United States International Trade Commission
Journal of International Commerce and Economics

Feeding the Dragon and the Elephant: How Agricultural Policies and Trading Regimes Influence Consumption in China and India

Web Version:
May 2013

Authors[1]:
Katherine Baldwin
Joanna Bonarriva

Abstract

China and India have posted impressive growth rates over the past decade, but face a number of challenges to sustained growth, including bureaucratic hurdles, large swaths of populations in poverty, and policy regimes that are sometimes at odds with global trade norms. These issues factor heavily in the evolving agricultural sectors of each country. Both China's and India's agricultural policies are developed out of a concern for domestic food security, and both nations use that objective as a justification for their policy regimes. But aside from this overarching goal, what do these countries have in common when it comes to agricultural trade? In this paper, we undertake a systematic analysis of the agricultural sectors of China and India, comparing and contrasting both domestic policies and trade regimes, and exploring how these regimes affect agricultural trade levels in both countries.

Suggested citation: Baldwin, Katherine and Joanna Bonarriva. "Feeding the Dragon and the Elephant: How Agricultural Policies and Trading Regimes Influence Consumption in China and India." *Journal of International Commerce and Economics*. Published electronically May 2013. *http://www.usitc.gov/journals*.

[1] This article represents solely the views of the author and not the views of the United States International Trade Commission or any of its individual Commissioners. This paper should be cited as the work of the author only, and not as an official Commission document. Please direct all correspondence to Katherine Baldwin or Joanna Bonarriva, Office of Industries, U.S. International Trade Commission, 500 E Street, SW, Washington, DC 20436, or by email to *Katherine.Baldwin@usitc.gov* or *Joanna.Bonarriva@usitc.gov.*

INTRODUCTION

As the two most populous nations on Earth, China and India have drawn considerable attention regarding their respective development paths. Both are large emerging economies that have exhibited annual GDP growth greater than 7.5 percent over the past decade.[2] China and India have both increased their integration into the global trading regime over the past few decades, but with respect to some segments of the economy such as agriculture, both countries have taken a more selective stance toward participating in global markets. What is the source of this reticence, and exactly how has it been manifested in the agricultural trade policies of each country?

In this paper, we undertake a broad-based analysis that compares and contrasts the agricultural sectors of China and India and uses that background as a framework to explain their current agricultural trade policy regimes. Specifically, we strive to answer three questions: how have conditions in domestic agriculture affected how these two nations approach trade in agricultural goods, to what degree have these countries utilized global markets to fulfill domestic food consumption needs, and what are the impacts of agricultural trade policies in these countries?

AGRICULTURE IN THE DOMESTIC CONTEXT

In order to understand how and why China and India participate in global agricultural markets, a preliminary discussion of agriculture in a domestic context is necessary. As both countries experienced widespread famine in their recent histories, the goal of maintaining self-sufficiency in important food grains is a national political issue. Additionally, as agriculture continues to make a substantial contribution to these nations' economies, the respective governments have a vested interest in the health of the sector. Despite these similarities, China and India's divergent histories, cultures, and resource endowments have led to different production systems in the two nations, influencing how each country deals with a wealthier and increasingly urbanized population.

Agriculture's role in the national economy

Agriculture is a vital component of the national economies of China and India, accounting for a significant portion of both employment and overall economic output. In China, agriculture accounted for more than 60 percent of total national employment in 2011, while 54 percent of India's population worked in agriculture.[3] Agricultural workers are important to both nations; however, farmers have much more political sway in India due to that country's democratic po-

[2] World Bank, "World Development Indicators" database (accessed August 1, 2012).

[3] FAOSTAT, "India Country Profile," (accessed August 1, 2012); FAOSTAT, "China Country Profile," (accessed August 1, 2012).

litical system, and are one of India's most unified voting blocs. Although Chinese farmers lack voting rights, they are not a completely overlooked demographic. Both central and provincial governments in China are aware of the potential for civil unrest in rural areas as a result of poor living conditions and scarce economic opportunities.

