

RICE: GLOBAL TRADE, PROTECTIONIST POLICIES, AND THE IMPACT OF TRADE LIBERALIZATION

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Rice is one of the most important food grains in the world, accounting for more than 20 percent of global calories consumed and 29 percent in low-income countries (table 10.1). Thus, policies that affect rice prices, production, and trade have a large impact on the poor.

Despite the importance of rice as a basic staple, global trade accounts for only 6.5 percent of consumption. That means that most countries are self-sufficient in rice and face increased price volatility in times of production shortfalls. By contrast, wheat trade accounts for 18 percent of consumption, corn for 12 percent, and soybeans for 35 percent (USDA PS&D 2003). The thinness of trade for rice stems primarily from the use of protectionist mechanisms to achieve national policy objectives of domestic food security and support for producer prices and incomes in major rice-producing and -consuming countries (box 10.1).

Jayne (1993) argues that the link between domestic stabilization policies and instability in world rice prices has been exaggerated, emphasizing instead the role of thin and fragmented

markets. Clearly, however, domestic price stabilization policies have been pursued by restricting imports, in turn contributing substantially to international market thinness. Therefore, it is difficult to ignore the effect of domestic stabilization policies achieved through import and export restrictions as a significant cause of international rice price instability.

In addition to the thinness of rice trade, another important structural characteristic is the geographic concentration of production and consumption in Asia. More than 90 percent of production and consumption occur in Asia—nearly two-thirds of it in just three countries (China, India, and Indonesia). With as much as 40 percent of Asian rice cultivated under rain-fed systems, the monsoon weather effects are magnified on rice trade.

Finally, there is substantial market segmentation by rice type and quality. A key structural dimension is the degree of end-use differentiation. Substitution among rice types and qualities is limited by differences in taste preferences. Low substitutability

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TABLE 10.1 Share of Calories from Rice by Region and Income Level, 2000

Region	Total Calories Per Capita	Rice Calories Per Capita	Share of Calories from Rice (%)
World	2,805	576	20.5
Developed countries	3,260	118	3.6
Developing countries	2,679	703	26.2
Low-income countries	2,405	702	29.2
Low-income food-deficit countries	2,625	732	27.9
Africa	2,434	178	7.3
Asia	2,713	856	31.6
Sub-Saharan Africa	2,226	174	7.8
South America	2,838	315	11.1
North and Central America	3,411	117	3.4
Europe	3,250	45	1.4

Source: FAOSTAT.

BOX 10.1 Definitions of Rice Trade Flows in This Study

The international rice trade is differentiated by type, quality, degree of processing, and degree of milling. *Long-grain* varieties are typically longer than 6.2 millimeters, while *medium- and short-grain* varieties are 6.2 millimeters or less. Many factors enter into the designation of quality for long-grain rice, including share of broken kernels, seeds, chalkiness, and color. In this study *high quality* refers to grain that contains 10 percent or less of broken kernels and *low quality* to rice that contains more than 10 percent broken

kernels. *Paddy rice* refers to rice as it is harvested in the field before the husk and bran layer are removed. *Brown rice*, also referred to as cargo or husked rice, has had the husk removed but retains the bran layer. *Milled rice*, also referred to as white rice, has had both the husk and bran layers removed. The *fragrant* rice varieties, basmati and jasmine, are generally considered long-grain types but are marketed and priced in global markets differently from unscented long-grain varieties.

for rice exists on both demand (mill and end-use) and supply sides. On the demand side, the closest substitute is wheat, particularly important in South Asia (India and Pakistan). In many Asian nations rice has become an inferior good, so that as incomes rise it is replaced by meats, fruits, and vegetables.

On the supply side, different rice varieties require different climatic conditions and production and milling technologies. This limits the ability of producers to respond to price incentives by switching the type of rice produced. Production benefits greatly from access to plentiful supplies of surface or ground water and soils with poor drainage that can maintain a flood condition. While these characteristics limit the potential rice

production area, they also limit the production of other crops that cannot withstand flood conditions. Development of rice varieties that will be much less dependent on water will have the potential to greatly expand production areas suitable for cultivation, changing costs of production and geographic areas of comparative advantage and disadvantage. As the first major food crop to have its genomic structure fully described, rice genomics and biotechnology are progressing rapidly (Khush and Brar 2002).

Thus, the combination of high levels of domestic protection, geographic concentration, erratic weather, inelastic price responses in production and end-use markets, and relatively thinly traded volumes results in volatile prices and trade (Waiiles 2002).

Rice Trade and Policies in the Major Producing and Consuming Nations

Because rice has been so highly protected in both industrial and developing nations, trade liberalization under the Uruguay Round Agreement on Agriculture is having a profound impact on the international rice market (Wailes 2002). Trade has essentially doubled in volume and as a share of consumption since the 1970s and 1980s (figure 10.1). The changes in protection have been modest, however, and rice remains one of the most protected food commodities in world trade.

As a result of the more limited and longer market access reforms required for developing countries under the Uruguay Round, rice policies in developing countries have not changed significantly since the early 1990s. This lack of rice policy reforms has intensified price volatility, placing a heavy burden on poor consumers and on governments to provide food distribution programs for the poor. The coefficient of variation of domestic prices in real terms over the past 20 years was 0.43 in India and 0.26 in Indonesia; it was 0.37 in China over the past 16 years. However, some price stability was achieved in these Asian countries in the 1990s because real world prices had fallen dramatically during this period as well as variability.

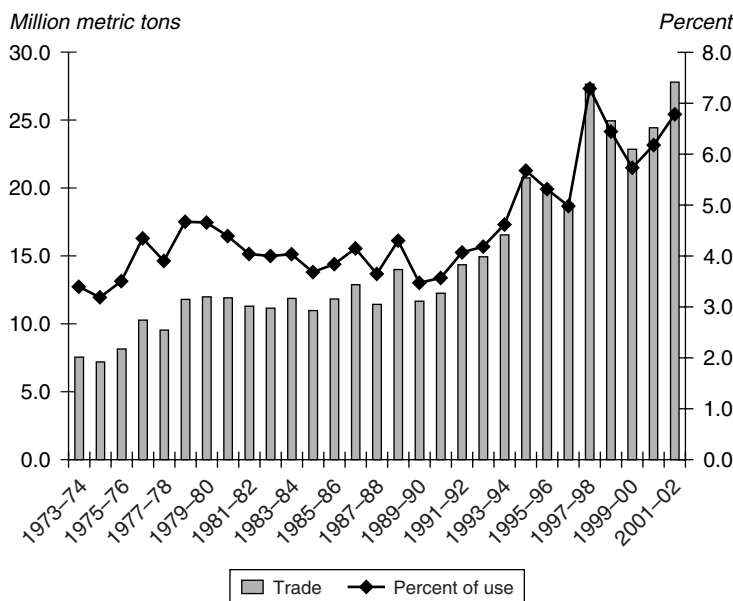
The major rice-producing countries are also the major rice-consuming countries and leading rice exporters and importers (tables 10.2 and 10.3 and annex table 1 on the CD-ROM).

China

China, the largest rice-producing and -consuming country, accounts for nearly a third of the global rice economy. Rice has been an important component of China’s food grain security objectives and has been managed through procurement support prices to ensure stable supplies. Government rice stocks increased in the late 1990s to about 100 million metric tons, 73 percent of domestic use. In 1999 the government eliminated purchases of low-quality early season rice and lowered the procurement prices for its rice purchases. The area planted with rice has declined (USDA PS&D 2003), and rice stocks were reduced by more than 30 percent by the end of 2002, to 67.6 million metric tons. In some coastal provinces the government has since eliminated its procurement policy entirely, leaving producers to sell their rice in the open market (Wade and Junyang 2003). The government policy now emphasizes quality over quantity, and rice producers are quickly adopting improved quality varieties.

