

Food Price Changes, Price Insulation & Poverty

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Context

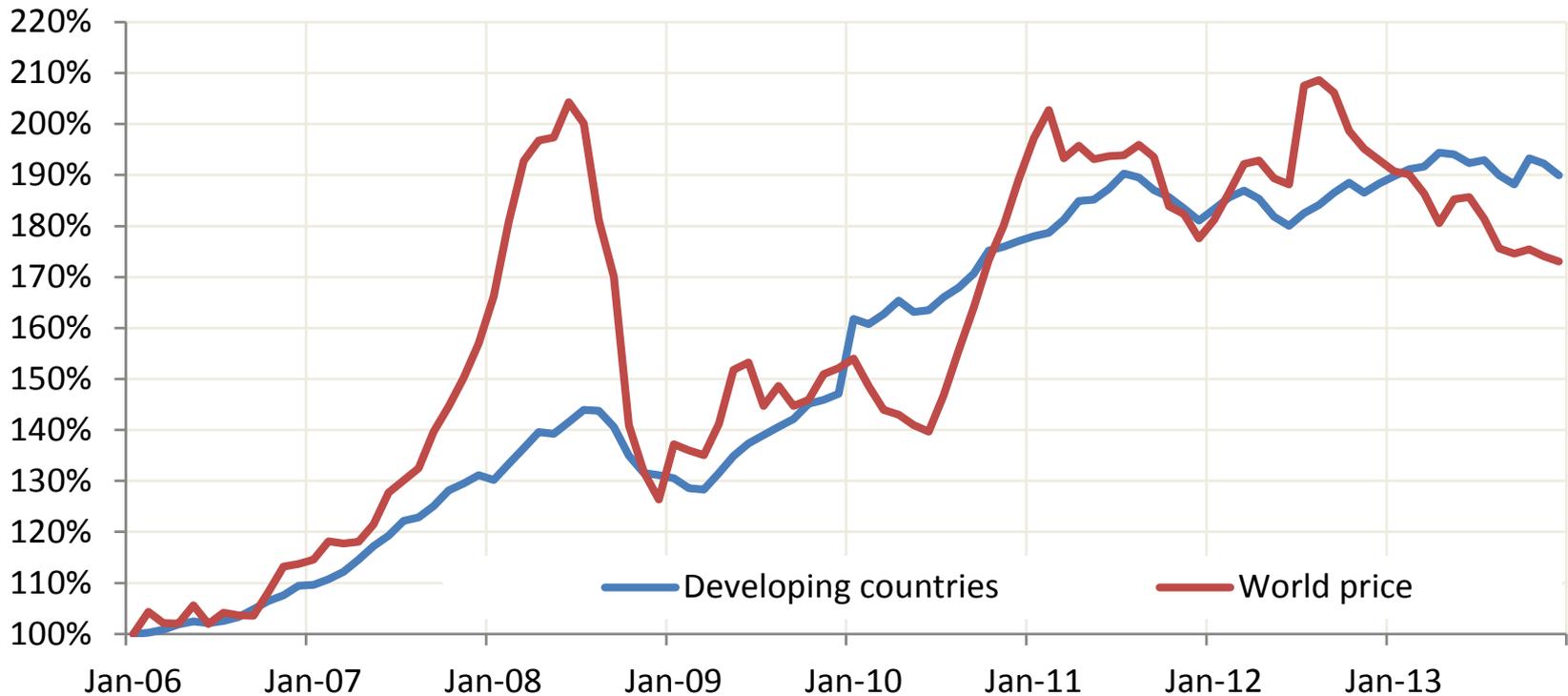
- ▶ What do agricultural trade policy makers do?
 - ▶ Why might they do it?
 - ▶ Does it work?
 - ▶ What might work better?
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Agricultural trade policy responses

