programs

Preventive actions e.g.:

- School feeding (new insights)
- Early childhood nutrition programs

Focus on children, women, and poorest

Action 4: Increase efficiency in linking producers to markets, specially small holders

A. Capture heterogeneity of producers

B. Infrastructure investments

C. Value chain approach

D. Institutional innovation

E. Research and development

Action 4: Innovate in insurance systems

- **Develop new insurance products (e.g. index-based weather insurance)**
- **Explore new delivery channels (e.g. NGOs, community support networks)**
- **Invest in information and technology (e.g. geographic information databases)**
- **Provide very smart insurance subsidies for the poor**