A Quantitative Analysis of Trade Policy Responses to High Agricultural Commodity Prices

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Abstract

In order to mitigate the food commodity price pressure on domestic markets in the 2007/08 marketing year, major exporting and importing countries, most of them developing economies, have adopted some trade policy changes such as imposing export bans (or raising restrictions) and reducing import tariffs. This paper evaluates the impact of those policies on the world price and trade of major agricultural commodities. We quantify the changes in prices, trade, production, and consumption by using a set of multi-country, multi-commodity, and partial-equilibrium models. Results show that most commodity prices increase when these trade policies are exercised. Rice price is distorted the most, followed by wheat and barley. The impact on the aggregate trade varies by commodities. Our analysis illustrates that the inefficient trade policies actually worsen the price inflation rather than solving the issue.

Key words: trade policy, agricultural markets, commodity prices, welfare analysis.

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Introduction

The highly volatile price movements over the past two years for the major agricultural commodities, such as grains and vegetable oils, have caught worldwide attention. The U.S. farm prices of rice, wheat, corn, and soybeans increased at least 70% between the 2005/06 and 2007/08 marketing years, while prices of other commodities also had strong performance (Westhoff). Although the prices of those commodities have drastically dropped since September 2008, the current world price index of grains and vegetable oils are still significantly above the historical levels over the past eight years (FAO 2008a).

The sudden price hikes of food commodities in 2007/08 have quickly received attention in the literatures (Pieses and Thirtle; Dewbre et al.; Headey and Fan). Some international institutes, e.g. International Food Policy Research Institute (IFPRI) and Food and Agricultural Organization of the United Nations (FAO), have particularly raised great concern regarding this price inflation issue as rice and wheat are staples in many developing economies, while corn is an important feedstock for the growing livestock sector in both developed and developing countries. For some developing economies in Africa and the Middle East, food consumption heavily relies on imports because of their limited potential to increase grain production. Furthermore, in major Asian rice producing and consuming countries, rice is a focus of national food security concern and policies (Wailes). Drastic increases in the prices of these crops have threatened the nutrition needs and social stability of these economies.

In order to slow down the domestic price increases, a number of key grain exporting countries, primarily in developing economies, adopted policies that included export bans or at

least partial export restrictions in an attempt to keep enough domestic production for the local consumption. Meanwhile, some major grain importing nations reacted in turn by tendering larger than anticipated import bids and reducing pre-existing import restrictions such as tariffs and tariff rate quotas. Imposing export bans or raising restrictions, as well as lowering import tariffs, can reduce domestic prices in the short-term, but is generally considered as an inadequate response to high commodity prices (Schnepf; Trostle; Von Braun). Introducing export bans will lower the incentives for producers in exporting countries to expand production, while lowering import tariffs will stimulate the consumers' demand in importing countries. The combination of these two polices will ultimately push the world commodity prices even higher, transferring more price pressure to domestic consumers. However, these two polices are usually the most-used means by governments since the short-term effect of lowering domestic prices is hard to resist. As of May 2008, there were 66 countries that have adopted various trade and consumption polices to mitigate domestic price pressure, while 18 economies (27%) chose to reduce import tariffs and 17 countries (26%) increased export restrictions (FAO 2008c).

It is generally believed that the price surge for the past two years was driven by some supply shifters (e.g. weather, energy costs), demand shifters (e.g. economic growth in China and India, biofuel production), and other factors, that include weak U.S. dollar, speculative capital, and so forth. Insufficient trade policy adoption is also a factor that likely exacerbates the soaring prices (Schnepf; Trostle; Westhoff; Von Braun). It is our interest to investigate the impact of these trade policies on the world agricultural commodity prices and trade. One previous study has estimated the impact of an import tariff cut on a single commodity (rice) market in Mali (Nouve and Wodon). The contribution of the current study is to generate a more comprehensive analysis by incorporating the most relevant export and import policy changes in the major

exporting and importing countries of rice, wheat, corn, soybeans and other crops. It also includes welfare analysis of these trade policy measures for consumers and producers in these countries.

