Emerging Countries: Converging or Diverging Economies?

Shida Henneberry

According to the World Bank, the five largest emerging markets (EMS) are China, India, Indonesia, Brazil and Russia. The emerging countries have restructured their economies along market-oriented lines and in the process have offered a wealth of opportunities in trade, technology transfers, and foreign direct investment. Nonetheless, their future role in global trade and growth potentials remain uncertain. Despite sharing many similarities, each country has gone through its own unique economic and political reforms to get to where it is today. Because state-led economic development failed to produce sustainable growth, many of these countries have gone through major political and banking reforms. As the two-way trade and capital flows between EMS and industrialized countries have flourished, foreign investment has replaced foreign assistance and global inter-dependency has taken the place of dependency.

As a group, the emerging countries have become a major power driving global agricultural markets. China and India, the only two countries in the world to have a population greater than 1 billion, together are home to more than a third of the world’s population. The emerging countries’ large population and their fast growing economies have provided a significant market for food and agricultural commodities. Accompanying their GDP growth, per capita demand for animal protein has risen in the EMS. Driven by increasing productivity and land expansion, their agricultural GDP has also been growing. However, because of land and other resource limitations, production increases have not kept up with the growth in food demand and therefore food imports have increased in some of these markets. For example, Russia and China are becoming major meat importers and have potential of becoming the U.S. top meat markets. Others, such as Brazil, are major agricultural suppliers to the world markets.

Another notable change in some of these countries has been the rural–urban migration of their population, driven by rapid economic growth and job possibilities in urban areas. The rural–urban migration has created new economic issues that have resulted from the widening of urban income and wealth disparities. The demographic trends have changed the type of foods that consumers demand and where they allocate their food expenditures. These trends have significant implications for food exporting countries.

Despite their commonalities, these countries have very different economic structures. Economies of some are more driven by government policies, while others are more free market and comparative advantage driven. The challenge facing these countries includes sustaining economic growth, a more equal distribution of income and reduction in rural poverty, improving infrastructure and reducing financial constraints in the farming sector (especially for small holders), ensuring environmental quality, and satisfying the growing demand for animal protein.
These papers address some of the crucial forces driving the economies of these countries, discuss food demand and supply, and highlight related economic and political reforms in China, Indonesia, India, Russia, and Brazil.

For China, Fred Gale and Shida Henneberry describe how domestic production and imports have accommodated dramatic improvements in living standards and dietary change during the last three decades. Chinese diets and farm production are flexible and responsive to market prices. The role of policy versus reformed markets in agricultural commodities on prices and China’s participation in global trade are discussed, with a focus on pork and soybeans.

Richard Barichello and Arianto Patunru examine Indonesia’s agricultural sector’s performance in domestic and global markets. They identify the key issues in Indonesia’s agricultural sector, including slow productivity growth, producer–consumer conflicts over high farm prices, politics and public support for biofuels, poverty, and environmental challenges. They conclude that these factors combine to give reason for reform of agricultural policies in Indonesia.

Ashok Gulati, Maurice Landes, and Kavery Ganguly describe India’s agricultural challenges to most effectively make the transition from ensuring adequate wheat and rice supplies to improving food grain management, enhancing the safety net for the poor, and managing rapid agricultural diversification. They further identify expanding the role of the private sector and linking small farmers with increasingly dynamic and diverse markets as key policy challenges in the near future.

William Liefert, Olga Liefert, and Eugenia Serova examine how Russia’s importance in world agricultural markets has expanded during the 2000s. The two main developments are that Russia has become the second largest agricultural importer in the world among emerging markets, after China, and a major exporter of grain. Meat imports in particular are substantial. Russia’s current agricultural trade is a major change from the Soviet period, when Russia, and the Soviet Union as a whole, imported a large amount of grain, soybeans, and soybean meal to support high levels of domestic production of livestock products.

Constanza Valdes, Ignez Vidigal Lopes, and Mauro de Rezende Lopes examine Brazil’s recent socio-economic shifts and discuss how these factors have led to structural changes in food demand and have impacted agricultural output and Brazil’s role in global agricultural markets. Brazil’s biofuel industry and its effect on the availability of grains and oilseeds for domestic food and feed uses and exports are discussed. Sustaining productivity growth to meet increasing domestic demand and, at the same time, maintaining its position as a major supplier of agricultural commodities to world markets are identified as major policy challenges.

This collection of papers underscores the complexities of the economies in these countries and the challenges faced by their policy makers in reducing poverty, increasing agricultural production, satisfying changing consumer demand, protecting domestic producers, and in making the transition from a developing country status to an emerging country with its own set of issues. The political and economic issues examined in these papers are likely to remain the key issues in determining the role of the emerging countries in global markets for the foreseeable future.

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Markets Adapt to China’s Changing Diet

Fred Gale and Shida Henneberry

JEL Classifications: Q1, F1, P2

Producers and consumers across the globe are concerned about the future impacts of a wealthier China. Many view its growing buying power as a potential market or investment opportunity while others worry that growing demand from China will stress natural resources or raise food prices. Still others view China as an emerging competitor.

In this article, we highlight major changes in China’s food demand and supply over the past three decades and discuss some of the factors behind those changes. Consumer demand in China has followed a path of rising animal protein consumption common among emerging countries, but we emphasize the role of prices in shaping consumption habits and production. The world food system can accommodate China’s changing diet if producers and consumers receive the right market signals about what commodities China needs—or doesn’t need.

Three Decades of Dietary Change

China’s agricultural sector has proven to be surprisingly resilient and flexible in responding to the country’s increasing and diversifying food intake (Lohmar et al.). In the three decades since China began its market-based reforms, rapid growth in per capita income has led to dramatic improvement in living standards and dietary change. According to FAO data, China’s per capita intake of calories, protein, and fat were all well below the world average in 1975, but each of these intakes is now well above the world average. Protein intake surpassed the world average in the mid-1990s, and protein from animal products surpassed the world average by the late 1990s (Figure 1).

At the same time food intake was rising, the share of Chinese households’ income spent on food fell from over half in the 1970s to about one-third now. The agricultural sector was able to generate a much-improved diet for Chinese citizens at low cost, allowing consumers to spend most of their income gains on nonfood items.

Changes in the diet are broad-based. High-income households with plentiful discretionary income are the main target for food marketers and retailers. China also has a large class of low-income and rural households who obtain as much as three-fourths of calories from staple grains (Jensen and Miller, 2008). But new consumption patterns are filtering down to the low-income population as well. For example, per capita poultry consumption rose sharply in every income class between 1991 and 2006. High-income households (the top decile) consumed about twice as much poultry per capita as did the lowest-income urban household strata in both years but the percentage increases were larger for low-income households (Figure 2). Consumption of poultry by the poorest urban households doubled. Rural households comprise more than half the population and now consume nearly 3.5 kg per person annually, about the same amount that was consumed by lower-middle-income urban households in 1991.
China is self-sufficient in most major commodities. Consumption of traditional staple grains—wheat and rice—has stagnated as diets diversified toward more meat. Once a major wheat importer, China’s wheat purchases have been modest in the most recent decade (Figure 3). Despite rising meat consumption, China remains an exporter of corn which is its most important feed grain. China imported large quantities of pork during 2007–08, but imports halted abruptly in 2008 as the domestic pork sector recovered from a temporary supply shortfall. China is a leading exporter of aquatic and horticultural products.

Imports have exploded for certain products—most prominently soybeans, vegetable oil and cotton. China has become the most important source of world demand for these products. Imports of soybeans surged from under 4 million metric tons in 1999 to 38 million metric tons in 2008. Imports of a host of other products have risen by smaller magnitudes. Its booming exports of textiles have made China the leading importer of cotton. China’s rising imports include premium products that are new to Chinese consumers: orange juice from Brazil and Israel; jasmine rice and tropical fruit from Southeast Asia; olive oil from Europe; and turkey meat from the United States. China is also a leading importer of barley for making beer and cassava for making starch and alcohol. It is a leading exporter of apples and apple juice, but it also imports premium-priced apples and oranges from the United States and Chile.

Prices Shape Demand
Most analyses attribute China’s dietary change to rising income, but changing relative prices have also played a role. Many of the major changes in Chinese diets occurred during the 1980s and early 1990s when most of the major distortions
in prices created under central planning were eliminated. Allowing grain prices to rise in the 1980s and ’90s encouraged farmers to plant more grain and induced the urban population to diversify their diets away from grains.

Consider, for example, the trend in prices of eggs versus wheat flour. In the early 1990s, consumer prices of staple grains—mainly rice and wheat flour—were controlled at low levels and products were rationed. Prices of “nonstaple” foods were mostly liberalized in the 1980s. In 1991, the retail price of eggs—a major source of protein in the Chinese diet—was about 12 times the price of flour (Figure 4). According to household surveys, urban people consumed 128 kg of grain products per capita that year, compared with just eight kg of eggs. As authorities relaxed controls on grain prices and abandoned rationing, the average retail price of both commodities (not adjusted for inflation) rose sharply, but grain prices rose faster. By 1995, the egg price was about three times the flour price. Since then, the ratio of egg to flour prices has been remarkably stable, fluctuating between two and three.