Given the large number of agriculture workers in both China and India, it is not surprising that agriculture is economically important in both countries. Agriculture accounts for approximately 10 and 19 percent of GDP in China and India, respectively, as compared to less than 2 percent in the United States.[4] Furthermore, China and India had the first and third highest estimated total agricultural production values in the world in 2010.[5]

Agriculture is also an important political issue due to each country's respective history of food shortages and famine, and achieving and maintaining agricultural self-sufficiency is a major political objective. Both countries have become self-sufficient largely due to the adoption of high-yielding varieties of seeds and chemical fertilizers and large public investments in irrigation. These measures, stemming from the "Green Revolution,"[6] boosted agricultural output by improving productivity (expressed in crop yield per hectare (ha)) rather than through increases in cultivated area. More recently, however, rates of productivity growth have slowed in both countries as the gains from new seed technology and modern farming practices in some sectors have run their course, and overuse of chemical inputs has led to deteriorating soils and shrinking groundwater supplies.[7] Slowed productivity growth has been particularly acute in India, where recent expenditures on input support programs and migrant farm labor payments have crowded out public funding for agricultural research, extension services, irrigation, and other rural infrastructure projects that would support agricultural sustainability in the long-run.[8]

Divergent agricultural production systems and crop mix

Production systems

Unequal land resource endowments have led to great differences in the agricultural production systems of China and India. Only about 13 percent of China's total land area is arable or planted to permanent crops, in contrast with 57 percent in India.[9] In 2009, India's total quantity of arable land (158 million ha) was second only to the United States (163 million ha), while China

---

[4] World Bank, "World Development Indicators" database (accessed August 1, 2012).

[5] FAOSTAT, "Value of agricultural production," (accessed August 1, 2012).

[6] The Green Revolution refers to a period of intense agricultural research (roughly 1940-70) into new high-yielding staple crop varieties to boost food production in developing countries. Hazell, *The Asian Green Revolution*, November 2009, 1.

[7] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 4-1 and USITC, *China's Agricultural Trade*, March 2011, 5-24.

[8] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 4-3.

[9] FAOSTAT, "China Country Profile," (accessed August 1, 2012); FAOSTAT, "India Country Profile," (accessed August 1, 2012).

lagged both with an estimated 110 million ha.[10] A comparison of agricultural land availability per agricultural worker yields a still more stark result––0.64 ha in India versus 0.25 ha in China.

While both countries improved productivity due to widespread adoption of Green Revolution technologies, China overcame its relative land deficit through higher average crop yields compared to those achieved in India. Average yields of corn and rice in China are double the level observed in India, and wheat yields are more than 50 percent greater.[11] This higher productivity is the result of several factors. First, China has almost twice as many agricultural laborers as India, despite a much smaller arable land base.[12] Second, Chinese agriculture is characterized by more intensive input usage. For example, the Food and Agricultural Organization of the United Nations (FAO) estimates that in 2009, average fertilizer consumption exceeded 400 kg per ha in China, and stood at roughly 150 kg per ha in India.[13] Last, Chinese farmers are able to achieve more consistent crop yields through greater access to irrigation. In 2009, nearly 60 percent of China's arable land was equipped for irrigation.[14] Indian farmers, with only 42 percent of arable land equipped for irrigation, are much more likely to rely on monsoon rains, leading to more variable crop yields and a higher probability of crop failure due to erratic rainfall in any given year.[15]

Crop mix

Agriculture in both China and India is structured to satisfy national food grain consumption needs first, with a secondary focus on all other agricultural products. China is the world's top producer of rice and wheat, and India ranks second for both products. The diets of China and India are centered around these two grains, with about half of daily per capita caloric consumption coming from wheat and rice combined.[16]

China also produces a significant amount of coarse grains[17] (specifically corn) largely used for feed in poultry, pork, and beef production. In 2010, production of coarse grains in China was more than five times higher than that of India, and meat production in China was nearly 13 times larger than in India.[18] Although India produces some livestock, the prevalence of veg-

[10] FAOSTAT, "China Country Profile," (accessed August 1, 2012); FAOSTAT, "India Country Profile," (accessed August 1, 2012); FAOSTAT, "United States of America Country Profile," (accessed August 1, 2012).

[11] USDA, FAS, PSD Database (accessed August 1, 2012).

[12] FAOSTAT, "China Country Profile," (accessed August 1, 2012); FAOSTAT, "India Country Profile," (accessed August 1, 2012).

[13] FAOSTAT, "China Country Profile," (accessed August 1, 2012); FAOSTAT, "India Country Profile," (accessed August 1, 2012).

[14] FAOSTAT, "China Country Profile," (accessed August 1, 2012).

[15] FAOSTAT, "India Country Profile," (accessed August 1, 2012).

[16] FAOSTAT, "Food Balance Sheets," (accessed August 1, 2012).

[17] The FAO definition of coarse grains includes barley, buckwheat, canary seed, fonio, maize, millet, oats, popcorn, quinoa, rye, sorghum, triticale, mixed grains, and other miscellaneous cereals.

