AGRM International Rice Baseline Highlights, 2006-2016

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International and U.S. Rice Prices, 2006/07
Tight exportable supplies across Asia and record low world rice stocks, coupled with a stronger Thai currency have resulted in sharply higher Thai export prices over the last 3 years. The average Thai 100% B long grain price is expected to be $321 per mt in 2006/07, nearly 7% higher than the previous year’s price. It is expected to weaken to $287 per mt in 2007/08 as world rice supplies expand. Likewise, tight U.S. rice stocks have pushed the average U.S. long grain rice price in 2006/07 substantially higher (23%) than the previous year’s level, and thereby doubling its premium over the Thai long-grain rice price.

World Rice Harvested, Production and Yield, 2006/07-2007/08
Global rice harvested area in 2006/07 is projected to decline marginally from the 2005/06 level, to 152.1 m ha, as harvest area recovers in India, China, and Bangladesh despite harvested area declines in Indonesia and Myanmar. Likewise, world rice production is estimated to be marginally lower in 2006/07 at 415.0 mmt, as world average yield remains flat. Higher yields occur in Myanmar, Taiwan, and the U.S. but a number of other countries are projected with declines in yield, including Australia, Brazil, and Turkey.

Higher prices in 2006/07 are expected to increase global rice area harvested in 2007/08 by 869 tha (or 0.6%) to 152.9 m ha. Production is projected to increase by 5.2 mmt (or 1.3%) to 420.2 mmt during the same period. Yield recovery in Australia and yield improvements in the U.S., E.U., Taiwan, and Mexico more than offset lower yields returning to trend levels in Argentina, Uruguay, Brazil, and Turkey.

After four consecutive years (2001/02 to 2004/05) of world rice production lagging consumption, in 2005/06 production exceeded consumption, but has now fallen behind in 2006/07. Higher production is expected to close the supply deficit in 2007/08, and keep pace with consumption over the baseline.

World Rice Consumption and Per Capita Use, 2006/07-2007/08
The world average per capita use of rice is projected to decline slightly, but total world rice consumption increases by 1.1%, to 416.2 mmt in 2006/07, as world population grows by 1.19%. Total global rice consumption in 2007/08 is projected to increase 0.5% to 418.5 mmt due solely to population growth, as per capita use declines by 0.6%.

Per capita use of rice in Asia is a result of the combined effects of the westernization of diets, urbanization, and diet diversification towards more protein-based foods, especially in rice economies with growing incomes, including India, China, Indonesia, Japan, and Taiwan. As a result of strong populations growth rates, India and Bangladesh combined, account for 80% of the gain in global consumption in 2006/07.
In 2007/08, with average world population growth of 1.18%, total global rice consumption is projected at 418.5 mmt, a 0.5% increase over the previous year—despite a 0.6% decline in average per capita consumption.

**Global Rice Trade, 2006/07-2007/08**

Total world rice trade in 2006/07 is projected at 28.1 mmt, up 0.9% from the previous year’s level. The combined increases in exports from Thailand, Vietnam, Argentina and Myanmar more than offset the declines in shipments from the U.S., Uruguay, Australia, and China. Net world rice trade in 2006/07 is 25.4 mmt, up 4.0% from the previous year’s level.

Total global rice trade expands to 30.0 mmt in 2007/08, up 7.1% from the previous year’s level as world prices decline. It is expected to continue to grow by 1.8% annually over the baseline period, as demand remains strong. With projected increases in supply relative to demand, international rice prices are expected to drop by 8.8% in the same marketing year.

**Global Rice Projections for the Next Decade, 2006-2016**

Over the 10-year baseline period, while global rice area declines marginally to 151.1 mha by 2016/17, average global rice yield continues to grow just above 0.7% annually, from 2.73 mt per ha in 2006/07 to 2.94 mt per ha by 2016/17—causing total production to grow at 0.7%. The projected contraction of rice area in China over the next decade exceeds the expected area expansion in Australia, Bangladesh, Brazil, Indonesia, India, Myanmar, and Nigeria. Seventy percent of the projected growth in total rice production over the baseline comes from India (which alone, accounts for 37%), Indonesia, Vietnam, Thailand, Myanmar, and Nigeria.