The decline in the relative price of eggs encouraged consumers to substitute eggs for grain. China’s egg consumption, as reflected by household surveys, rose sharply during the early 1990s period when the relative price of eggs was declining. Average urban per capita egg purchases rose from about seven kg per year in 1990 to about 11 kg in 1997. Per capita purchases of grain products fell sharply over that period. Interestingly, the rise in urban egg consumption stopped after 1997, a flattening of the trend that coincides with the leveling-off of the relative price of eggs.

China’s farmers are a fluid population of entrepreneurs always ready to enter or exit industries seeking the highest profits. China has seen big surges in production of dozens of commodities—fruits, vegetables, fish, poultry—induced by profit opportunities. Production of many commodities has expanded so fast that supply overwhelmed demand, driving prices down until profits were erased. For example, since 1991 egg production has tripled and the average egg price (with no adjustment for inflation) in figure 4 shows no discernable upward trend during 1991–2009. When the price rises, supply increases, knocking the price back down. The egg price has followed an upward trend at times, but it has dropped sharply at other times. The retail price of eggs in 2009 was about 3.3 yuan per 500 grams, roughly the same as 15 years earlier.

Poultry and eggs have been important contributors to dietary change and efficiency of resource use in China. Pork is traditionally the dominant meat consumed in China, but poultry and egg production and consumption has grown much faster. Chickens convert feed to meat and eggs more efficiently than pigs and cattle—the feed conversion ratio for poultry and eggs is less than 2:1 vs. 3:1 for pork. The increase in poultry and egg production provided animal protein efficiently at low cost. Since poultry feed has a high proportion of soybean meal, the growth of poultry has been an important factor behind China’s exploding soybean demand.

Chinese farmers still have a lot of potential to increase production efficiency (Lohmar et al., 2009). Officials have been pushing farm mechanization, new seed varieties and animal breeds, and a “modern agriculture” campaign that subsidizes breeding farms, greenhouse agriculture, “ecological” demonstration projects, and other measures. Chinese policymakers are experimenting with new types of rural credit institutions, cooperatives, and new ways of leasing and transferring land to create large-scale farms (Gale, Lohmar, and Tuan, 2009). The vast central and western regions of China have considerable potential to raise productivity and integrate small farmers into modern supply chains. Some of the resources devoted to producing exports of corn, fruits, vegetables, and fish may be redeployed to produce for the domestic market if they receive the right price signals.

**Pork Policies and Prices**

Policymakers in China acknowledge the important role of markets in resource allocation, but they try to engineer market outcomes using various subsidies, taxes and price controls. Their response to soaring pork prices in 2007 shows how policymakers can underestimate the role of market prices in resource allocation.

Chinese officials became greatly concerned when pork prices soared about 50–60 percent in 2007. Officials were worried that soaring prices could portend general inflation and erode the purchasing power of poor people. There were concerns that the supply was constrained by disease and rising feed costs. The government rolled out an aggressive package of subsidies designed to boost pork production, including a doubling of the per-head subsidy for breeding sows, a new subsidy for sow insurance, subsidies for breeding centers, barn construction, and immunizations. Local authorities were encouraged to attract pork processing and feed companies to invest in large vertically-integrated “production bases.” Corporate income taxes were waived for companies involved in hog farming.

Pork production is a prominent example of an industry in which farmers regularly expand and contract production as prices fluctuate. Most production is small scale with little fixed investment, so farmers can enter, exit, expand, or shrink production relatively easily. Authorities apparently did not anticipate that high pork prices would provide strong incentives for farmers to enter the hog industry. Nonfarm businesses also
entered hog farming. In 2007–08, news articles reported many instances of foreign investment banks, Chinese real estate businesses, feed companies and large meat processors setting up farms raising thousands of hogs. It is likely that pork supplies would have rebounded without the policy inducements, as they had done in earlier up-down cycles.

By mid-2008 hog production was surging again and pork prices were falling rapidly. By the end of 2008, there were news reports of widespread losses and farmers began liquidating sows. The decline in pork prices accelerated in 2009 and the government announced intentions to implement a new pork stock-holding program intended to support hog prices.

The pork price surge also revealed Chinese consumers’ sensitivity to price. Per capita pork purchases reported in Chinese household surveys declined for all but the richest decile of urban households. The amount of the decrease in consumption and the percentage decrease was greater for lower-income households (Table 1). Those in the middle fifth of urban households reduced their purchases by 1.9 kg (9%) and those in the lowest income category decreased their purchases by 3.1 kg (19%). Rural households reduced consumption by 2.1 kg (14%). The larger response by low-income consumers is consistent with Zheng and Henneberry’s (2009) finding that low-income consumers are especially sensitive to both price and income changes.

The price-sensitivity of Chinese households means that consumption patterns are flexible. The Chinese diet is driven to some extent by the inertia of tradition, but it can be altered by changing relative prices. Pork has historically been the predominant meat consumed in China, but its consumption has stagnated as the supply of low-priced alternatives like poultry and farm-raised fish has risen.

Conversely, growth in beef consumption is limited by its relatively high cost. Beef and mutton are the most expensive meats in China— retail prices are about twice the price of chicken and 5 times the price of eggs. The high price of beef in China reflects the scarcity of rangeland and consequent high cost of raising ruminant animals. Beef consumption is rising in step with the proliferation of hamburger and hot pot restaurants and steakhouses, but its expense will probably prevent it from becoming a major component of the Chinese diet.

Clear Market Signals Needed

Farmers in China and overseas have shown that they can respond and adjust to changes in demand and resource scarcity in China when they receive the right price signals. For example, producers in South America and the United States have boosted soybean acreage to accommodate China’s booming demand. Traders and farmers in the United States are keenly attuned to China’s soybean demand. Similarly, market information websites in China carry daily reports on Chicago soybean prices.

The world does not always receive accurate signals from China. During the 2007–08 spike in world commodity prices, Chinese authorities imposed policies that shut off grain exports to prevent domestic prices from rising. There is some evidence that the export restraint on corn directly affected world prices—buyers from South Korea and other markets had to look elsewhere for corn when Chinese corn disappeared from the international market (Dollive, 2008). The grain export restraints also may have sent the world a false signal of scarcity. Articles in the news media and investment newsletters routinely referred to “demand from China” (for an example, see Krugman, 2008) as a cause of the global commodity price spike. Headey and Fan (2008) have argued that this was not a major cause, but at the time China’s withdrawal from the export market seemed to support this notion. One of the authors of the current article received an unusual surge of inquiries about China’s food consumption statistics from investment firms during

### Table 1. Change in Annual Pork Consumption Per Capita by Chinese Households, 2006-07

<table>
<thead>
<tr>
<th>Type of household</th>
<th>Change in pork consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kg</td>
</tr>
<tr>
<td>Urban households</td>
<td>-1.8</td>
</tr>
<tr>
<td>Rural households</td>
<td>-2.1</td>
</tr>
<tr>
<td>Urban households by income class:</td>
<td></td>
</tr>
<tr>
<td>Highest decile</td>
<td>0</td>
</tr>
<tr>
<td>Second-highest decile</td>
<td>-1.2</td>
</tr>
<tr>
<td>Upper-middle quintile</td>
<td>-1.3</td>
</tr>
<tr>
<td>Middle quintile</td>
<td>-1.9</td>
</tr>
<tr>
<td>Lower-middle quintile</td>
<td>-2.1</td>
</tr>
<tr>
<td>Second-lowest decile</td>
<td>-2.5</td>
</tr>
<tr>
<td>Lowest decile</td>
<td>-3.1</td>
</tr>
</tbody>
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Note: Rural data refer to consumption; urban data are purchases. Data do not include away-from-home consumption.

Source: Calculations based on National Bureau of Statistics household surveys.
this period, as financial newsletters began to recommend investments in commodities based on the prospect of rising demand from China.

When China cut off grain exports it still had vast amounts of grain in warehouses. China does not reveal how much grain it holds in reserve, but materials from China’s State Council indicated that reserves had grown 5 years in a row and were 35% of a year’s consumption in 2008 (Gale, Lohmar, and Tuan, 2009). Wheat reserves were believed to be particularly large because the government had been buying wheat at support prices for several years.

When world commodity prices began plummeting in the fall of 2008, China suddenly had a glut of most commodities. Chinese authorities began supporting prices and stockpiling wheat, rice, corn, sugar, pork, rapeseed, rubber and pork. The government purchased most of the northeastern region’s 2008 corn and soybean harvests. The high support price discouraged private sector purchases and the stockpiles of corn and soybeans overwhelmed warehouses. China’s soybean imports accelerated to a record pace in 2009 despite a good domestic harvest because imported soybeans were so much cheaper. Many soybeans remained unsold in farmers’ backyards. China’s booming demand for imported pork in 2008 dried up the following year as the recovery of the pork sector pushed hog prices down. By May 2009, the Chinese government was preparing to stockpile frozen pork to support prices.

Accommodating China’s Growth

It is likely that China’s role in international agricultural trade will grow. The country faces many challenges, such as widening income disparities, unemployment, and the prospect of an aging population, but more growth and dietary change is certain. Increasing animal protein consumption and other dietary changes are likely to continue as new consumption habits filter down to the general population.