[18] FAOSTAT, *China Country Profile*, (accessed August 1, 2012); FAOSTAT, India Country Profile, (accessed August 1, 2012).

etarianism among that country's Hindu population translates into most animals being raised for milk production rather than for meat. A comparison of commodity production by countries illustrates this divergence (table 1). While pork, chicken, and beef rank highly for China, no meat products appear on India's list. Similarly, while buffalo and cow milk are two of India's largest commodities, they do not rank among China's top ten.

TABLE 1 Top ten domestically produced agricultural commodities, by value

Rank	China	India
1	Pork	Rice
2	Rice	Buffalo milk
3	Fresh vegetables	Cow milk
4	Hen eggs	Wheat
5	Chicken	Mangoes/guavas
6	Beef	Bananas
7	Wheat	Sugarcane
8	Tomatoes	Cotton
9	Apples	Fresh vegetables
10	Other bird eggs	Potatoes

Source: FAOSTAT, *China and India Country Profiles* (accessed August 1, 2012).

It should also be noted that both countries also have large, diverse fruit and vegetable production sectors. China leads the world in the production of labor-intensive vegetables such as asparagus, garlic, and tomatoes, while India's diverse agro-economic zones help the country to be the world's leading producer of bananas, dry beans, and mangoes.

The challenge of feeding larger and more affluent populations

Both China and India face unique agricultural challenges due to changing national diets as a consequence of economic development. Generally, as countries develop economically and urbanize, traditional diets heavy in staples (such as grains and tubers) gradually shift to more meats, vegetable oils, dairy, aquatic products, fruits, vegetables, and processed foods. As incomes rise, attitudes towards foods can change and consumers place greater emphasis on food safety and quality. Urbanization also influences food preferences because urban dwellers have higher average incomes and different food consumption patterns than their rural counterparts. Urban populations not only consume fewer staples, such as grains, but tend to consume more food overall.

These changing demographic and consumption patterns are clearly evident in both China and India. China's per capita gross national income (GNI) more than quadrupled between 2000 and 2011 to $4,940,[19] and this increased income has been accompanied by higher consump-

[19] World Bank, "World Development Indicators" database (accessed April 26, 2013).

tion of meats and processed food products.[20] Since 2000, domestic meat supplies in China have grown 13 percent, with beef and poultry up 19 percent and pork supplies up 7 percent.[21] Most of the increase in China's meat supplies can be attributed to greater domestic production, and given China's relative dearth of arable land, larger domestic livestock production has increased demand for feed grains. In India, per capita income tripled between 2000 and 2011 to $1,420, but was still less than a third of GNI in China.[22] India's smaller per capita income, combined with the prevalence of a vegetarian diet, has led to increased demand of different foods than in China—per capita consumption of vegetable oils, sugars and sweeteners, animal products (including meat and dairy), and fruits have all increased, while calories from rice and wheat have declined. The rise in demand of oils, sweeteners, and animal products has led to fundamental shifts in the agricultural sectors and the overall food systems of both India and China.

AGRICULTURAL TRADE

Despite similarities including large agricultural production and the shared challenge of feeding large populations, China and India exhibit vastly different degrees of participation in global agricultural markets. In 2011, the value of Chinese agricultural imports and exports accounted for 11 percent and 5 percent, respectively, of global agricultural trade, compared to just 2 percent and 3 percent for India.[23] China depends on international markets for a number of key products, making it the world's second largest agricultural product importer. In contrast, only about 3 percent of Indian food and agricultural demand is met by imports, compared with 13 percent for Asia as a whole.[24]

China's agricultural trade

China's engagement in global trade began in the late 1990s with trade liberalizing reforms that reduced agricultural protection and barriers to imports. After China's WTO accession in 2001, its agricultural exports steadily expanded, growing from about $12 billion in 2001 to $43 billion in 2011. China became a net importer of agricultural goods for the first time in 2003, and imports have continued to grow faster than exports, reaching almost $90 billion in 2011 (figure 1).

[20] USITC, *China's Agricultural Trade*, March 2011, 3-4, 3-7—3-9.

