

# A Composite Index of Market Access for the export of rice from the United States

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## CHAPTER 1. CONTEXT AND ISSUE

### 1. Methodology

This case study evaluates the use of the Composite Index of Market Access (CIMA) by applying the concept to U.S. rice exports. CIMA is designed to capture the full range of costs faced by rice exporters when they sell into import markets (Josling, 2008).

Calculation of CIMA is based on the concept of a price ladder beginning with costs of production of the primary product through the value chain defined by costs, prices, taxes and subsidies that result in a final price in the import market.

#### 1.1 Measurement units

The U.S. exports rice in many forms by degree of processing, including, paddy, brown and milled. Further, both long and medium grain markets are important components of U.S. rice export flows. Standard conversion from paddy to brown is 0.8. The conversion from paddy to milled for a standard of 55/70 (55% whole grains and 15% broken) is 0.7.

#### 1.2 Degree of processing

The Harmonized System (HS) at 10 digits is used in this study. The schedule is as follows:

1006	Rice
1006.10	Rice in the husk (paddy or rough)
1006.20	Husked (brown) rice
1006.20.20	Basmati
1006.20.40	Other
1006.20.40.20	Long grain
1006.20.40.40	Medium grain
1006.20.40.60	Short grain
1006.20.40.80	Mixtures of any of the above
1006.30	Semi-milled or wholly milled rice
1006.30.10	Parboiled
1006.30.10.20	Long grain
1006.30.10.40	Other, including mixtures
1006.30.90	Other
1006.30.90.10	Long grain
1006.30.90.20	Medium grain
1006.30.90.30	Short grain
1006.30.90.40	Mixtures of any of the above
1006.40	Broken rice

#### 1.3 Period of study

Calendar years 2006, 2007 and 2008 were selected for the purpose of this case study in consultation with ICTSD and the authors

of the Uruguay case study. Because the U.S. marketing year is August 1 – July 31, calendar year prices received by farmers, mills and exporters were used. However, farm level production costs from the previous calendar year were used.

For comparison with other countries, where marketing year does not coincide with calendar year and where there are multiple production seasons, choice of year and what should be used is problematic.

#### 1.4 Data sources

All data used in this study were obtained from primary or secondary data sources. Cost of production data at the farm level are from USDA, ERS. Milling costs and transportation costs were estimated based on cost models maintained by the author or from industry sources. Trade data and fob value of trade was obtained from the USDA, FAS Global Agricultural Trade System Online (GATS). Trade data was checked with the UN Comtrade data system but where there were discrepancies, the GATS data was used.

There is likely great heterogeneity in the costs and prices depending on time of year, location within country, by size of firm, etc. For this case study, complexity in determining transportation costs was an issue, for example freight rates are rather different to same destination locations depending on port location, e.g. Gulf ports and California. Fortunately, export shipment data was available by customs district, which made this less problematic but could contribute to sources of inaccuracy if ignored.

## 2. U.S. Rice Sector

2.1 The United States is the fourth largest rice exporter following Thailand, Vietnam, and India. For the 2006 through 2008 marketing years, rice exports averaged 49% of U.S. production, making this sector relatively trade dependent.

Table 1. Total Supply and Distribution of U.S. Rice (million cwt. Rough equivalent)

Item	2005/06	2006/07	2007/08	2008/09
Beginning Stocks	37.7	43	39.3	29.4
Production	222.8	194.6	198.4	203.7
Imports	17.1	20.6	23.9	19.2
Total Supply	277.7	258.2	261.6	252.4
Domestic Use	119.9	128.1	127.4	128.4
Exports	114.8	90.8	104.7	93.6
Total Use	234.7	218.8	232.2	222
Ending Stocks	43.0	39.3	29.4	30.4
Exports/Producti	51.5	46.7	52.8	45.9

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Source: Childs, N. and K. Baldwin. 2009. Rice Outlook. RCS-09j. Economic Research Service, U.S. Department of Agriculture. October.

The U.S. produces long, medium and short grain rice and export shares for the 2005/06 to 2008/09 marketing years for long and medium/short were 50% and 48%, respectively. U.S. Exports were sold in 160 countries. The major importers by value and quantity for the 2006-2008 period were Mexico, Japan, Haiti and Canada as shown in Figures 1 and 2. The U.S. exports rice by various degrees of processing. Figures 3 and 4 show value and quantity shares for rough, brown, milled, and broken rice exports for the 2006-2008 period. Milled rice exports accounted for 57% of rice exports of which 38% were long grain and 19% were medium/short. The U.S. is the only major exporter of rough (paddy) rice and it accounted for 31% of export value. Brown medium/short grain exports and brown long grain accounted for 6% and 3%, respectively of total export value and brokens accounted for 2 percent.

