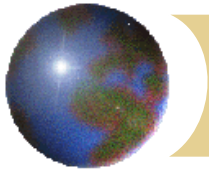


Trade Distortions and Food Price Surges

Will Martin and Kym Anderson
World Bank and University of Adelaide

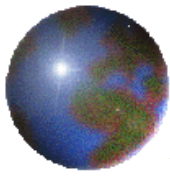
55th Annual Conference of the Australian Agricultural and Resource
Economics Society (AARES), Melbourne, 9-11 February 2011

Financial assistance from the World Bank and the ARC are gratefully acknowledged.
Views expressed are the authors' alone and not necessarily those of the World Bank or its Executive Directors.

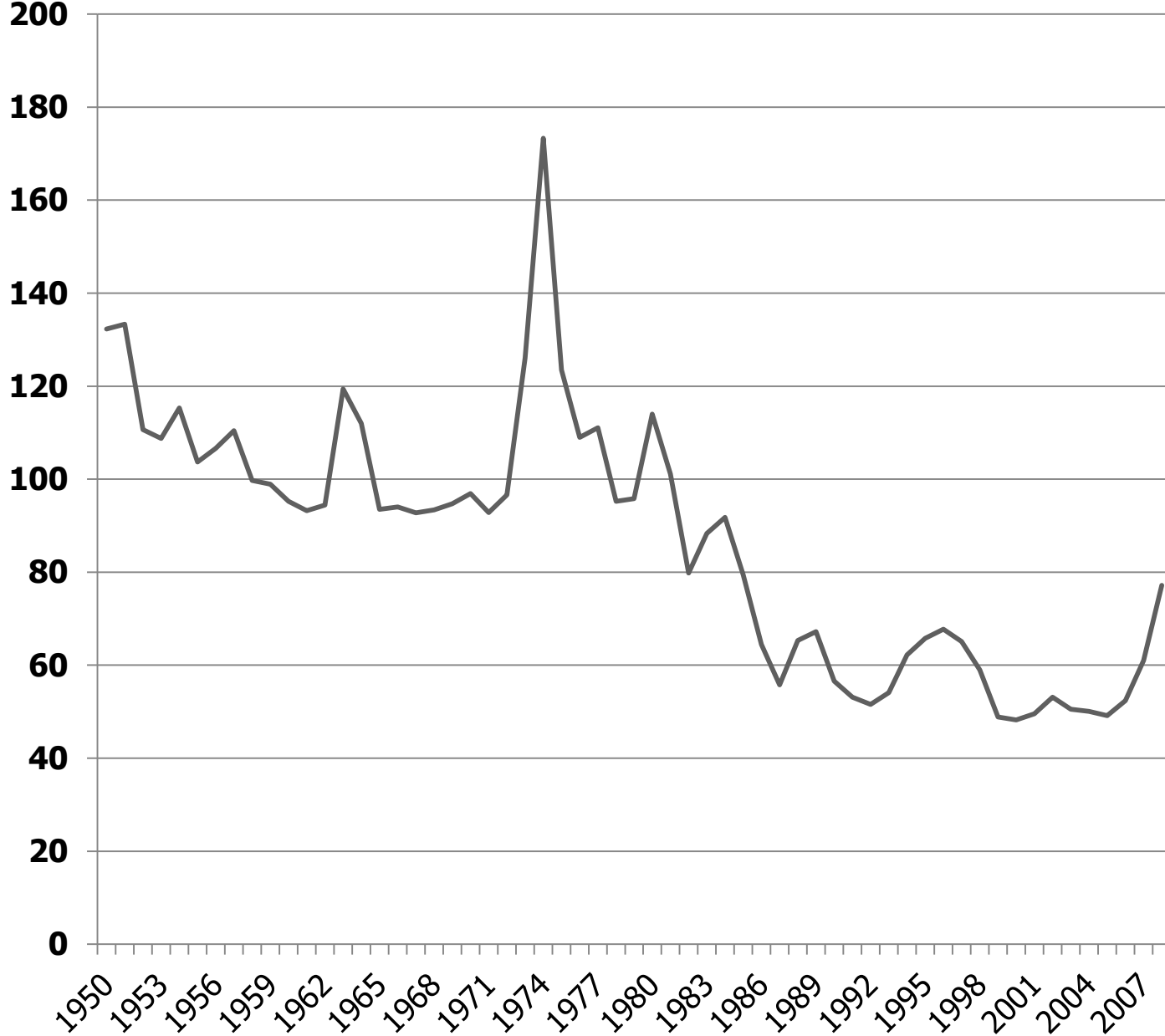


Context

- ❖ Domestic market insulation from int'l food price fluctuations, using variable trade restrictions, is still WTO-legitimate
- ❖ But such variable trade restrictions **contribute** to int'l price instability (an international public 'bad')
 - ❖ To what extent did they contribute to the food price spikes of 1974 and 2008?