As China grows, its limited resource base will constrain its ability to meet its growing demand for food and fiber. More integration with world markets is inevitable. The integration can proceed more smoothly if world markets receive accurate signals about China’s demand growth and resource scarcity.

For More Information


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Agriculture in Indonesia: Lagging Performance and Difficult Choices

Richard Barichello and Arianto Patunru

JEL Classifications: O13, Q18

The Indonesian agricultural sector remains large, comprising 14% of the country’s aggregate Gross Domestic Product (GDP) in 2007. It is internationally significant in its production and export of rice, palm oil, coffee, rubber, cocoa, and spices (nutmeg, cinnamon, and cloves). Half the population is still defined as rural, although this has been declining steadily over the past 50 years as nonfarm incomes have come to dominate agricultural income, even in rural areas. These are common features of an agricultural sector in a growing economy and are generally viewed overall as healthy developments. Indonesia has succeeded in reducing rural poverty significantly over the last 40 years. National poverty, both urban and rural, measured at the national poverty line, fell in 2008 to 15% despite the rapid rise in food prices at that time (World Bank, 2008a). However, this success has as much to do with factors outside the agricultural sector as within it.

Value-added in the agricultural sector has grown much slower than in the nonfarm economy. From 1990 to 2005, agricultural GDP grew at only 2.3% per year (WDR, 2008), less than half the 4.8% growth in aggregate GDP over this period. Additionally, it has been one of the slower growth agricultural sectors throughout developing country Asia. Of 13 countries, Indonesia ranks 10th over this period. Only the agricultural sectors in Thailand, Sri Lanka and Malaysia have grown more slowly. This situation is not new. In the decade of the 1980s the agricultural sector grew at only 60% of the domestic economy, and within developing country Asia only three countries grew more slowly in agricultural GDP. Slow productivity growth is a sector-wide issue, although it is cited most often in the import-competing sectors of Indonesian agriculture, notably in rice and sugar.

Indonesia has maintained export competitiveness in tree crops and spices. Its trade balance in agricultural products is strongly positive, at US$3 billion averaged over the three years 2002–2004, relative to comparable export values of $8 billion. Most domestic markets, including those for rice, sugar, maize and soybeans, are judged to be integrated with world markets (domestic and world prices highly correlated), despite the policy-induced differences in price levels that exist (World Bank, 2008c).

We identify six major issues, chosen from the perspective of their political importance as well as what we judge to be their importance to the country’s agricultural development prospects. It is striking how similar they are to those in other agricultural sectors around the world, especially in the OECD countries. Producer-consumer food price conflicts, slow productivity growth, public support of biofuels programs, environmental conflicts, and poverty reduction have generated the key policy debates within the sector.

Rice Policy

The number one agricultural issue in Indonesia without question is rice policy. Only fuel would be considered as politicized a commodity as rice. Public policy involves raising the domestic price as well as increasing the degree of rice self-sufficiency. The current price is roughly 10% above the world price for medium quality rice, but a 50% margin has been a good guide overall from 2000 to 2007. There is a longstanding political demand for protection of rice in Indonesia. That protection takes the form of preventing decreases in its price through the use of trade policy instruments, namely a tariff plus exclusive import rights granted to a well-known state enterprise, the food logistics agency, BULOG.

Rice continues to be the most important staple food, provides the main source of income for small farmers and is the main food expenditure for agricultural households in Indonesia. Rice represents 7.2% of average consumer
and increased domestic productivity in the growing of rice. The latter requires greater investment in rural infrastructure, more agricultural research, and continued improvements in rural capital markets.

The rapid increase in rice prices in late 2005 and 2006 following the 2004 ban on rice imports brought the domestic debate on food security into greater focus. But political pressures by the interest groups noted above stalled any real reform. Their influence is a notable change from the Suharto era. Since the post-1998 democratic reforms, agricultural lobby groups have become well organized, present politically forceful arguments, and are a significant factor in agricultural, especially rice, policy decisions. This policy regime has been strengthened by the Ministry of Agriculture’s interests in expanding domestic rice production with its own programs. Recently favorable weather and rice crops have allowed various interests to take credit for this higher production by pushing their own programs, whether they be new seed varieties or irrigation investments. The increased production has also temporarily removed the need for imports, removing any sense of crisis.

BULOG itself has worked to limit policy change, given the substantial budget support (roughly half a billion US dollars) it receives for the rice procurement program to help farmers and for a targeted price subsidy for poor rice consumers, both of which it operates. This bureaucratic lobby work has prevailed. “No parliamentarians have been willing to take on both dimensions of the rice program simultaneously, and so the huge budget subsidies that accrue to BU LOG to run these programs, and the corruption that accompanies them, go unchallenged.” (World Bank, 2008b) Despite the considerable need for rice policy reform, the window of opportunity to do it appears for now to have closed.

Trade Protection and Self-Sufficiency in Nonrice Commodities

The desire for protection and domestic self-sufficiency is not limited to rice. It extends to other food crops, namely sugar, corn and soybeans. The priority of these secondary food crops is lower than for rice but important nevertheless. A variety of protectionist measures going back at least to the early Suharto era have been used on these crops, whether they be imports administratively controlled through BU LOG (sugar and soybeans), or tariffs. The regulatory details and politics motivating protection have varied, but there is uniformly a stated desire to achieve self-sufficiency.

It is not possible for all these crops to be produced at sufficient levels to achieve self-sufficiency. They all compete for a similar set of basic resources, such as agricultural land. Expanded production of one crop to a large extent will result in less (or more expensive) land available for the others. This policy direction is not being matched with increased efforts to increase supply capabilities such as through agricultural research to increase yields per hectare. With the rice price raised sufficiently high to outcompete most other crops, moderate price increases from protection on corn, soybeans and sugar have relatively little effect on their production, even though it would be desirable for income diversification reasons to produce more nonrice food crops.

The other important effect of this self-sufficiency policy is on consumers. As for rice, consumers finance this policy through higher domestic prices because they are caused by border restrictions. Poor consumers who wish to substitute nonrice cereals as a cheaper source of calories and other nutrients find this option less attractive due to these higher prices.

On a related issue, trade policy is also being used with worrying results in the export sector, especially tree
crops. Previously it primarily took the form of export taxes, mostly on crude palm oil to protect domestic consumers and encourage value-added in exports. The latter objective, however, has motivated a wider desire to ban the export of raw materials (e.g., logs, rattan) and more recently to ban the export of low quality cocoa, coffee and cashews, or to increase quality standards for these exports. This often hurts farmers and even reduces the export of high quality products in some cases, but the political economy at work is protection of the processing jobs at the expense of those harvesting or growing the raw material. This issue has arisen regularly since the 1980s. A more desirable policy direction for sustainable food security is to substitute productivity investments (discussed in Lack of Agricultural Productivity section) for border restrictions and to avoid export bans, taxes, and quality restrictions.

**Biofuels Policy**

A new agricultural policy issue is the encouragement of biofuel production. The objective is to convert 6 million hectares of land to biofuel production, based on increased oil palm production (Basri and Patunru, 2006). The expectation is that this would generate increased production of 22.5 million kilolitres of biofuel and create 3–5 million jobs. Additional biofuel initiatives have been proposed: banning crude palm oil exports and diverting this production to biodiesel production, and banning sugarcane molasses exports to use them instead for bioethanol production. Estimates of the 2007 budget cost ranged from Rp 1 to 13 trillion for these initiatives (Rp 1 trillion is equivalent to almost US$100 million at current exchange rates). In late 2008 mixing regulations for gasoline were introduced to require the addition of biofuels. The objective is to absorb more crude palm oil (CPO) produced in Indonesia and increase its value-added instead of exporting the currently large and growing volume. In addition the program is aimed at increasing the supply of green fuels produced in Indonesia to combat global warming, and, it is argued, reducing unemployment.

This program has attracted more than its share of criticism. In addition to the questionable economic viability of these investments, and even their energy viability, they have been criticized for not offering a significant reduction in unemployment. To avoid the now well-known side effect of biofuels programs bidding up the cost of various food crops to some degree, this program could have been designed to support only oil palm production on dry land. These programs have included no such targeting to minimize food production conflicts. So far, only about 10-15% of domestic production of CPO is being used to produce biofuels, and there is no evidence of any effect the program has had on world prices, a concern because Indonesia is a major CPO producer. Because little is known about how large the budget commitment will be, what the true social and economic costs of the program are, and how much deforestation will be caused, the program remains suspect.

**Lack of Agricultural productivity**

The relatively slow growth of agricultural value-added is another important issue in the country's agriculture, even though it does not merit newspaper headlines. Agriculture’s GDP share has leveled off at a high 15% (Figure 1). This slow agricultural productivity growth has persisted for almost three decades, despite bright spots like increased poultry production.

This problem has damaged the country’s pursuit of increased self-sufficiency by limiting the crop yield growth and cost reductions that would enhance its comparative advantage in food crops. It has also reduced Indonesia's international competitiveness in agricultural products. Without productivity growth, the only hope of reducing reliance upon imports is to restrict trade and raise domestic prices, exactly what has been done in food crops, with negative effects on consumers and poverty reduction.