Figure 1. U.S. Export share by market by value, average 2006-2008 calendar years.

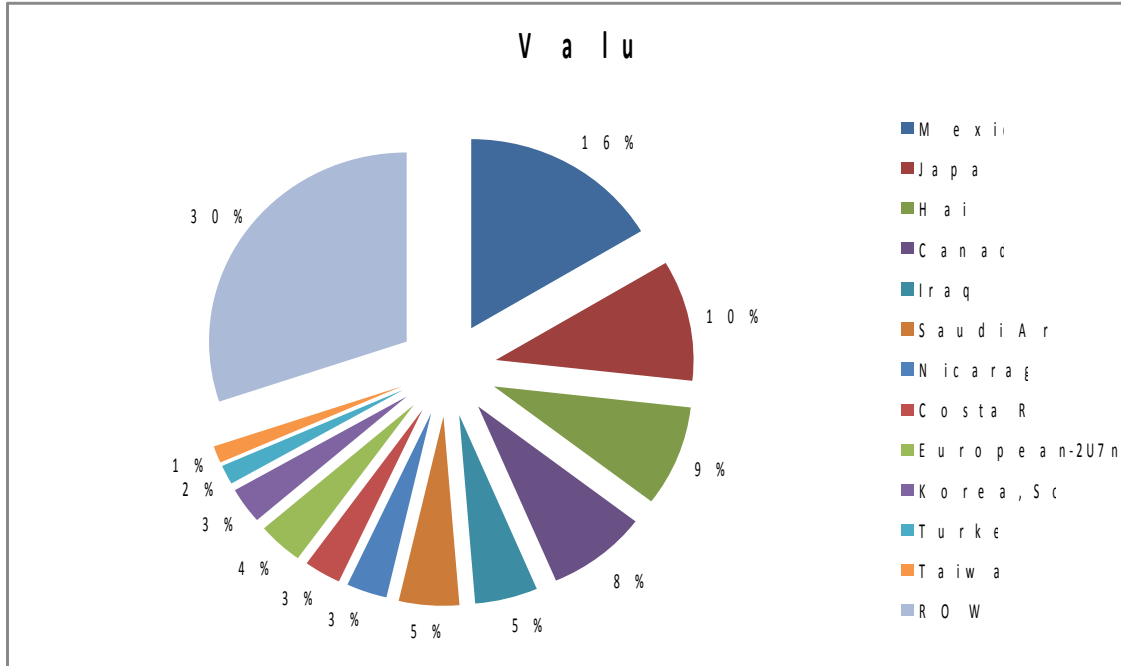


Figure 2. U.S. Export share by market by quantity, average 2006-2008 calendar years.

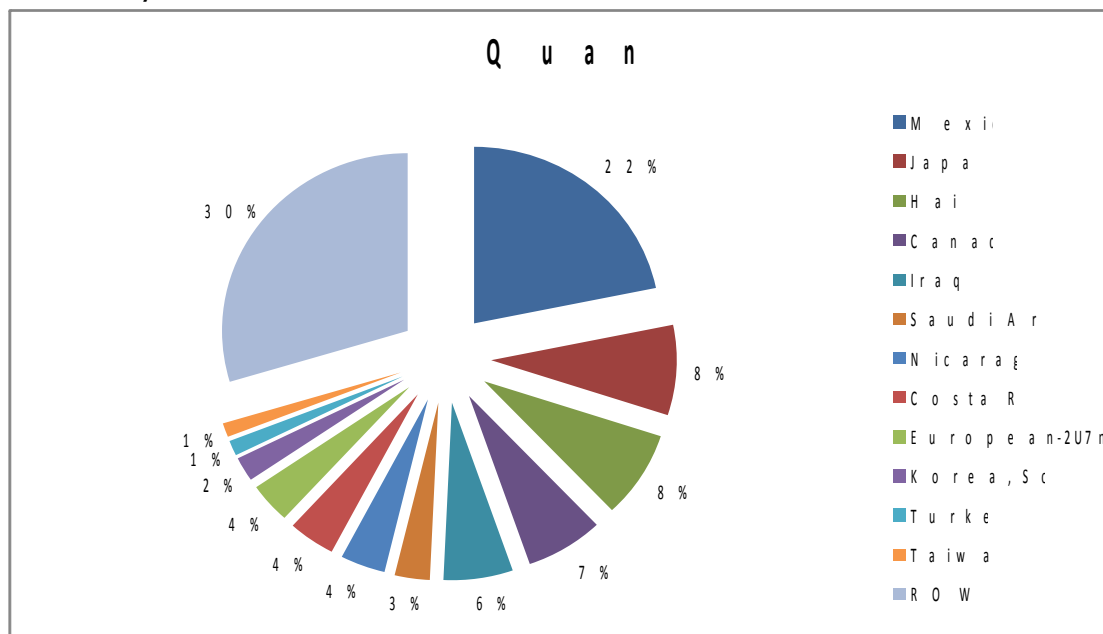


Figure 3. U.S. Rice export value by classification of rice type, average 2006-2008.