Method of Analysis

In order to capture the inclusive impact of trade policy modifications on agricultural commodity markets, a broad modeling system of the world agricultural sector is utilized. The models are a set of multi-market, partial-equilibrium, and non-spatial models of agricultural crops. The models cover major temperate crops, such as wheat, corn, barley, sorghum, rice, soybeans, rapeseed, and sunflower for all major producers and consumers. Extensive market linkages exist in these models, reflecting competition for land in production and consumer substitution possibilities for close substitutes.

The model structure and the elasticities used in the model are based on analysis of historical data, current academic research, and a reliance on accepted economic and agronomic relationships in the agricultural markets. The models are used to establish commodity projections for a baseline and for market outlook and policy analyses. This set of agricultural models have been used in a number of studies including Fabiosa et al. (2005), Fabiosa et al. (2007), and Tokgoz et al.

In general, for each commodity sector, the economic relationship that supply equals demand is maintained by determining a market-clearing price for the commodity. The models include behavioral equations for area harvested and yield on the supply side, and feed use, per capita consumption, stocks, and net exports on the demand side. The models solve for representative world crop prices by equating excess supply and excess demand across countries. To generate domestic prices of crops for each country, price transmission equations are used that

link the representative world price to domestic prices by using exchange rates and other price policy wedges.

The models incorporate major agricultural and trade policies in each country since they affect the supply and demand decisions of the producers and the consumers. Macroeconomic variables, such as GDP, population, and exchange rates, are exogenous variables that drive the projections of the model.

In this study, the analysis is based on a 2008 baseline (FAPRI) modified by specifying the 2007 export and import policy regimes that existed before the commodity price inflation. The baseline projections include supply, utilization, and prices for grains, rice, and oilseeds, including their by-products. The scenario is then generated by imposing for three years (2008/09 – 2010/11) the export and import policy changes that were adopted in response to the price inflation in 2007/08 marketing year. The difference between the baseline and scenario represents the impact of the trade policy changes. These changes in export and import policy restrictions in the major grain exporting and importing countries for the scenario are summarized in Table 1.

Results

Figure 1 presents the world price and net trade changes for the trade policy scenario in deviations from the baseline for 13 selected agricultural commodities. Results are the average of the annual changes between 2008/09 and 2010/11. It is clear that the world prices for selected grains and oilseed products all increased due to higher export restrictions and lower import tariffs in the global market, except rapeseed meal. World rice price increased the most since rice is a thinly traded commodity in the global market, where less than 7% of the production enters international markets. Furthermore, trade is highly concentrated with only six countries accounting for 90% of

the global rice exports. Increases in grain prices were generally higher than the increase in oilseeds and its derived products prices as more policy adjustments were executed in the grain markets.

Changes in aggregate world net trade varied by commodities: trade of wheat, corn, sunflower, sunflower meal and rapeseed oil expanded, while rice, barley, and sunflower oil market experienced a trade reduction. The difference primarily depends on which policy was primarily used in each market. For instance, export tax and restrictions were heavily utilized in those primary rice exporting countries, which consequently reduces the trade in the international rice market.

Following is an explicit discussion of the impact of trade policy by commodity markets. We focus on the major food commodities or commodities that experienced a 1% or more change in the scenario. The detailed tables showing the average impact of scenario on trade, production and consumption are not included here due to limited space, but available upon request.

Rice

The scenario results for rice contribute to our understanding of why international rice prices increased dramatically in the 2007/08 marketing year. The Thai 100% B world reference price for long grain rice increased from $346 per metric ton (MT) in 2006/07 to $551 in 2007/08, a 59.2% increase. The policies modeled in this analysis resulted in an increase of 36.8% in 2008/09, thus explaining approximately 62.2% of the actual rice price increase. The three-year average price impact was an increase of 24.4%. This price increase is driven by a decline in the world net trade by 1.13 million metric ton (MMT) which is approximately 4.1% of global net trade for the three-year period. The net trade was reduced particularly in the key exporting countries of India (-27.0%), Vietnam (-12.2%), Egypt (-28.0%), and Pakistan (-3.7%). Partially

offsetting the net trade decline were increases in net trade by the Western Hemisphere exporters, the U.S. (+54.2%), Uruguay (+5.7%) and Argentina (+3.1%).

For the three-year period, the higher prices encouraged a dynamic production response so that the world rice area increased for the three-year average by 1.1%. Yields increased by an average of 0.6% and consumption declined by 0.6%.