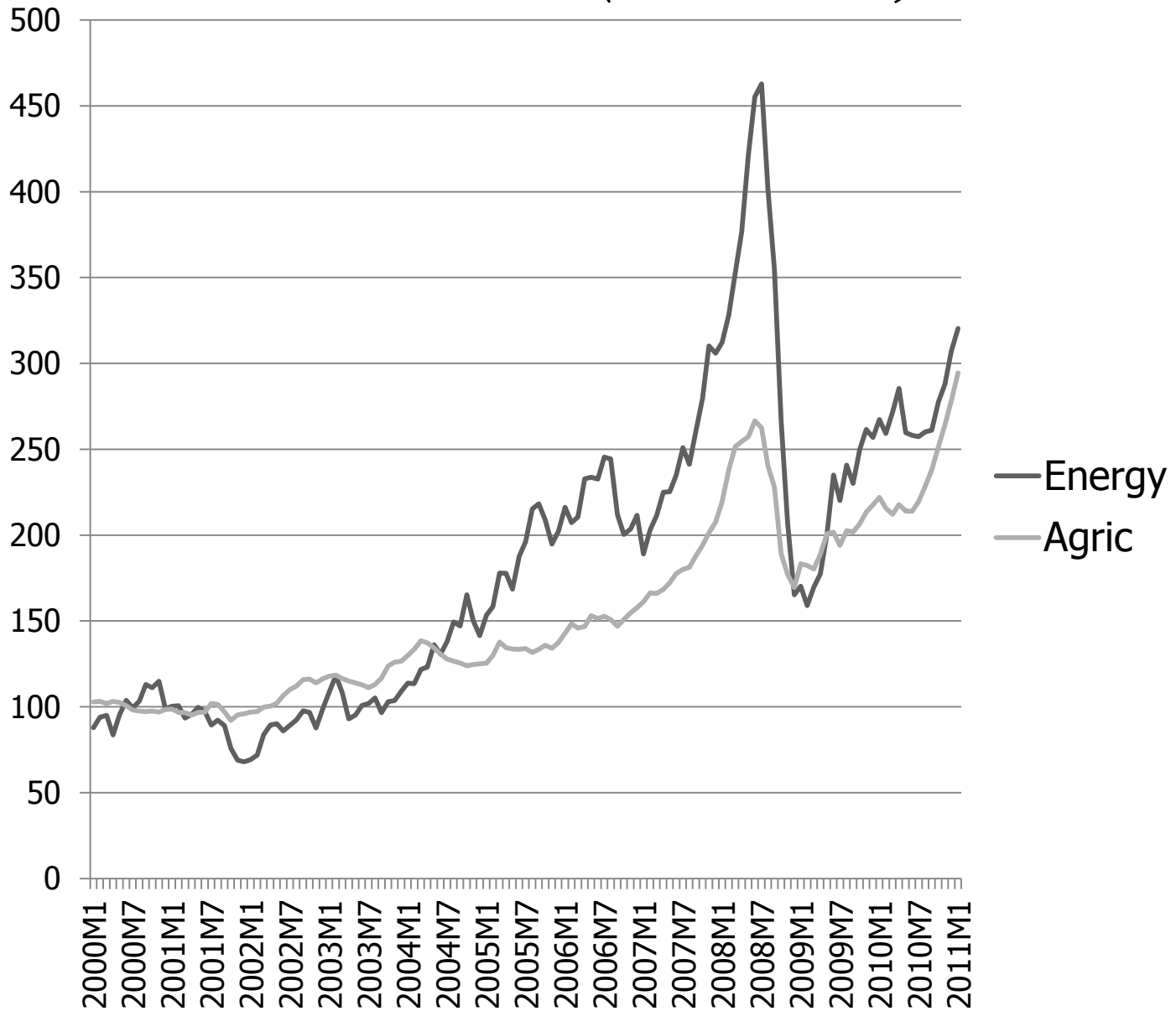


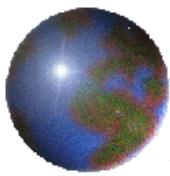
Real int'l food price, 1950 to 2008





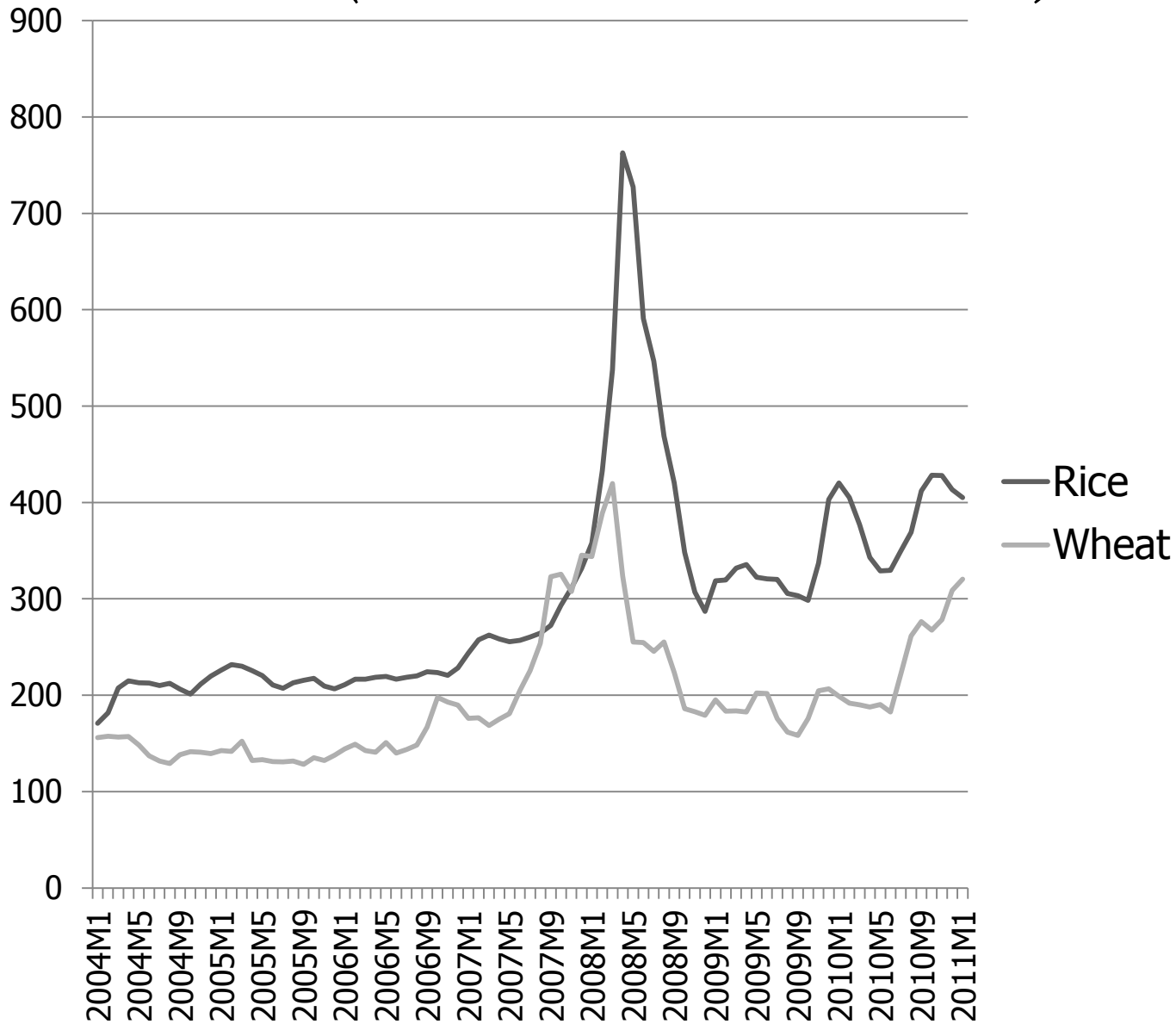
Int'l energy & agric price indexes, 01/2000 to 01/2011 (nominal, 2000 = 100)

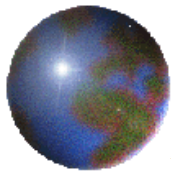




Rice & wheat prices, 01/04 to 01/11

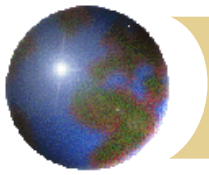
(nominal US\$/tonne)





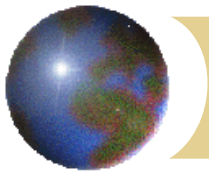
The issue

- ✦ Grain price spikes in 2008 and 2010 have revived interest in the role of trade restrictions aimed at stabilizing domestic food prices
- ✦ ***This paper :***
 - ❏ 1. Shows exporter responses would be futile if food-importing countries **fully** offset exporter responses;
 - ❏ 2. Provides evidence of extent of partial insulation by both groups when int'l prices have spiked up (and also down); and
 - ❏ 3. Estimates extent to which partial insulation policies have contributed to int'l rice and wheat price spikes



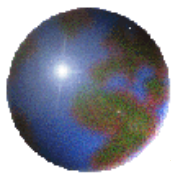
1. Why food export restrictions are ineffective nationally when importing countries respond

- ✚ For exporting countries, int'l price insulation may appear to be a politically low-cost way to minimize variability in domestic prices
 - ✚ And possibly even economically beneficial (terms-of-trade improvement, through a rise in int'l price), if enough exporters act simultaneously
 - as Russia and its neighbors did in 2010