The rice tariff rate quota negotiated by China was initially 2.66 million metric tons in 2002,

FIGURE 10.1 World Rice Trade and Share of Total Use



Source: USDA PS&D 2003.

TABLE 10.2 Leading Rice-Producing, -Consuming, -Exporting, and -Importing Countries

Rank	Producing	Consuming	Exporting	Importing
1	China	China	Thailand	Indonesia
2	India	India	India	Nigeria
3	Indonesia	Indonesia	Vietnam	Bangladesh
4	Bangladesh	Bangladesh	United States	Iran
5	Vietnam	Vietnam	China	Philippines
6	Thailand	Japan	Pakistan	Brazil
7	Japan	Thailand	Uruguay	Iraq
8	Myanmar	Myanmar	Argentina	Saudi Arabia
9	Philippines	Philippines	Egypt	European Union
10	Brazil	Brazil	Myanmar	Senegal
11	United States	Korea, Rep. of	Australia	China
12	Korea, Rep. of	United States	Japan	South Africa
13	Pakistan	Nigeria	European Union	Côte d'Ivoire
14	Egypt	Egypt	Guyana	Malaysia
15	Cambodia	Iran	Ecuador	Cuba

Source: USDA PS&D 2003.

equally divided between long-grain and medium- and short-grain or other rice (WTO 2001). Only 10 percent of the long-grain tariff rate quota and 50 percent of the medium-short grain quota are designated for private firms. The tariff rate quota rose to 3.78 million metric tons in 2003 and will increase to 5.32 million metric tons by 2004 (Sun and Branson 2002; Zhang, Matthews, and Branson 2002). Nearly all rice imports are fragrant jasmine rice, primarily from Thailand. Domestic production of fragrant rice is increasing, however, and displacing imports. Unless there is a significant adverse weather event, China is not expected to fill its rice tariff rate quota. In-quota tariffs are 1 percent for grains (including milled rice) and no more than 10 percent for partially processed grain products. Over-quota tariffs will be 76 percent initially, reduced to 65 percent in 2004 (WTO 2001).

China is a significant exporter of low-quality long-grain rice, with principal markets in Côte d'Ivoire, Cuba, and Indonesia. Medium-grain rice is exported competitively into Russia, Japan, the Republic of Korea, and the Democratic Republic of Korea (Hansen and others 2002). While the state trading agency handles most rice exports, export subsidies are not considered necessary for China's rice export shipments (except for out-of-condition stock liquidation).

India

As the second-largest rice producer, consumer, and exporter, India plays an important role in the global rice economy. India is a major supplier of low-quality long-grain rice and fragrant basmati rice. Like China, India views rice as a strategic commodity for food security based on grains (rice and wheat). Consequently, the government intervenes in the market through grain procurement, price supports, and export subsidies. In recent years the government has procured some 25 percent of the annual harvested crop to replenish government stocks. Since April 2001 the government has actively subsidized rice exports at 50 percent of procurement prices, underselling Pakistan, Thailand, and Vietnam in low-quality long-grain markets by \$15–\$20 a metric ton. Major markets for India's low-quality parboiled and regular long-grain rice include Bangladesh, Côte d'Ivoire, Indonesia, Nigeria, Philippines, and South Africa. Major markets for basmati rice include the European Union (EU), Iran, Kuwait, Saudi Arabia, and United Arab Emirates.

India bound its rice tariffs under the Uruguay Round at zero percent. Until May 1997 all rice was imported through the Food Corporation of India. Under an agreement to privatize the rice trade, the government negotiated higher import tariffs that

TABLE 10.3 Net Rice Trade, 1982–2002
(thousands of metric tons)

Countries by Trade Status	1982–83	1990–91	1995–96	2001–02
Net exporters	9,167	12,041	17,415	24,522
Thailand	4,111	4,432	5,249	7,468
India	–255	643	2,900	5,275
Vietnam	–65	1,481	3,183	3,685
United States	2,222	2,070	2,302	2,699
China	631	731	15	1,738
Pakistan	1,159	1,347	1,733	1,225
Myanmar	739	181	140	1,000
Uruguay	191	302	619	550
Egypt	43	184	269	350
Australia	286	534	567	310
Argentina	106	140	440	222.5
Net importers	4,735	5,460	9,789	15,129
Indonesia	744	366	960	3375
Nigeria	774	260	325	1803
Iran	715	938	1431	1,250
Iraq	364	408	489	1175
Philippines	–16	175	829	1,050
Saudi Arabia	507	553	716	919
Brazil	187	708	801	650
South Africa	152	339	466	650
Côte d'Ivoire	329	216	402	637.5
Malaysia	386	333	483	616.5
Japan	–135	18	461	525
European Union	321	33	492	525
Mexico	53	280	290	472
Bangladesh	249	25	593	387.5
Eastern Europe 10	0	163	311	367.5
Hong Kong (China)	369	398	345	320
Turkey	44	227	301	272.5
Canada	102	182	233	242.5
Taiwan (China)	–452	–150	–193	–54
Korea, Rep. of	44	–8	58	–55
Rest of the World	4,432	6,581	7,626	9,380

Source: USDA PS&D 2003.

become effective April 2000. Current tariffs are 80 percent on paddy, brown rice, and broken rice and 70 percent on milled rice.

Indonesia

The third-largest rice-producing and -consuming country, Indonesia is also the largest rice importer. Rice policy, particularly price stabilization policy, was historically implemented through quantitative

management of imports by the state monopoly, the National Logistics Agency (BULOG). In late 1998, Indonesia agreed to liberalize the rice trade to private traders, but unable to sustain the domestic floor price, the government restored market powers to BULOG.

Following Indonesia's financial collapse and political instability in the late 1990s, the government sought to stabilize and support producer rice prices through a specific rice tariff of 430 rupiahs (Rp)

per kilogram (equivalent to a 30 percent ad valorem tariff). Nontariff barriers and trader response to risks and regulation (including a 2002 requirement for an import license and redlining) have raised the effective rate of protection to 100 percent (Timmer 2002). Average border prices of milled rice were \$200 per metric ton in 2002, while monthly retail prices in Jakarta averaged \$377 per metric ton (Katial-Zemany and Alam 2003). It is believed that a significant share of imports in 2002 was smuggled into the country, thanks to a porous border and this large difference between world and domestic prices.

The tariff policy is currently under review, and producers are pressuring for an increase to Rp 510 per kilogram, equivalent to a 36 percent tariff but well below the WTO (World Trade Organization) bound rate of 160 percent until 2004 (Katial-Zemany and Alam 2003). Floor prices for paddy and milled rice were increased by 13 percent in 2003. In early 2003 BULOG's status was changed from a state agency to a state trading enterprise. It continues to distribute subsidized rice to low-income consumers. Current import and domestic price support policies clearly have negative consequences for Indonesia's consumers, especially poor consumers, and negative consequences on real wages and therefore economic growth.

Bangladesh

Bangladesh is the fourth-largest rice-producing and -consuming nation and an important but highly variable rice import market. Since much of the rice production in Bangladesh is dependent on monsoon weather, production can fluctuate greatly. In 1998 Bangladesh was the world's second largest importer at 2.5 million metric tons, but since 1998 it has imported an average of only 500,000 metric tons annually.