Exporting countries that responded with adjustments to export policies included China, India, Pakistan, Vietnam and Egypt. China removed its export tax rebate of 13% and imposed an export tax of 5%. In our analysis, this resulted in an average reduction of 3.3% in exports. Higher prices led to an average increase in rice area of 2.1%, a yield increase of 1.1% and a decline in domestic consumption of 2.1%. As the world's second largest producing and consuming nation, India's policy response included an imposition of a minimum export price and an export tax on basmati rice. The magnitude of India's response has the largest impact on the global rice market. Restrictions on exports resulted in lower domestic price and allowed domestic consumption to increase 1.1% above the baseline. As a result, net exports declined from an average of 4.8 MMT to 3.5 MMT. Pakistan also imposed minimum export prices and this allowed domestic consumption to increase by 2.0%, while net exports declined by 3.7%. Vietnam is the second largest exporter of rice following Thailand. Vietnam restricted exports and net exports declined over the three-year period from 4.6 MMT to 4.1 MMT. This allowed for domestic consumption to increase by 3.3%. Egypt is a significant exporter in the medium grain rice market. The Egyptian government increased the export tax by 50% from EGP 200 per MT to EGP 300 per MT. Domestic use increased by 12.1%, resulting in an average reduction in net trade from 1.0 MMT to 0.7 MMT.

Importing countries who grew anxious with the price inflation responded by lowering import tariffs or with larger than normal import tenders. Particularly important was the Philippines which lowered the import tariff from 50% to 7% and tendered large import requirements. Net trade increased by 21.0% with domestic consumption increasing by 3.2%. Nigeria, also an important rice importer, reduced import tariffs from 100% to 2.7%. Net imports increased by 19.9% and consumption increased by 6.2%. In the medium grain market, Turkey reduced import tariffs from 34% to 25%. Net trade increased by an average of 4.7% and domestic consumption increased by 1.5%.

The model results demonstrate that much of the export supply response over a three year period comes from Western Hemisphere net exporters including the U.S., Uruguay and Argentina. Inelastic supply and demand throughout much of Asia, where rice is the dominant food staple, thus explains why the rice sector, which is politically sensitive, can induce a large price movement.

Wheat

The scenario results for the wheat market contribute to our understanding of why international wheat prices increased dramatically in the 2007/08 marketing year apart from the supply shortage caused by weather related disruptions. In the scenario, world wheat price increased by 14.3% to $283.1 per MT. This price increase is because of an import demand increase on part of the importing countries that resulted in an increase of 5.8% in world wheat net trade for the three-year period. Exporters such as Argentina, Russia, and China implemented export restrictive policies and decreased their export supply to the world market. Other exporting countries increased their production and exports to meet this increasing demand. Net exports of wheat decreased in countries like Argentina (-0.7%) and Russia (-35.1%). China switched to being a

net importer of wheat in this scenario. Canada increased its net exports of wheat by 7.4%, U.S. increased it by 23.2%, and EU-27 increased it by 8.8%. Decreases in the import tariffs have contributed to this higher demand. Indian net imports of wheat increased by 786.1%. While, Chinese net exports of wheat were 0.76 MMT in the baseline, China imported 3.3 MMT in the scenario. Countries which did not adjust their import policy regimes in this environment decreased their imports of wheat due to higher prices in the world market. Net imports of wheat decreased in Brazil (-4.9%), Morocco (-6.8%), Iran (-88%), Japan (-4.4%), and Mexico (-17%) among others. The increase in Indian and Chinese wheat net imports were more than enough to offset the decline in wheat imports of other countries.

The countries that implemented export restriction policies saw their production of wheat decline; Russian production declined 3.8% and Chinese production declined 2.9%. Argentine wheat production increased slightly, 0.4%, since the increase in world price of wheat was higher than the increase in the Argentine wheat export tax.

Coarse grains

In the scenario, world corn price increased by 4.7% to $201.1 per MT. Import demand increased in many countries, increasing the world net trade of corn by 6.8% over the three-year period. Export restrictive policies decreased the corn supply in the world market and import regime changes increased the demand.