The seriousness of this productivity shortfall is finally causing it to receive serious attention among multilateral aid agencies as well as among government officials. High farm prices have not been sufficient. The Government of Indonesia with World Bank support has formulated

![Figure 1. Time Path of Agriculture's Contribution to GDP](source: World Bank)
a rural development strategy with an emphasis on reinvigorating productivity growth among rural producers and ensuring these measures are sustainable in the long run (World Bank 2007).

The components of this strategy draw on established methods to enhance productivity and sustainable resource management. They include improving property rights to land by increasing the proportion of formal title certificates from the current 25%, improving water resource management through better irrigation operations and maintenance, and reducing water waste, groundwater depletion, water pollution, and soil degradation.

Agricultural research expenditures must be increased significantly after 20 years of decline. The details include replacing retiring senior researchers, integrating private sector agricultural research capacity (such as commercializing new varieties and hybrid seeds) with public sector efforts, reinvigorating sub-national adaptation institutes, strengthening biotechnology research capacity and giving greater emphasis to nonrice commodities. Extension services are equally in serious need of greater public sector contributions to upgrade educational qualifications, raise salaries, retain the most capable personnel, and coordinate with private sector and civil society extension providers. Rural infrastructure also suffers from a long-term decline in investment. Reinvestment, including roads, rail and sea transport, irrigation, and electricity provision, is necessary both to support intensification of commercial agriculture and to improve living standards of the rural poor.

Closely related to these productivity growth issues is attention to environmentally sustainable practices. This includes reduction of deforestation and pollution externalities from agriculture and food processing. Deforestation, partly from biofuel subsidies, has become a particularly pressing issue due to the contribution it makes to Indonesia’s greenhouse gas emissions. Reducing it, however, is complex and will be expensive. These matters have become an issue not simply due to increased environmental awareness in Indonesia but recognition that climate changes and less predictable weather are placing a premium on better environmental management. These concerns have been applied to the question of future rice productivity (World Bank 2008b), but the key question for success in better environmental management in agriculture is implementation and enforcement. This leads directly to the issue of local governance.

**Local Governance and Decentralization**

Since 2001 Indonesia has embarked upon a major decentralization of economic power to the district level, with financial services, personnel, and responsibilities for basic services being allocated to district governments. This has since been modified by some increase in provincial government review and monitoring, but the basic thrust has been a devolution of power and resources to the regions from the central government. This is of particular importance to the agricultural sector because (a) local government policies and regulations are often very important, and (b) most agricultural commodities are regional (e.g., dominance of food crops in Java and tree crops in Sumatra and Kalimantan). But there is also the danger of inconsistent regional policies; trade policy and domestic pricing require national policies.

This step has been welcomed by many observers as an antidote to widely-acknowledged corruption by the central government on many issues related to ongoing policies and regulations as well as one-time development projects. It was also seen as a valuable step to ensure more responsive management of local resources as well as to inject local data and concerns into various policy decisions, especially given the diverse ethnic and geographic composition of the country. However, the results have been mixed and the challenge of quality local governance remains.

This comment summarizes the situation: “Overall, the environment for ‘good governance’ at the local level is weak and corruption similar to the national situation is endemic.” (World Bank, 2007a) The comment also highlights the need to reduce corruption within public sector activity

![Figure 2. Poverty Trends in Indonesia](source: SUSenas & World Bank)
in Indonesia, at both national and local levels. It remains important to the agricultural sector and contributes not only to problems of local governance but also to agricultural sector productivity levels, and the choice, enforcement and ultimate efficiency of various policies such as trade protection and domestic pricing. Decentralization has its advantages but is no panacea.

Alleviation of Poverty
Poverty remains a major social issue in Indonesia, by any measure. Because most poverty is still located in rural areas, many agricultural policies embrace the rhetoric of poverty alleviation as one of their objectives. In the first two decades of the Suharto period, to the mid-1980s, agricultural policies that supported rice production contributed to pro-poor economic growth and reduced rural poverty. Figure 2 above shows Indonesia’s progress in poverty reduction: poverty declined from 1990 to the Asian Financial crisis of 1997/98, rose sharply with the crisis but declined again steadily from 1999 to 2008.

But over the past two decades, the contribution of these policies to economic growth has been reduced; government priorities shifted away from productivity-enhancing policies and flowed to rice price protection policies whose costs were growing. In addition, the leverage of agricultural price policies on rural poverty has been reduced. Raising the price of rice no longer reduces poverty because the poorest Indonesians are net rice consumers, wage rates now appear to be influenced most heavily by the non-farm labor market, and the benefits of price policies have been strongly tilted toward farmland owners. There have been efforts to soften the impact of higher rice and cooking oil prices for the poorest consumers through targeted consumer subsidies (“rice for the poor” targeted 19 million poor households in 2008), and expenditures on these programs increased in response to the 2008 price increases. Overall, rural poverty has been reduced since 1999, seen in Figure 2, but this has been due to strong nonfarm economic growth and a dynamic rural labor market that features substantial off-farm employment and rural-urban migration. So although the alleviation of poverty is still promoted as an important issue for agricultural policy, this is now largely political rhetoric. Much more could be done.

For More Information


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Ensuring food security—the availability of basic staples at affordable prices—for a large and growing population has been one of India’s biggest economic and political challenges. Since the 1960s, policies have sought to balance producer and consumer welfare by focusing on increasing wheat and rice production, supporting prices, maintaining buffer stocks, and broadly distributing subsidized grain to consumers. With improved food grain supplies, the focus is now turning to reducing the high cost of public food grain management and improving the safety net for the poor. In addition, significant new challenges have emerged as rising incomes shift demand patterns in favor of high value foods such as fruit, vegetables, milk, meat, and eggs, and away from cereals. Diversification of agricultural production and marketing now offers the primary opportunity to strengthen lagging growth in farm output and rural employment. However, achieving diversified growth with equity also requires new measures to increase investment and provide the market institutions needed to develop India’s inefficient food processing and marketing sectors, and to ensure that the transformation to higher-value agriculture is inclusive of India’s large number of marginal and small farmers.

By far the most striking transformation occurring in Indian agriculture is the shift from a food grain-oriented supply led framework dominated by the public sector, to a more diversified and demand driven framework with an expanding role for the private sector. Against this backdrop, we examine the emerging dynamics and challenges in India’s agricultural sector, including managing improvements in food access for the poor, facilitating a private sector led transformation to more efficient agricultural markets, and effectively linking small farmers to these increasingly diverse markets.

**Food Security: A Challenge Met?**

Despite marked improvement in food grain production since the 1960s, when India was heavily dependent on food aid, ensuring adequate domestic supplies and stable prices remain top priorities for Indian policymakers. Although India still periodically imports wheat, it is now a net food grain exporter that is typically among the top three world rice exporters and periodically a significant exporter of wheat and coarse grain. India’s improved domestic food grain supply situation is reinforced by a dramatic rise in foreign exchange reserves stemming from the increased competitiveness of its nonfarm exports since the early 1990s. In contrast to the 1960s and 1970s when cereal import costs exceeded foreign exchange reserves (Ganesh-Kumar, Gulati, and Cummings, 2007), current (April 2009) reserves of about $250 billion now far exceed the cost of any plausible grain import requirement without disrupting other trade and capital account transactions.

Despite the improvements in domestic supplies and commercial import capacity, events such as the 6.3 million tons of wheat imports required in 2006/07 and the global food price spike of 2007/08 continue to spark political pressure to continue to give food grain production top priority. The 2007/08 global price spike triggered a ban on rice exports to insulate domestic consumers from world prices, but added fuel to the rise in global rice prices. With the recent drop in prices for rice and other commodities, India is likely to resume rice exports.

**Food Grain Management: A Continuing Challenge**

The efficient management of public procurement, handling, and storage of food grains by the Food Corporation of India (FCI), and effective targeting of consumer subsi-
dies on low-income groups are continuing challenges in the food grain economy. Changes in weather and price policy have driven large swings in public procurement and stocks of wheat and rice since the early 1990s (Figure 1). Sharp hikes in minimum support prices led to the accumulation of large surpluses far in excess of targeted food security needs during the early 2000s—and now again in 2009/10—to be worked off through domestic and export subsidies, as well as storage losses. The real cost of public food grain management is growing about 9% annually, and now far exceeds annual public investment in agriculture [Landes, 2008].

Even with a vastly improved availability of food staples and burgeoning outlays on consumer subsidies, effectively targeting food subsidies on India’s large population of rural and urban poor remains a challenge. India’s national subsidized food distribution program was renamed the Targeted Public Distribution System (TPDS) in 1997/98, with a sharpened focus on targeting people living below the poverty line. Although subsidies have been increased for the poorest consumers, the TPDS is criticized for pilferage, poor delivery of services, and failure to make an effective dent in hunger, particularly in states where the concentration of poverty is highest. The National Rural Employment Guarantee Scheme (NREGS), a large program introduced in 2006, aims to enhance livelihood security and household purchasing capacity by ensuring at least 100 days of wage work annually in rural areas. Local governance issues remain critical to the success of the NREGS and other efforts to target transfers to poor households.