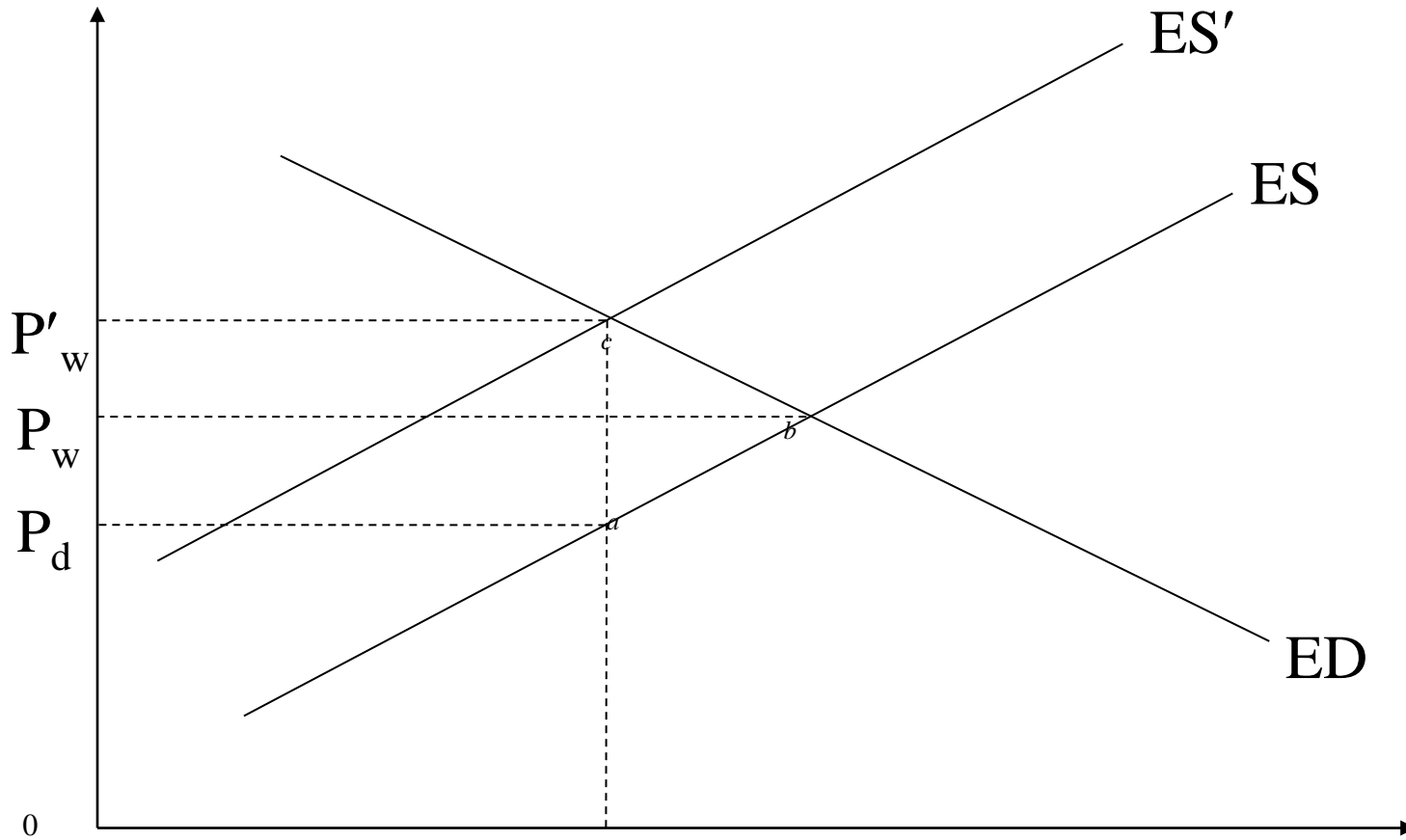


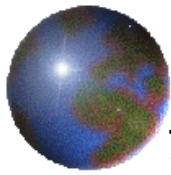
Consider national responses following an exogenous shock that raises int'l food price

- ❖ Exporting countries can offset the shock to domestic price with an export restriction
- ❖ But what if food-importing countries then reduce their import duty (or introduce an import subsidy), to counter the exporting-country response?