In 2000 Bangladesh imposed an import tariff of 5 percent on rice. The rate was raised to 25 percent in 2001, and a 10 percent regulatory duty was added mid-year, along with an advance income tax of 3 percent and a development surcharge of 2.5 percent. These import protections along with a crop shortfall in 2001 and a policy shift to distributing money instead of food grains in the national food distribution program resulted in a higher domestic price and a rise in smuggled imports from India. As

a result, the government withdrew the 10 percent regulatory duty in 2002 and more recently reduced letter-of-credit margins from 100 percent to 25 percent. Import restrictions that remained in 2003 include a tariff of 22.5 percent, an advance income tax of 3 percent, and a development surcharge of 3.5 percent. Bangladesh imposes no quantitative restrictions.

Vietnam

Vietnam produces the fifth-largest rice crop and is also the fifth-largest rice-consuming country. Following the adoption of the Doi Moi reform program in late 1986, Vietnam's rice economy recovered, and by the mid-1990s Vietnam had become the world's second-largest rice exporter. Vietnam exports both high- and low-quality long-grain rice. Important export destinations include Cuba, Indonesia, Iraq, Malaysia, and several African countries. Rice exports and prices are under the control of the Ministry of Trade and Vietnam's Food Association (Vinafood) (Young, Wailes, Cramer, and Tri Khiem 2002).

Vietnam has no significant production support policies or export subsidy programs. Vietnam and the other major Asian rice exporters (China, India, Pakistan, and Thailand) have discussed the formation of a rice export cartel in response to the low world prices for rice since 1999. India rejected the idea, but the others are developing the concept.

Thailand

Thailand has been the world's leading rice exporter for the past several decades. Private export companies supply world markets with a wide range of long-grain rice, including the fragrant jasmine rice. The primary government rice policy is the paddy mortgage scheme, a loan program operated under the Bank for Agriculture and Agricultural Cooperatives (BAAC). Participating farmers can obtain loans from BAAC using their crop as collateral. The loan price is set at 95 percent of a government-determined target price. In 2002 loan rice prices were \$8 to \$10 per metric ton higher than market prices (a 10 percent price support). Nearly a third of the Thai crop was pledged to the loan price support program. Government stocks increased as farmers defaulted on their loans. The government

procured rice is milled and then exported through government-to-government arrangements.

Japan

Japan's rice economy is supported by the high prices paid by consumers. Japan controls rice imports through a tariff rate quota with a prohibitive over-quota tariff. As the traditional staple food, rice dominates the government's agricultural policy (Fukuda, Dyck, and Stout 2003).

In 1996 the government ended regulation of rice marketing, freeing up wholesale and retail markets from government supervision and licensing requirements. With market liberalization, farm-gate prices have declined. In 1998 the government adopted the Rice Farming Income Stabilization Program. When prices fall below a seven-year, moving-average standard rice price, producers are paid 80 percent of the difference between the current year price and the standard price. Payments are made from the Rice Farming Income Stabilization Fund, with 25 percent of contributions from rice producers and 75 percent from the government. Participation is voluntary, but participants must also enroll in the Production Adjustment Promotion Program, which diverts land from rice to other crops (wheat, barley, soybeans, forages, vegetables, and fruits). Since stabilization fund payments are tied to a diversion program, Japan claims Blue Box treatment (see chapter 3). Income stabilization payments to rice producers in 1999, the most recently reported year, were \$815 million. Payments under the diversion program were \$1.03 billion.

Before the Uruguay Round Agreement on Agriculture, Japan had banned rice imports for 30 years, except following the devastating production shortfall in 1993. Japan now imports 682,000 metric tons annually under a tariff rate quota, 7.2 percent of domestic consumption in the base period 1986–88. In-quota purchases are controlled exclusively by the Food Agency, for which a markup of up to ¥292 (\$2.41 in 2001) per kilogram is allowed.

Imports are purchased through either ordinary market access or the simultaneous-buy-sell system. Under ordinary market access, which accounted for 85 percent of imports in 2001, the Food Agency imports rice and resells it into Japan's domestic market or donates it to food assistance programs. Under the simultaneous-buy-sell system, purchases are

made through an auction at which importers sell rice to the Food Agency and simultaneously buy it back. The Food Agency selects bids that maximize the markup. They have averaged ¥100–¥200 per kilogram (\$1,000 to \$2,000 per metric ton). Over-quota tariffs are ¥341 per kilogram, (\$2,842 per metric ton in 2003). The average successful bid price in December 2002 was \$318 per metric ton. Summary measures of protection from the Organisation for Economic Co-operation and Development (OECD 2003) indicate that the average producer support estimate in Japan for 2000–02 was 86 percent and the nominal protection coefficient was 6.89.

Republic of Korea

The Republic of Korea also protected its rice sector with an import ban until 1995, when it agreed to a minimum market access import commitment in the Uruguay Round. In 2004, the final year of commitment, Korea will import 205,000 metric tons, 4 percent of domestic consumption in the 1986–88 base period. Consumption has been declining and, coupled with rising minimum market access imports, this has resulted in excessive stocks.

In April 2002 the government released "A Comprehensive Plan on the Rice Industry" to cope with the structural problem of oversupply and to prepare for future restructuring. The government had relied on a procurement program to support farm prices. In 2002 it procured 789,000 metric tons of a total production of 4.9 million metric tons at 2,097 won per kilogram (\$1,667 per metric ton). Under the proposed comprehensive plan the government intends to decouple payments, moving from price supports to income support. In 2002 the government made a direct payment of 500,000 won (\$398) per hectare in agricultural promotion areas and 400,000 won (\$319) per hectare in nonpromotion areas. The program is similar to Japan's income stabilization program in that it will be linked to a production adjustment system to shift rice areas to other crops (soybeans, forages, and fallow) and therefore will claim Blue Box WTO status. In 2003 the government announced plans to keep rice land fallow by paying producers 3 million won (\$2,531) per hectare on 27,500 hectares—2.6 percent of total rice area. OECD (2003) estimates an average producer subsidy equivalent to 82 percent and a nominal protection coefficient of 5.35 percent for Korean rice producers in 2000–02.

Imports are guided by the Uruguay Round minimum market access agreement and are assessed a 5 percent tariff under this tariff rate quota agreement. Imports, strictly controlled by the Ministry of Agriculture, have generally been of low-quality rice and are made available to end-users through controlled channels.

European Union

The European Union maintained an intervention price on paddy rice of €298.35 per metric ton. Since 1996 the European Union has accumulated intervention stocks as a result of increased production and imports. Direct payments were introduced in 1997, with payments up to a maximum guaranteed area of 433,123 hectares. The current direct payment rate is €325.70 per hectare. Based on average yields, the direct payment is equivalent to €52.65 per metric ton. Total support to rice producers, taking into account the intervention price and direct payment, is €351 per metric ton (Commission of the European Communities 2002).

Under the Uruguay Round agreement, the European Union agreed to convert variable levies to fixed tariffs and to reduce them by 26 percent by 2000. Current tariff levels are €211 per metric ton for paddy, €264 per metric ton for brown rice, and €416 per metric ton for milled rice. Import prices of brown rice were approximately €250 per metric ton in 2003, so the €264 tariff provides a protection rate of 105 percent. Tariff escalation makes the tariff rate on milled rice prohibitive.