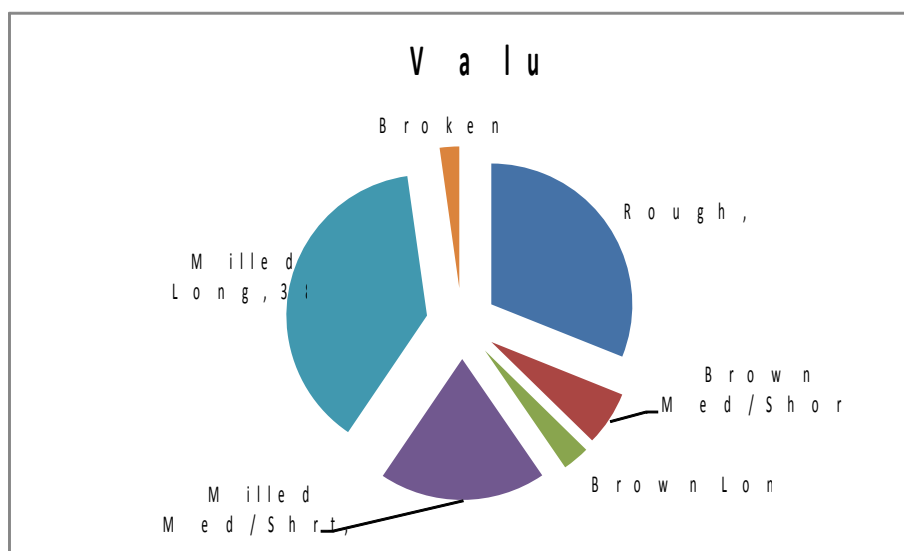
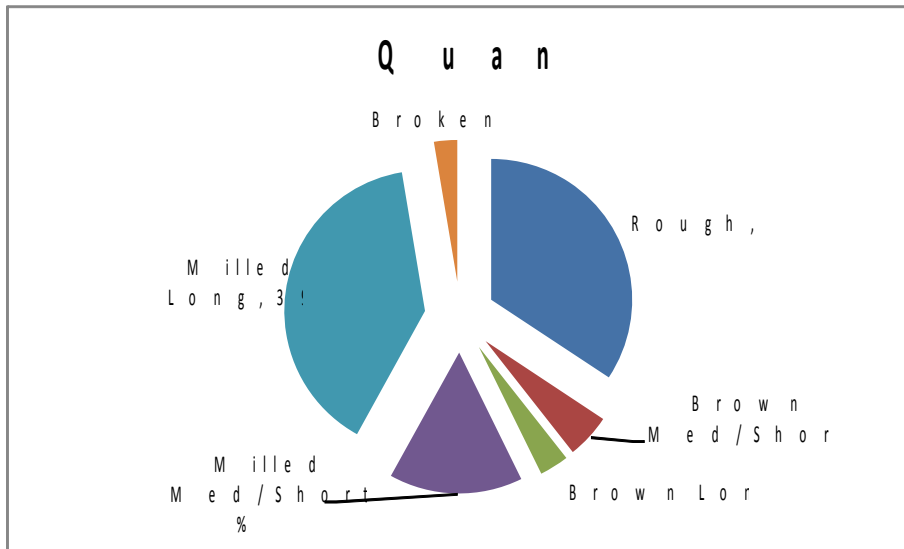


Figure 4. U.S. rice export quantity by classification of rice type, average 2006-2008.



Rice exports by rice type in Figure 4 is given in milled equivalents. The shares are approximately the same as value shares, with somewhat higher quantity shares for rough rice and milled long grain and smaller shares for milled and brown medium/short grain exports.

## 2.2 Structure of the rice industry

There are several excellent descriptions of the U.S. rice market structure in the literature including Childs and Livezey (2006), Livezey and Foreman (2004), Cramer et al. (2003), Chambers and Childs (2000), Childs and Burdett (2000), Setia et al. (1994). (This section will be expanded). The U.S. rice marketing system can be understood with the use of the following graphics which shows the key elements and actors in the production, processing and utilization of U.S. Rice.