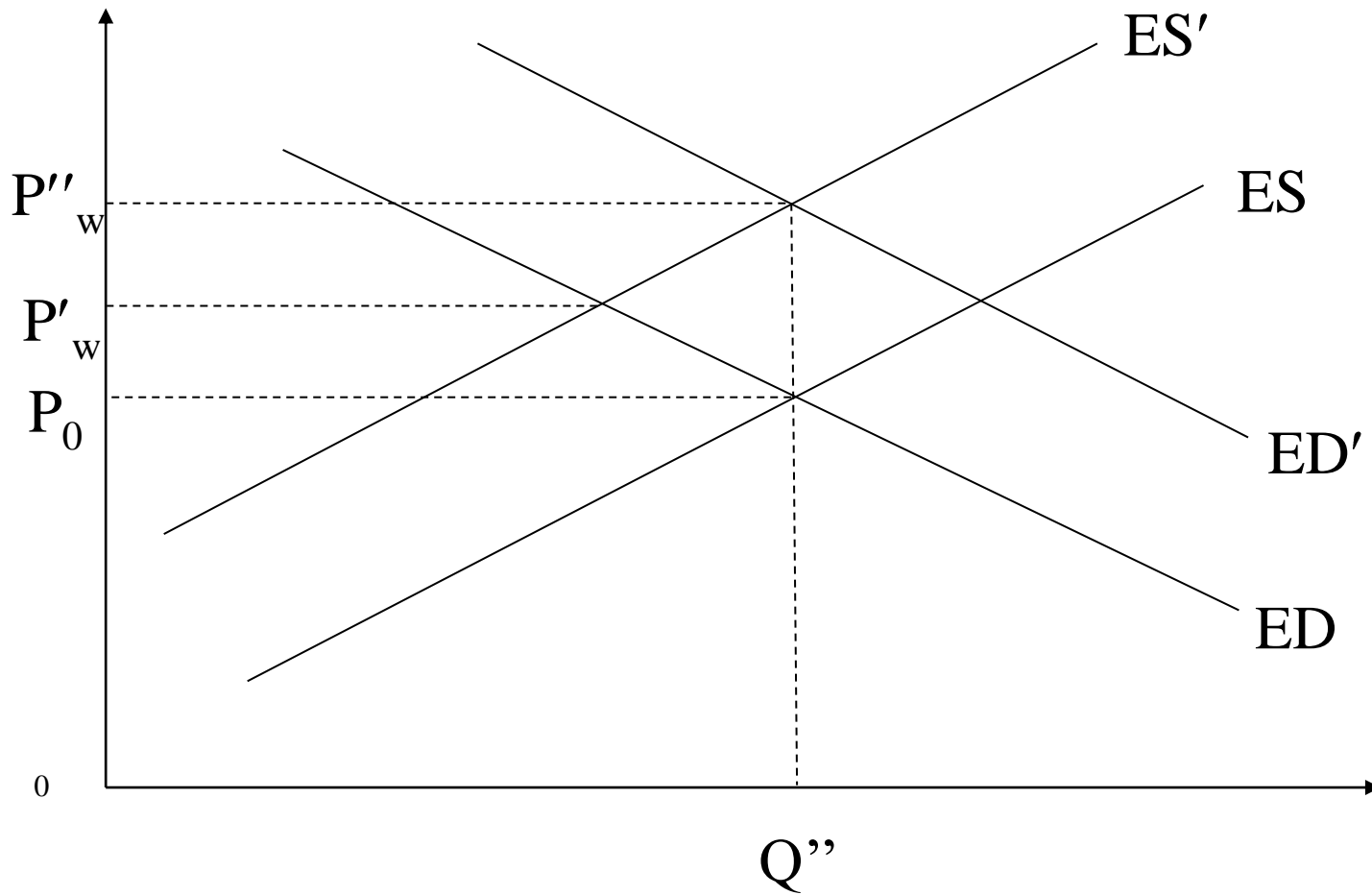


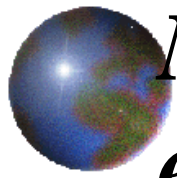
Impact on int'l food market of a large increase in export barriers, in response to exogenous price rise from P_d to P_w





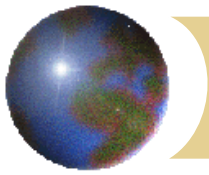
Export barrier increase with exactly- offsetting lowering of import barriers





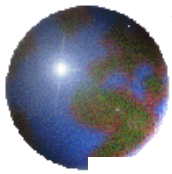
National responses following an exogenous shock that raised P_w (continued)

- ✚ If food-importing countries cut their import duty to counter exporting-country responses:
 - ▣ P_w rises further, **increasing** terms-of-trade transfer from importing to exporting countries
 - In contrast to HG Johnson or Bagwell/Staiger-type retaliation, which is intersectoral & so **offsetting**
 - ▣ But trade volume, and hence P_d , return to their initial post-shock levels
- => **neither** country group achieves its objective of avoiding transmission of initial int'l price rise from P_d to P_w
- Similar to crowd standing in a stadium to see better**



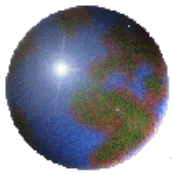
2. Evidence of partial insulation by exporters AND importers when int'l food prices spike

- ⊕ Farm product nominal rates of assistance (NRAs) tend to be highly correlated with corresponding consumer tax equivalents (CTE)
 - ⊕ i.e., trade policy instruments dominate, so we can focus just on NRAs
- ⊕ NRAs (hence also CTEs) are strongly negatively correlated with movements in pertinent int'l price
- ⊕ On average, for top traded farm products, **barely half** the change in an int'l price is transmitted to domestic markets within 1 year
- ⊕ Tendency hasn't diminished over the decades