Total rice consumption continues to increase steadily by 0.7% annually, with expansion driven solely by population growth, as average per capita use declines by 0.4% per year. China and India remain the top consumers of rice over the next decade, which together account for 50% of total global rice use. However, China’s total consumption declines slightly over the next decade; and over 70% of the projected net gain in world rice consumption over the same period is accounted for by India, Bangladesh, Indonesia, Nigeria, Philippines, Myanmar, and Vietnam. Strong consumption demand, coupled with low stocks, keeps the world stocks-to-use ratio around 19% over the 10-year baseline.

Driven by consumption and trade, and appreciation of the Thai baht, international rice prices continue to move higher, albeit at a modest rate of 0.3% annually. The Thai 100% B rice price is projected to reach $331 per mt by 2016. Over the next decade, the premium of U.S. long grain rice price over the Thai long grain rice price is expected to remain generally around $80-100 range.

Over the baseline period, world rice trade is expected to grow annually by an average of 1.8%. By 2016, global rice trade is projected to reach 33.4 million tons, 17% higher than the record set in 2002. Despite the growth, rice trade as a share of world rice consumption is only 7.5% by 2016 and remains small relative to other grains.

**Major Rice Exporters**

With increasing available rice supplies caused by improving rice yields and declining per capita rice use, India and Thailand are projected to account for virtually all (98%) of the net volume
growth in world rice exports over the next decade. Net exports of these two countries are projected to grow at a compounded annual rate of 4.9% and 2.2%, respectively.

Pakistan’s exports decline, and Vietnam’s exports stagnate, as domestic uses in both countries grow much faster than domestic supplies.

Uruguay, Myanmar, and Australia are also expected to expand exports following their recovery from recent declines.

**Source of Growth in Rice Imports**

Rising import demand in Africa and the Middle East accounts for nearly 42% of the net volume growth in world rice imports over the next decade. Nigeria is expected to import 2.4 million tons by 2016, as consumption continues to outstrip production. Because rice production in the Middle East is constrained by water availability, rice imports in Iran, Iraq, Saudi Arabia, and Ivory Coast continue to expand along with population and per capita consumption.

Over the same period, nearly 30% of the projected net growth in import volume is accounted for by other net importers including the E.U., Mexico, South Korea, and the Philippines.

**Projections of Rice Supply and Use by Net Exporting Countries, 2006-2016**

**Argentina.** Argentina continues to enjoy a strong economy, with real GDP and per capita income growing annually at 5.5% and 4.6%, respectively. The country’s total rice output grows by 0.7% per year—0.2% of which comes from slight area expansion and 0.5% accounted for by yield gain. With population growing over 0.8% and per capita rice use gaining 0.7% per year, total consumption expands at 1.6% annually—faster than production, causing exports to increase only marginally over the baseline period. Total rice export gain over the 10-year period amounts to 25 tmt, reaching 501 tmt by 2016/17.

**Australia.** Over the projection period, Australia’s economy grows at 2.9% per year, which is translated to a per capita income growth of 2.1%. Australia experienced severe drought and shortage of irrigation water last year, causing its production to plummet nearly 90%. Using the abnormally low area and yield in 2006/07 as the base, the country’s rice production is projected to recover and grow at 24.8% per year over the baseline—with 3.5% coming from yield and 20.6% coming from area recovery. With population growing at 0.8% and per capita rice use increasing at 1.7% per year, total rice consumption lags output—enabling the country to increase rice exports by 25.7% per year over the same period.

It should be noted, however, that the growth rates would have been substantially lower if 2005/06 were to be used as the base—in which case the growth rates for production, area, and trade would have been 1.2%, 2.0% and 4.2%, respectively. Rice exports reach 394 tmt by 2016/17. These recovery projections assume favorable government policy that will make adequate irrigation water available for rice production.

**China.** China is a major producer and consumer of rice, with area accounting for nearly 20% of world total, and production and consumption accounting for close to 30% of world total.
China’s real GDP grows at a robust 7.8% rate, equivalent to a per capita income growth of 7.1% per year—the fastest among the rice economies. However, the country’s rice industry has a different story. Over the baseline, rice production declines annually by 0.4%, as area contracts by 1.0% (equivalent to 280 thousand hectares) per year even as yield gains 0.7% per year. While population grows at 0.7%, per capita rice use declines by 0.8% per year—causing total rice consumption to contract 0.2% annually.

