

EXPORT RESTRICTIONS AS STABILIZATION RESPONSES TO FOOD CRISIS

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In response to the dramatic increases in world agricultural commodity prices during the food crisis of 2007–08 many countries pursued trade and domestic policy responses intended to stabilize domestic markets and protect urban consumers (Abbott 2009). Import tariffs were reduced, strategic grain reserves were released, domestic taxes were cut, and in some cases imports and consumption were subsidized (Demeke, Pangrazio and Maetz 2008). Exporters, including some of the major suppliers to world markets, restricted exports by imposing taxes, quotas, and even outright bans on exports. Those export restrictions are believed to have contributed significantly to the extent of world price increases (Mitra and Josling 2009). The extraordinary increase in the world rice price, without justification based on supply, use and stocks worldwide, has been attributed mostly to export bans and restrictions by the large traders (Timmer 2008).

Not all of the major grain exporters restricted exports. Table 1 shows who among the major exporters restricted exports in some fashion and also indicates who among the rice exporters limited exports. It also shows a number of developing country importers who restricted exports to ensure that their stabilization measures did not result in grain leaving those countries to higher priced neighbors. The key question addressed here is why did some exporters leave their borders open while others withdrew from world markets? The answer comes from the level of development, which determines dietary composition and the length

of the supply chain, and political economy explanations of historical agricultural policy choices. Diet and margins between the farm-gate and consumer determined who was at risk, and policy decisions clearly redistributed potential windfall gains away from farmers in some but not all cases.

Market and Welfare Outcomes

Numerous studies have recently explored why exporters tax or ban exports (Mitra and Josling 2009, Bouet and Laborde 2010, Nogués 2008). Some rationales, including exercise of market power, revenue generation, and stimulation of a domestic processing sector via differential taxes, address longer run economic objectives. Export restrictions in 2007 and 2008 were short run policies achieving short run objectives, principally stabilization of domestic markets and redistribution of the potential windfall gains away from farmers and toward consumers, intermediaries, food processors, livestock producers and government. Welfare implications found in the recent studies did not generally examine time frame, leading to long run recommendations, such as increasing agricultural production, that were not viable options to combat the market extremes faced during the food crisis. At least one study (Mitra and Josling 2009) ignored large country effects that are mandatory if a country's export limits are going to affect world prices. That was the only study to recognize political economy motivations behind policy decisions that influenced past choices and recent decisions regarding exports, however.

Figure 1 depicts the large country case when an exporter faces an increase in net import demand by foreigners and shows the consequences of the imposition of an export tax.

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Table 1. Countries who Imposed Export Restrictions during the 2007–08 Food Crisis**Major grain exporters¹ who left their borders open**

U.S. (wheat, coarse grains, rice, oilseeds)
 Canada (wheat, coarse grains)
 Australia (wheat, coarse grains) – Drought limited availability
 South Africa (coarse grains – no longer a major exporter) – Between parity bounds
 Thailand (rice) – Was debating restrictions as rice market broke

Major grain exporters¹ who restricted or taxed exports

Argentina (wheat, coarse grains, oilseeds)
 Brazil (coarse grains, oilseeds) – Reduced taxes on wheat (an importer)
 Russia (wheat, coarse grains) in 2008 and 2010
 Ukraine (wheat, coarse grains)
 Kazakhstan (wheat)
 E.U. (wheat) – Two-way trade in grains, taxed wheat exports in 1995, but stabilized imports in 2008 by only reducing tariffs

Rice exporters who restricted exports

India (Quantitative Restrictions on rice)
 Vietnam (Quantitative Restrictions on rice)
 China (coarse grains and rice) – Also taxed fertilizer exports
 Pakistan
 Cambodia

Rice importers who banned exports

Egypt
 Indonesia
 Bangladesh

Developing countries (nes) who banned or restricted grain exports

Iran	Jordan	Lebanon
Myanmar	Nepal	Syria
Cameroon	Ethiopia	Guinea
Kenya	Malawi	Tanzania
Zambia	Bolivia	Ecuador

¹Major grain exporters are as identified in USDA's WASDE reports (ERS 2010).