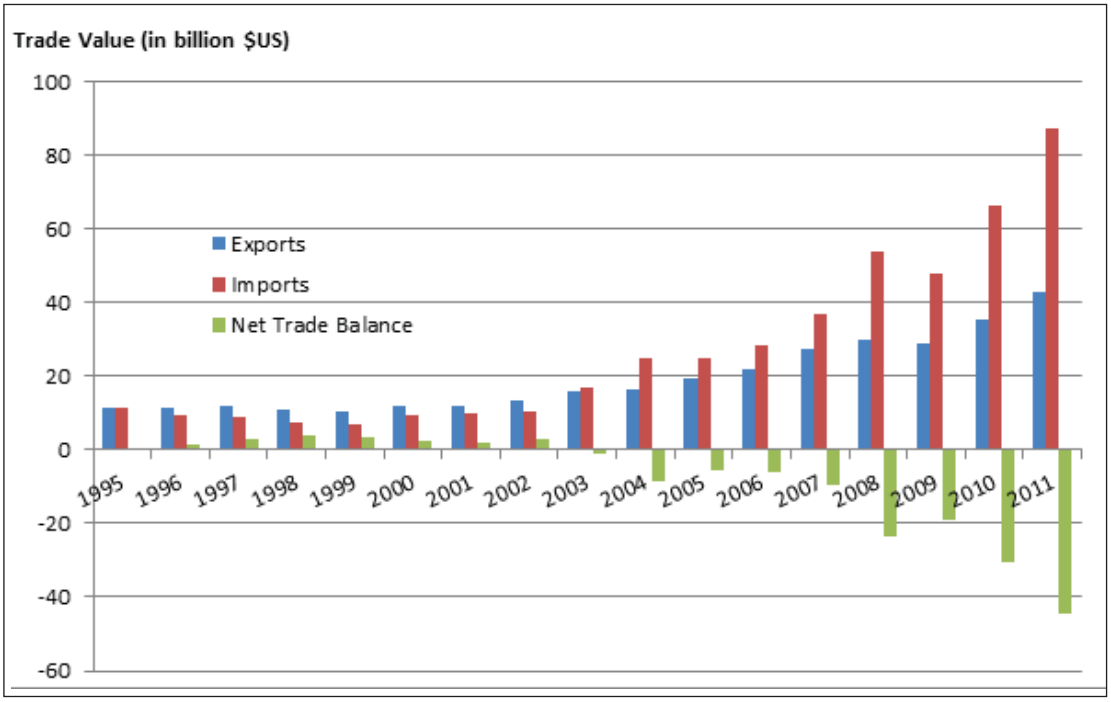
[21] FAOSTAT, "Food Balance Sheets," (accessed August 1, 2012).

[22] World Bank, "World Development Indicators" database (accessed April 26, 2013).

[23] GTIS, GTA database (accessed August 1, 2012).

[24] Narayanan and Walmsley, *Global Trade, Assistance, and Production*, 2008.

FIGURE 1 China's Balance of Trade in Agricultural Goods



Source: GTIS, GTA database (accessed August 1, 2012).

Although total Chinese agricultural imports have increased by value, imports are concentrated in a handful of products. Almost 70 percent of China's imports in 2011 were in just 6 product categories: soybeans, vegetable oils, cotton, hides, wool, and dairy. Since China is a global leader in production of labor-intensive goods, such as horticultural products, and owing to its relative scarcity of arable land, it tends to import large volumes of land-intensive products, such as cotton and soybeans. Soybeans accounted for about 35 percent of China's total imports, and together with cotton, accounted for close to half of its agricultural imports in 2011. Soybeans are used in animal feed, an important input into its rapidly growing livestock sector. Cotton imports are important inputs into the Chinese textile and apparel industry, as are hides and wool.

Higher incomes and diet diversification are evident in the widening range of imported products in China over time. While the vast majority of China's agricultural imports continue to be bulk, relatively unprocessed products, China has experienced strong import growth in several high-valued product categories in recent years, albeit from a small base. For example, since 2006, there has been a 30 percent annual increase in Chinese cheese imports, likely associated with the growing fast food sector. Fresh fruit imports (specifically grapes, cherries, and apples) are on the rise, as are imports of wine which experienced 70 percent annual growth over the past five years.