Figure 5. U.S. Rice industry product flow.

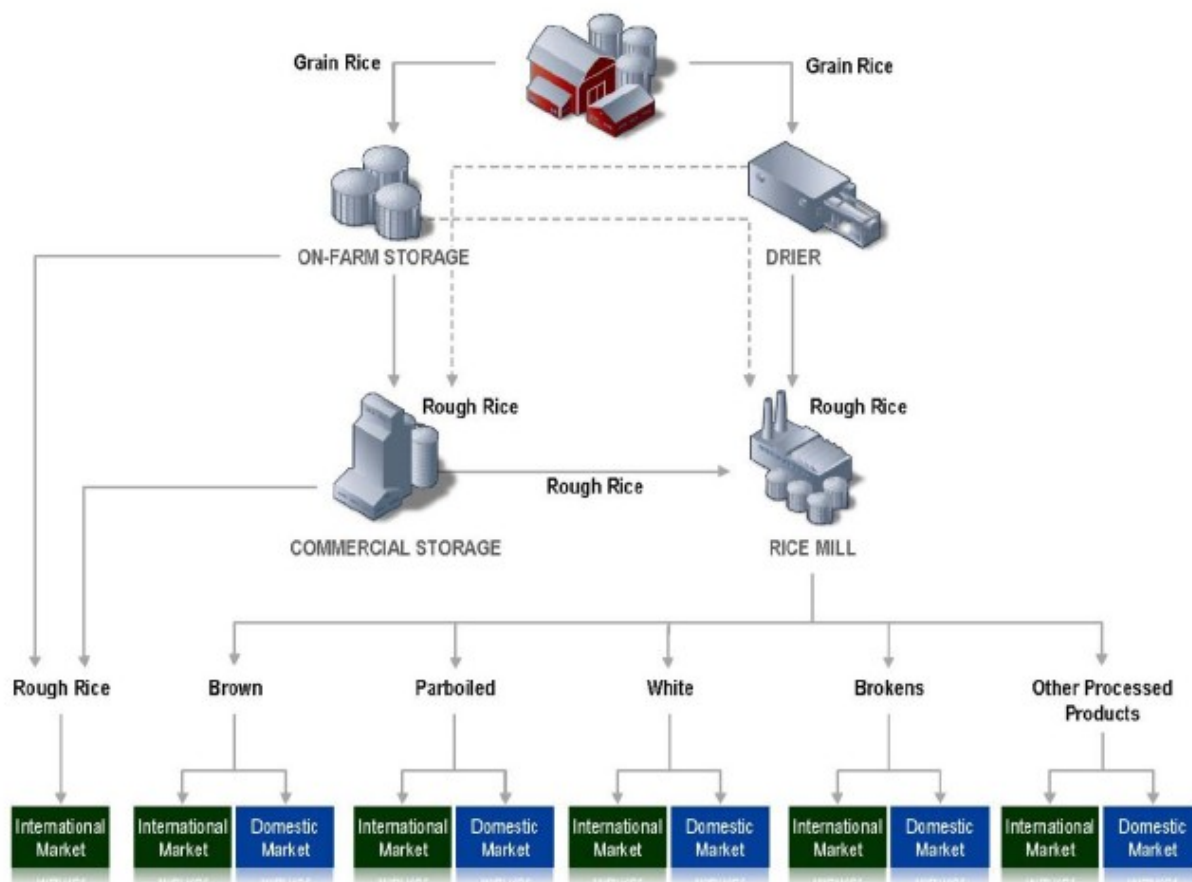
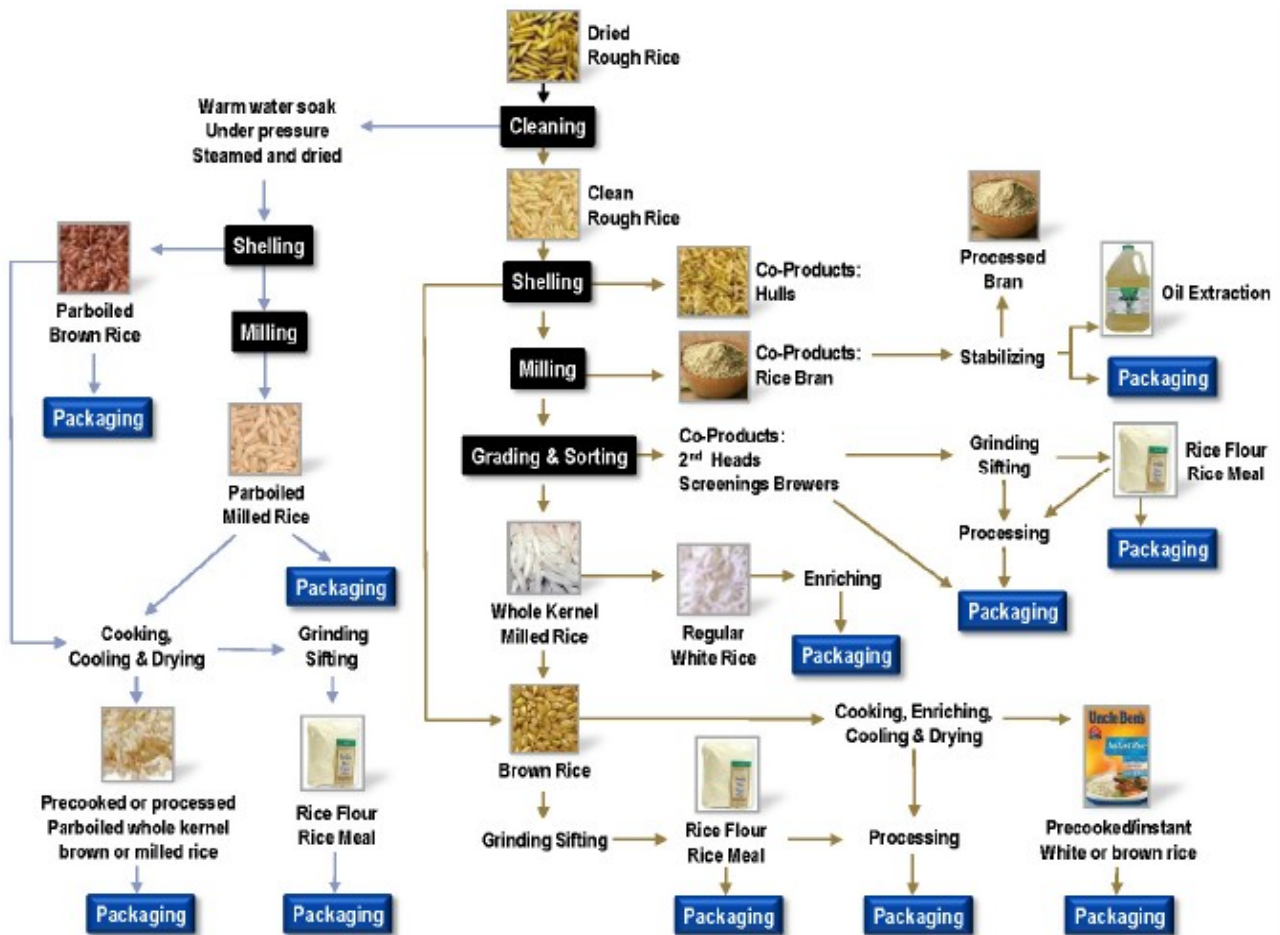