A variety of tariff concessions and preferences for EU rice imports exist. Brown basmati imports from India and Pakistan are given a €250 per metric ton reduction, resulting in a tariff of €14 per metric ton. With the accession to the European Union of Austria, Finland, and Sweden in 1995, a tariff rate quota was negotiated with zero tariff per metric ton on imports of 63,000 metric tons of milled rice, €88 per metric ton on imports of 20,000 metric tons of brown rice, and €28 per metric ton on imports of 80,000 metric tons of broken rice. Egypt has an import concession for 39,000 metric tons at a 25 percent tariff reduction, and Bangladesh has a 4,000 metric ton concession for brown rice at a 50 percent tariff reduction. Preferences are given through a 110,000 metric ton quota to the African, Caribbean, and Pacific countries at a 35 percent tariff reduction and overseas countries and

territories at zero percent duty. Beginning in 2007, tariffs on imports from the 48 least-developed countries will be progressively reduced to zero by 2009 under the Everything but Arms agreement negotiated in 2001.

The export regime for rice is based on Uruguay Round agreement commitments, which limit refunds to 133,400 metric tons of milled rice equivalent and a subsidy expenditure of no more than €36.8 million (\$39.4 million). Export refunds are set by type of rice and destination. In 2003 export subsidies ranged from €111 to €165 (\$119 to \$177) per metric ton. The OECD (2003) estimates the producer subsidy equivalent at 31 percent and nominal protection coefficient at 1.24 for 2000–02.

United States

The United States is the world's fourth-largest rice exporter, exporting nearly 45 percent of its production. Under the 2002 Farm Bill, the U.S. government provides price supports through a market loan rate of \$143 per metric ton of paddy rice. A market loan deficiency payment is made if the world reference price falls below the market loan rate. The 2002 crop received an average payment of \$73 per metric ton.

Producers also receive income support through two payment programs, a fixed decoupled direct payment of \$51.80 per metric ton and a decoupled countercyclical payment when the direct payment plus the market price or market loan rate (whichever is higher) are below a target price of \$231.48 per metric ton.¹ When the market price is below the market loan rate, the maximum countercyclical payment is \$36.68 per metric ton. Both direct payment and countercyclical payment are made on 85 percent of a fixed historical production level.

Rice imports are subject to tariffs of \$14 per metric ton for milled rice, 11.2 percent ad valorem for parboiled, \$21 per metric ton for brown, \$8.30 per metric ton for basmati brown, and \$18 per metric ton for paddy rice. In 2002, 10 percent of exports (380,000 metric tons) were funded by government programs, all food aid shipments. Export subsidies under the Export Enhancement Program have not been used for U.S. rice exports since 1996. The OECD (2003) estimates a producer subsidy equivalent of 50 percent and a nominal protection coefficient of 1.77 for 2000–02.

Magnitude of Policy Distortions in Key Rice Markets

The major distortions in world rice markets are caused by import tariffs and tariff rate quotas in key importing countries and price supports in key exporting countries. The global trade-weighted average tariff on all rice was 43.3 percent in 2000: 217 percent for medium- and short-grain rice and 21 percent for long-grain rice. Medium-grain rice markets are far more distorted than long-grain rice markets because of tariff rate quotas and quotas in the major medium-grain rice importing countries of Japan, the Republic of Korea, and Taiwan (China). OECD countries are a major source of distortions, with average annual producer support reaching \$25 billion in 2000–02.

Trade protection is also provided for domestic milling industries. This protection is expressed in tariff escalation and is especially prevalent in Cen-

tral and South America and the European Union. EU tariffs are 46 percent for brown rice but 80 percent for milled rice (table 10.4). In Mexico, paddy rice imports pay a 10 percent tariff while brown and milled rice pay a 20 percent tariff.

The effect of tariff escalation is seen in trade flows. Most of the trade in milled high-quality long-grain rice goes to countries with low tariffs, while most of the trade in brown and paddy rice goes to countries with high tariff escalation. Trade-weighted average tariffs for high-quality long-grain rice are estimated at 4.3 percent for milled rice, 31.4 percent for brown rice, and 16.9 percent for paddy rice. Simple non-trade-weighted averages are 13.7 percent for milled rice, 18.7 percent for brown rice, and 25.4 percent for paddy.

The greatest degree of protection in world rice trade is in medium- and short-grain rice. Protection by Japan, the Republic of Korea, and Taiwan

TABLE 10.4 Schedule of Tariffs, Tariff Rate Quotas, and Quotas in Rice, 2002–03 Levels
(percent)

Country or Region	Long-Grain				Medium-Short		Tariff Rate Quota (1,000 MetricTons)
	Milled Nonfragrant	Milled Fragrant	Brown	Paddy	Milled	Brown	
Bangladesh	22.5	22.5	22.5	22.5	22.5	22.5	
Brazil	15.0	15.0	13.0	13.0	15.0	13.0	
Canada	0.0	0.0	0.0	0.0	0.0	0.0	
China	1.0	1.0	1.0	1.0	1.0	1.0	5,320
Costa Rica	35.0	35.0	35.0	20.0	35.0	35.0	
Côte d'Ivoire	32.0	32.0	12.0	7.0	32.0	12.0	
European Union	80.0	71.0	46.0	146.0	75.0	64.3	
India	70.0	70.0	80.0	80.0	70.0	80.0	
Indonesia	21.0	16.1	25.0	35.0	14.3	15.6	
Japan (yen/kg)	341	341	341	341	341	341	682
Korea, Rep. of	5.0	5.0	5.0	5.0	5.0	5.0	204*
Malaysia	0.0	0.0	0.0	0.0	0.0	0.0	
Mexico	20.0	20.0	20.0	10.0	20.0	20.0	
Nigeria	50.0	50.0	50.0	50.0	50.0	50.0	
Philippines	50.0	50.0	50.0	50.0	50.0	50.0	
Russia	5.0	5.0	5.0	5.0	5.0	5.0	
Senegal	12.7	12.7	12.7	12.7	12.7	12.7	
Taiwan (China)	0.0	210.0	0.0	0.0	210.0	229.4	
Turkey	35.0	27.0	35.0	27.0	35.0	35.0	
United States (\$/metric ton)	14	14	21	18	14	21	

* The Republic of Korea uses a quota rather than a Tariff Rate Quota (TRQ).

Sources: AMAD (Agricultural Market Access Database), USDA, FAS GAIN reports.

(China) lowers world export prices by some 100 percent. Currently, very few rice exporting countries produce medium- and short-grain rice. The clear beneficiaries of trade liberalization in medium- and short-grain rice will be countries, especially China, with a competitive advantage in production costs and logistics relative to such other export competitors as Australia, Egypt, and the United States.

Trade liberalization would be expected to stimulate production of medium- and short-grain rice in other countries, but current varieties are suitable only for temperate climates. Thus South American exporters such as Argentina and Uruguay could develop adapted varieties more quickly. Many other developing countries have tropical or subtropical climates and would require a decade or more to develop varieties that would be competitive in liberalized medium- and short-grain rice markets. Production capacity in Australia and the United States and to some degree in China is increasingly constrained by lack of water.