Argentine corn net exports decreased by 0.7% because of the higher export tax for corn. China implemented export restrictive policies for corn. This negatively impacted farmers' profitability in some regions of China, which are corn net exporters. The resulting decline in corn production led to higher corn net imports by China, an increase of 60.8%. India eliminated its import tariffs for corn, which increased the domestic consumption. This also reduced domestic

production due to cheaper corn imports coming into the country. Thus, Indian net exports of corn declined by 79%. Higher world corn prices led some major exporters increase their exports to meet the growing demand. Brazil increased net exports of corn by 3.5%, U.S. by 11.3%, and South Africa by 5.3%. In response to higher world corn prices, many countries and regions decreased their net imports since they did not implement any changes in their tariff policies. Canadian net imports of corn declined by 2.6%, EU by 0.9%, Indonesian by 3.2%, and Taiwanese by 1.5%. South Korea that eliminated its corn import tariff increased its net imports by 59.6%.

In the scenario, sorghum and barley markets also changed. World price of sorghum increased by 4.7%, while world barley price was up by 9.2%. These increases are partially due to changes in trade policies for these crops and partially in response to changes in the wheat and corn markets. Russia introduced a barley export tax, which led to lower domestic production and therefore a 65.8% decline in its net exports. Other exporters responded to the increase in world barley prices and increased their net exports of barley, such as EU (3%) and Canada (12.5%). Chinese barley export tax reduced farmers' profit margins from barley production because of cheaper barley imports coming into the domestic market. Chinese barley production declined by 2% and its net imports increased by 10.9%. Other importers decreased their barley net imports due to higher barley prices in the world market. Japanese net imports declined by 1.6%. Saudi Arabian net imports declined by 1.3%. World net trade of barley decreased in total by 1.3%.

Soybean sector

Changes in the world trade and price of soybean and derived products were relatively smaller than that in the grains as policy modifications were much less exercised in this sector. The three-year average soybean world price increased by 3.8%, partially driven by the changes in trade

policies and partially by the response to area competition from corn and wheat. The aggregate trade remained stagnant, but the trade flows changed among countries. Although Argentina increased the soybean export tax, the net trade of Argentina increased by 1.5% because the reduction in soybean crush (-1.7%) outweighed the production decrease (-0.9%). Domestic use of soybean oil increased by 1.9% because of the lower domestic price caused by the increased export tax. The increase in domestic demand for soybean oil and lower crush resulted in a 2.4% reduction in the net exports of soybean oil. Lower crush also made soybean meal exports down by 1.8% in Argentina. Brazil's net exports for soybeans, meal and oil rose by 0.2%, 1.5% and 4.1%, respectively. Net exports of soybeans also increased in Canada (1.7%) and Paraguay (5.7%). The U.S. soybean exports decreased by 1.2% as soybean area shifted to other commodities with a stronger price performance, such as wheat. Soybean oil domestic demand declined because of higher price; hence a 6.4% increase in the net exports to those countries that lower the import tariffs, e.g. India.

Except China, a higher soybean price lowered the net imports of soybean in other importing countries. Chinese soybean net imports increased by 0.9% given its import tariffs being reduced from 3% to 1%. India's lower tariff in soybean oil encouraged its domestic consumption, and net imports accordingly increased by 10.8%. Other importing countries of soybean oil generally reduced their consumption, which made the world trade stable.

Other oilseeds

The world price of sunflower, meal and oil increased by 3.1%, 2.1% and 4.7%, respectively, in the scenario. It was primarily driven by the increases in Argentine export tax on sunflower sector. Similar to the soybean sector, the increases in Argentine export taxes on sunflower derived products (by 50%) are higher than of those in sunflower seed (by 36%) (see Table 1). The crush

of sunflower declined, which outweighed the reduction in sunflower production. Thus, the net exports of sunflower improved substantially. In contrast, lower domestic prices for meal and oil stimulated the respective consumption levels by 3.3% and 2.3%. Combined with lower crush, Argentine net exports of sunflower meal decreased by 6.6%, while sunflower oil net exports were lower by 4.6%. The Commonwealth of Independent States (CIS), the dominant sunflower exporter, increased its net exports of sunflower by 15.5%. The leading sunflower importing economy, EU-27, increased its crush by about 2.7% to meet its domestic demand for meal and oil, given the increases in the prices of derived products. Thus, the EU-27 net imports of sunflower were up by 15.4%, while its respective net imports of meal and oil declined by 9.5% and 10.2% in the scenario.