Sources: Demeke, Pangrazio and Metz (2008), Trostle (2008), and Timmer (2008). There may be countries that imposed export restrictions that were not looked at in those studies. This list may be incomplete, but it does cover all WASDE major grain exporters.

(There is in this simple theoretical framework a tax equivalent of export bans and quotas.) Increasing world demand would result in higher prices for the commodity and windfall gains to producers. This is shown by shifting the net import demand function outward, as represented by the dashed downward sloping line in the second panel of figure 1, resulting in a world price (Pw_1) at the horizontal dashed line in both panels in the absence of an export tax. This brings standard changes in

producer surplus (increasing by $a + b + c + d$) and consumer surplus (decreasing by $a + b$) that follow from higher prices. Imposition of an export tax increases the world price further (to Pw_2) while reducing the domestic price (to Pd_2), as shown by the horizontal dotted lines in figure 1 that differ by the size of the tax ($T = Pw_2 - Pd_2$). Hence, producer surplus does not increase as much as it would without the tax ($a + c$) and consumer surplus declines less (a). Tax revenue is collected from both foreigners ($f + h$) and domestic agents ($e + g$), yielding the possibility that welfare increases for a large country exporter when tax revenue from ROW exceeds deadweight losses in the exporting country (i). World welfare has declined, however, as tax revenue collected from foreigners is simply a redistribution, and both the exporting and importing nations incur deadweight losses ($i + j$) due to the tax.

The extent of adjustments in supply, demand and trade, and how the burden of this tax is shared between consumers, producers and foreigners depends not only on domestic supply and demand elasticities – that determine the elasticity of net export supply – but also the elasticity of foreign import demand. More inelastic foreign demand means a greater increase in world price and a greater share of the tax born by foreigners. Large country impacts that depend on the magnitude of this foreign net import demand elasticity are why it has been well known that stabilization by a large trader of its domestic market destabilizes the world market (Bale and Lutz 1979, Tyers and Anderson 1992, and rediscovered by Bouet and Laborde 2010).

The framework described above is what is used in most recent studies, although it is acknowledged that impacts on intermediaries, domestic food processors and livestock producers need to be taken into account. Additional agents need to be modeled and imperfect competition may need to be taken into account to represent the observed declines in mark-ups accruing to intermediaries and in profits to food processors and livestock producers. An export tax will redistribute income away from farmers, and not only toward consumers but also to these additional agents. In practice such models would need to capture the much smaller changes in consumer food prices that followed from both large world price increases and imposition of export taxes by large exporters.

Political economy analysis has related these surplus changes that follow from trade and

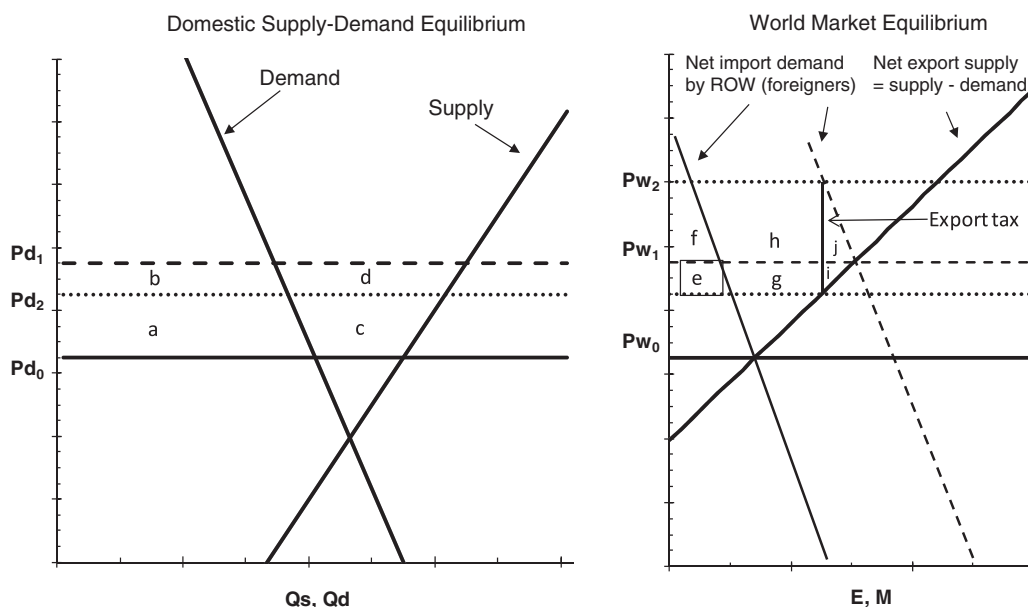


Figure 1. Export tax impacts following an increase in net import demand.