Long-grain rice markets are far less protected. Tariffs in major low-quality rice-importing nations such as Indonesia and Bangladesh are estimated to reduce world prices by as much as 30 percent compared with full liberalization. The major impact is on consumers in these low-income developing countries and on producers of low-quality long-grain rice in exporting countries such as India, Pakistan, Thailand, and Vietnam. While tariffs are lower than on medium- and short-grain rice, tariff escalation is substantial, particularly in the European Union and several Central and South American countries. This pattern of protection depresses world prices for milled high-quality long-grain rice relative to brown and paddy rice, creating economic hardship for the milling industry in high-quality long-grain exporting countries such as Thailand, Vietnam, and the United States. Protection in high-quality long-grain milled rice markets is estimated to reduce prices by 10–20 percent.

Trade Flow and Price Impact of Rice Trade Liberalization

Estimates of the impact of the elimination of import tariffs and export subsidies using a spatial equilibrium model, RICEFLOW (Durand-Morat and Wailes 2003), show a significant expansion of

rice trade and large price adjustments. An earlier version of the model was used to assess trade liberalization prior to the Uruguay Round (Cramer, Wailes, and Shui 1993; Cramer and others 1991). For the current study RICEFLOW was more completely disaggregated by rice type and degree of milling, and the baseline trade flows and elasticity estimates were updated through 2000. The results reflect the effects of trade liberalization applied to year 2000 trade flows and prices. Detailed analysis by quantities traded and prices are presented in table 10.5.

Complete liberalization in 2000 would have resulted in a significant expansion in global rice trade of nearly 3.5 million metric tons, a 15 percent increase in trade. Trade-weighted average export prices would be 32.8 percent higher and trade-weighted import prices would be 13.5 percent lower.

Trade in medium- and short-grain rice, where initial protection was highest, would increase by 73 percent. Producer export prices would rise 91 percent and import prices would decline 27 percent.² In the most protected medium- and short-grain brown rice markets, trade would increase 141 percent, export prices would increase 200 percent, and import prices would decrease 41 percent. Trade would expand 59 percent in milled medium- and short-grain rice markets, with export prices 71 percent higher and import prices 25 percent lower.

Because trade in high-quality, long-grain markets is subject to much less protection, trade liberalization results in only slight increases in volume traded—4 percent more for paddy rice, 7 percent for brown rice, and 3 percent for milled rice. Export prices increase only 2 percent but import prices fall 18 percent (10 percent for paddy, 31 percent for brown rice, and 4 percent for milled rice), improving consumer welfare in rice-importing countries. Most of the expansion in trade occurs in the low-quality markets, such as Bangladesh, Indonesia, and the Philippines. Traded volumes increase 13 percent and import prices fall 14 percent, improving consumer welfare in many low-income developing countries. Removing protection in these markets also improves producer welfare in developing countries as export prices rise 7 percent. In the fragrant rice market liberalization results in a 41.5 percent lower import price but only slight increases in the volume traded and the export price.

TABLE 10.5 Simulation Results for Rice Trade Liberalization Using RICEFLOW, 2000

Rice Type	Baseline	Free Trade	Change (%)
Long grain			
<i>High-quality</i>			
Paddy			
Quantity (metric tons)	1,035,320	1,081,254	4.4
Export price (\$/metric ton)	149.21	154.67	3.7
Import price (\$/metric ton)	185.51	166.89	-10.0
Brown			
Quantity (metric tons)	856,798	916,721	7.0
Export price (\$/metric ton)	223.75	219.25	-2.0
Import price (\$/metric ton)	363.32	250.64	-31.0
Milled			
Quantity (metric tons)	7,495,594	7,704,482	2.8
Export price (\$/metric ton)	225.97	225.58	-0.2
Import price (\$/metric ton)	262.06	252.16	-3.8
<i>Low-quality</i>			
Milled			
Quantity (metric tons)	8,084,093	9,149,728	13.2
Export price (\$/metric ton)	177.05	188.70	6.6
Import price (\$/metric ton)	248.19	213.09	-14.1
<i>Fragrant</i>			
Milled			
Quantity (metric tons)	2,449,711	2,467,502	0.7
Export price (\$/metric ton)	265.24	267.07	0.7
Import price (\$/metric ton)	511.20	299.07	-41.5
All long grain			
Quantity (metric tons)	19,921,516	21,319,687	7.0
Export price (\$/metric ton)	206.87	210.68	1.8
Import price (\$/metric ton)	287.45	236.43	-17.7
Medium and short grain			
Brown			
Quantity (metric tons)	483,063	1,162,478	140.6
Export price (\$/metric ton)	271.80	814.47	199.7
Import price (\$/metric ton)	1438.54	842.75	-41.4
Milled			
Quantity (metric tons)	2,487,760	3,946,170	58.6
Export price (\$/metric ton)	367.71	628.92	71.0
Import price (\$/metric ton)	855.89	645.69	-24.6
All medium and short grain			
Quantity (metric tons)	2,970,823	5,108,648	72.0
Export Price (\$/metric ton)	352.11	671.14	90.6
Import Price (\$/metric ton)	950.63	690.53	-27.4
All rice			
Quantity (metric tons)	22,892,339	26,428,335	15.4
Export Price (\$/metric ton)	225.71	299.69	32.8
Import Price (\$/metric ton)	373.51	322.97	-13.5

Source: Durand-Morat and Wailes 2003.

Welfare Impact of Rice Trade Liberalization

Global rice trade liberalization results in a total economic surplus gain of \$7.4 billion annually.³ Importing countries have a net gain of \$5.4 billion and exporting countries a net gain of \$2 billion. Gains vary considerably by country, rice type, and degree of milling.

Impact on Price Importers and Exporters

In most rice-importing countries, consumers gain (\$32.8 billion for all importers), but producers lose (\$27.2 billion). In some countries with large but not prohibitive tariffs, significant tax revenues evaporate under free trade (\$2.9 billion in aggregate), while significant public savings occur with the removal of domestic support (\$2.7 billion in aggregate).

In rice-exporting countries producers gain from higher prices and expanded output (\$70.3 billion), while consumers lose (\$68.8 billion). Among exporters, China accounts for the bulk of the producer gains and consumer losses. Behind the net gains are much larger transfers between producers and consumers. When these transfers are normalized by population to account for the large number of producers and consumers in China and some other countries, the transfers are much smaller and less daunting than they appear. Many households are involved in both production and consumption. The net buyers detached from production activities are the largest losers.

Impact by Type of Rice

This logic of large transfers between consumers and producers holds on examination of the impact of reforms by rice type. Reform of trade in medium-grain milled rice accounts for more than 60 percent of the total global welfare improvement, at \$4.3 billion, with importers benefiting by \$3.4 billion and exporters by \$905 million. A breakdown by milling stage reveals that importers of medium-grain brown rice benefit by \$1 billion and exporters by \$449 million. Liberalization of long-grain rice trade generates improvements of \$1.14 billion, with importers gaining \$1.06 billion and exporters just \$80 million. High-quality rice trade yields welfare gains of \$218 million—\$195 million to importers

and \$23 million to exporters. Most of these gains are for high-quality milled rice (\$69 million) and brown rice (\$124 million). Liberalization of paddy rice trade improves the welfare of exporters by \$2.4 million and of importers by \$22.4 million. Liberalization of low-quality rice trade improves the welfare of importing countries by \$315 million and exporters by \$52 million.

Again these small net figures hide the large transfers at work between sellers and buyers of rice. Nearly all of the net gains are captured by developing countries. Reform of fragrant rice trade is estimated to improve the welfare of importers by \$547 million, a result due primarily to Japan. Exporting countries (India, Pakistan, and Thailand) gain marginally in the net, although their producers do gain substantially.