USDA reported that an estimated 60% of China’s urban population and 55% of the rural population consume rice as a staple food. Indica rice is mainly consumed in southern part of the country while Japonica rice is consumed in the northern part. While per capita use for food is declining as incomes rise, rice use in the processing sector is reportedly increasing. Low quality early rice varieties and stale rice reserves are used to feed swine and poultry at both commercial and in rural households. China has reportedly developed several varieties of transgenic rice, but none has been commercialized.

Exports from China have declined in recent years because of reduced stocks and less exportable supplies. Over the next decade, China is expected to become a net rice importer as area contracts, and output declines faster than consumption. Projected net rice imports in 2016/17 total 153 tmt, as opposed to net exports of 251 tmt in 2006/07.

**Egypt.** The country’s economy grows at 4.7% and per capita income grows at 3.1% per year. The country’s rice area is flat and both yield and production gain 1.4% per year. Rice is second only to cotton as the largest summer crop in Egypt (corn ranks third). The entire rice crop is irrigated. The government targets 420,000 hectares of rice every year in order to ration the limited irrigation water resources. However, with irrigation water provided free of charge to farmers and rice being more profitable than corn or cotton, some farmers reportedly shifted from cotton to rice. The result is that current total area planted exceeds the government target by 30%.

Increase in total rice consumption comes solely from population which is growing at 1.6% per year. Medium grain variety, which is preferred by Egyptian consumers to the higher-yielding long grain variety, accounts for 85% of the rice crop. Medium grain is also popular to farmers because it is easily milled in local mills, and it commands higher price in the market.

With domestic use expanding faster than domestic supply, rice exports are projected to decline over the baseline period—from 928 tmt in 2006/07 to 825 tmt in 2016/17.

**India.** India is a major rice producer and consumer—accounting for nearly 30% of total world rice area, and over 20% of world rice production and consumption. India enjoys a fast-growing economy, with real GDP and per capita income growing at 6.9% and 5.3%, respectively. The country’s rice output increases by 1.2% per year, with most of the growth coming from yield improvement, at 0.9%.

The 0.6% net growth in total consumption comes from a population growth of 1.5% and per capita rice use decline of 0.6% per year. With increasing available rice supplies, India accounts for 53% of the net volume growth in world rice exports over the baseline. The country’s rice exports expand from 3.8 mmt in 2006/07 to 6.2 mmt in 2016/17.
Because rice is predominantly a rain-fed crop in India, wide year-to-year fluctuations in production can occur. The baseline projections assume normal monsoon rains.

**Myanmar (Burma).** Myanmar’s real GDP grows at 5.0%, equivalent to a per capita growth of 4.3%. With slight growth in area (0.4%) and yield (0.8%), total rice production increases by 1.2% per year. Total rice consumption increases by 1.0% annually, as population grows at 0.7% and per capita rice use increases marginally at 0.3%. Rice exports reach 319 tmt by the end of the baseline.

**Pakistan.** Over the baseline, Pakistan’s total economy grows at 4.4% per year—with per capita income improving at 2.5% per year. The country’s rice production increases marginally at 0.5% per year, with growth coming solely from yield gain. There are basically two predominant types of rice grown in the country—basmati and IRRI varieties. IRRI rice is grown in areas that rely heavily on canal irrigation, while basmati is grown in areas that rely on large-scale tube well irrigation.

As opposed to wheat, rice is not considered a staple food in the Pakistani diet. With per capita rice use declining slightly at 0.2% per year, the 1.7% net increase in total consumption per year is accounted for by the 1.9% population growth.

Net rice exports contract by 100 tmt, to 2.8 mmt by the end of the baseline—equivalent to 0.4% decline annually. Since 2000, the government abandoned rice procurement through state trading enterprises. All trade is conducted by private sector, with the assistance of Trading Corporation of Pakistan on government-to-government exports.

**Thailand.** Thailand’s real GDP grows at 4.7% per year, which translates to a per capita income growth of 4.1%. While the country’s rice area declines marginally, improvement in yield enable total production to grow at 1.1 percent per year. Total rice consumption grows only marginally at 0.2%, as decline in per capita use (0.4%) nearly offsets the growth in population (0.6%).