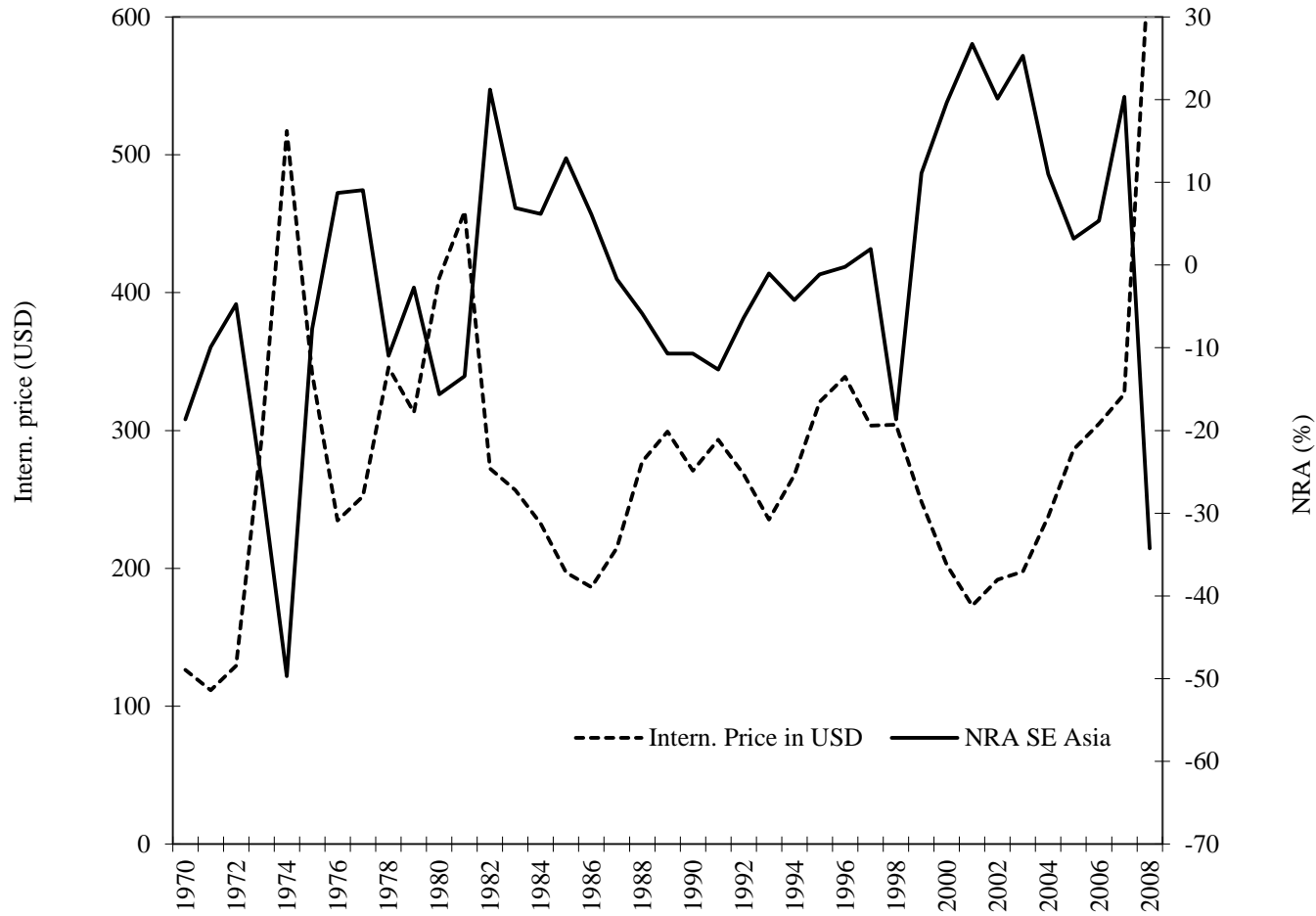


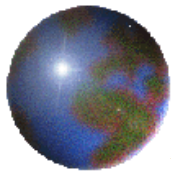
Rice NRA for South Asia, 1970-2008





Rice NRA for SE Asia, 1970-2008

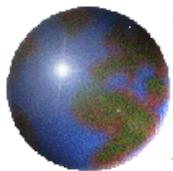




Short-run price transmission elasticity

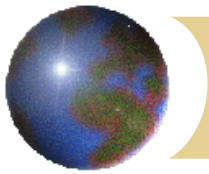
Globally, 1985-2007

Rice	0.52
Wheat	0.47
Maize	0.57
Sugar	0.31
Cotton	0.57
Coffee	0.71
Beef	0.68
Pork	0.49
<i>Av. (unwted)</i>	<i>0.54</i>



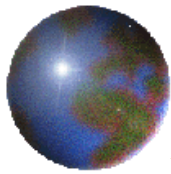
Annual deviation of national NRA around trend *(percentage points)*

	NRA deviation (unwted av. of national)		<i>NRA (%)</i> <i>average</i>
	1965-84	1985-04	<i>1985-04</i>
Rice	37	103	28
Wheat	56	65	18
Maize	43	41	7
Sugar	132	116	42
Cotton	35	32	-5
Coffee	41	27	-12
Milk	200	137	88
Pork	90	62	3
<i>Av. (unwted)</i>	79	73	



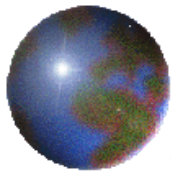
Further evidence of partial insulation by exporters & importers when int'l prices spike

- ✪ In times of int'l price spikes, both export and import restrictions are altered, and by both high-income and developing countries
 - ✚ See next tables, based on estimates from World Bank's agric distortions database for 75 countries and >70 products
 - ✚ Uses merchantilist trade restrictiveness index (building on J. Anderson and P. Neary 2005):
 - uniform national trade tax which, if applied in place of actual structure of country's agric trade taxes, would have same agric trade volume effect