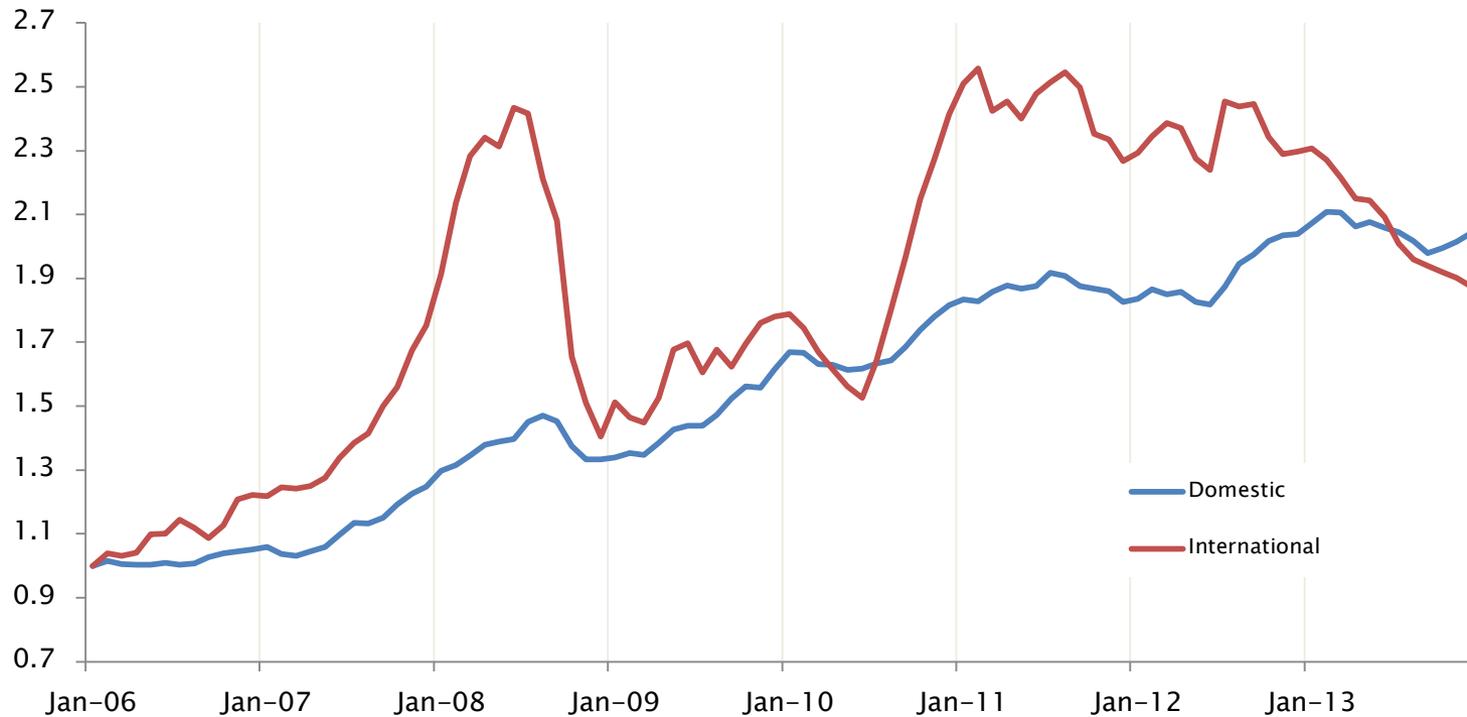
What drives agricultural trade policy

- ▶ We have a great deal of theory to explain how policy makers set the level of protection
 - Depends on levels of political support
 - And the cost of protecting particular sectors
 - This theory guides our policy advice for trade reform
- ▶ But the past few years of price volatility have highlighted something very different
 - Policy makers set domestic prices to insulate against sudden price shocks
 - Particularly for staples like rice & wheat
 - But pass through longer run changes in prices