The world price of rapeseed increased by 4.6%; this increase is because of the trade policy adoption in the rapeseed oil market and the market adjustments from other oilseeds and crops. The aggregate trade of rapeseed dropped by about 0.6% since the planted area of rapeseed in both Canada and Australia, the two major rapeseed exporters, declined resulting from the stronger price of coarse grains. In addition, increases in domestic crush demand driven by the higher rapeseed oil prices also cut the net exports of those two major countries. Rapeseed imports in the EU-27, the leading importing country, increased by 3.0% to meet the domestic demand for oil and meal. Elimination of import tariffs on rapeseed oil in India has strongly encouraged its domestic consumption and required additional imports of 354 thousand metric tons (TMT). This stimulated the world price of rapeseed oil by 5.9% and discouraged the imports of other importing counties, such as China and EU-27. The world net trade of rapeseed oil expanded by 6.5% in scenario. The rapeseed meal price decreased by 1.9% because of increasing crush for the rapeseed oil demand. This lower meal price encouraged the trade up by 3.3%.

Welfare analysis

To further explore the impacts of increasing export constraints and lowering import tariffs in individual countries, a welfare analysis consisting of the changes in the producer surplus (PS), consumer surplus (CS) and tariff and tax revenues (TR) was conducted for the major trading countries. The three-year average production, consumption and real price (in 2000 U.S. dollars) of commodities were used to calculate the change in PS, CS and TR for each market. Table 2 presents welfare changes for a few select countries, i.e. Argentina, India, U.S. and Mexico, in this study. The changes in trade policies affect consumers and producers, as well as the revenue for the government. The net impact of a trade policy depends on various factors, such as whether the country is a net exporter or a net importer. It also depends whether there were changes in the trade policies of other commodities which are close substitutes in demand or which compete for crop area. The final change in the price of a commodity will determine whether consumers and producers will lose or gain.

The change in the domestic price of a commodity in a country reflects the change in the representative world price of that commodity and the policy changes implemented in that country. Since policy changes were implemented for multiple commodities in many countries, the final change in the domestic price for a given crop in one country is affected not only by the trade policy changes in this country, but also the interconnectedness of world agricultural markets. Argentina is a significant net exporter of corn, wheat, soybeans, sunflower and derived products such as meals and oils in the world markets. The Argentine government has a long history of utilizing export taxes to control domestic crop prices and generate government revenue. In this study, the export taxes on corn, wheat, soybeans and derived products, sunflower seed and derived products were increased by 40, 25, 27.3, 33.3, 36.2, and 50%, respectively (see

Table 1). With higher export taxes, the average domestic prices of all the evaluated commodities decrease, except for wheat. The wheat price increased in the world markets, driven by the changes in multiple country policies and the surge of the rice price in world markets. The domestic wheat price in Argentina increased despite a higher export tax reflecting the fact that the increase in world price outweighed the impact of export tax policy change in Argentina. This in turn impacted the welfare computations for the Argentine wheat consumers and producers, where producers gained and consumers lost. For corn, soybeans and derived products (meal and oil), sunflower and derived products, the PS decreases by more than 460 million dollars. Because of lower domestic prices for these crops, a small gain was observed in the CS for these commodity markets although the loss in PS clearly surpassed the CS gain. As expected, the government is the biggest winner in this case as the export tax revenue increased by 2.4 billion dollars. The net welfare change in the market of these eight commodities was nearly 2.0 billion dollars.

India, a major net exporter of rice, increased its export tax and minimum export price to secure its domestic rice supply when the world rice price skyrocketed in 2007/08. It also made significant reduction in the import tariffs for corn, wheat, and vegetable oil during the same period as India heavily relies on imports for these commodities, except for corn. As expected, both export tax and import tariffs lowered the domestic prices of those commodities, which consequently depressed the production and encouraged the consumption. The loss in PS almost equaled the gain in CS; however, the increase in export tax for rice dominated the decrease in import tariffs for wheat and oilseed products. The net welfare change for these commodities in India is 472 million dollars.

The United States is a major exporter of these evaluated agricultural commodities. The

higher world commodity prices also affected this market notably. However, the U.S. did not choose any trade policy changes during this price storm. Therefore, all the changes in the U.S. market were driven by the changes in trade policies imposed by other countries. The surging world prices benefited the producers of eight evaluated commodities; the change in PS was 5.6 billion dollars. On the other hand, the consumers suffered because of the higher prices with a loss of 262 million dollars in CS. Clearly, as a major exporting country for those commodities, the gains in the PS exceeded the loss in the CS in the U.S. agricultural commodity markets.