domestic policies to optimal instrument settings when agents do not all count equally for decision-makers. That analysis has also been used to compute relative weights assigned to different economic agents, assuming observed policy choices are optimal for the re-distributional goals of the social welfare function (Paarlberg and Abbott 1986). Applied research has shown that U.S. policy has favored grain farmers and harmed livestock producers and food processors, at least since export restrictions were banned after brief use in the late 1970s. In countries that have historically applied export taxes, such as Argentina and Brazil (Nougés 2008, Mielke 2008), greater political weight is given to government revenue, consumers, food processors, and livestock producers than to farmers. Decisions taken in 2007 and 2008 relative to export taxes are consistent with this historical pattern of policy choices and so lower political weight on farmers.

Social welfare functions used in past literature do not accommodate well stabilization objectives. Realistic functions would need to be non-linear to capture stabilization as a goal, weighting less heavily positive deviations from the status quo and weighting more heavily negative deviations. They would also need to accommodate policies that seek to keep outcomes out of the tails of price distributions and avoid market extremes (Abbott

2010). In stabilizing cases it is likely that computed political weights from the food crisis would place increased weight on consumers and intermediaries relative to what has been the case in the past, reflecting this desire to avoid extremes.

Producer and Food Price Impacts in 2007–08

Table 2 presents information on what actually happened to farmgate and food prices in the major grain trading countries in 2007 and 2008. Producer price data in local currency from FAOSTAT (FAO 2010) are converted to indices by dividing deflated prices in 2007 and 2008 by prices in 2006. Food inflation indices from the OECD (2010) are divided by the consumer price index (CPI) to gauge changes in relative food prices. The major traders as identified in table 1 (from ERS 2010) are described as well as simple averages for the major traders who left their borders open, those who employed export restrictions, and a set of rice exporters. World prices from the IMF are reported in a similar format to serve as a basis for comparison to the large world price shocks.

Aggregation over time is an issue in interpreting this annual data. World prices are a simple average of monthly data, whereas farmers may not have been able to sell at peak

Table 2. Real Relative Producer Price Indices and Food Inflation in 2007 and 2008

Exporter		Producer Prices ¹				Inflation ²	
		Maize	Rice	Soybeans	Wheat	Food	CPI
Argentina	2007	1.18	1.15	1.15	1.23	1.03	1.09
	2008	1.29	1.26	1.39	1.40	0.95	1.18
Australia	2007	1.24	1.21	1.14	1.16	0.99	1.02
	2008	1.55	1.42	1.33	1.80	0.99	1.07
Brazil	2007	1.23	1.06	1.17	1.25	1.03	1.04
	2008	1.38	1.32	1.55	1.37	1.10	1.10
Canada	2007	1.29		1.24	1.61	1.00	1.02
	2008	1.57		1.65	2.20	1.02	1.05
China	2007	0.70	0.62	1.22	1.06	1.07	1.05
	2008	0.68	0.66	0.95	1.06	1.16	1.11
France	2007	1.40	1.28	1.58	1.59	1.00	1.01
	2008	0.88	1.44	1.45	1.25	1.02	1.04
India	2007	0.69	0.51	0.99	1.05	1.02	1.07
	2008	0.98	1.28	1.22	1.09	1.04	1.12
Kazakhstan	2007	1.00	1.05	0.93	1.24		1.11
	2008	1.21	1.19	0.98	1.70		1.30
Pakistan	2007	0.97	1.02	0.99	0.94	1.01	1.08
	2008	0.83	0.88	0.84	0.82	1.12	1.29
Russia	2007	1.39	1.18	1.10	1.39	1.00	1.09
	2008	1.36	1.17	1.53	1.34	1.06	1.24
South Africa	2007	1.38		1.49	1.54	1.03	1.07
	2008	1.42		2.30	1.27	1.06	1.19
Thailand	2007	1.24	1.24	1.38			1.02
	2008	1.46	1.28	1.49			1.08
Ukraine	2007	1.42	0.95	1.40	1.33	0.98	1.14
	2008	0.97	1.65	1.15	0.99	1.07	1.44
United States	2007	1.34	1.25	1.53	1.47	1.01	1.03
	2008	1.25	1.57	1.45	1.48	1.04	1.07
Vietnam	2007		1.07				1.08
	2008		1.32				1.33
World Market Price	2007	1.31	1.04	1.42	1.29		
	2008	1.72	1.61	1.95	1.59		
Major grain exporters³ who left borders open							
Averages for	2007	1.30	1.23	1.36	1.44	1.01	1.03
	2008	1.45	1.43	1.64	1.69	1.03	1.09
Major grain exporters³ who restricted exports							
Averages for	2007	1.19	1.04	1.22	1.30	1.02	1.07
	2008	1.11	1.24	1.29	1.30	1.06	1.20
Rice exporters³ for	2007	0.79	0.81	1.06	1.02	1.04	1.07
	2008	0.83	1.03	1.00	0.99	1.11	1.21