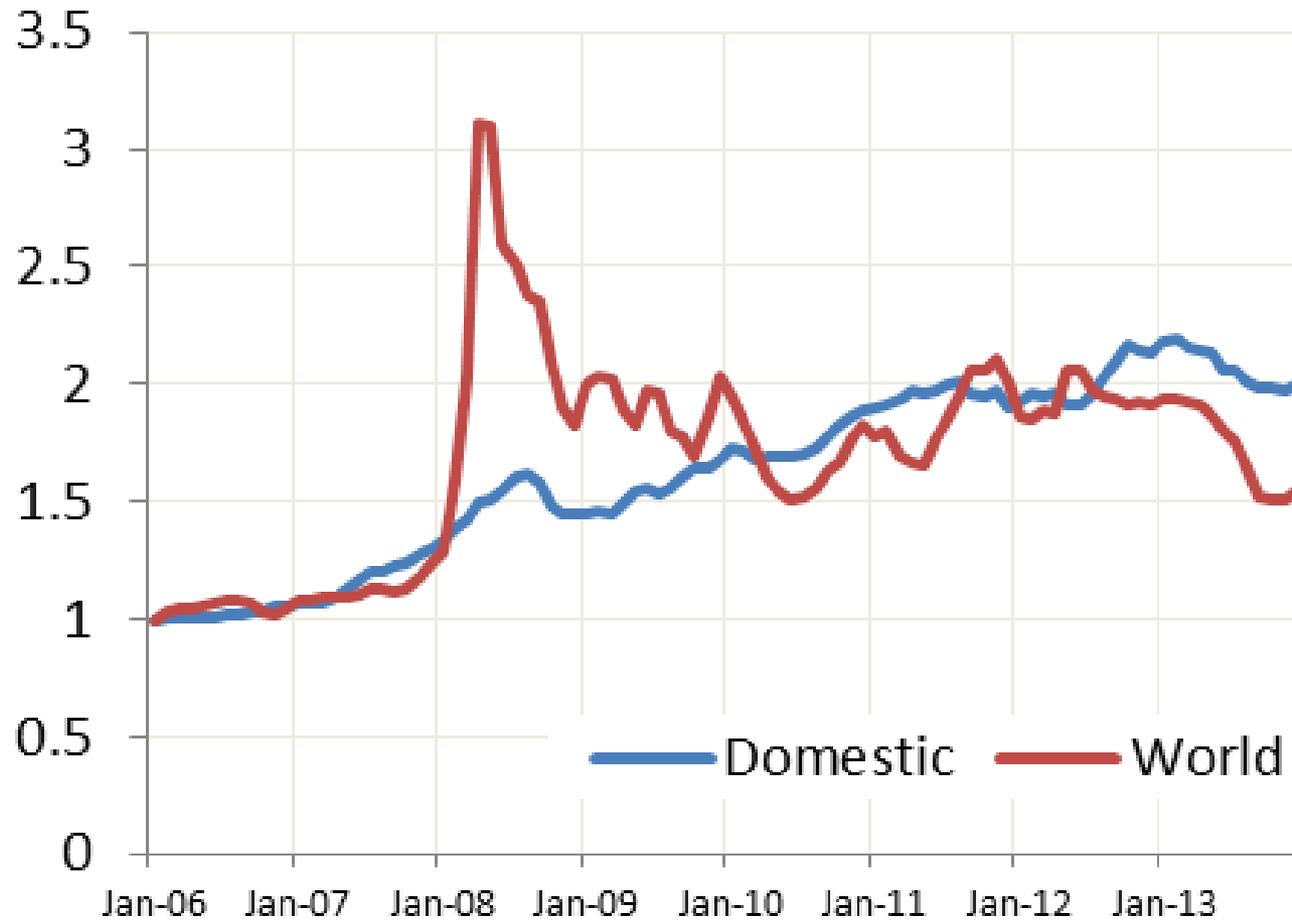
Food CPIs in developing countries



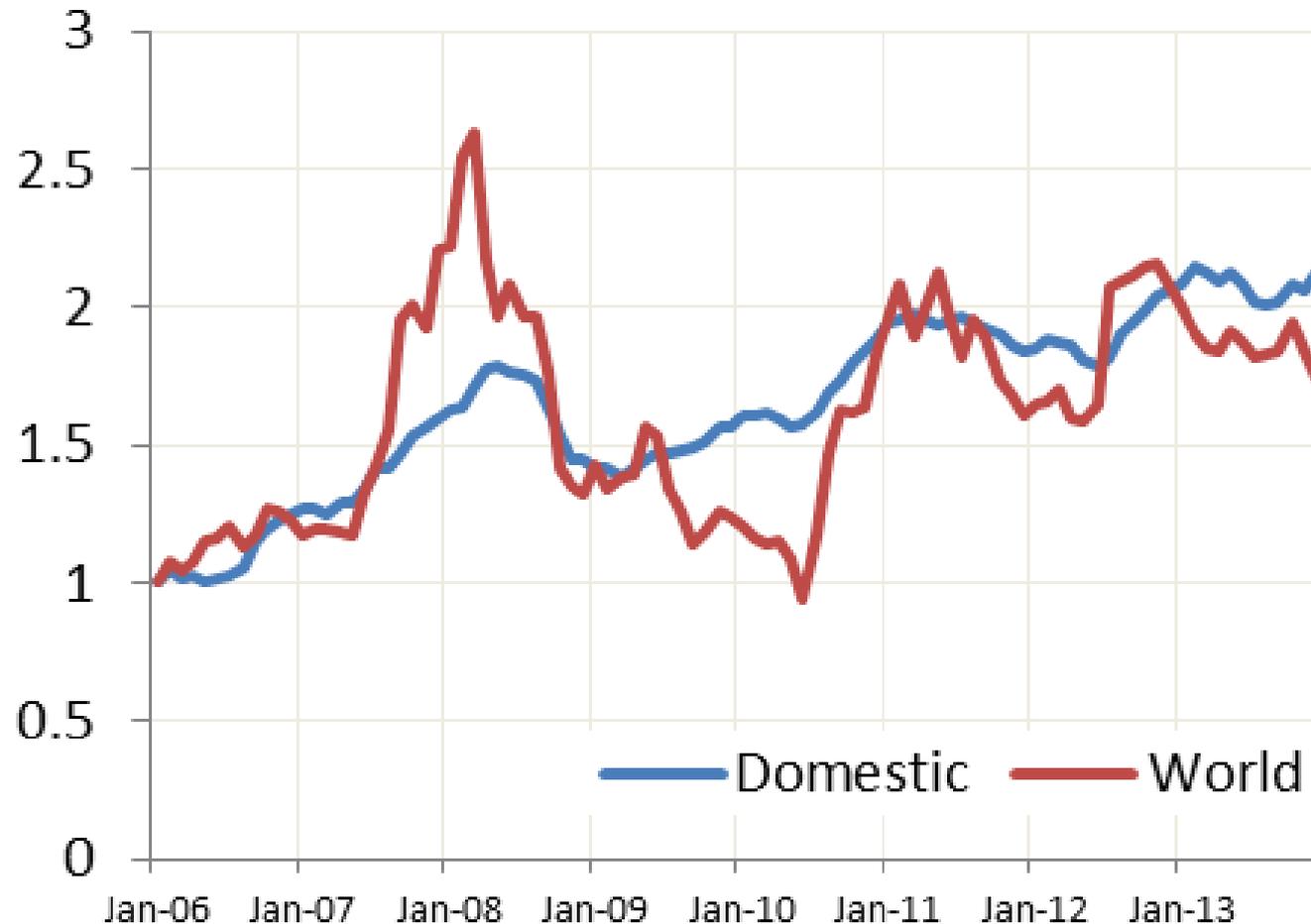
Indexes of staple food prices



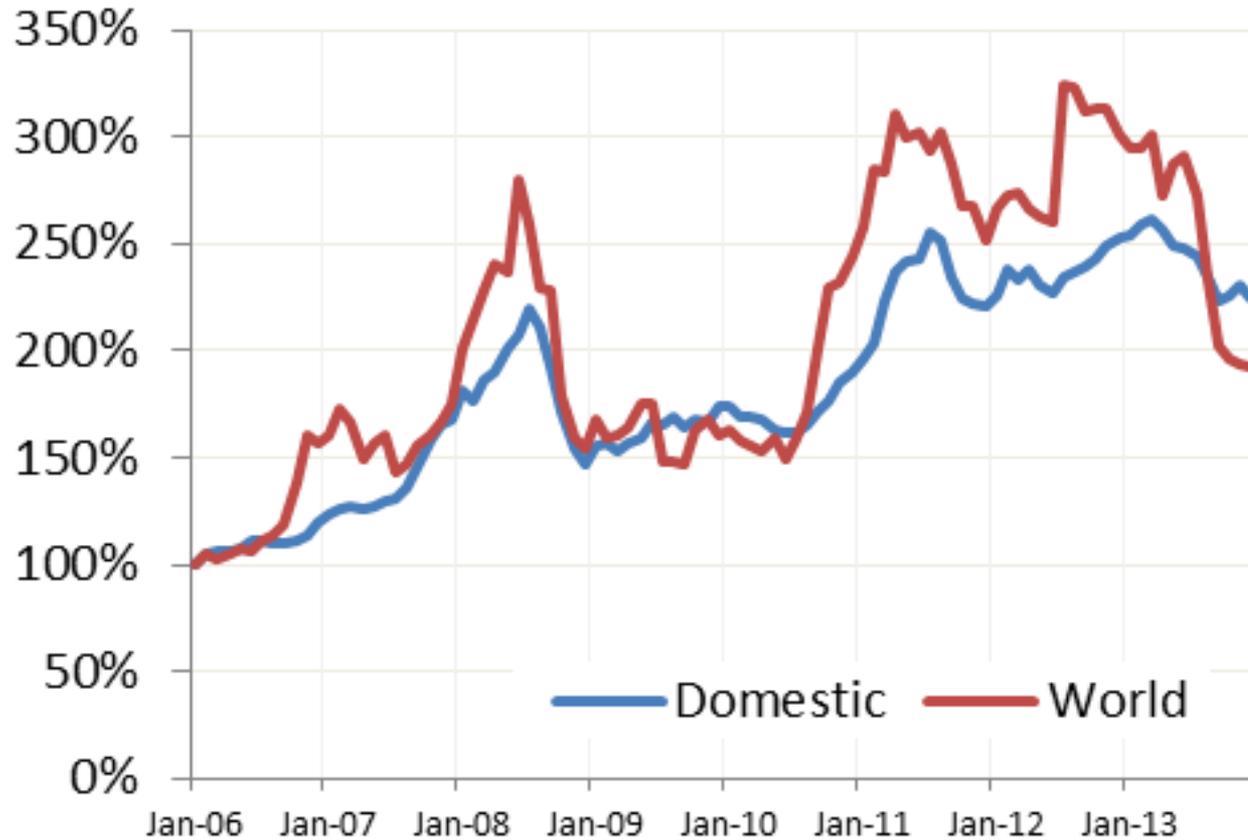
Very strong insulation for rice



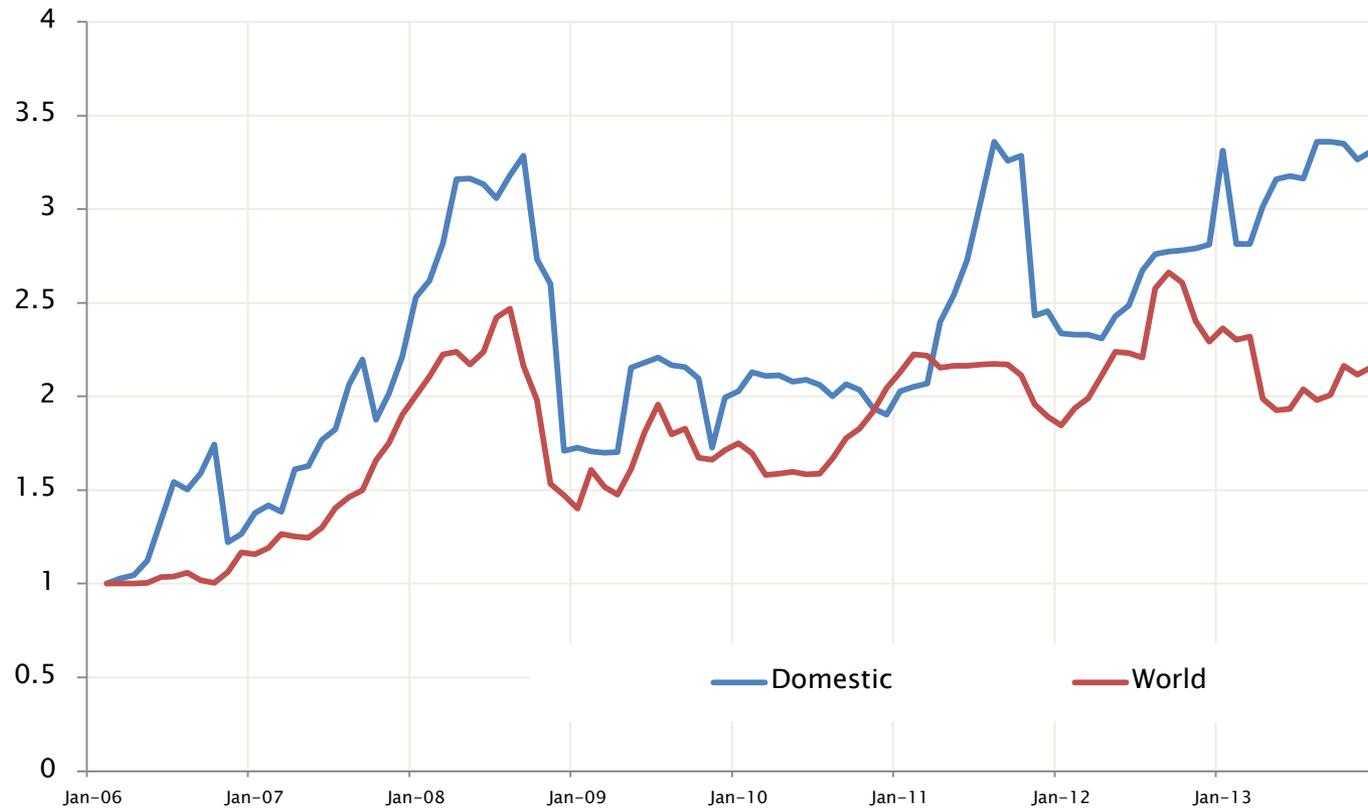
Also strong insulation for wheat



Weaker insulation for maize



Much weaker insulation for soybeans



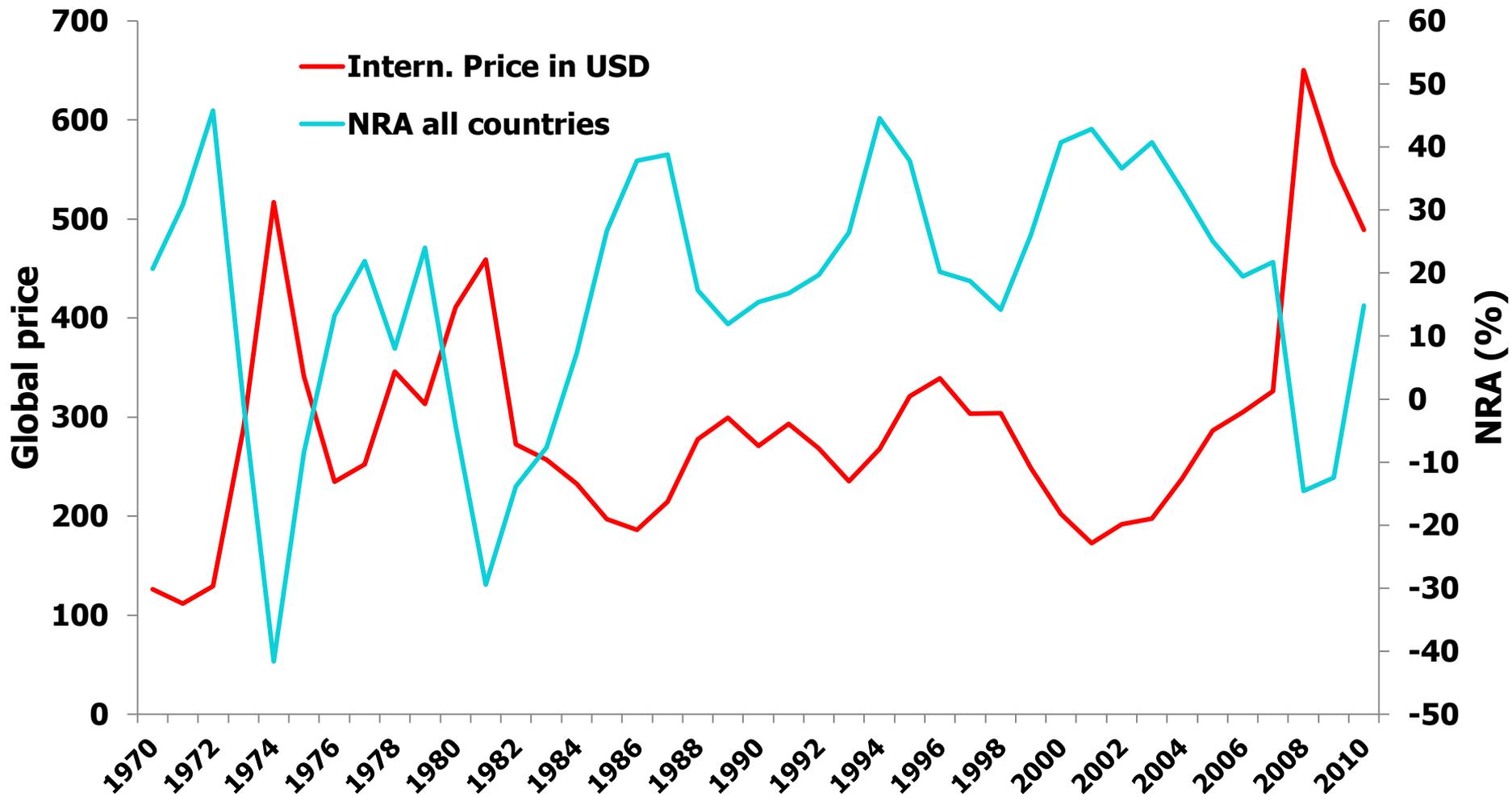
Why might policymakers do this?



What drives agric trade policy?

- ▶ Partly an inverse relationship between world prices and protection rates
 - With the goal of stabilizing domestic prices