Figure 6. Rice processing flows in the U.S.



### Trade Barriers for U.S. Rice exports.

The U.S. rice industry views the primary constraint on global rice trade as one of limited market access. Trade barriers in rice importing countries are driven by policies that seek to protect producers, rice millers, and consumers in importing countries to achieve self sufficiency, policies to promote multifunctional public good attributes, policies to insulate domestic markets from international market instabilities, and policies that respond to rent-seeking behavior of particular groups of individuals. Various forms of protection are used by rice importers including tariffs, tariff escalation, tariff rate quotas, state enterprise trading, non-science based sanitary/phytosanitary requirements, etc.

The U.S. Rice industry faces a wide variety of trade barriers given the large number of countries to which it exports. The willingness of the U.S. rice industry to export brown and rough (paddy) rice in the face of tariff escalation, provides it a competitive advantage but at the same time a loss in domestic value-added from processing milled rice in the U.S. Global estimates of protectionism in rice are well documented in studies by Wailes (2006), Childs and Livezey (2006), Calpe (2005), and Gulati and Narayanan (2002).



### 3. Price Levels

The key prices used in this study are farm level prices, rough rice price at mill, processor/mill price FOB, and port prices FOB.

#### 3.1 Farm Prices

Farm prices used in this study are based on calendar year monthly averages as reported in the USDA, ERS Rice Yearbook 2008. Long grain and medium grain rough rice prices were used based on export market.