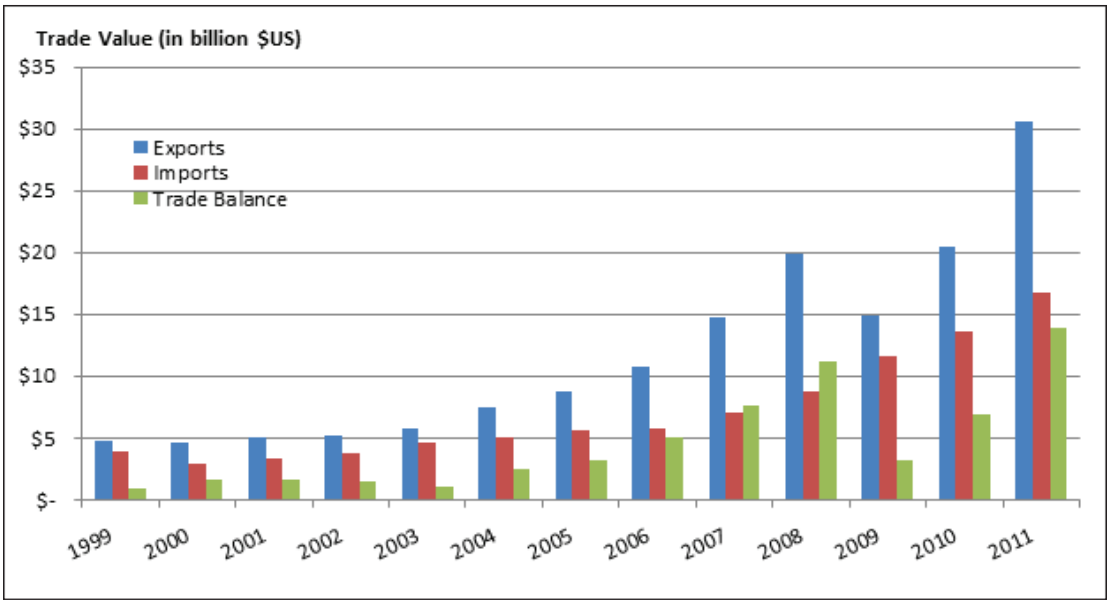
China also has a large and growing agricultural trade deficit with the United States. Over the past 10 years, Chinese imports from the United States grew from under $3 billion to over $22

billion, and in 2011 China was the United States' second leading agricultural export market behind Canada. Much of this growth can be attributed to rising soybean and cotton demand in China, as the United States is the dominant global exporter of these two products. In 2011, soybeans accounted for 57 percent, and cotton for another 13 percent, of U.S. agricultural exports to China. Chinese imports of soybeans from the United States more than quadrupled between 2000 and 2011, and imports of products in most other agricultural import categories have grown since 2007. After soybeans and cotton, the largest increases in Chinese agricultural imports from the United States (by value) were for other oils, dairy, fresh fruit, and processed foods.

India's agricultural trade

In stark contrast to China, India engages relatively little in global agricultural trade. India is one of the top three global producers of wheat, rice, sorghum, sugarcane, and many fruits and vegetables (including bananas, mangoes, broccoli, cauliflower, garlic, lentils, and onions), but is only the 14th largest global agricultural exporter. Further, although India is the world's second most populated country, it ranks 16th among global agricultural importers. India's total agricultural exports were approximately $31 billion in 2011 while imports were $17 billion (figure 2).

FIGURE 2 India's Balance of Trade in Agricultural Goods



Source: GTIS, GTA database (accessed August 1, 2012).

As is the case for China, India's imports occur mainly in product categories for which India has a low comparative advantage, such that domestic supply is unable to meet domestic demand. While China's demand for feed grains for its livestock industry fuels a huge portion of its imports, the Indian preponderance of vegetarianism limits its demand for meat and feedgrains

for meat production. Instead, vegetable oils are a staple food product in India, and imports accounted for more than 50 percent of Indian vegetable oil consumption in 2011.[25] India's primary agricultural imports in 2011 were palm oil (40 percent), pulses (peas, beans, and lentils) (10 percent), and soybean oil (7 percent). Since 2009, India's agricultural imports have grown mainly to combat food price inflation. As in China, rising incomes have also fueled imports of processed foods, high-valued foods, and snack foods, including nuts.

Unlike China, India's imports from the United States are extremely limited. In 2011, the United States exported $776 million in agricultural products to India, which accounted for only 5 percent of total Indian agricultural imports.[26] U.S. exports to India are concentrated in nuts (mainly almonds and pistachios), soybean oil, pulses, and cotton. Limited imports from the United States reflect, in part, price competition in the Indian market from other suppliers. For many products, India is a price-sensitive market, and some U.S. products are of a higher quality—and hence higher priced—than similar products supplied by other countries.

APPROACHES TO AGRICULTURAL TRADE IN CHINA AND INDIA

Although both China and India have a measured view of agricultural trade, evolving consumption patterns and slowing productivity growth are transforming agricultural trade policy in these countries. In both China and India, domestic agricultural policy and trade policy are generally crafted in tandem with the intent of achieving three overarching goals: stability of supplies, stability of prices, and stability of farmer incomes. Both countries have historically preferred to meet national consumption needs of staple foods (wheat, rice, and pulses in India; and wheat, corn, and rice in China) with domestic production if possible, but will relax this objective if trade will help keep domestic prices under control for the benefit of poor consumers. At the same time, both countries strive to boost farmer incomes through income support because of the large number of poor residing in rural areas and the large share of employment based in smallholder agriculture.