- ▶ Also a centripetal force holding domestic prices in a stable relationship with world prices?
 - Perhaps driven by Grossman–Helpman political–economy (PE) forces
 - Tending to result in high average protection in rich importers, low protection in poor exporters
- ▶ And, when prices rise, concerns about impacts on the poor

Price insulation, rice, all countries



Source: Kym Anderson
(www.worldbank.org/agdistortions)

Features of price transmission

- ▶ Governments seem averse to sharp changes in prices
 - But also to moving too far from the Political Economy (PE) equilibrium
- ▶ Perhaps like an Error Correction Model?
 - $\Delta\tau = \alpha \cdot (p^w - p^w_{t-1}) + \beta [p_{t-1} - \gamma \cdot p^w_{t-1}]$
 - Where $\tau = (p - p^w) \approx (1 + t)$; α reflects costs of adjustment, $\alpha < 0$
 - $[p_{t-1} - \gamma \cdot p^w_{t-1}]$ is the deviation from the political-economy equilibrium;
 - β the cost of being out of equilibrium, $\beta < 0$
 - All variables in logs

ECM estimates

Strong insulation for staples

	α	β
Rice	-0.50	-0.36
Wheat	-0.52	-0.31
Sugar	-0.53	-0.20
Maize	-0.35	-0.44
Soybeans	-0.40	-0.46
Beef	-0.39	-0.31
Poultry	-0.34	-0.46