Table 2. US Farm Prices

Item	2006	2007	2008
	USD/mt	USD/mt	USD/mt
Long	180.87	235.69	297.26
Medium	233.19	289.72	405.47

Source: USDA, ERS, Rice Outlook, 2008

#### 3.2 Processor Prices

Rough rice prices at the processor were calculated as the sum of prices received by farmers plus costs of 3<sup>rd</sup> party inspection and grading service plus cost of drying and storage (six months) plus freight costs from farm to river/country elevator or rice mill depending on whether the export shipment was rough rice or brown or milled rice.

This price was then converted to a processed equivalent price by dividing the rough rice price by conversion factors of 0.8 for brown rice and 0.55 for milled rice. Average estimates of rice milling costs were then added to develop processed prices at the mill FOB.

#### 3.3 Exporter Prices

Exporter prices FOB were estimated from unit prices derived from the FAS GATS value and quantity export data by destination for the type of rice exported. Milling margins were estimated as the sum of average transport costs to port from country/river elevator for rough rice, or from the rice mill to the port for brown or milled rice export flows plus third party inspection and grading service and any additional certification/inspection fees such as cost of meeting GMO certification. These costs were subtracted from the FOB export prices to estimate milling margins. Exporter prices at destination were estimated by adding estimated transport costs, shipping and insurance to obtain an exporter price CIF at destination.

### 4. Costs

The key cost components of this study included farm level costs of production, inspection and grading service costs for both rough and processed flows, drying and storage costs, transportation costs from farm to elevator or mill, milling costs, transportation costs from elevator or mill to the port, costs of meeting GMO certification, and costs of shipping

and insurance to export destinations. Costs used in this study did not vary from year to year. However, energy costs did vary considerably over the 2006 to 2008 calendar years. Obtaining more precise detailed year to year cost data is a serious challenge when one must depend upon industry sources as the basis of cost estimates.

#### 4.1 Costs of Farm Production

Farm costs of production are developed from the USDA, ERS ARMS data base. Costs are based on the previous year production costs, i.e. 2006 farm production costs are the 2005/06 costs of production estimates. Costs of production used included Mid-South for long grain exports and California for the medium grain exports evaluated in this study.

#### 4.2 Inspection and grading service fees

Inspection and grading is done between the farm and processor levels and between the processor and port levels. Industry sources provided estimated of these fees.

#### 4.3 Drying and storage costs

Costs of drying rough rice to 12.5% and storage for an average period of 6 months were based on industry source estimates.

#### 4.4 Transportation costs

Farm to elevator or mill transport costs were based on industry source estimates of average costs. Elevator or mill transportation costs to port were based on industry source estimates. Costs of international shipping and insurance were based on industry supplied estimates from destination.

#### 4.5 Processing costs

Milling costs are based on industry estimates and estimates from costs models developed and maintained by Wailes.

### 5. Subsidies and taxes

#### 5.1 Subsidies and taxes in the U.S.

The U.S. government provides deficiency payments based on loan rates. If prices received by farmers are below a loan rate of \$143/mt, then a loan deficiency payment is made available to the producer. For the 2006 to 2008 time period there were no price subsidies provided as market prices were in excess of \$143/mt. Decoupled income support is provided to farmers who have historically produced rice. A direct payment of \$51.80/mt is made to farmers whether they currently produce rice or not. This payment is subject to a payment limitation and an adjusted gross income (AGI) limit. An additional decoupled payment is made if the market price plus the direct payment is below \$231.48/mt. This payment, known as a counter-cyclical payment, is also paid on historical rice production program acreage and yields. A producer does not have to produce rice to qualify for this income support payment. A deficiency payment is made if the market price plus the direct payment are below the so-called target price of \$231.48/mt. This payment is also subject to payment limits and AGI limits. Because the direct payment and counter-cyclical payment are decoupled, they are not introduced into the CIMA accounting framework.

#### 5.2 Taxes and trade barriers in importing countries

This case study evaluates eight major export markets in terms of the most important rice type exported to that country. The countries and type of rice include: Mexico—long grain rough rice, the EU-27—long grain brown rice, Turkey—long grain rough rice, and Japan—medium grain milled rice.

#### 5.2.1 Mexico

Mexico is the largest market for US rice. Rough rice accounted for approximately 85% of the milled equivalent rice exports from the US to Mexico. Under the NAFTA agreement, tariffs on US rice were eliminated and therefore, there are no tariffs or other protectionist barriers on US rice during the 2006 to 2008 period. In early 2007, Mexico held US rice for testing until Mexico approved LL62, which had contaminated US rice supplies.