Impact by Country

Results by country or region depend on the type of rice and degree of protection. The results discussed here are for some key countries that are highly protectionist or large traders of rice.

Asian importers. Among Asian importers, Japan, the most protectionist country in rice trade, would gain the most from liberalization. Medium-grain white rice prices would decline from \$3,098 per metric ton to \$656 per metric ton, while the volume of trade would increase from 392,000 metric tons to 2.18 million metric tons. This results in a welfare gain of \$3.6 billion per year, with producers losing \$19.2 billion and consumers gaining \$24.2 billion. Savings from removing farm programs more than offset the loss in tariff revenue.

The patterns for the Republic of Korea and Taiwan (China) are similar. Border reform would triple Korean imports of medium-grain rice to 306,000 metric tons. Prices would decline from \$1,952 per metric ton to \$840 per metric ton. Korea also imports fragrant rice. With liberalization, the fragrant rice price would fall from \$2,003 per metric ton to \$288 per metric ton. Consumers would experience a net gain of \$6.2 billion, while producers would lose \$5.9 billion. Taiwan (China) shows trade and welfare patterns similar to those of Korea, but the welfare gains are of magnitude smaller.

The Philippines is a major low-quality, long-grain rice importer. Elimination of import tariffs

would result in an increase of imports from 787,000 metric tons to 1.02 million metric tons, induced by price declines to \$215 per metric tons. Consumers would gain \$701 million annually, and producers lose from lower prices by \$629 million.

The largest rice importer, Indonesia, would benefit from tariff reform of its low-quality long-grain rice imports. The volume of imports would increase from 1.3 million metric tons to 1.7 million metric tons. Prices would decline from \$228 per metric ton to \$196 per metric ton. Producers would lose \$1.02 billion annually while consumers would gain \$1.07 billion.

Asian exporters. China is the world's largest producer of medium-grain rice and would therefore be the largest export beneficiary of medium-grain rice trade liberalization. Exports would more than double, from 614,000 metric tons to 1.47 million metric tons. Export prices would increase from \$270 per metric ton to \$647 per metric ton. Brown medium-grain rice trade would increase from 113,000 metric tons to 403,000 metric tons, with prices rising from \$233 per metric ton to \$834 per metric ton. China is also a significant exporter of low-quality long-grain rice. With trade liberalization, exports would increase from 1.9 million metric tons to 2.3 million metric tons, and prices would increase from \$178 per metric ton to \$190 per ton. Producers would gain \$64.2 billion in aggregate, and consumers would lose \$63.6 billion, a large aggregate loss but less so when normalized by population.

Vietnam is the major low-quality long-grain rice exporter. Therefore tariff reform by importers of this type of rice would mostly benefit Vietnam. Exports would be expected to increase from 2.7 million metric tons to 3.1 million metric tons, and prices would rise moderately to \$185 per metric ton. Vietnam has steadily increased its volume of high-quality milled long-grain rice. Trade reform would increase this volume moderately as well as its price. In aggregate, Vietnamese consumers would lose from higher prices by \$210 million annually, but producers would gain \$229 million.

Thailand is the world's dominant rice-exporting nation. All Thai exports are long grain, which is the least protected rice type in world trade. As a result, the benefits of rice trade liberalization are small for Thailand. Milled high-quality long-grain rice exports would increase from 3.3 million metric

tons to 3.4 million metric tons, milled low-quality long-grain exports from 1.6 million metric tons to 1.8 million metric tons, and fragrant rice exports from 1.21 million metric tons to 1.23 million metric tons. Price increases would be modest and lead to small gains to producers of \$123 million annually, while consumers would lose \$101 million.

In India producers of long-grain rice would gain substantially (\$973 million) but the gains would be almost offset by losses to consumers (\$967 million). These figures are the results of moderate price changes applied to large volumes and represent moderate impacts per producer or consumer.

Other exporters. Among other exporters, the United States would be the next most important beneficiary of rice trade liberalization after China. Milled medium-grain rice exports would increase from 226,000 metric tons to 383,000 metric tons, with prices rising from \$270 per metric ton to \$617 per metric ton. Brown medium-grain exports would increase from 292,000 metric tons to 594,000 metric tons, and prices would rise from \$296 per metric ton to \$803 per metric ton. The United States is also a major exporter of high-quality long-grain rice. Summing across all rice imports and exports, the net gain to the United States would be \$326 million annually, a result of higher total gains to producers of \$2.2 billion and losses to consumers of \$1.9 billion annually.

Australia is the third largest medium-grain rice producer and exporter and would also benefit greatly from rice trade liberalization. Exports of milled medium-grain rice would increase from 475,000 metric tons to 756,000 metric tons, with prices rising from \$271 per metric ton to \$615 per metric ton. The net welfare gain for milled medium-grain rice is \$211 million. Brown medium-grain rice export prices would increase from \$235 per metric ton to \$805 per metric ton. Producers would gain \$1.03 billion from higher prices, while consumers lose \$745 million.

The fourth major medium-grain exporter is Egypt. Trade reform would result in an increase in exports of milled medium-grain rice from 326,000 metric tons to 448,000 metric tons and an increase in prices from \$298 per metric ton to \$629 per metric ton. Producers would gain \$1.39 billion and consumers lose \$1.26 billion, with a moderate aggregate net gain of \$128 million.

Other importers. Among importers outside Asia, the European Union would have an overall net welfare gain from rice trade liberalization of \$145 million annually. As an importer of high-quality long-grain brown rice, the European Union would increase imports from 451,000 metric tons to 588,000 metric tons, and prices would fall from \$496 per metric ton to \$260 per metric ton. The aggregate welfare gain for high-quality long-grain brown rice imports would be \$138 million annually. This gain is offset by the higher prices that the European Union would pay for medium-grain imports, up from \$372 per metric ton to \$624 per metric ton. The volume of medium-grain imports would decline from 645,000 metric tons to 595,000 metric tons. The aggregate welfare change would be a gain to consumers of \$254 million annually and a loss to producers of \$109 million.

Africa. Nigeria became a major rice importer when it relaxed quantitative restrictions to rely primarily on tariffs. Nigeria imports milled high- and low-quality parboiled rice. High-quality imports would increase from 36,000 metric tons to 144,000 metric tons, and low-quality imports would increase from 682,000 metric tons to 877,000 metric tons. Prices would fall substantially for both. Rice producers would lose \$186 million annually while consumers would gain \$271 million. Several smaller African developing nations would gain similarly, with large gains to consumers partially offset by losses to producers.

North and Central America. Central American paddy rice importers would capture most of the gains associated with liberalization of paddy rice. On the export side the analysis does not change current rules in most countries, which ban paddy export. Only Argentina and the United States currently export paddy. The net gain to these two countries would be \$2.4 million. Paddy rice importers—Costa Rica, El Salvador, Guatemala, Honduras, Mexico, and Nicaragua—would have a net gain of \$22.4 million from lower import prices and increased imports. The expanded trade would benefit the domestic milling industries in the importing countries and rice consumers at the expense of rice producers.

Other countries. Several developing countries and regions would lose from rice trade liberalization.