Short vs long run poverty impacts

- ▶ Short run impacts of food prices on welfare largely depend on whether households are net buyers or net sellers
 - Consumers adjust, but elasticities typically low
 - Urban households typically net buyers so hurt
 - Farm households in poor countries often net buyers
- ▶ In the longer term, wages may affect result
- ▶ Producer responses may also be important
 - Elasticities likely much larger than on demand side

Channels of effect

- ▶ Exogenous food price changes affect household welfare directly
 - Through own-price effects on the cost of living
 - And on the value of output from household business
 - Deaton net-buyer, net seller criterion
- ▶ Also affect factor prices, esp unskilled wages
 - Stolper-Samuelson effects
- ▶ Useful to combine these two approaches

Capturing food price impacts on welfare

- ▶ Consider welfare of a household as a function of prices and wages
- ▶ $B = \pi(\mathbf{p}, w) - e(\mathbf{p}, w, u) = z(\mathbf{p}, w, u)$
 - $\pi(\mathbf{p}, w)$ represents profits from household firm(s)
 - $e(\mathbf{p}, w, u)$ a “full” cost function representing the cost of expenditure less wage earnings
 - Represents the behavior of the household as consumer & factor supplier

1st order impacts of change in p

Net sales*
Price change

$$dB = (\pi_p - e_p)\Delta p$$

Net Labor
Sales* Wage
change

$$+ (e_w - \pi_w)\Delta w$$

Short run impacts– no wage change

- ▶ Begin with the Deaton method to measure impacts on household real incomes

- $\Delta B = (\pi_p - e_p) \cdot \Delta p = z_p \cdot \Delta p$

- Where e_p is food demand & π_p is the household's supply
 - Net sales determine the effect on incomes

- ▶ Plus 2nd order effects on the demand side

- ▶ $\Delta B = z_p \cdot \Delta p + 1/2 \cdot \Delta p \cdot e_{pp} \Delta p$

Medium & Long-run welfare

$$\Delta B = [z_p \quad z_w] \begin{bmatrix} \Delta \mathbf{p} \\ \Delta w \end{bmatrix} + \frac{1}{2} [\Delta \mathbf{p} \quad \Delta w] \begin{bmatrix} z_{pp} & z_{pw} \\ z_{wp} & z_{ww} \end{bmatrix} \begin{bmatrix} \Delta \mathbf{p} \\ \Delta w \end{bmatrix}$$

- ▶ 1st-order impacts are Deaton measures + wages
- ▶ 2nd order impacts take into account qty changes
 - z_{pp} are changes in quantities because of price changes
 - z_{ww} changes in labor supplied outside hhold business
 - z_{pw} , z_{wp} are cross effects

Assumptions on prices & wages

- ▶ Recent food price rises appear to have arisen outside low income countries
 - Biofuel growth
 - Black Sea basin droughts
 - Low stocks
 - Speculation?
- ▶ Quite different from a price rise due to drought
- ▶ Specify wage responses to food price changes
 - Assume no structural change in developing countries
 - Maintain constant employment levels

Price–wage responses

- ▶ Calculating wage–price elasticities
 - Effect arises because of different factor intensities
 - Poor–country agriculture very intensive in unskilled labor
 - Higher food prices raise wages for unskilled workers
- ▶ Use national versions of the GTAP model
 - Only need the supply side
 - To assess impacts of higher food prices on wages for unskilled labor
- ▶ How much do food prices affect wages of poor?