#### 5.2.2 European Union—27

The EU—27 was the most important market for US brown rice exports prior to the GM contamination events in 2006 and 2007. Over the 2006 to 2008 period, US rice exports declined to minimal levels due to difficulties in agreeing to testing and certification protocols. Current testing is estimated to add an additional \$10/mt to cost of entering the EU market.

MFN tariffs apply to the US for brown rice the bound duty is 65 Euro/mt while the applied duty varies depending upon import levels relative to specified upper and lower thresholds calculated at the beginning and mid-way of the marketing year. Finally, a 4% Value Added Tax (VAT) is charged to cereals. According to the EU Commission for the period from January 1 - February 28, 2006 the applied duty for husked (brown) rice was 42.5 EURO/mt. From March 1 2006 until December 31 2008 the applied duty for husked rice was 65 EURO/mt.

#### 5.2.3 Turkey

Turkey is an important market for medium grain rice from the US, primarily as rough rice. In 2005 the US brought a dispute (DS334) against Turkey regarding its use of Certificates of Control as an import barrier. This mechanism required domestic purchase requirements. US exports declined from 255 thousand metric tons in 2005 to less than 18 thousand metric tons by 2006. In September 2007, the dispute settlement panel agreed with the US that Turkey's failure to grant licenses to import rice and its operation of a discretionary import licensing system for rice were in breach of Turkey's market access obligations. The panel also found that the domestic purchase requirement was in breach of national treatment of the MFN. Subsequently by 2008, US rice exports to Turkey increased to 133 thousand metric tons.

Applied duties for rice imports by Turkey are 34% for rough rice, 36% for husked (brown) rice and 45% for milled rice.

#### 5.2.4 Japan

Rice imports into Japan are controlled by the tariffication of the Minimum Market Access agreement agreed to under the Uruguay Round Agreement on Agriculture. It agreed to a minimum access of 767,000 metric tons of brown rice requiring a markup of 292 Yen/kg. Imports that

exceed the minimum access are dutied at 341 Yen/kg. Japan also requires certification on GMO from US exports

#### 6. Price Ladders and Calculation of CIMA

Based on the price and cost data the following tables provide estimates of the Composite Index of Market Access for US exports to Mexico, the EU, Turkey and Japan.

<b>Mexico price ladder</b>		<b>2006</b>	<b>2007</b>	<b>2008</b>
HS code		100610	100610	100610
		USD/mt	USD/mt	USD/mt
Cost of production	COP	191	197	202
TAX (subsidy if PLC < \$143.30, equal to \$143.30 - PLC)	TAX	0	0	0
Price received by farmers		180.87	235.69	297.26
Cost of meeting private standards	PLC			
Costs of meeting health and safety standards	SPC	1.76	1.76	1.76
Price paid by mill				
Processing costs (Dry and store 6 months)	PRC	29.39	29.39	29.39
Freight from farm/drier to barge		9.92	9.92	9.92
Processor price (River Elevator FOB)		221.94	276.76	338.33
Domestic cost to port	OMC	12.13	12.13	12.13
Costs of meeting health and safety standards	SPC	3.31	3.31	3.31
Margin		1.09	-17.35	66.18
Exporter price (FOB port)		238.46	274.85	419.95
Transport costs, shipping, insurance, etc	TRA	30	30	30
Exporter price (CIF port)	PRX	268.46	304.85	449.95
Import duties and other charges	MTD	0	0	0
Excise taxes in importing country	EDT	0	0	0
Importer Price	PRM	268.46	304.85	449.95
Barrier Market Access	BMA	3.31	3.31	3.31
Barrier Market Access Percentage	BMAP	1%	1%	1%
Composite Index Market Access	CIMA	99%	99%	99%