¹ Producer price indices are computed from local currency producer price data on FAOSTAT (FAO, 2010). These producer price indices equal one in 2006 and are deflated using inflation data (CPI) from IMF (2010). All indices are relative to 2006.

² Food inflation data from OECD (2010) and various national statistical websites are expressed relative to the CPI.

³ Major exporters and rice exporters are as defined in table 1.

or even average world prices, and imports may have been reduced as world prices rose. Nevertheless, some generalizations appear in these results. Contrasting responses are seen by the United States, Canada and Australia, who avoided trade restrictions, versus Argentina, Brazil, the European Union, Russia and most Asian rice exporters, who taxed or

banned exports to limit impacts on consumers, agribusiness or intermediaries. Among those who restricted exports, greater price stabilization is observed for the Asian rice exporters than for Latin American and Eastern European export taxers.

In the U.S. relative real producer prices increased about 25% in 2008 from 2006 for

corn, 57% for rice, 45% for soybeans and 48% for wheat. These are only somewhat lower than real world price increases, as the U.S. left its border open and world prices are denominated in dollars, and may be as good a standard as world prices to gauge other countries' behaviors toward farmers. The major grain exporters who left borders open realized similar, if higher, farmgate price increases, at about 45% for corn and rice and 65% for wheat and soybeans. Those major exporters who restricted exports realized lower farmgate price increases, at 11% for corn and 25–30% for the other agricultural commodities. While these are less than half the increases for the free traders, they are substantial windfall gains nevertheless. Farmers in rice exporting countries fared less well on average, as producer prices there for rice fell in 2007 and increased only 3% relative to 2006, while world prices were flat in 2007 and up 61% in 2008. Thailand, the most open rice exporter, saw producer prices 28% higher in 2008. Farmers in Vietnam and India realized a similar windfall in 2008, but prices in China were flat over 2007–08, and a third lower than in 2006. Thus, most farmers realized substantial windfall gains from high world prices, but those gains were smaller in the countries that restricted exports.

Data on inflation and relative food prices tell a somewhat different story. The small increases in food and consumer price (CPI) inflation from 2006 to 2008 in the U.S., at 4% and 7%, respectively, are very similar to outcomes for other major grain exporters who left borders open, and lower than in the cases of countries who restricted exports. For both major grain and rice exporters who restricted trade, CPI's increased on average about 20%, while relative food prices increased another 6% for major grain exporters and 11% for rice exporters. Food inflation in Asia is mostly due to the high level in China, caused by disease issues in domestic livestock production and not high world grain prices. The low levels of food inflation in the U.S., Canada and Australia are remarkable, and in contrast with experience in other exporting and in importing countries, in spite of stabilization efforts. Clearly, countries that restricted trade were much more susceptible to food inflation, and to world agricultural commodity price changes reaching consumers.