Thailand’s increasing available rice supplies enable the country to increase its exports by 2.2% per year—accounting for 45% of the net volume growth in world rice exports over the next decade. Rice exports increase to 10.7 mmt in 2016/17, from 8.6 mmt in 2006/07.

During the current marketing year, the government of Thailand targets government-to-government sales to boost its rice exports. Projected volume under this marketing channel is 1.0 mmt. One concern is the uncertainty in the direction of the post-coup interim government’s policy on rice price and stocks in the future. Sometime in October 2006, the government decided to lower the intervention price by about 10% to minimize carry-over stocks and avoid program losses.

**United States.** The U.S. economy is projected to grow at 2.8% per year, with per capita income improving at 1.9%. U.S. rice acreage increases marginally (0.4%), while yield improves by 1.1% per year—enabling the country to increase total rice output by 1.5% per year over the baseline. Total rice consumption steadily increases, as both population and per capita rice use
grow at 0.9% annually. Rice exports from the U.S. are expected to decline from 2.7 mmt in 2006/07 to 2.4 mmt in 2016/17, as growth in consumption outpaces growth in output.

**Uruguay.** The country’s economy grows at 3.8%, with per capita income growing at 3.4%. Total rice production increase by 3.9% per year—with 3.3% of the growth coming from area expansion and 0.6% coming from yield improvement. With strong growth in per capita rice use of 1.8% per year, and slight growth in population of 0.4%, total rice consumption expands at 2.2% per year. As production increases faster than consumption, Uruguay is able to increase its rice exports by 5.0% per year, i.e., from 584 tmt to 952 tmt over the baseline period.

**Vietnam.** At 7.3% average real GDP growth over the next decade, Vietnam is second only to China as far as strength of the economy is concerned. The same is true for per capita income growth, at 6.3%. Total rice production grows at 1.0% per year solely because of yield gain, as area remains flat. Total rice consumption increases by 0.9% per year, as population grows at nearly 1.0% and per capita use declines marginally. Rice exports increase only marginally, to 4.9 mmt by the end of the baseline period.

Relatively poor technology, poor infrastructure, and lack of post-harvest handling facilities make Vietnam’s rice less competitive in the export market. One uncertainty is Vietnam’s policy on export controls. Sometime in November 2006, the government suspended rice shipments in line with a new policy of limiting exports to reduce domestic prices.

**Projections of Rice Supply and Use by Net Importing Countries, 2006-2016**

**Bangladesh.** The economy of Bangladesh is expected to grow at 5.4% per year—with per capita income improving at 3.5% per year over the baseline period. Rice production is projected to grow at 1.7% every year, given that yield grows at 1.4% and area increases marginally at 0.3%. Although per capita rice use declines marginally by 0.4%, population grows relatively fast at 1.9%—causing total consumption to expand at 1.6% per year. Rice imports of Bangladesh are expected to decline as slight production gains are achieved over the projection period.

As rice production in Bangladesh is largely rain-fed, weather-related yearly fluctuations in the country’s production could occur. The baseline projections are based on occurrence of normal monsoon rains benefiting the country’s three rice crops per year.

**Brazil.** Brazil’s real GDP and per capita income grow at 3.6% and 2.6% per year, respectively. Rice area is expected to expand by 1.5% per year, and yield to improve marginally by 0.2%—which combined account for an annual increase of 1.8% in production per year over the baseline. The increased output and a moderate decline in per capita consumption are behind the 6.9% annual decline in Brazilian rice imports over the same period—from 697 tmt in 2006/07 to 479 tmt in 2016/17.

**Canada.** Real GDP growth of Canada stands at 2.6% per year, with per capita income growth of 1.8%. Demand for rice continues to grow at 2.5% per year, as population grows at 0.8% and per capita rice use increases by 1.6%. Because Canada does not produce rice, rice imports grow in tandem with total consumption, reaching 420 tmt by the end of the baseline period.
European Union. The E.U.’s real GDP and per capita income grow at 1.9% and 1.8% annually, respectively. CAP reforms in the E.U. result in slow growth in production and an increase in imports of rice. The marginal growth in production (0.4%) is a net result of area declining by 0.3% and yield improving by 0.7%. The marginal gain in population and a 0.5% annual increase in per capita rice use cause a 0.6% growth in total rice consumption. Net rice imports by the end of the baseline period stand at 1.0 mmt.