These are countries that have been importing rice without trade barriers. In a sense they have benefited from protection by other importers since this protection has depressed export prices. Removing trade barriers would boost export prices for all rice types by degree of milling. This has negative consequences for countries that have had little or no import protection in rice. Most seriously affected would be Turkey, a major importer of medium-grain rice, which faces much higher export supply prices after global trade reform. The estimated net welfare loss for Turkey is \$137 million. All importers of medium-grain rice, except Japan, the Republic of Korea, and Taiwan (China) lose as a result of significantly higher import prices after global reform. The same situation holds for long-grain rice importers that have little or no import protection. This includes Middle Eastern countries such as Iran, Iraq, and Saudi Arabia. Brazil, Canada, Hong Kong (China), Malaysia, Singapore, and South Africa would also not be expected to benefit from rice trade liberalization.

Dynamic Analysis of Rice Trade and Domestic Policy Reforms

The RICEFLOW model used for the trade and welfare analysis presented above is a static spatial equilibrium framework of excess supply and demand equations. It does not allow for analysis of domestic farm policies. For that, the Arkansas Global Rice Model (AGRM) was used. The AGRM is a partial equilibrium nonspatial dynamic econometric model of the global rice economy (Fuller, Wailes, and Djunaidi 2003; Wailes, Cramer, Chavez, and Hansen 2000). The AGRM structure is based on equations for supply (expressed for estimated area harvested and yields) and demand (domestic consumption, exports, imports, and ending stocks). Rice prices are endogenized, with world reference equilibrium prices for long-grain and medium-grain rice. The AGRM is used to generate baseline estimates for domestic and international rice for the FAPRI outlook (FAPRI 2004).

For this analysis, policy interventions in rice supply that are trade distorting (Amber Box in WTO parlance) were removed. The model was also simulated for the removal of import tariffs and export subsidies, to provide perspective. Finally AGRM was used to examine the net effect of complete policy reform including domestic support, import protection, and export subsidies.

The AGRM baseline global trade (sum of all exports) projections are 27.9 million metric tons in 2005 increasing to 33.6 million metric tons by 2012.⁴ Long-grain rice prices in the baseline begin at \$232 per metric ton in 2005 and increase to \$277 per metric ton by 2012. Medium-grain prices rise from \$332 per metric ton in 2005 to \$406 per metric ton by 2012.

The removal of tariffs dominates all policy reform scenarios. Global rice trade increases by 3.5 million metric tons in 2005 and continues to expand to 5.3 million metric tons above the baseline. The removal of export subsidies reduces global rice trade in the short term by 720,000 metric tons, but the long-term effect is negligible. Taken together, the tariff effects swamp the export subsidy effects, and global trade is higher by 2.7 million metric tons in 2005 and by 5.2 million metric tons in 2012. Elimination of domestic supports in the United States, the European Union, and Japan reduces trade very slightly in the short term and not at all over the longer term. The combined effect of the removal of tariff barriers, export subsidies, and domestic supports increases trade by 2.4 million metric tons in 2005 and by 4.9 million metric tons in 2012. The 15 percent expansion of global rice trade given by the more aggregated but dynamic AGRM model is remarkably similar to the static results generated by the RICEFLOW model.

The impact on global export prices follows the impact on trade, with the dominant impact on prices resulting from removal of import tariffs. The long-grain export price is higher by \$23 per metric ton in the short term and by \$43 per metric ton in the longer term relative to the baseline level. In the more highly protected medium-grain rice market, tariff removal boosts prices by \$291 per metric ton in 2005 and by \$340 per metric ton in 2012. The impact of removal of export subsidies is important only in the short term, with long-grain rice export prices 6 percent higher and medium-grain prices 5 percent higher. The effect of removal of domestic support is negligible throughout the projection period. The aggregate effects of policy reforms, including tariffs, export subsidies, and domestic supports, is significant for both long-grain rice and medium-grain rice prices. Long-grain rice export prices are 18–22 percent higher. This result differs from the RICEFLOW model result. Medium-grain rice prices are higher than baseline projections by

70–80 percent, a result similar to the findings using the RICEFLOW model.

Policy Implications and Conclusions

Despite the importance of rice as a basic food staple, especially in developing countries, rice trade accounts for only 6.5 percent of consumption. Such limited trade is due partly to preferences for specific types and grades of rice, but also to protectionist policies based on food security objectives or price and income support for producers. The trade-weighted average import tariff on rice was 43 percent in 2000, and tariff escalation is common, to protect rice milling industries.

Several market and production characteristics make rice prices more volatile than the prices of most other commodities. Much of Asian rice production is subject to monsoon climates, resulting in uncertain yields. Global rice trade is highly segmented by rice type (long and medium), degree of processing (milled, brown, and paddy), and quality (generally pertaining to the percent of broken kernels). As a staple food, the demand for rice is not very responsive to price and income changes.

The combination of a high degree of protection, geographic concentration, market segmentation, inelastic supply response to price, and inelastic demand response to price and income results in volatile prices and volumes traded. Distortions in rice trade occur throughout the world. State trading enterprises are pervasive in rice trade, most notably in China, Indonesia, India, Japan, Republic of Korea, Vietnam, and Australia. State trading tends to result in a lack of transparency in pricing and trade competitiveness. Thailand is a clear exception, as rice trade is managed by a very competitive group of export companies.

Domestic policy distortions exist in a number of major rice trading nations, including Japan, the European Union, and the United States. In the United States and the European Union, domestic support results in implicit or direct export subsidies. In Japan the government's commitment to support rice prices is based on an aggressive rice land diversion program and a tightly managed tariff rate quota.

Policy reforms to eliminate protection in the global rice economy are estimated to boost economic welfare by more than \$7.4 billion per

year. But the real story is the large transfers between consumers and producers that lead to these net gains. Most of the gains can be achieved by eliminating tariffs on imports. In importing countries consumers gain \$32.8 billion, while producers lose \$27.2 billion. Governments lose \$2.9 billion in tariff revenue but gain \$2.7 billion by eliminating domestic supports. The net welfare gain to rice-importing countries is estimated at \$5.4 billion. In exporting countries producers gain \$70.2 billion, while consumers lose \$68.8 billion. Imports by the exporting countries result in a loss of tariff revenue of \$5.3 million while elimination of domestic supports saves \$598 million. The net welfare gain in exporting countries is \$2 billion.

With global policy reform, rice trade is estimated to increase by 10–15 percent. Prices received by exporters would be 25–35 percent higher. Prices paid by importers would be 10–40 percent lower, depending on the type of rice. Rice trade, despite the expansion, would remain relatively thin. Complete policy reform would result in an increase in rice trade from the current level of 6.5 percent of consumption to 8.4 percent by 2012. Thus, one of the major sources of world rice price instability is likely to remain after liberalization. Global rice stocks have declined by 30 percent between 2000 and 2003. Thus, the ability of stocks to buffer supply shocks has been markedly reduced. Global rice trade liberalization would make low-income, net-rice-importing countries more reliant on world rice trade, likely reducing political and food security.

Medium-grain rice is the most protected rice type. Consequently, policy reform would have its biggest impact on countries that export and import medium-grain rice. Japan is estimated to capture nearly 70 percent of the global economic welfare gains. Other industrial countries, such as Australia, the European Union, and the United States, that export medium-grain rice would also be significant beneficiaries of trade policy reform.

Countries that had little or no protection before reform are likely to be harmed by global policy reforms. This result is due to the large country impacts that increased imports in countries like Japan would have, increasing the demand for medium-grain rice and thereby boosting world prices. Countries like Turkey and Russia that have imported medium-grain rice with moderate or no

protection would experience higher prices as a result. The benefits of removing moderate levels of tariff protection, as in the case of Turkey, are swamped by the price effect of free and expanded trade in medium-grain rice.