The Diversification Challenge

Indian farm output has been diversifying away from cereals and towards high value crop and livestock products since the early 1990s (Figure 2). The share of cereals in the total value of farm output has steadily declined, while growth in high-value products, including fruits and vegetables, sugar and fiber crops, milk, meat, and eggs, has significantly outpaced that of cereals. In recent years, India has emerged as the world’s largest producer of milk, the second largest producer of fruit and vegetables, and among the top producers of poultry meat and eggs. Increasingly, it is not just food grains that drive the agricultural sector and farm incomes, but growth in a broadening range of high value products.

In contrast to cereals, where policy intervention has been extensive, the expansion of high-value crop and livestock agriculture has been led primarily by growth in consumer demand and changing preferences associated with rising incomes, urbanization, and youthful demographics. Although India’s climate, soil, and water resources provide the potential to diversify output, agricultural markets, market institutions, and processing industries needed to support...
The progress achieved in food security and agricultural diversification is promising for Indian agriculture, but perhaps the key challenge in achieving welfare gains lies in ensuring agricultural growth that is inclusive of small holders. It has been well documented that agricultural diversification generates greater employment opportunities, particularly for women, and higher incomes for farm households (Joshi, Birthal, and Minot, 2006). The area shift from cereals to vegetables, in particular, has enhanced employment opportunities in rural areas (Joshi, et al., 2005). However, the combination of a large number of small farmers, poor rural infrastructure, and fragmented and underdeveloped markets complicates establishment of efficient and equitable links between farmers and the diverse, emerging domestic market.

Marginal and small farmers, whose average operational landholding declined from 2.2 hectares in 1970 to 1.06 hectares in 2003, continue to dominate India’s large agrarian economy. Nearly 88% of holdings are less than two hectares, with these holdings accounting for about 44% of the operated area (Figure 3). Fragmentation of operational holdings has expanded the bottom of the agrarian pyramid in all but a few Indian states. Small farms have proved to be more productive than large farms—they contribute about 51% of the value of farm output—owing to their intensive cultivation practices and abundance of family labor. In the case of fresh fruit and vegetables, survey results show that 52% of fruit area and 61% of vegetable area is cultivated by smallholders (Birthal, et al., 2006).

But, significant progress needs to be made in developing efficient and equitable markets for large numbers of small surpluses of perishable goods, and in managing the limited risk diversification remain severely underdeveloped because of weak public and private investment. The agricultural marketing and processing sectors are characterized by a large number of small-scale, nonintegrated, and inefficient enterprises, and relatively few large vertically or horizontally integrated firms.

Accelerating private investment in marketing and processing agribusiness requires overcoming a historically risky central and state government policy climate that heavily regulates movement, storage, and marketing of farm products, as well as poor power and transport infrastructure (Landes, 2008). Recent domestic and foreign private investment activity in marketing and processing, in part associated with regulatory reform by some states, may signal the emergence of a more dynamic agribusiness sector to support agricultural diversification. The rapid expansion of India’s poultry industry since the mid-1990s, driven by private investment in integrated operations that have significantly reduced the cost of producing and marketing poultry, is an example of the potential for private sector led growth (Landes, Persaud, and Dyck, 2004). Another is the expansion of private investment in milk processing and marketing after 2002, when regulatory reform allowed private firms to compete with the traditional dominance of dairy cooperatives. The market share of private players in the dairy sector is now expected to overtake the cooperatives by 2011 (Gupta, 2007).

Since 2000, there has also been rapid growth in investment in modern food wholesaling and retailing by both domestic and foreign players. Food marketing in India has traditionally been dominated by small-scale independent wholesalers and retailers with little backward integration to farmers. Although the modern retailers still account for only about 1.5% of total food sales, and “back end” investment in supply chains remains limited, the expansion of modern retailing has the potential to spark investment in marketing efficiency and processing that yields benefits to both producers and consumers.
bearing capacity of small farmers. India’s agricultural markets are crowded with middlemen and commission agents who receive high fees and margins that eat into the farmer’s incomes (Mattoo, Mishra, and Narain, 2007). Part of the problem lies in lack of adequate storage and transport infrastructure and integration between growers and markets which result in large postharvest losses. Because marketing regulations have historically prevented direct links between farmers and agribusinesses, a great deal needs to be done to build integrated processing and marketing firms, and to develop contract farming models and other market institutions to link small producers with markets.

Small farmers primarily engaged in the traditional grain cultivation also typically lack incentives, capital, and expertise to venture into high value markets, and have limited ability to cope with the risks that may be associated with new enterprises. Although the potential gains from diversification are higher than for producing grains alone, measures are needed to mitigate potential price, production, and marketing risks.

**Policy Challenges**

Indian agricultural policy must balance a changing food security landscape with the emerging need to diversify farms and markets towards high value commodities. On the food grain front, where the focus has been on increasing productivity, the current challenges are to reduce the cost and inefficiency of public food grain operations by the FCI, and to ensure an effective food safety net for low-income households. A key policy option is to shift responsibility for procuring, handling, and transporting operational supplies of wheat and rice to the private sector and confine the role of the FCI to holding buffer stocks (Srinivasan, Jha, and Landes, 2007). To improve the food safety net, current options include expansion of targeted rural employment and food distribution schemes such as the NREGS and school feeding programs, and the introduction of bio-metric identity cards to improve targeting the poor.

Realizing the benefits from agricultural diversification implies significant challenges for agricultural price policy. The current price policy of favoring rice and wheat cultivation with support prices set on a cost-plus basis has become a politically important source of income support in grain surplus areas, but undermines incentives to diversify even when diversified enterprises potentially yield more income per hectare. Lower relative support levels for food grains are necessary in order to allow market forces to play a larger role in resource allocation, but it is unclear how politically feasible this will be or if suitable compensating measures can be identified. The most-discussed option has been to reduce the minimum support prices for grain, while purchasing all operational and buffer stocks required for subsidized distribution programs at prevailing market prices.

In contrast to the dominant role played by the public sector in the development of India’s food grain sector, the process of diversification into high-value agriculture will largely depend on participation and investment by the private sector. The policy challenge is to shift from the role of dominant market player, to that of facilitator of private investment and efficient private markets. The pace of diversification is likely to hinge on an improved climate for private investment in agribusiness and infrastructure, including continued market-oriented reform of central and state level regulations that impede the emergence of modern, integrated marketing and processing firms.

Meeting the challenge of fostering inclusive growth appears to be tied closely to easing restrictions on private sector participation in agricultural markets. Policymakers are increasingly focused on reforms that can help develop firm-firm linkages, including contract farming, cooperatives, and grower organizations. These activities have been restricted by state marketing regulations now being amended in some states to permit backward integration to the farm level by private agribusinesses. India’s poorly developed land rental markets are also a potential obstacle to firms and farms coming together to do business. Current laws do not adequately protect either party in land rental agreements, creating risks that minimize formation of larger operational holdings that might be more conducive to improving farm-firm linkages and on-farm investment. However, the politically sensitive legal reforms and costly improvements in land records needed to develop a more viable land rental market appear unlikely in the foreseeable future.

**For More Information**


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The views expressed here by Maurice R. Landes are those of this author, and may not be attributed to the Economic Research Service or the U.S. Department of Agriculture.
Russia’s Transition to Major Player in World Agricultural Markets

William M. Liefert, Olga Liefert, and Eugenia Serova

JEL Classifications: F14, P33, Q17

Russia’s importance in world agricultural markets has grown substantially during the 2000s, on both the demand and supply sides. The two main developments are that agricultural imports have surged and the country has become a large grain exporter.

From 2000 to 2008, Russia’s agricultural imports grew from $7 billion to $33 billion, making the country the second largest agricultural importer among emerging markets, after China (Figure 1). The main imports are meats, processed foods, fruits, and vegetables. On the export side, over 2001–08, Russia’s net annual grain exports have averaged 9 million metric tons (mmt; Table 1). In marketing year 2008/09, Russia is predicted to export 20 mmt of grain (net), and Russia, Ukraine, and Kazakhstan collectively about 48 mmt of grain onto the world market (FAS).

Russia’s status as a big meat importer and grain exporter is a reversal of its agricultural production and trade during the Soviet period when Russia, and the Soviet Union as a whole, was a heavy producer of meats and large importer of grains and oilseeds (Table 1). During the 1980s, the Soviet Union imported an average of 34 mmt of grain per year.

Figure 1. Russian Agricultural Trade

The region’s switch from annual grain importer of 34 mmt to grain exporter of 48 mmt in 2008/09 is a huge shift of over 80 mmt toward increased supply of grain on the world market. This article examines why these large demand and supply shifts in Russia’s agricultural trade have occurred, and the near- to mid-term outlook for trade.

Russia’s Changed Agricultural Commodity Structure

Russia’s transition from a planned to a market economy that began in the early 1990s fundamentally altered the volumes and commodity composition of its agricultural production and trade. The changes appear to be an economically justifiable restructuring consistent with the country’s underlying cost and price competitiveness, or comparative advantage, across major agricultural commodities, especially meat versus grain.