Explaining Deviations from Theory

While focusing on developing countries, the OECD and FAO (2008) observed these effects

of high world prices on food inflation, and attributed this result to differences in dietary composition. They reported that food as a share of consumer expenditure is much higher in developing countries, so played a much greater role in determining inflation. Two additional factors related to stage of development exacerbate this effect and resulted in greater food inflation in poorer countries. Not only is the share of expenditure on food greater, but those diets also contain lower shares of meat and processed foods. Diets in the poorest countries are more dependent on staple grains. Moreover, supply chains are longer in developed countries, resulting in larger margins between farmgate prices and consumer prices.

In cases where farmgate prices followed world prices during the crisis, livestock feeders or food processing and distribution margins absorbed much of the impact before it reached consumers. In the U.S., for example, meat prices never increased to the extent that feed prices increased, even if grains and oilseeds constituted a large share of production costs. This shock-absorber effect of shrinking margins, not only for livestock producers, but also for food processors and intermediaries, meant there was little pressure to protect consumers in the U.S., as well as in Canada and Australia. In the European Union (France), reducing import tariffs permitted stable higher farmgate prices, and inflation was lower, so export taxes were not used (as they had been in 1995). In developing countries, both food inflation and consumer inflation were much higher during this incident, and had increased over subdued levels earlier. These results highlight the willingness of developing countries to protect consumers, and the willingness of the free traders to allow returns to intermediaries, food processors and livestock producers to vary (fall). These agents were more important for the middle income major grain exporters in Latin America and Eastern Europe, who therefore restricted exports.

Dollive (2008) also examined short term trade flow data for individual cases, and found delays in implementation of export restrictions. For example, in Argentina the effects of export taxes were not evident in trade flows until months after taxes were raised. These implementation delays contributed to the windfall gains realized by farmers where trade restrictions were imposed, and mitigated impacts on other agents.

Political Economy of Export Restrictions

The farmgate price (Pd) can serve as a proxy for producer welfare, and is appropriate in the very short run if supply is perfectly inelastic. Relative food inflation can roughly proxy for the consumer price (Pd), hence consumer welfare. Differences in changes in food inflation versus the farmgate price indicate how markups have changed, hence the welfare of intermediaries, including distributors, food processors and livestock producers.

Using these welfare proxies, three distinct political economy cases emerge from observed behavior and outcomes during the food crisis. They are the same cases that have been observed in past food policy decisions, with the possible exception of the European Union, who remained more open than much earlier regimes might have allowed. The U.S., Canada and Australia (free traders) followed trade regimes that benefitted farmers, and hurt consumers less than agents between consumers and the farmgate. Argentina and Brazil (export taxers) continued a history of intervention that put less political weight on farmers, and may have included a desire that the government share in the windfall gains from higher export prices. Russia, Kazakhstan and the Ukraine are similar to Latin America, but more driven by consumer protection. Asian rice exporters (stabilizers) pursued isolationist regimes highly consistent with past trade policy, and allowed negligible influence of world prices to spill over into domestic rice markets.

Policy Recommendations

WTO commitments only required reporting of export taxes, and had little effect on the imposition of export restrictions by traders (large or small) during the 2007–08 food crisis (Mielke 2008, Mitra and Josling 2009). The relevant policy question is whether countries should (and will) accept new disciplines on export measures to ensure greater global market stability. Abbott (2010) argues that domestic stability remains a preference of national governments, and that unless the large traders as well as large but largely self-sufficient domestic markets (eg. China and India) open their borders, there will be insufficient global stability to allow most countries to choose not to impose export restrictions. Moreover, that desire for stability extends to welfare of specific agents

to differing degrees, as does the extent of deviation that will elicit a stabilizing policy response. Countries that stabilized consumers were more susceptible to world price increases, whereas in free trading countries they realized less food inflation. Future global policy responses will have to address the consumer and agribusiness interests many governments chose to protect. Private risk management strategies cope better with producer volatility than consumer costs, so are unlikely to offer a good alternative to public stabilization. Moreover, governments are unlikely to give away the right to stabilize in WTO negotiations, so rules on export restrictions will be hard to establish.

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