Domestic policy reforms in the United States and the European Union are estimated to reduce rice exports by less than 5 percent in the initial years and to have little or no impact on trade in the longer term. Prices are estimated to be 5–10 percent higher initially, but the effect diminishes to zero over the longer term.

The multilateral and regional trade policy reforms adopted since the early 1990s have contributed to an expansion in rice trade and more stable prices. The achievements of the Uruguay Round Agreement on Agriculture include the opening of the previously closed Japanese and Korean markets. But the limits on domestic support and export subsidies have yet to have a significant impact. Regional agreements such as NAFTA (North American Free Trade Agreement) and Mercosur have increased rice trade in the Western Hemisphere. The prospects for the success of the Doha Round of the WTO hinge to a great extent on continuing the expansion of market access, reductions of tariffs, and limits on export subsidies required to achieve the benefits estimated here from global trade liberalization.

Notes

1. The direct payment is paid on a historical base production, decoupled from both current production and current market conditions. The countercyclical payment is also paid on a historical base production, and although payment is decoupled from current production, it is triggered by current market price conditions. The government claims both payments as Green Box in the WTO.

2. The large increase in the export prices for short- and medium-grain rice does not consider the likely supply responses by less-competitive producers that could enter the market and survive at that high price. Hence, this is an upper-bound estimate of the likely price increase.

3. Consumer and surplus gains and losses are estimated using the results of the baseline and free trade results of the RICEFLOW model. The welfare estimates for producers and consumers are detailed in annex table 3 on the CD-ROM. The results are reported for the major importing and exporting countries or regions by rice type and degree of milling. Annex table 4 on the CD-ROM includes the producer and consumer welfare estimates with the impact on government revenues lost due to tariff elimination and government expenditures eliminated because of the elimination of domestic support programs.

4. Results are presented in annex table 5 and annex figures 1–3 on the CD-ROM.

References

- Agricultural Market Access Database. (AMAD). Online: <http://www.amad.net/index.htm>.
- Childs, N. W., and L. Hoffman. 1999. "Upcoming World Trade Organization Negotiations: Issues for the U.S. Rice Sector." Rice Situation and Outlook. RCS-1999. U.S. Department of Agriculture, Economic Research Service, Washington, D.C.
- Commission of the European Communities. 2002. "Rice: Markets, CMO and Medium Term Forecasts." Commission Staff Working Paper SEC(2002) 788. Brussels.
- Cramer, G. L., E. J. Wailes, and S. Shui. 1993. "The Impacts of Liberalizing Trade in the World Rice Market." *American Journal of Agricultural Economics* 75 (February): 219–26.
- Cramer, G. L., E. J. Wailes, J. Goroski, and S. Phillips. 1991. "The Impact of Liberalizing Trade on the World Rice Market: A Spatial Model Including Rice Quality." Arkansas Experiment Station Special Report 153. University of Arkansas, Fayetteville.
- Durand-Morat, A., and E. J. Wailes. 2003. "RICEFLOW(R): A Spatial Equilibrium Model of World Rice Trade." Staff Paper SP 02 2003. University of Arkansas, Department of Agricultural Economics and Agribusiness, Division of Agriculture, Fayetteville.
- Food and Agricultural Policy Research Institute (FAPRI). 2004. *FAPRI 2004 World Agricultural Outlook*, Iowa State University and University of Missouri, Ames, Iowa, Staff Report 1-04, ISSN 1534-4533.
- Fukuda, H., J. Dyck, and J. Stout. 2003. "Rice Sector Policies in Japan." RCS-0202-01. U.S. Department of Agriculture, Economic Research Service, Washington, D.C.
- Fuller, F., E. J. Wailes, and H. Djunaidi. 2003. "Revised Arkansas Global Rice Model." Staff Paper SP 01 2003. University of Arkansas, Department of Agricultural Economics and Agribusiness, Division of Agriculture, Fayetteville.
- Hansen, J., F. Fuller, F. Gale, F. Crook, E. Wailes, and M. Moore. 2002. "China's Japonica Rice Market: Growth and Competitiveness." *Rice Situation and Outlook Yearbook*. RCS-2002. U.S. Department of Agriculture, Economic Research Service, Market and Trade Economics Division, Washington, D.C.
- Jayne, T. S. 1993. "Sources and Effects of Instability in the World Rice Market." MSU International Development Paper 13. Michigan State University, Department of Agricultural Economics, East Lansing, Michigan.
- Katial-Zemany, A., and N. S. Alam. 2003. "Indonesia Grain and Feed Annual, 2003." Foreign Agricultural Service GAIN Report ID3008. U.S. Department of Agriculture, Washington, D.C.
- Khush, G. S., and D. S. Brar. 2002. "Biotechnology for Rice Breeding: Progress and Potential Impact." Presented at the 20th Session of the International Rice Commission, July 23–25, Bangkok, Thailand. www.fao.org/DOCREP/MEETING/004AC347E/AC347E00.HTM.
- Nielsen, C. P. 2002. "Vietnam in the International Rice Market." Rapport 132. Fødevareøkonomisk Institut. Copenhagen.
- OECD (Organisation for Economic Co-operation and Development). 2003. *Agricultural Policies in OECD Countries: Monitoring and Evaluation*. Paris.
- Sun, X., and A. Branson. 2002. "Food and Agricultural Import Regulations and Standards, Interim Rules and Regulations of Tariff Rate Quota 2002." Foreign Agricultural Service GAIN Report CH2007. U.S. Department of Agriculture, Washington, D.C.
- Timmer, C. P. 2002. "Food Security and Rice Price Policy in Indonesia: The Economics and Politics of the Food Price Dilemma." Indonesian Food Policy Program Working Paper 14. BAPPENAS/Department Pertanian/USAID/DAI Food Policy Advisory Team. Jakarta.
- USDA PS&D (U.S. Department of Agriculture, Production, Supply and Distribution). 2003. PS&D Online. www.fas.usda.gov/psd.
- USDA, FAS. "Rice. Annual." Various years and countries. Global Agricultural Information Network (GAIN) Reports, Foreign Agricultural Service (FAS), Washington, D.C.
- Wade, J., and J. Junyang. 2003. "China Grain and Feed Annual 2003." Foreign Agricultural Service GAIN Report 3010. U.S. Department of Agriculture, Washington, D.C.
- . 2002. "Trade Liberalization in Rice." In P. Lynn Kennedy, ed., *Agricultural Trade Policies in the New Millennium*. New York: Haworth Press.
- Wailes, E. J., G. Cramer, E. Chavez, and J. Hansen. 2000. "Arkansas Global Rice Model: International Baseline Projections for 2000–2010." Arkansas Agricultural Experiment Station Special Report 200. University of Arkansas, Fayetteville.
- WTO (World Trade Organization). 2001. "Report of the Working Party on the Accession of China." WT/MIN(01)/3. Presented at the Fourth Session of the Ministerial Conference, November 9–14, Doha, Qatar.
- Young, K. B., E. J. Wailes, G. L. Cramer, and N. Tri Khiem. 2002. "Vietnam's Rice Economy: Developments and Prospects." Arkansas Agricultural Experiment Station Research Report 968. University of Arkansas, Fayetteville.
- Zhang, J., R. Matthews, and A. Branson. 2002. "Food and Agricultural Import Regulations and Standards, Implementation Measures for 2002 TRQ Allocation." Foreign Agricultural Service GAIN Report CH2008. U.S. Department of Agriculture, Washington, D.C.