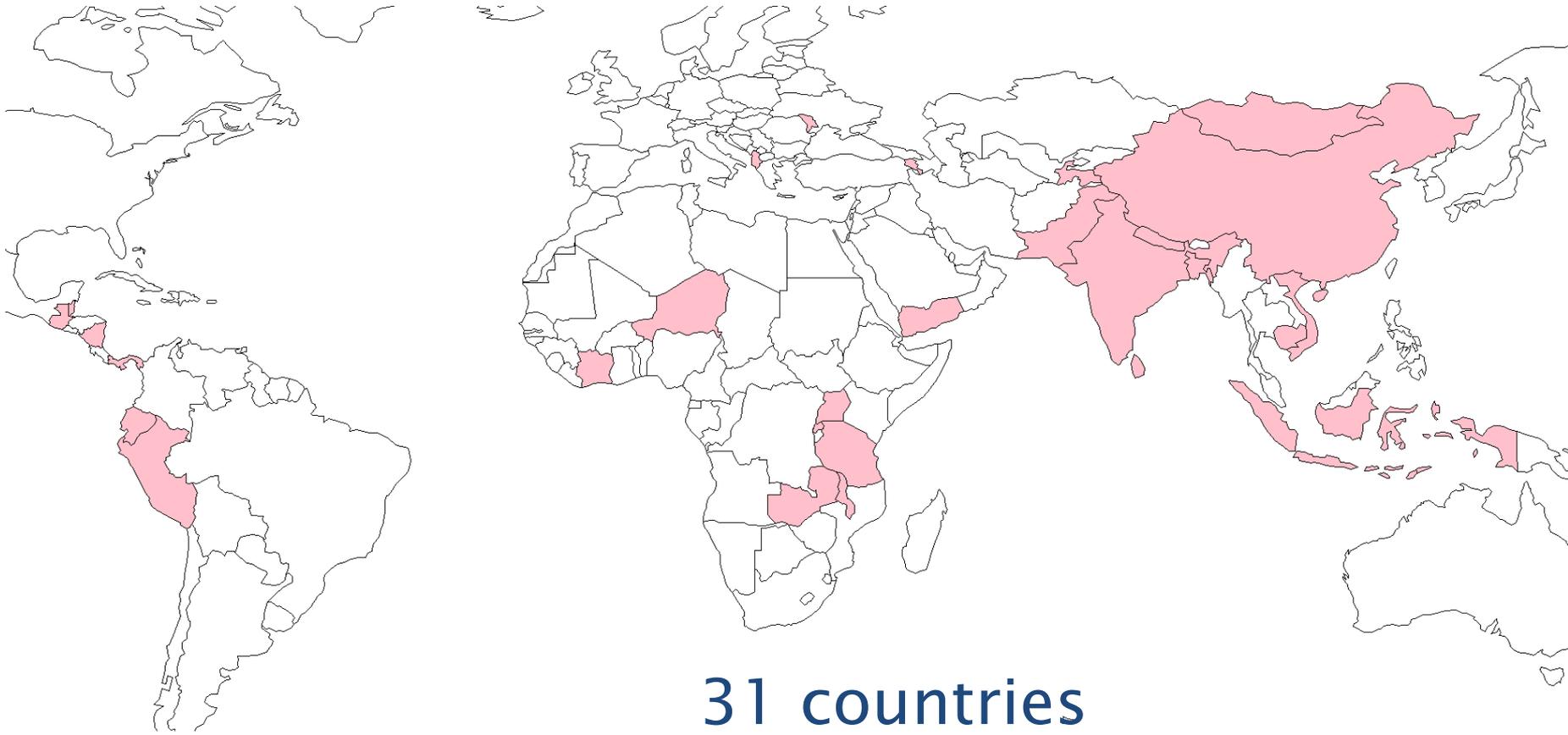
Wage-price elasticities

	Main commodity	Elasticity	All Food
Bangladesh	Rice	0.6	1.2
China	Other proc. foods	0.3	0.6
India	Other proc. foods	0.3	1.0
Nigeria	Cassava	0.5	1.2
Pakistan	Milk	0.2	1.1

Global Poverty Impacts

- ▶ Assess impacts on the income of each household
- ▶ Calculate resulting poverty measures
 - Headcount, poverty gap, poverty gap squared etc
- ▶ Extrapolate from national to global impacts
 - Use sample to represent countries regional WB income group

Sample countries



31 countries

315,000 households; 76% of world's poor

Poverty headcount: 10% food price rise

Country	Short run	Short run + wages	Medium run	Long run
Bangladesh	1.4	0	-0.4	-0.6
China	-1.3	-1.9	-2.1	-2.2
India	2.6	-1.1	-1.2	-1.4
Indonesia	1.7	0.8	0.8	1
Vietnam	-0.4	-2.1	-2.2	-1.9
Zambia	1.1	-0.4	-0.4	-0.9
Global	0.8	-1.1	-1.2	-1.4

Food price impacts on poverty

▶ Rural households

▶ Urban households

Food price change	Short run	Short run + wages	Medium run	Long run	Food price change	Short run	Short run + wages	Medium run	Long run
10%	0.5	-1.4	-1.6	-1.8	10%	1.5	-0.3	-0.4	-0.4
50%	4.3	-5.7	-6.7	-8	50%	9.2	0.2	-0.4	-0.6
100%	8.9	-9.5	-11.4	-13	100%	22.5	3.2	1.1	0.9

- Rural households benefit more than urban in long run
- Wage impacts important for urban & rural households
 - Urban households worse off even in the long run

Policy makers respond rationally

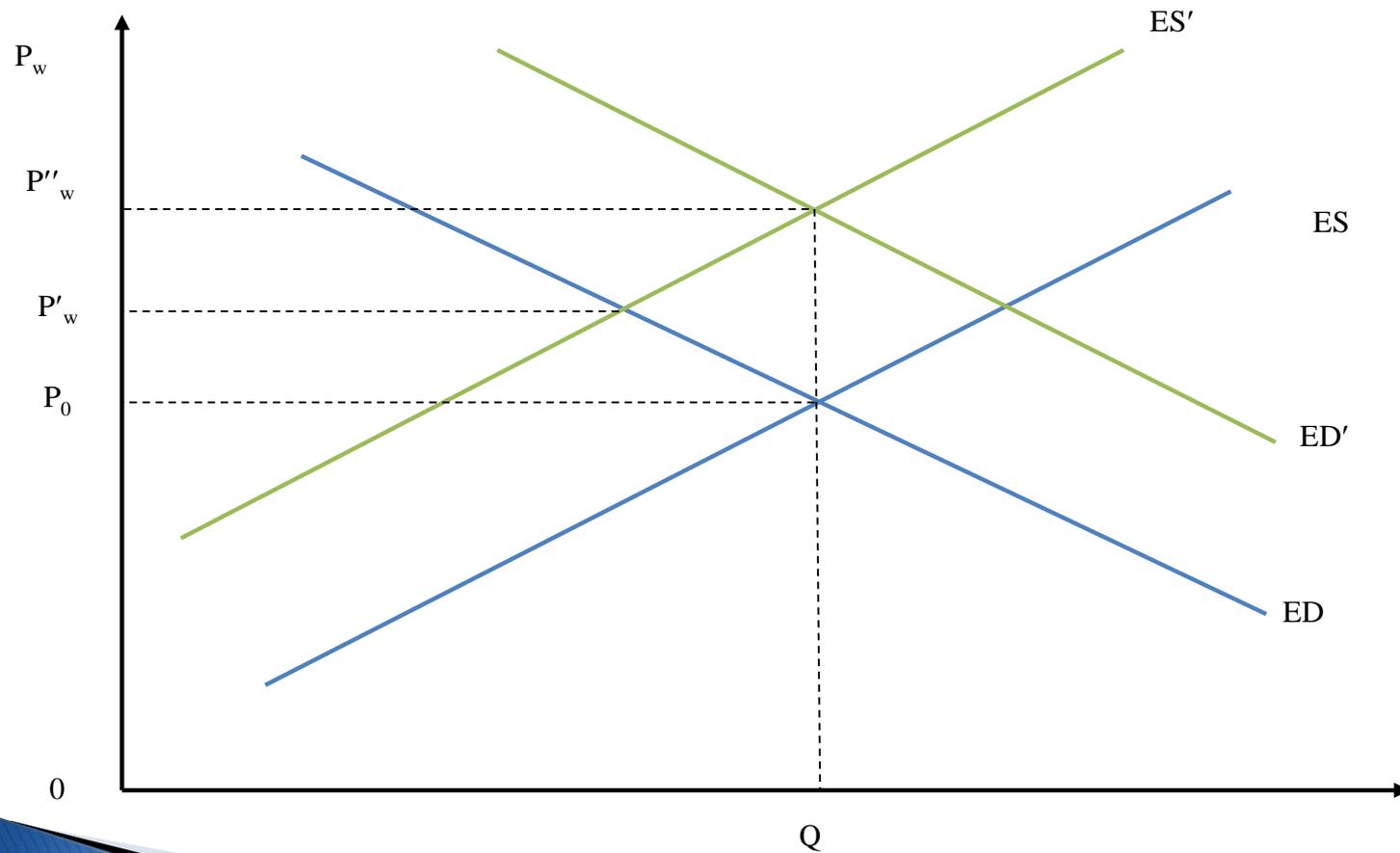
- ▶ Very concerned about the adverse impacts of food price shocks on the poor
 - And especially the urban poor
 - Hence short-run insulation
- ▶ But willing to allow longer-term changes in prices to be transmitted