<b>EU price ladder</b>	<b>ITEM</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
HS Code		100620	100620	100620
		USD/mt	USD/mt	USD/mt
Cost of production (previous year)	COP	191	197	202
TAX (subsidy if PLC < \$143.30, equal to \$143.30 - PLC)	TAX	0	0	0
Price received by farmers (calendar year)		180.87	235.69	297.26
Cost of meeting private standards	PLC	0	0	0
Costs of meeting health and safety standards	SPC	1.764	1.764	1.764
Processing costs (Dry and store 6 months)	PRC	29.39	29.39	29.39
Freight from farm/drier to mill		9.92	9.92	9.92
Paddy price at mill		221.94	276.76	338.33
Brown rice price at mill (conversion 0.80)		277.43	345.96	422.92
Processing costs (Husked rice)		45.45	45.45	45.45
Brown rice price at mill (FOB)		322.89	391.41	468.37
Domestic cost to port	OMC	12.13	12.13	12.13
Costs of meeting health and safety standards	SPC	3.31	3.31	3.31
Costs of meeting GMO certification	SPC	0.00	10.00	10.00
Margin		-67.72	-74.94	174.99
Exporter price (FOB port)		270.6	331.9	658.8
Transport costs, shipping, insurance, etc	TRA	87	87	87
Exporter price (CIF port)	PRX	357.6	418.9	745.8
Import duties and other charges	MTD	81.63	89.02	95.08
Excise taxes in importing country	EDT	17.57	20.32	33.64
Importer Price	PRM	456.80	528.24	874.52
Barrier Market Access	BMA	102.51	122.65	142.02
Barrier Market Access Percentage	BMAP	29%	29%	19%
Composite Index Market Access	CIMA	71%	71%	81%

<b>Turkey price ladder</b>		<b>2006</b>	<b>2007</b>	<b>2008</b>
HS Code		100610	100610	100610
		USD/mt	USD/mt	USD/mt
Cost of production	COP	191	197	202
TAX (subsidy if PLC < \$143.30, equal to \$143.30 - PLC)	TAX	0	0	0
Price received by farmers		180.87	235.69	297.26
Cost of meeting private standards	PLC	0	0	0
Costs of meeting health and safety standards	SPC	1.76	1.76	1.76
Processing costs (Dry and store 6 months)	PRC	29.39	29.39	29.39
Freight from farm/drier to barge		9.92	9.92	9.92
Processor price (River Elevator FOB)		221.94	276.76	338.33
Domestic cost to port	OMC	12.13	12.13	12.13
Costs of meeting health and safety standards	SPC	3.31	3.31	3.31
Margin		-8.91	-17.35	28.81
Exporter price (FOB port)		228.47	274.8494	382.58
Transport costs, shipping, insurance, etc	TRA	95	95	95
Exporter price (CIF port)	PRX	323.47	369.8494	477.58
Costs of meeting Turkish Food Codex standards	SPC			
Import duties and other charges	MTD	109.98	125.75	162.38
Excise taxes in importing country	EDT	0	0	0
Importer Price	PRM	433.45	495.60	639.96
Barrier Market Access	BMA	101.07	108.40	191.19
Barrier Market Access Percentage	BMAP	31%	29%	40%
Composite Index Market Access	CIMA	69%	71%	60%

<b>Japan price ladder</b>		<b>2006</b>	<b>2007</b>	<b>2008</b>
HS Code		1006309020	1006309020	1006309020
		USD/mt	USD/mt	USD/mt
Cost of production (previous year)	COP	273	249	267
TAX (subsidy if PLC < \$143.30, equal to \$143.30 - PLC)	TAX	0	0	0
Price received by farmers (calendar year)		233.19	289.72	405.47
Cost of meeting private standards	PLC	0	0	0
Costs of meeting health and safety standards	SPC	1.76	1.76	1.76
Processing costs (Dry and store 6 months)	PRC	29.39	29.39	29.39
Freight from farm/drier to mill		9.92	9.92	9.92
Paddy price at mill		274.26	330.79	446.54
Milled rice price at mill (conversion 0.6)		457.11	551.32	744.24
Processing costs (Husked rice)		54.55	54.55	54.55
Milled rice price at mill (FOB)		511.65	605.87	798.79
Domestic cost to port	OMC	12.13	12.13	12.13
Costs of meeting health and safety standards	SPC	3.31	3.31	3.31
Costs of meeting GMO certification	SPC	0.00	10.00	10.00
Margin		-17.25	-71.50	-216.01
Exporter price (FOB port)		509.84	549.8	598.21
Transport costs, shipping, insurance, etc	TRA	86	86	86
Exporter price (CIF port)	PRX	595.84	635.8	684.21
Market Access markup	MTD	2510.77	2479.75	2774.83
Out of Market Access duty	MTD'	2932.10	2895.87	3240.47
Excise taxes in importing country	EDT	0	0	0
Importer Price	PRM	3106.61	3115.55	3459.04
Barrier Market Access	BMA	2514.08	2493.05	2788.13
Barrier Market Access Percentage	BMAP	422%	392%	407%
Composite Index Market Access	CIMA	-322%	-292%	-307%
Barrier over Minimum Market Access	BMMA	2935.40	2909.17	3253.77
Barrier over Minimum Market Access Percentage	BMMAP	493%	458%	476%
Composite Index over Minimum Market Access	CIMMA	-393%	-358%	-376%