The high commodity prices caused by the trade restrictions in some countries resulted in a significant net adverse effect in the net importing countries. We use Mexico to illustrate the net loss in the welfare for these net importing countries. Mexico is a net importer of wheat, corn, rice and soybeans and derived products of soybeans. Although the increase in world prices of these commodities provided additional surplus to Mexican producers, the increase in the price of these crops created substantial pressure onthe local consumers. The loss in CS for these six commodities totaled 388 million dollars, which outweighed the gains in PS of 316 million dollars. Since Mexico did not make any trade policy changes, the surging world prices of crops generated a net loss of 72 million dollars in welfare. This similar situation can be found in plenty of developing countries in Africa, Middle East and Latin America that heavily rely on imports.

Conclusions

It is generally believed that inefficient trade policies, such as export restrictions or import tariffs, can only create a short-term impact of mitigating the upward pressure on domestic commodity prices, but ultimately to have an adverse impact on domestic prices. Unfortunately, most policy makers focus on the short-term impacts and adopt these polices as a way to combat price inflation. We use a set of multi-market, partial-equilibrium, and non-spatial models of

agricultural commodities to investigate the impacts of adopting these trade-restrictive policies on the world agricultural commodity prices and trade. The policy scenario is based on the relevant policy parameters utilized by the major exporting and importing countries by July 2008 in a period when these countries attempted to slow the price hikes in their domestic markets.

The scenario results suggest a consistent world price behavior but a heterogeneous trade pattern among agricultural commodities. As expected, world prices of all evaluated commodities increased, except for rapeseed meal. Rice presented the largest increase as major exporting countries imposed the most export bans and restrictions, negatively impacting the global rice market. A considerable increase in the world price of wheat and barley was also observed due to the additional export taxes and lower import tariffs. Similar to rice market, world net trade of barley fell. However, wheat and corn world net trade expanded as higher demand was encouraged by the lower import tariffs. Oilseed prices reacted moderately to the policy modifications as fewer trade policies had been exercised in these markets. However, vegetable oil price responses were larger as India eliminated or cut the typical high import tariffs.

Some commodities, such as sorghum, are not directly involved with any specific trade policy change. However, world prices of these commodities also moved up in the scenario. It is understandable because the land competition and consumption substitution occur when the world prices of other crops increase, such as the price of corn.

The study also includes welfare analysis of these trade policies for producers and consumers in these markets. Increasing export taxes or lowering import tariffs achieves lower domestic prices to help domestic consumers. However, producers in these countries suffer with lower profit margins, and thus decrease their production, leading to more pressure on world prices. Restrictions in trade increase the commodity prices in the world markets, and in turn

negatively impact the consumers in the countries that do not impose any trade restrictions. The negative impact in welfare is particular observed in many developing countries in Africa and Latin America, which generates more challenges on food security in those countries.

This study provides a clear picture of the adverse impacts of exercising inefficient trade policies to mitigate the price pressure in commodity markets. Applying these trade policies will not only distort one specific commodity market, but the overall commodity markets as consumption substitution by consumers and planting choices by producers will eventually take place. The policy-makers in the major trading countries need to carefully consider these policy options as the prices of agricultural commodities are crucial to the social stability and food security of many countries, particularly developing economies. A quick and convenient decision of imposing trade policy barriers may temporarily release the domestic price pressure, but in the long-term will negatively impact the global and domestic food markets. As suggested by Von Braun and illustrated by Nouve and Wodon, policies that encourage productivity improvements that boost the supply would be a much more beneficial and long-term solution for the price inflation problem of today's agricultural markets.