Sometime in August 2006, there was an incidence of contamination of U.S. long grain shipment in Europe, and E.U. responded by implementing test and inspection of U.S. rice exports.

China-Hong Kong. Being a non-producer of rice, Hong Kong’s rice imports grow in tandem with rice consumption at 1.0% per year. Both population and per capita rice use grow at 0.5% annually. Rice imports total 344 tmt by 2016/17.

Indonesia. Indonesia’s economy is projected to grow at 4.8% annually, and per capita income is expected to grow by 3.7%. With a slight 0.2% increase in rice area and a 0.5% improvement in yield, the country’s rice production is projected to increase by 0.8% per year. The government continues to subsidize seeds and fertilizers. Fertilizer subsidies in 2006 increased nearly 67% compared to the previous year.

While per capita rice use declines marginally by 0.4%, population growth of 1.1% cause total consumption to increase by 0.7% per year. Rice imports of Indonesia are expected to decline marginally over the baseline period, as slight gains in output materialize. Rice imports are expected to range from 1.0 to 1.7 mmt over the projection period.

Indonesia resumed imports in 2005, after a long import ban. Recent weather-related challenges (floods, delayed planting and harvest) that led to increased rice prices and tight stocks, caused the government to allow rice imports of 500 tmt of rice during the current year.

Iran. Iran’s real GDP grows at 4.3%, and per capita income grows at 3.3%. The country’s rice area is flat around 650 thousand hectares, and production increases at 0.6% per year mainly because of slight increase in yield. The 1.3% annual increase in rice consumption comes from 0.9% population growth and 0.4% gain in per capita rice use. The gap between consumption and production cause Iran’s rice imports to grow at 2.5% per year, from 802 tmt in 2006/07 to 1.0 mmt by 2016/17.

Iraq. Depending on the outcome of the current situation in Iraq, there’s an uncertainty in the future growth of the country’s economy. Iraq is expected to increase rice area by 2.5% per year, and with a yield increase of 1.0%, total production increases by 3.5%.

Total consumption is projected to expand by 3.2%, which comes from 2.4% population growth and 0.0.8% increase in per capita rice use. Rice imports are projected to grow at 1.1% per year, reaching nearly 1.4 mmt by 2016/17.
Ivory Coast. Ivory Coast’s real GDP grows at 3.3%, equivalent to a per capita income gain of 1.5% per year. Slight growth in rice area (0.5%) and yield (0.6%) causes production to increase at 1.1% per year. Total rice consumption expands at 2.8% per year, given that population grows at 1.9% and per capita rice use increases by 0.9% per year. Rice imports expand at 3.6% per year, reaching 1.2 mmt by 2016/17.

Japan. Japan’s real GDP growth rate, at 1.5%, is the lowest among the rice economies. Per capita income grows a little faster at 1.7% per year, as population declines slightly. Rice production contracts by 1.7%, as area declines by 2.1%, even as average yield gains 0.4% per year. Productive rice farmers are expected to benefit from Japan’s new food policy which is focused on providing assistance to the most efficient producers.

Consumption decreases by 0.8% due to the combined effects of decline in population and per capita rice use. Japan’s rice imports are expected to remain flat at 482 tmt, in the absence of further market access expansion under the WTO.

Malaysia. Malaysia’s economy grows at 5.1% and per capita income grows at 3.4%. With slight annual increases in area (0.5%) and yield (0.8%), the country’s rice output gains 1.4% per year. Total consumption increases by 2.1% per year—accounted for by 1.7% growth in population and 0.4% gain in per capita rice use. Malaysia’s rice imports increase steadily at 1.6% per year—from 862 tmt in 2006/07 to 1.0 million tons by 2016/17.

Recent USDA report indicates that the government of Malaysia is encouraging large-scale private sector commercial rice production, especially in the states of Sabah and Sarawak where land is still abundant. If successful, this program could potentially cause rice imports to decline relative to the baseline.

Mexico. The annual real growth of Mexico’s economy is 3.4%, with per capita income increasing at 2.6%. Rice production expands at 2.6% per year, with both area and yield growing at 1.3%. With competition from cash crops dampening expansion in rice area, population growth (1.1%), and continued strong growth in per capita rice consumption (2.1%) in Mexico, rice imports will increase by 3.8% per year—reaching 871 tmt by 2016/17.