Did it work?

Was the 2006–8 insulation a success?

- ▶ Policy makers insulated their domestic prices against the surge in world prices
- ▶ But their actions contributed substantially to these increases in world prices
 - A beggar thy neighbor problem
 - Even countries that don't want to insulate are forced to
- ▶ Each individual country sees its actions as a success
 - But is this the case for countries as a whole?

Ineffectiveness: equal export tax & import duty reduction



Methodology

- ▶ Calculate the changes in trade distortions between 2006 & 2008 for each country
 - ▶ Calculate impacts of these changes on world & domestic prices
 - ▶ Calculate counterfactual poverty implications
 - Poverty impacts of each country's own policies alone
 - Poverty impacts of all actions
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Poverty impacts at \$1.25 /day, % pts

	Everyone's action	Own actions
China	0.4	-0.6
Côte d'Ivoire	0.5	-1.8
Indonesia	0	-1.4
India	0.1	-4.2
Malawi	2.4	0.7
Niger	1.0	-0.5
Nigeria	-0.9	-1.9
Tanzania	0.1	-0.3
Viet Nam	-2.6	0.3
Zambia	-1.9	-1.5
World (million)	8	-84

Problems with insulation

- ▶ It looks successful even when it isn't
- ▶ It's contagious
 - If other countries do it, I have to as well
 - Even if I would not have intervened
- ▶ Export restrictions, in particular, raise concerns about food availability
 - And face next to no constraints from WTO rules

Some policy options

Potential policy options

- ▶ Improving information & market efficiency
 - ▶ Social safety nets
 - ▶ Rational storage policies
 - ▶ Disciplines on the collective action problem
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Improving information

- ▶ Poor information about stocks played an important role in the 2008 food crisis
- ▶ Improving market information an important goal of the AMIS initiative
 - Better market information can have an enormous impact
 - Improved information technology can have a huge impact
- ▶ Need to avoid extrapolative expectations
 - By market participants and governments

Social safety nets

- ▶ Policies such as social safety nets are individually and collectively effective
 - There is an income effect that adds to price volatility
 - but the increase in demand by the poor is offset by a decline in demand from the rich
 - Despite this “rebound”, access to food by the poor can be increased
- ▶ Domestic food aid exempt from WTO disciplines
 - Consistent with both mercantilist & economic logic
- ▶ Insulating policies cause substitution towards food by all consumers
 - The combination of substitution and income effects creates the ineffectiveness problem

Rational storage policies

- ▶ Storage is potentially “help thy neighbor” as distinct from “beggar thy neighbor” insulation
- ▶ Combinations of trade and storage more cost-effective for small countries than either pure insulation or pure storage policies
- ▶ But storage policies for a small country require use of insulating trade policies
 - And combined storage & trade still end up being beggar-thy-neighbor
- ▶ In practice, storage is frequently destabilizing
 - Excessive stocks accumulated in many countries during 2008–10

Disciplines on insulating policies

- ▶ Some precedents in WTO
 - Price-based SSM proposal would involve a discipline on the duties used to offset falls in world prices
 - ▶ Needed to reduce the collective action problem
 - Creating more “policy space” for all members doesn’t address the collective action problem
 - Need to remember that the WTO is about addressing collective action problems
 - ▶ Partial disciplines on export restrictions likely important
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Conclusions

- ▶ Policy makers appear to adjust protection in response to changes in world prices
 - This makes sense for individual countries
 - Both for political–economy considerations and in light of poverty reduction goals
- ▶ In the short run, food price increases appear to increase poverty
 - But to lower it in the longer term
 - When supplies adjust and unskilled wage rates rise
- ▶ Collectively, insulation appears to be ineffective
 - Need to develop policies that work
 - Lots more research and policy development needed

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