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Table 1. Policy Scenarios

Export policies in selected countries by commodity	Units	Baseline	Scenario
Rice			
China: export tax	%	0	5
China: export tax rebate	%	13	0
Egypt: export tax	EGP/mt	200	300
Egypt: export restriction (estimate)	%	0	30
India: export tax (basmati rice)	$/mt	0	200
India: minimum export price (basmati rice)	$/mt	0	1,000
Pakistan: minimum export price (super basmati)	$/mt	0	1,500
Pakistan: minimum export price (medium grade basmati)	$/mt	0	1,300
Pakistan: minimum export price (IRRI-6)	$/mt	0	750
Pakistan: export restriction (estimate)	%	0	10
Vietnam: export tax	$/mt	0	176
Vietnam: export restriction (estimate)	%	0	10
Wheat			
Argentina: export tax	%	20	28
China: export tax	%	0	20
Russia: export tax	%	0	40
Corn			
Argentina: export tax	%	20	25
China: export tax	%	0	5
Barley			
China: export tax	%	0	20
Russia: export tax	%	0	30
Soybeans			
Argentina: export tax	%	27.5	35
Soy meal			
Argentina: export tax	%	24	32
Soy oil			
Argentina: export tax	%	24	32
Sunflower			
Argentina: export tax	%	23.5	32
Sun meal			
Argentina: export tax	%	20	30
Sun oil			
Argentina: export tax	%	20	30
Palm oil			
Indonesia: export tax	%	1.5	15

Table 1. Continued

Import policies in selected countries by commodity	Units	Baseline	Scenario
Rice			
Indonesia: import tariff	Rp/kg	550	450
Japan: import markup	Yen/mt	154,023	152,004
Japan: special safeguard duty	Yen/mt	374,162	351,486
Japan: specific import tariff	Yen/mt	281,325	264,275
Nigeria: import tariff	%	100	2.7
Philippines: (milled rice) in-quota tariff	%	50	7
Turkey: import tariff	%	35	25
Wheat			
India: import tariff	%	50	0
South Korea: import tariff	%	2	0
Corn			
India: in-quota import tariff	%	15	0
India: out-of-quota import tariff	%	50	0
South Korea: import tariff	%	428.7	0
Barley			
South Korea: import tariff	%	406.4	0
Soybeans			
China: import tariff	%	3	1
Soy meal			
China: import tariff	%	5	2
Soy oil			
India: import tariff	%	45	0
Palm oil			
India: import tariff	%	80	46.5
Rape oil			
India: import tariff	%	75	0
Peanut oil			
India: import tariff	%	100	92.7

Table 2. Welfare Effects of Trade Policy Scenario on Major Crops in Selected Countries

Average 2008-2010	(2000 million U.S. dollars)			
Category	**Change in Producer Surplus***	**Change in Consumer Surplus †**	**Change in Revenue ‡**	**Net Welfare Change**
Argentina				
Wheat	15.68	-4.28	295.93	307.33
Corn	-60.18	4.71	170.97	115.50
Soybeans, meal and oil	-341.35	7.00	1,669.84	1,335.50
Sunflowers, meal and oil	-65.30	8.98	213.99	157.68
Total 8 commodities	-451.15	16.41	2,350.74	1,916.00
India				
Wheat	-5,394.18	5,757.94	-126.94	236.82
Corn	-267.54	139.60	0.00	-127.94
Rice	-2,191.98	2,094.04	1,201.67	1,103.73
Soybeans, meal and oil	-160.44	24.67	-604.20	-739.96
Total 6 commodities	-8,014.15	8,016.26	470.53	472.64
United States				
Wheat	1,698.89	-808.81	--	890.08
Corn	2,472.64	-261.72	--	2,210.93
Rice	519.75	-308.12	--	211.62
Soybeans, meal and oil	922.65	-322.91	--	599.74
Sunflowers, meal and oil	19.10	-15.74	--	3.36
Total 9 commodities	5,633.03	-2,471.61	--	3,915.74
Mexico				
Wheat	111.58	-183.22	--	-71.64
Corn	171.13	-119.20	--	51.94
Rice	15.85	-67.24	--	-51.39
Soybeans, meal and oil	17.61	-18.73	--	-1.13
Total 6 commodities	316.17	-388.39	--	-72.22

* For oilseeds, change in producer surplus is computed for seed and bean producers and for the crushers

† For oilseeds, change in consumer surplus is computed for oil consumers and seed consumers where there is food consumption of seeds

‡ Change in revenue refers to the change in tax revenue of countries that applied an export tax rate change and to the change in tariff revenue of countries that applied a tariff rate change

Figure 1. Impact of trade policy changes on world prices and net trade of agricultural commodities