Around 1970, the Soviet government decided to expand the livestock sector, the main motive being to improve consumers’ standard of living by increasing meat and dairy consumption. Using large budget subsidies to both livestock producers and consumers along with controlled prices and trade, the regime succeeded in raising meat production by over 60% between 1970 and 1990 (Liefert, 2001). Because the Soviet Union could not produce enough animal feed to support its growing livestock herds, it became a large importer of feed grain, soybeans, and soybean meal, to the benefit of U.S. bulk crop producers.

The move to a market economy in the 1990s reversed the expansion of the livestock sector during the earlier planned period. Because of budget stringency, the huge government support to agriculture, and especially the livestock sector which received the bulk of subsidies, was largely eliminated. Also, integration into world markets revealed that Russia was a high cost producer of livestock...
goods, making it difficult to compete with lower priced imports. Put in other words, the country had a large comparative disadvantage in the livestock sector (Liefert, 2002). Output of meat plunged, falling from 10.1 mmt in 1990 to 4.4 mmt in 2000 (Table 1). Meat imports in turn began to rise, though imports of not only meat but all agricultural goods fell sharply during Russia's economic crisis in the late 1990s (Table 1 and Figure 1).

Another reason Russian agricultural imports began to increase during the 1990s was because the country’s consumers were exposed to the array of world food products, as well as other consumer goods, they had been denied during the planned period. Russian consumers in particular became interested in foreign-produced processed foods.

The contraction of the livestock sector during transition is also a key reason why Russia has become a major grain exporter in the 2000s. Rather than importing grain, soybeans, and soybean meal to feed a large livestock sector, Russia now is importing more meat and other livestock products and exporting grain. The decrease in Russia’s need for animal feed has been so great that the country has been able to move from big grain importer during the Soviet time to exporter in this decade despite a large drop in grain production over the two periods. Russian average annual grain output during 2001–08 was 83 mmt, down from 103 mmt over 1987–90 (Rosstat).

### Agricultural Imports Surge during the 2000s

Although Russia’s meat imports began to rise during the 1990s, from 2000 to 2008 they increased by a substantial 78% in volume (FAS). The meat import growth was part of a boom in the country’s total agricultural imports during the 2000s.

There were two main macroeconomic causes of the import surge. The first was high Russian Gross Domestic Product (GDP) growth, which averaged 7% a year over 2000–08. Rising GDP boosted consumer income and food demand, benefiting both domestic producers and foreign suppliers. For example, from 2000 to 2007 Russian per capita meat consumption rose from 41 to 56 kilograms (Rosstat).

The second cause of growing agricultural imports was an improvement in the price competitiveness of imports vis-à-vis Russian-produced goods. During the 2000s, Russia’s nominal market exchange rate used to buy and sell rubles has not changed much against the U.S. dollar, euro, and other major currencies. However, price inflation has been much higher in Russia than in the United States, European Union (EU), and many other countries that export to it. Over 2001–07, Russia’s inflation averaged 13–14% a year, resulting in total inflation during the period of about 140% (Rosstat). Over this time, overall inflation in the United States was only 20%, and in the EU 15%. The greater inflation in Russia compared to its major trading partners made Russian-produced goods more expensive compared to imported products, such that Russians switched to buying more imports. The real exchange rate of the ruble captures these relationships, as it equals the nominal exchange rate adjusted for Russia’s level of inflation relative to that of its trading partners. Using this measure of the exchange rate, the ruble appreciated against the dollar in real terms by over 100% between 2000 and 2007, and against the euro by over 50% (ERS).

The economic crisis that hit Russia in autumn 2008 reversed the two macroeconomic developments that had been driving agricultural import growth, thereby also reversing the import rise. Because of the crisis, Russian GDP will almost certainly fall in 2009, and maybe also in 2010. In April 2009, the macroeconomic consulting firm Global Insight forecast that 2009 GDP would decline 3.8%. Yet, if the economy stabilizes within a year or two, as Global Insight and other major forecasters predict, GDP could begin to grow again at 4–5% a year.

The crisis also has caused the ruble to depreciate substantially, in both nominal and real terms, mainly because of capital outflows. From mid-July 2008 to mid-April 2009, the ruble nominally depreciated against the U.S. dollar by 30%, with the ruble/dollar exchange rate rising from 23.3 to 33.5.

Yet, if both the Russian and overall world economy begin to grow again within one to two years, the ruble should resume its real appreciation. During the 2000s, Russia...
had large total trade surpluses. For example, in 2005 Russia's trade surplus of $118 billion equaled 15% of its GDP (Global Insight). The bulk of the country's export earnings come from oil and natural gas. Renewed world growth is expected to put upward pressure on energy prices, such that Russia would probably continue to run trade surpluses. This in turn would strengthen the ruble.

Given that every year in the 2000s, Russia had inflation of 9% or higher, one can expect that over 2009–12 the country will experience annual inflation of at least 6–10%. In April 2009, Global Insight forecast Russian average annual inflation over this time of 11%. Higher inflation in Russia compared to that in its main trading partners will cause the ruble to continue to appreciate in real terms (as during 2000–07), or in other words, will reduce the prices of imports relative to domestic production.

The return of Russian GDP growth and ruble real appreciation also should bring a return of agricultural import growth, though probably at a lower rate than in the past eight years. One reason the import growth is expected to be lower is because GDP growth and ruble real appreciation will be at reduced rates compared to past years. Another reason will be the high investment in Russian agriculture and the food industry in the past few years. From 2004 to 2007, investment in the two activities rose in real terms by about 275% and 175%, respectively, for reasons discussed in the next section (Rosstat). The increased domestic output from this investment will mitigate future agricultural import growth.

Russia Emerges as a Major Grain Exporter

As discussed earlier, a major reason Russia has become a grain exporter in the 2000s is because the contraction of the livestock sector during transition substantially reduced domestic demand for feed grain. Another reason is that, after falling during the 1990s, Russian grain production in the 2000s began to rise.

The factors that explain why grain output has grown in the decade do not include a rise in grain production area. Average annual Russian grain area over 2001–08 was 45 million hectares, a drop from 50 million hectares over 1996–2000, and a large fall from 65 million hectares over 1987–90 (Rosstat). In Russia, Ukraine, and Kazakhstan together, average annual grain area during 2001–08 was down by 30% compared to 1987–90. Most of the reduced grain area was not lost to other crops, but rather became fallow. The rise in world agricultural and food prices in 2006–08 sparked interest in returning the idle grain area in this region to production, which could substantially increase world grain supplies. This would put downward pressure on world prices, mitigating any future price jumps and benefiting the consuming poor of the world.

During Russia’s grain price surge of 2006–08, area did respond to some degree, rising over the period by about 5% (Rosstat). Yet, in Soviet times, the regime pushed grain area throughout the country on to marginal land, resulting in much inefficient high cost production. In order for grain area now to rebound substantially, world prices probably would have to rise again considerably, and remain high. Also, Russia would have to invest heavily in improving the physical and commercial infrastructure for storing, transporting and loading grain at ports for export.

Given that grain area fell in the 2000s, the reason Russian production rose is because of growth in yields. Russia’s average annual grain yield over 2001–08 was 1.83 tons per hectare, compared to 1.30 over 1996–2000 (Rosstat). The dominant type of grain producing farm in Russia continues to be the inefficient former state and collective farm of the Soviet period. Although most of these farms have been officially reorganized during transition as joint stock companies, they remain largely unreformed (Brock et al., 2008). However, a likely major reason for the growth in grain yields, as well as an overall increase in the productivity of resource use in the grain sector, is the rise during the 2000s of new agricultural “operators.” These are large vertically integrated enterprises that bring investment, new technology, and superior managerial practices into the sector (Serova, 2007). The new operators are especially attracted to grain production, because of the profitable export opportunities. The new operators represent best current production practice in Russian agriculture, and continued growth in Russian grain yields, production, and exports depends largely on whether they keep expanding in numbers and influence.

However, another reason Russian grain yields and production have risen during the 2000s is favorable weather. The continental climate of Russia and other former Soviet Union countries results in volatile weather conditions for grain production, especially rainfall. Figure 2 gives Russian annual grain output and exports over 1995–2008. Grain output was low every year over 1995–2000 except for a big upward spike in 1997. On the other hand, grain production over 2001–08 was high every year except for a plunge in 2003. The weather indicators show that in every year during the second half of the 1990s, Russia had unfavorable weather for grain, except for 1997, while in every year during the 2000s, it has had relatively good weather, except for 2003. Also, the surge in grain output in 2008 coincided with highly favorable weather.
How Has Russian Policy Affected Agricultural Trade?

Russian policy during the 2000s has resisted, rather than promoted, the country’s move toward importing livestock products and exporting grain. In 2003, the Russian government established restrictive tariff rate quotas (TRQs) for imports of beef and pork, and a pure quota for poultry, converted in 2006 to a TRQ. In January 2009, the low tariff-rate quotas for pork and poultry were lowered further and the out-of-quota tariffs raised, to 75% and 95%, respectively. During the 2000s, Russia also has imposed many sanitary-based restrictions, and often complete bans, on imports of meat (especially poultry) and other livestock products.