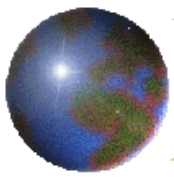
Trade Reduction Index, all agric (%)

	1965-71	1972	1973	1974	1975	1976
Import taxes:						
<i>DCs</i>	9	13	3	2	10	11
<i>HICs</i>	34	29	20	17	24	35
Export taxes/subsidies:						
<i>DCs</i>	19	15	29	32	26	17
<i>HICs</i>	-4	-4	-2	-1	-2	-2

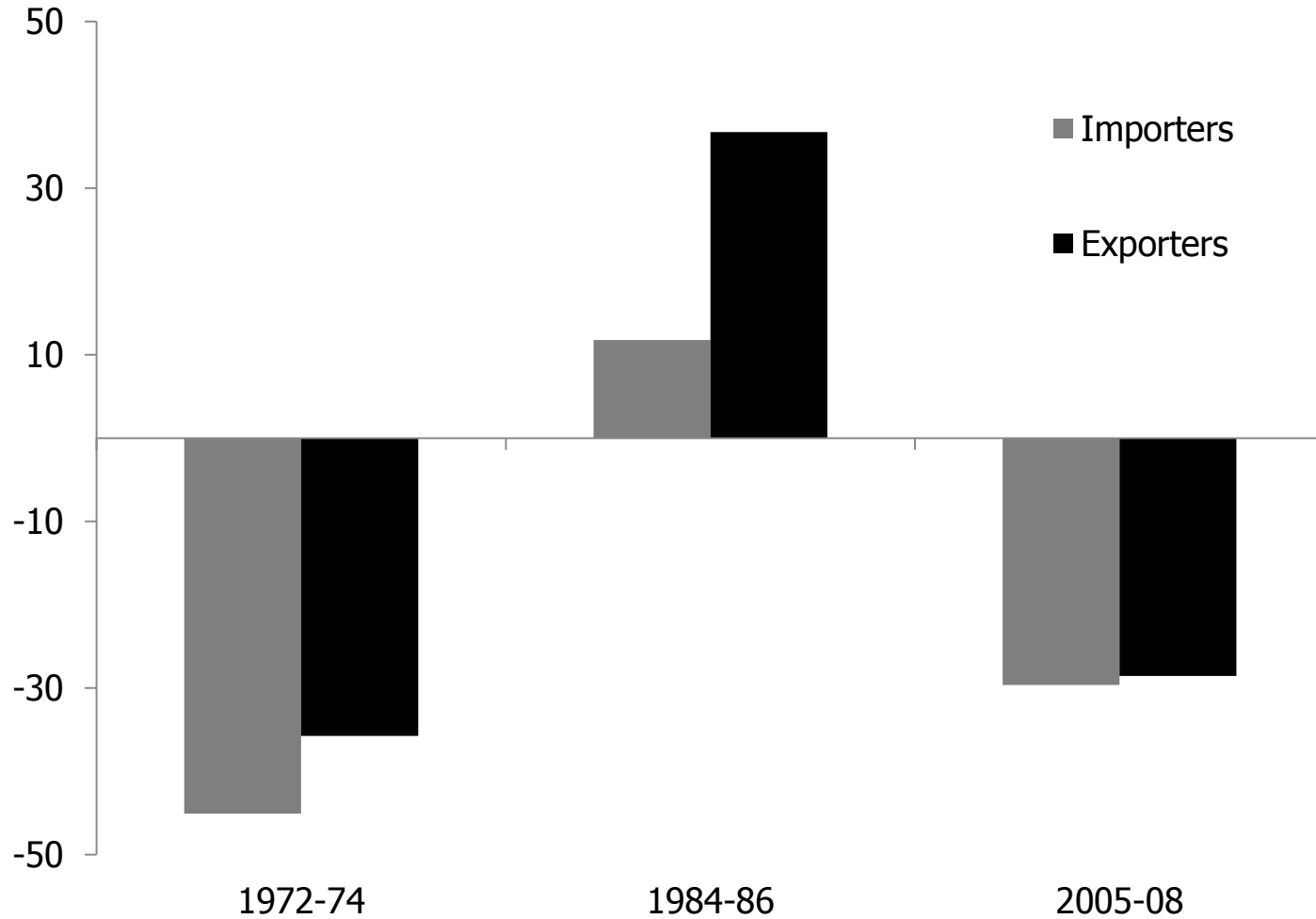


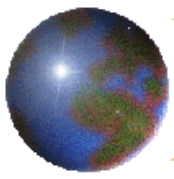
Trade Reduction Index, all agric (%)

	1977-83	1984	1985	1986	1987	1988
Import taxes:						
<i>DCs</i>	9	10	13	14	15	11
<i>HICs</i>	37	40	41	60	60	51
Export taxes/subsidies:						
<i>DCs</i>	22	28	20	26	32	30
<i>HICs</i>	-3	-3	-5	-8	-8	-6