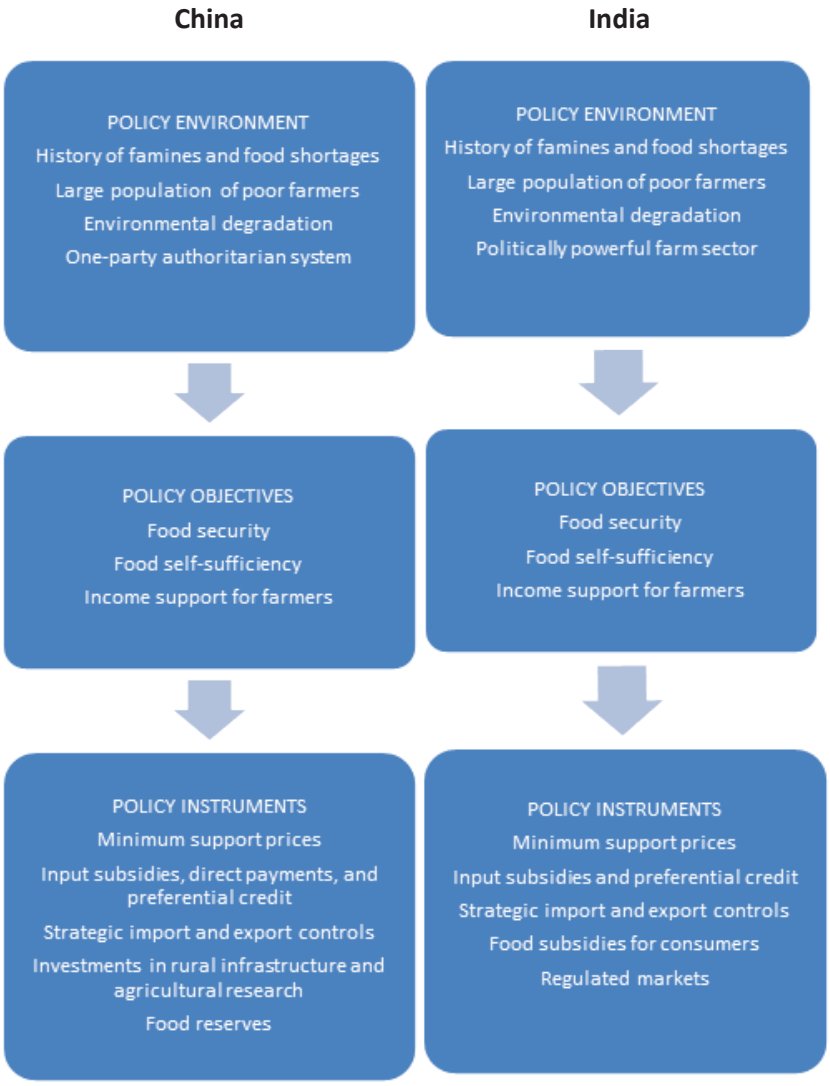
Achieving these outcomes requires the balancing of various policy tools, particularly given their somewhat contradictory objectives. Both governments employ a wide range of subsidies and policy measures intended to increase farmer incomes while maintaining low and stable

[25] USDA, FAS, PSD Database (accessed August 1, 2012).

[26] This compares to U.S. agricultural exports to China that represented 25 percent of China's total agricultural imports in 2011.

consumer food prices.[27] A basic framework outlining the policy environment, objectives, and instruments for both countries can be seen in figure 3, below.

FIGURE 3 Comparative agricultural policy frameworks for China and India



Source: USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009; USITC, *China's Agricultural Trade*, March 2011.

[27] Tension exists between the goals of increasing farm incomes and lowering consumer food prices because they are inherently contradictory. For example, policy interventions that support producer incomes by increasing crop prices may lead to higher food prices that negatively affect poor consumers. Food security requires low and stable prices of food staples for poor consumers, yet the drive for food self-sufficiency requires sufficiently high crop prices to expand domestic food production. USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 1-9.

As is evident from the figure, agricultural policy measures in China and India include both domestic policies and trade-related actions. We explore these two broad types of interventions in further detail below.

Domestic agricultural policy interventions

In maintaining domestic supplies of staple food grains, China and India have both shown a preference for boosting domestic production over participation in the global market. China's two most recent 5-year plans[28] aim to alleviate poor conditions in the rural sector by improving basic services in rural areas, boosting farmer incomes, and creating non-farm rural employment to slow the flow of rural to urban migration. To ensure basic nutrition and food security for all citizens, China intends to expand domestic production by promoting the increased use of agricultural technology, mechanization, and extension services. Imports are viewed as secondary in attaining food security.