In 2005, the Russian government identified agriculture as a national priority area that would receive increased funding along with health, education, and housing. From 2005 to 2007, state support to agriculture from the federal and regional governments together rose 87% in nominal rubles and 52% in real (inflation-adjusted) rubles (Rosstat). According to the government, the main objective of agricultural policy is to revive the livestock sector, which is getting the bulk of the new agricultural subsidies. Russian support to, and trade protection for, livestock producers could continue to increase.

In January 2009, the Russian government established a state grain company. The officially identified functions of the “United Grain Company” are to increase the state’s involvement in the domestic grain market, increase grain exports, and improve the physical infrastructure for the grain sector. However, the nature and full objectives of this company are not yet clear. Might one of its purposes be to use the grain sector to further the expansion of the domestic livestock sector, say by restricting grain exports at times of low harvests and high prices?

A potential constraint on future Russian agricultural policy is accession to the World Trade Organization (WTO). Russia officially began its WTO accession bid in the mid-1990s. By early 2009, it had concluded bilateral negotiations with most WTO members, including the United States and EU.

In the two key areas of import tariffs and domestic support, Russia in its accession negotiations has been asking for bound commitments above the existing levels (a bound tariff or support amount is a maximum allowable level in the future). Russia’s current average agricultural import tariff is about 18%, up from 10% in 2000. However, Russia is negotiating for bound agricultural tariffs above actual applied tariffs. On domestic support, Russia is asking for annual bound support of $9.5 billion, which compares to its 2007 actual support level of $5.7 billion (Russia and World Trade Organization; Rosstat).

If Russia soon joins the WTO, its negotiated bound levels of tariffs and support might be above the current levels. Accession on such terms would not liberalize Russian agricultural trade and support policies, and thereby not increase imports. Yet, the United States and other foreign suppliers would benefit because the bound levels would provide a cap on any future rise in tariffs and support. Russia’s agricultural trading partners might gain the most from Russia’s WTO accession by having an official forum for challenging the country’s sanitary and phyto-sanitary import restrictions.

Concluding Comments

During the 2000s, Russia has become a big agricultural importer, especially of meat and processed foods, and a major grain exporter. Even more so, Russia, Ukraine, and Kazakhstan together are now a very large grain exporting region. Russia likely will recover from its current economic crisis within a year or two. Its agricultural import growth thereupon should resume, though probably at a lower rate than in past years. One reason for import growth will be rising consumer income, and another expected reason will be renewed appreciation of the ruble in real terms. Russia is likely to return to the precrisis situation where its large exports of oil and natural gas put upward pressure on the ruble’s exchange rate. A strong ruble will
hurt the price competitiveness of all other domestically produced tradable goods, including agricultural products. Whether Russia’s grain exports keep rising largely depends on whether the productivity-enhancing improvements in farm management during the 2000s continue, as driven by the “new operators.”

Russian policy statements and actions during the 2000s show stronger interest in reviving the livestock sector than in exploiting the country’s potential as a grain exporter, and especially reveal dissatisfaction with large meat imports. Policies therefore could expand to curb agricultural imports, particularly of meat. Such policies would resist the economic forces driving Russia’s growing role in world agricultural markets.

For More Information


Global Insight. Country Reports, Russia (subscription service).


World Trade Atlas, Global Trade Information Services (subscription service).

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Brazil’s Changing Food Demand Challenges the Farm Sector

Constanza Valdes, Ignez Vidigal Lopes, and Mauro de Rezende Lopes

JEL Classifications: Q11, Q13

Brazil, an upper middle income country, is facing rapid socioeconomic shifts: rural to urban migration, increases in the size of the middle class, and improvements to the distribution of income. These shifts present Brazil’s farm sector with new challenges, including shifts in commodity demand and subsequent changes in economic signals. In this paper, we examine the magnitude of the production challenge from increased food demand and evaluate the farm sector’s ability to meet that challenge.

Brazil, a country that enjoys ready availability of land, water and labor has achieved an impressive agricultural performance. From 1996 to 2008, Brazil’s gross domestic product (GDP) of agriculture expanded by an average 12% a year. This growth, driven by increasing productivity and expansion of land devoted to agriculture, has allowed Brazil to become a major food supplier to international markets: a quarter of what Brazil produces in grain, oilseeds and meats is sold in world markets.

Brazil is also a major consumer of food. With a population of 191 million, Brazil is one of the world’s leading consumers of cereals, pulses, oil crops and meats. Domestic demand is likely to grow as Brazil’s population gains 23 million people by 2018. Income growth, a more balanced income distribution, and increased urbanization are expected to lead to higher demand for all foods, and a shift from staple foods to a diversified diet with higher animal protein consumption.

Brazil’s rising food consumption will require continued increases in food supplies. The challenge for Brazil’s farm sector is to sustain productivity growth to meet increasing domestic demand and, at the same time, maintain its position as a major supplier of agricultural commodities to world markets. The growth of Brazil’s biofuel industry could affect the availability of grains and oilseeds for other domestic uses or exports. Brazil’s agricultural system still has much potential to supply more agricultural products if it can address financial constraints for farmers, infrastructure challenges along the food supply chain, and environmental concerns about land expansion.

Brazil’s Income and Food Consumption Rising

Brazil is categorized by the World Bank as an “emerging country” based on its large population, large resource base, and large market. Brazil is categorized as an upper middle income country with per capita gross national income of $5,860 in 2008. The average masks a disparity between the very rich and very poor. The richest 10% of the population receive 44% of total income while the poorest 50% receive less than 10 percent. Twenty-two percent of the Brazilian population lives in poverty, and rural poverty is especially prevalent. About 8% of the population is below the minimum level of dietary energy consumption (World Bank).

Economic reforms implemented during the 1990s and early 2000s in Brazil restored steady economic growth and reduced inflation from over 1,000% per year to around 5%. The resulting economic stability and “wealth effect” from slower inflation set off a domestic demand boom. Other reforms implemented since the early 1990s also helped stimulate food demand. Labor reforms kept the real minimum wage above inflation, trade reforms increased imports of foods and other consumer goods, financial reforms increased credit availability, and family farming programs provided credit to low-income, small-holdings producers (owning less than 26 hectares of land).

Brazil implemented some programs aimed at reducing income inequality. Food assistance programs established under the “Zero Hunger” (Projeto Fome Zero) government initiative provide low-income program participants with

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supplemental food. Bolsa Familia is a targeted conditional cash transfer program serving nearly one quarter of Brazil’s population (MDS).

The economic reforms implemented after 2003 led to increases in real per capita income, and an improved income distribution. Real per capita income increased 14% from 2004 to 2007 and the inequality in the distribution of income, measured by the Gini coefficient (which ranges from 0, which reflects equality, to 1, which indicates inequality), diminished from 0.6 in 2000 to 0.5 in 2007. The reforms brought more people into the formal labor force and expanded the middle class (defined as families earning between $600 and $2,600 monthly), to 54% of the total population in 2008, up from less than 42% in 2004 (Neri).

With growth in per capita income, Brazil’s food consumption, measured by calories per person per day, has grown steadily from 1980 to 2007 at an annual rate of 0.8% and now exceeds the average for upper-middle-income countries.

**Brazil’s Food Consumption Patterns Are Changing**

Food consumption in Brazil is shifting toward vegetables, fruits, oils, meats and milk. Consumption of meat and milk is expanding the fastest. By 2008, total red meat and poultry meat consumption had risen to 89 kilograms per person, 31 kg above the 1993 level (USDA, 2009). Per capita consumption of milk has risen to 112 kg in 2008, up 20 kg from 1993, aided by milk donations to low-income populations through the food and nutrition security programs (Bolsa Familia and School Meals programs).

Rising incomes have led to increased consumption of some grain products with consumption of 131 kg per person in 2008, up 6% from 1993. Rice and wheat are the most popular cereals, with 41 kg and 52 kg per person, respectively, in 2008. Consumption of staples (beans and starchy roots) has reached 97 kg per person, and vegetable and fruit consumption have also been on the rise, with a 12% gain in vegetable and fruit consumption since 1993. Sugar consumption—currently double the world average—reflects abundant domestic supply and low price (FAOSTAT).

As Brazil becomes more urbanized and Brazilian consumers grow wealthier, the composition of food demand will move towards that of higher-income countries (Figure 2). To match average consumption shares in high-income countries, consumption of meat, vegetables, fruit and milk would grow the fastest. Consumption of pulses will be relatively unaffected by urbanization since urban and rural consumption levels are similar.

USDA Agricultural Projections to 2018 indicate that 2.9% annual Brazilian income growth will lead to gains in consumer spending on food. Per capita consumption of red meats and poultry will increase from 89 kg per person in 2008 to 92 kg per person in 2018. Poultry will be the fastest growing component of meat consumption with its share of meat consumption increasing from 45% in 2008 to 47% in 2018. While per capita beef consumption is projected to decrease 0.2% per year during 2008–18, per capita poultry and pork consumption will rise steadily with increasing incomes (0.8% and...
Overall food use of grains is projected to decrease; this will likely occur through shifting of coarse grains to feed use, but wheat and rice consumption will rise to levels observed in the high-income countries. Brazil’s per capita demand for wheat is projected to rise to 56 kg per person by 2018, or 7% above the 2008 level. Consumption of rice, a major staple in the diet of more than half of Brazilians, is projected to grow to 43 kg per person by 2018, a 5% increase from 2008.