Nigeria. Nigeria’s economy is strong, with real GDP growing at 6.0% per year. With population growth of 2.4%, annual per capita income grows at 3.5%. Rice production increases at 3.6% per year--2.3% of which comes from yield improvement and 1.2% from area expansion. Rice consumption grows at 3.7%, caused by growth in both population and per capita rice use. Rice imports expand steadily at 4.1% per year, reaching 2.4 mmt by 2016/17.

Philippines. The Philippine economy is projected to grow at 4.6% per year over the baseline. Per capita income grows at 2.9% over the same period. With slight growth in rice area (0.2%) and yield (0.3%), total rice output will increase by 0.6% per year. Although per capita rice use declines by 0.5% per year, total consumption expands by 1.2% as population grows by over 1.6%.
The use of subsidized high-yielding hybrid seeds is the centerpiece of the country’s self-sufficiency program. Slow farmer adoption of the hybrid technology due to relatively higher costs of seeds, higher requirement of fertilizers and chemicals, and recent controversy involving monopoly of hybrid seed source cause the government to remove the subsidy for hybrid seeds in 2007. Given this constraint in the country’s self-sufficiency efforts, the Philippines is expected to remain a major rice importer over the projection period. Rice imports are projected to increase 3.4% per year, from 1.3 mmt in 2006/07 to 1.8 mmt by 2016/17.

**Saudi Arabia.** Saudi Arabia’s real GDP grows at 4.9% and its per capita income grows at 3.1%. A non-producer of rice, Saudi Arabia depends totally on imports for its domestic rice needs. Total consumption expands at 2.4%—with the increase coming from 1.7% population growth and 0.7% gain in per capita rice use. Rice imports increase steadily by 2.0% per year, reaching 1.5 mmt by 2016/17.

**South Africa.** South Africa’s economy grows at 5.5% per year. Per capita income grows at 6.0% per year, as population declines by 0.5%. Per capita rice use gains slightly at 1.0% per year, causing total consumption to increase by 0.5%. Rice imports increase by 1.3% per year, reaching 892 tmt by the end of the baseline period.

**South Korea.** With real GDP growing at 4.5% per year, South Korea’s per capita income growth stands at 4.2%. The country’s rice area contracts by 1.6% per year and with yield remaining stagnant, total rice output declines by the same magnitude. While population grows at 0.3% per year, per capita rice use declines by 0.6% due to rising incomes and the growing popularity of Western foods—causing total consumption to contract annually by 0.3%. Net rice imports are expected to increase by 9.3% over the baseline period, reaching 409 tmt by 2016/17.

USDA reported recently that South Korea started to impose a 100% arrival-testing requirement for imported rice shipments to verify the absence of LLRice.

**Taiwan.** Taiwan’s economy is expected to grow by 4.2% per year, and per capita income, by 3.7%. As a result of 1.5% annual contraction in rice area and 0.7% improvement in yield, Taiwan’s rice production is projected to decline by 0.8% per year. Rice consumption is expected to be flat over the baseline period, as growth in population nearly offsets the 0.5% decline in per capita rice use. Taiwan’s rice imports are projected to be flat at 127 tmt over the same period.

**Turkey.** Turkey’s real GDP grows at 5.0%, and per capita income grows at 4.0% per year. Rice production contracts by 1.3%, as area declines by 1.5% and yield gains slightly. Consumption, on the other hand, increases by 1.5% as population and per capita rice use grows by 0.9% and 0.6%, respectively. As rice competes with bulgur (cracked wheat) and pasta in the Turkish diet, the prices of bulgur and pasta can significantly affect rice consumption. Rice is largely consumed in big cities and western provinces.

In Turkey, rice may be imported only within a tariff quota. Under this system, importers could only apply for an import license if they bought domestic paddy (rough) or milled rice. The quota was 500 kg for paddy, 400 kg for brown rice and 300 kg for milled rice—if importers bought 1,000 kg of paddy rice from Turkish Grain Board (TMO). If the 1,000 kg paddy rice were bought
from producers, the quota was 800 kg for paddy, 640 kg for brown rice and 480 kg for milled rice.

Driven by population growth and rising incomes, rice imports in Turkey continue to expand by 1.9% annually, exceeding 300 tmt by 2016/17. Should Turkey liberalize its rice import regime, the country could be a promising market outlet for U.S. medium grain exports.