Similarly, the Indian government actively regulates the agricultural sector, including production, marketing, consumption, and international trade. In the view of Indian policymakers, the large number of poor people whose livelihoods depend on agriculture makes the risks of agricultural trade liberalization high and requires the management of many aspects of agriculture.

Regulation of agricultural trade in China and India

Even though competitively priced imports could lower prices for domestic consumers and exports could provide higher incomes for Indian and Chinese farmers, Chinese and Indian policymakers appear to focus on the possible negative effects of lower-priced imports on the incomes of domestic producers, and the possibility that large volumes of exports could cause shortages in the domestic market of key products, thus creating higher prices for domestic consumers. To avoid these possible negative outcomes for key foodstuffs, tariffs and nontariff measures (NTMs) are used strategically to increase or decrease food supplies in these countries, thereby raising or lowering food prices when domestic policy instruments fail or in response to drought or other natural disasters. In fact, many trends in Chinese and Indian agricultural trade are better explained by domestic and trade policy initiatives than by changing market factors of supply or demand.[29]

India's agricultural trade policy is consistent with the government's long-standing attempts to strictly regulate trade in order to protect domestic producers from foreign competition and insulate consumers from global price fluctuations. The Indian government explicitly links tariffs to its domestic policies, stating that agricultural import duties should be carefully calibrated with domestic support prices to meet price stability goals. Likewise, China uses tariff rate quotas

[28] China's 5-year plans lay out policymakers' objectives, policies, and targets for achieving them.

[29] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 2-1.

(TRQs)[30] and other trade mechanisms to regulate imports of staple foods. Both countries also appear to link NTMs to domestic policies by relaxing these barriers when policymakers determine that imports are needed to relieve food price inflation or food shortages.[31]

Tariffs and tariff rate quotas

While China's bound and applied tariffs on agricultural products are generally low, India's are among the highest in the world. The average bound rate for agricultural imports in India is 113 percent, much higher than other developing countries such as Brazil (35 percent) and China (16 percent), and higher than its 37 percent average bound rate for nonagricultural products.[32] Indian applied tariffs across all agricultural goods are typically much lower than bound rates, but tariff peaks occur for certain sensitive products that are key to employment and food security, such as sugar and grains. Market conditions, industry stability, and the importance of a particular product to Indian consumers are other factors that contribute to significant differences in applied tariff rates for certain products at certain times.

The disparity between India's high bound tariff rates and lower applied rates allows the government to modify tariffs to counter domestic and international market conditions, while still complying with its WTO commitments. For example, when there are shortages in the Indian market of important food products––a situation that threatens sharp price increases––tariffs can be lowered or eliminated completely to encourage imports into the Indian market. As an example, poor domestic harvests and rising prices led to the elimination of duties on sugar in 2009 and 2010, on wheat between September 2006 and January 2009, on rice from March 2008 to March 2009, on pulses in June 2006, and on vegetable oils in 2007. Although lower tariff rates theoretically encourage imports, frequent changes in tariffs, as well as the complex process for notifying India's trading partners of tariff-rate changes, creates uncertainty for global exporters to India and can discourage imports over the long term. Tariffs may also be raised to protect domestic concerns; for example, the Indian cut flower tariff was raised from 30 to 60 percent in the FY 2005/06 budget, reportedly to protect an infant industry with expanding employment and export potential.[33]

TRQs are one of the key mechanisms that China employs to regulate trade. China converted absolute quotas to TRQs as a condition of its WTO accession and maintains TRQs for wheat, corn, rice, cotton, sugar, and wool. These TRQs represent very small shares of Chinese domestic consumption of these products and fill rates are extremely low in most years (except for cotton and wool), which can be an indication that an import barrier exists. In addition, the administration of the TRQs, including the fact that majority shares of TRQ allocations are controlled by Chinese state trading enterprises, has been characterized as nontransparent.[34] For example, 90

---

[30] A tariff rate quota is an import quota that allows a limited quantity of a good to be imported at a reduced tariff rate during a specified period.

[31] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 1-10.

[32] WTO, *World Tariff Profiles*, 2011, 14.

[33] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 5-7—5-9.

[34] USITC, *China's Agricultural Trade*, March 2011, 7-9.

percent of the Chinese TRQ for wheat is allocated to the Cereals, Oils and Foodstuffs Import and Export Company (COFCO), a state trading enterprise. Under the terms of China's WTO agreement, any quota volume that remains unfilled in the first 3 quarters of the quota year is to be reallocated to any firms wishing to import, yet this is reportedly not the case in practice.[35] Considering the importance of these TRQ products to achieving the Chinese goal of food security through self-sufficiency, these practices can be interpreted as efforts to regulate the flow of key products into China.