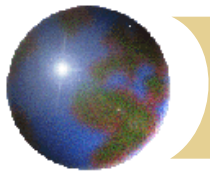
% change in NAC for rice in price-spike periods (importers vs exporters)





% change in NAC for wheat in price-spike periods (importers vs exporters)





3. How much have partial insulation policies contributed to int'l price spikes?

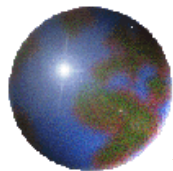
✚ Think of global market equilibrium as:

$$\sum_i S_i(p_i, \lambda_i) - \sum_i D_i(p_i) = 0$$

where

λ_i is an exogenous production shock, and

p_i is domestic price (different from int'l price p^* due to a trade tax, t_i)



Trade tax contribution to int'l price spike

- ✚ If $T_i (=1+t_i)$ is power of the trade tax t_i , then proportional change in int'l price is

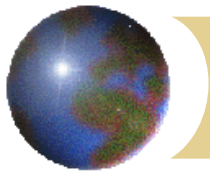
$$\hat{p}^* = \frac{\sum_i H_i \hat{S}_i + \sum_i (H_i \gamma_i - G_i \eta_i) \cdot \hat{T}_i}{\sum_i (G_i \eta_i - H_i \gamma_i)}$$

where:

\hat{S}_i is an exogenous shock to i 's supply,

H_i and G_i are national shares of global prod'n and cons'm at int'l price, and

γ_i and η_i are supply & demand elasticities

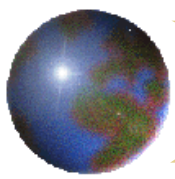


Trade tax contribution to int'l price spike (continued)

- ✚ If supply cannot respond in short term, so $\hat{S}_i = 0$, equation has 3 implications

Implication 1: if the proportional change in T_i is the same for all countries, that is also the proportional change in p^*

=> domestic prices, p_i , are unchanged
(as noted earlier)



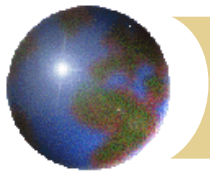
Trade tax contribution to int'l price spike (continued)

- ➊ **Implication 2:** if trade policy is no longer exogenous, previous equation reduces to:

$$\hat{p}^* = \frac{\sum_i H_i \hat{S}_i}{\sum_i (G_i \eta_i \theta_i - H_i \gamma_i \phi_i)}$$

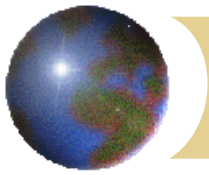
where θ_i and ϕ_i are elasticities of transmission of int'l price to the domestic consumer and producer prices (so $\theta_i = \phi_i$ for trade policy)

E.g., if $\theta_i = \phi_i = 0.5$, impact of a supply shock on p^* will be twice as large (and variance of p^* will be 4x as large) as would be the case with no insulation



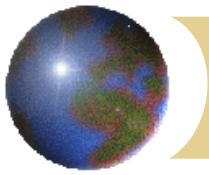
Trade tax contribution to int'l price spike (continued)

- ✚ **Implication 3:** If farmers cannot respond in short term, so $\gamma_i = 0$, and if national price elasticities of demand for the product are equal across countries, then the contrib'n of changes in T_i to the change in p^* is the negative of the consumption-weighted global average of T_i changes



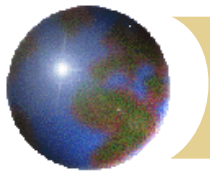
Consumption-weighted global average of T_i changes (%)

	1972-74	2005-08
Rice	-58	-46
Wheat	-30	-28



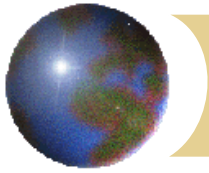
Int'l price rises for rice & wheat
(cumulative, nominal, %)

	1972-74	2005-08
Rice	300	127
Wheat	157	114



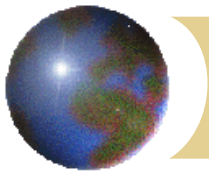
Hence trade tax contributions to int'l price spikes for rice & wheat are (%):

	1972-74	2005-08
Rice	19	36
Wheat	19	24



WTO implications

- ❖ Large cuts to WTO-bound tariffs would reduce 'binding overhang' & thus prospect of NRA increases **when prices spike downwards**
 - ❖ SSM, however, would do the opposite
- ❖ **When prices spike upwards**, WTO commitments don't help, because of absence of disciplines on agric export restrictions



Summary

- ❏ Shown exporter responses to int'l food spikes would be futile if food-importing countries **fully** offset those exporter responses
- ❏ Shown that **partial** insulation is practiced by **both** X and M countries when int'l prices spike up and down
 - Collective action problem, requiring multilateral agreement to desist (i.e., **tighter disciplines on import restrictions, and new disciplines on food export restrictions**)
- ❏ Provided crude estimates of contribution of partial insulation policies to int'l rice & wheat price spikes:
 - One-fifth in 1972-74
 - Even more in 2005-08: 1/4th for wheat, 1/3rd for rice