Sugar consumption is expected to decline to levels similar to that of higher-income countries, leaving more sugarcane available for biofuel production. About 53% of Brazil’s sugarcane is being distilled into fuel ethanol. Brazil’s ethanol domestic demand has increased 3% per year since the late 1990s, as sales of “flex-fuel” cars powered by gasoline and ethanol in any proportion in a single tank of fuel have boomed with the increase in the income earnings of Brazilians. Ethanol represents 41% of gasoline use in Brazil, compared to 7% in the United States. Brazil’s ethanol consumption is projected to rise to 14 billion gallons by 2018, compared to 4.3 billion gallons in 2008 (MAPA).

Brazil Will Need to Increase Agricultural Output to Meet Rising Demand

USDA Agricultural Projections to 2018 indicate that Brazil will need to produce 7% more grain and 43% more oilseeds from 2008 levels to meet projected domestic and foreign demand in that year. This is in response to increased demand from major soybean importers—such as China, and reduced soybean exports from the United States. More than 57 million tons of feed grains are projected to be needed to supply Brazil’s livestock sector, 6% more than was consumed in 2008. To meet domestic and foreign demand for fuel ethanol, ethanol production is projected to rise to 16 billion gallons by 2018 from 7 billion gallons produced in 2008. Brazil’s ethanol exports are expected to increase an additional 1 billion gallons, to 2.3 billion gallons by 2018 (MAPA). This increase in ethanol exports could help the U.S. meet ambitious biofuel demand targets under the 2007 Energy Independence and Security Act (EISA). The law allocates 3 billion gallons out of 26 billion in 2018 for renewable fuel other than ethanol derived from corn starch, a category that could include imported sugarcane-based ethanol.

Brazil will need to import the commodities that it does not produce competitively, including wheat and rice, two commodities that Brazilian consumers are expected to demand at a slightly faster rate over the next decade, as incomes grow. Wheat imports, which for the past decade have accounted for over two thirds of supply, are projected to increase to 7.4 million tons in 2018, a 376,000 ton increase over 2008. The main suppliers of wheat to Brazil over the past decade have been Argentina, the United States, and Canada. Brazil is usually a net importer of rice and its imports are projected to increase 26% to reach 43 kg per capita in 2018.

Table 1 Brazil’s Land Use and Yields

<table>
<thead>
<tr>
<th>Commodity</th>
<th>2000-02</th>
<th>2003-05</th>
<th>2006-08</th>
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<tbody>
<tr>
<td></td>
<td>Area</td>
<td>Yields</td>
<td>Area</td>
</tr>
<tr>
<td></td>
<td>Ha 000</td>
<td>Tons/ha</td>
<td>Ha 000</td>
</tr>
<tr>
<td>Soybeans</td>
<td>14,628</td>
<td>2.7</td>
<td>20,962</td>
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<tr>
<td>Corn</td>
<td>12,459</td>
<td>2.9</td>
<td>12,319</td>
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<tr>
<td>Cotton</td>
<td>784</td>
<td>1018.7</td>
<td>1,002</td>
</tr>
<tr>
<td>Wheat</td>
<td>1,482</td>
<td>1.6</td>
<td>2,421</td>
</tr>
<tr>
<td>Rice</td>
<td>3,315</td>
<td>2.2</td>
<td>3,613</td>
</tr>
<tr>
<td>Sugarcane Ethanol</td>
<td>5,036</td>
<td>68.5</td>
<td>5,609</td>
</tr>
</tbody>
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Source: Foreign Agricultural Service (FAS), U.S. Dept. of Agriculture. FAS Production, Supply and Distribution Online.
strongly between 2003 and 2008, increasing at an annual rate of 22% in U.S. dollars terms. Brazil is the largest world exporter (global market shares in parentheses) of sugar (48%), ethanol (40%), beef (18 percent), coffee (30%), and orange juice (39%); and second largest exporter of soybeans (32%) and poultry meat (27%), after the United States. These gains are also reflected in the loss of market share by the United States.

Despite its successes in expanding production, Brazil’s future growth in agriculture could slow unless it can address financial constraints for farmers, infrastructure constraints along the food supply chain, and environmental concerns about land expansion. In addition, the growth of Brazil’s biofuels industry could reduce the availability of Brazil’s exportable surpluses of some commodities. Demand for soybeans as a raw material for biodiesel will likely increase use of Brazil’s excess crushing capacity and dampen the recent boom in soybean exports. Planned increases to Brazil’s biodiesel mandate from the current 3% of transportation fuel would likely reduce soybean oil exports.

Lack of credit is a constraint on farm investment and output growth but prospects for farmers’ access to credit for production and marketing of crops and livestock are poor due to the currently high rate of indebtedness in the sector. In Brazil, the cost of credit is high and its availability is limited. Total credit granted by the financial system is less than 30% of GDP, which is one of the lowest levels of credit availability anywhere in the world. During the past 10 years, to alleviate the low official credit availability, input supply companies and trade companies provided the bulk of production financing for farmers, a critical factor in the expansion of the agricultural sector. However, the current global financial crisis has reduced the ability of these companies to finance farmers in the near term. Many Brazilian farmers are now struggling to pay debts. Brazil’s agriculture-related debt in arrears in 2008 reached 7% of agricultural GDP (Banco Central).

Infrastructure bottlenecks are the main obstacle to Brazilian agriculture’s capacity to supply domestic and world markets. Poor roads impose high costs on farmers in the agricultural frontier in the Center-West region, where the crops have the highest yields in the country. Large investments in maintenance and expansion of transport infrastructure are needed to keep up with the expected growth in demand, to lower delivery times and costs and to maintain product quality. In recent years, private investment in infrastructure has exceeded federal investments, and new Public-Private Partnerships (PPPs) have been improving roads and port facilities. The Brazilian Government estimates that it needs to invest $200 billion in infrastructure over the next decade.

Potential for output growth from bringing more land under cultivation is limited. Although there is still land available for crop and livestock expansion, continued expansion in the Cerrados (savannah areas) and Amazon region is likely to be constrained by environmental concerns about land clearing. Based on yield projections, the projected production levels in 2018 assume that an additional 10 million hectares of cropland will be brought into production. The expected rate of expansion for new area brought into cropland production is one of the world’s highest at 2.1% per year over the next 10 years. This expansion in cropland is likely to come from new land brought into production and from converted pasture land. Pasture land is expected to decline as cattle growers adopt new technologies and feeding practices.

Brazil’s current agricultural area totals 76 million hectares, with 58 million hectares of annual crops and 18 million hectares of perennial crops. Pasture lands now stands at 172 million hectares. The scope for cropland expansion in Brazil is estimated at 119 million hectares, with 69 million hectares in the Cerrados, and 50 million hectares from pasture-land conversion.

Biofuels production in Brazil is facing increasing pressure to respond to environmental sustainability concerns related to land use of cropping systems (sugarcane, soybean and palm oil plantations) to produce biofuels and land use change impacts. Frequently cited are the environmental risks from intensified competition for land currently planted to other crops and the conversion of forest or grassland to crop production which may result in habitat loss. Sugarcane area is projected to increase 2.2% annually during 2008–18, from 8 million hectares in 2008 to over 10 million hectares in 2018, driven by biofuel demand (MAPA).

**Concluding Comments**

Over the past two decades, Brazil’s rapid economic growth has been driven by stabilization and structural reforms that have led to high rates of investment and gains in productivity throughout the economy. Reforms led to growth in employment and income, improved income distribution, poverty alleviation, and stronger food demand. More consumers are participating in formal markets, expanding the quantity and quality of food products demanded by Brazilian consumers. As household incomes rise the structure of Brazilian food expenditures is changing, with demand shifting toward fruits, vegetables and meats.

At this point, it appears that Brazil will be able to meet these challenges and that the agricultural sector will produce sufficient quantities of food to meet domestic demand and—depending on future changes to Brazil’s biofuels mandate—exports as well. Brazil’s impressive agricultural performance of the past few years is likely to
continue, despite the pressures faced by the farm sector. On the positive side, productivity advances for crops and animal products seems almost guaranteed given the anticipated supply of improved seeds, soil correction techniques, and other technologies generated by EMBRAPA.

In addition, the Public Private Partnership (PPP) initiatives will enable accelerated investment in the much needed transport, ports and storage infrastructure. The large investments needed for infrastructure development, and budgetary constraints make PPPs the most viable option. These positive factors will minimize the pressures from the lack of credit availability, and the rapid growth of the biofuel sector, allowing Brazil to meet the new challenges from changes in dietary consumption patterns.

For More Information


Ministério da Agricultura, Pecuária e Abastecimento, MAPA. http://www.agricultura.gov.br/pls/portal

Ministério do Desenvolvimento Social e Combate à Fome, MDS http://www.mds.gov.br


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