Nontariff measures

NTMs—or nontariff measures that impact trade volumes, prices, or both—may raise the cost of imports or bar them completely from a given market.[36] Globally, as tariff rates have been reduced through international agreements, the prominence of NTMs in certain countries has increased.[37] Indian NTMs have included quality standards on certain processed foods; fumigation requirements for pulses; government monitoring of import volumes of fruits and nuts, cotton, and alcoholic beverages; stringent purity standards in wheat; health standards for poultry, swine, and dairy inconsistent with international norms; and effective bans on most products containing genetically modified organisms. For example, the Indian government maintains very low or zero tolerances for certain contaminants in wheat imports that are reportedly virtually impossible for shippers to meet. However, in the face of domestic shortages, the government relaxed certain standards for wheat during a short period in 2007, clearing the way for imports.[38]

Chinese NTMs have included bans on U.S. beef inconsistent with the World Organization for Animal Health (OIE) recommendations; zero tolerance for pathogens in meat and poultry; restrictions on apples, potatoes, and strawberries; unnecessary labeling and customs requirements; and value added tax (VAT) policies that disadvantage imports over domestically produced goods. Like India, China sometimes relaxes NTMs when policymakers determine that imports are needed to relieve food price inflation or shortages. For example, China does not allow imports of fresh strawberries on sanitary and phytosanitary (SPS) grounds. However, strawberries exported from the United States were permitted in China in advance of the Beijing Olympic Games in 2008, apparently because of the increased demand from international visitors. However, since the Games ended, U.S. exporters have been denied clearance for shipments.[39]

---

[35] Because of the lack of transparency, the volumes reallocated to individual private traders are unknown, and U.S. exporters report that unused within-quota volumes are not reallocated. USITC, *China's Agricultural Trade*, March 2011, 9-17.

[36] USITC, *China's Agricultural Trade*, March 2011, 9-1; WTO Secretariat, "Data Day at the WTO," May 18–19, 2009, 25.

[37] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 6-1.

[38] USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 6-7.

[39] USTR, *2010 Report on Sanitary and Phytosanitary Measures*, March 31, 2010, 36–37.

Impacts of trade regulation in China and India

Empirical research supports the finding that China and India selectively apply trade restrictions in order to manage agricultural trade. USITC simulations of the effects of selected agricultural tariffs and NTMs found that these measures significantly reduced U.S. exports to these countries. Simulations suggest that U.S. agricultural exports to China were reduced by up to $2.1 billion in 2009, and that U.S. wheat and poultry exports would have experienced particularly significant gains absent these tariffs. China would have also seen greater imports from the rest of the world, mainly for pork offal, wheat, and soybean oil. A simulation of the removal of China's NTMs suggests that such measures have an even greater impact on trade—U.S. agricultural exports to China were reduced by up to $3.1 billion by NTMs, and world exports to China were reduced by up to $4.1 billion in 2009. The analysis suggests that large amounts of U.S. wheat, cotton, pork offal, frozen pork, and potatoes are being kept out of China because of Chinese NTMs.

For India, USITC simulations suggest that Indian tariffs reduced U.S. agricultural exports by $200–291 million in 2007. The removal of Indian tariffs on U.S. agricultural products would have resulted in higher imports of almonds, soybean oil, apples, and cotton. Similarly, a simulated removal of India's NTMs suggests that U.S. agricultural exports to India would have been at least $187 million greater in the absence of these restrictions, with U.S. exports of wheat experiencing the largest increase.[40] While the absolute effects of the simulations for India are much lower than those for China, these results can largely be attributed to India's much smaller base level of U.S. agricultural imports.[41]

CONCLUSIONS AND OUTLOOK

Rapid population growth, rising incomes, and urbanization are having important effects on Chinese and Indian societies, and these countries' domestic agriculture sectors struggle to keep up with the growth in demand for increased volumes of a more diverse array of agricultural products. Land constraints, low labor productivity, environmental degradation, and slowing crop productivity pose significant hurdles for both countries to overcome even with significant additional investments in domestic agriculture. Both countries address these challenges, in part, through policies that impact international trade.

---

[40] These simulation results are based on 2007 levels of trade. USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009, 5-18 and 6-19.

[41] In fact, on a percentage basis, the simulations suggest that the increase in U.S. agricultural imports to India as a share of total agricultural imports absent tariffs would have been larger than that for China, or 42-61 percent higher in India versus 11-19 percent higher in China. For more information on the USITC simulations on India and China, see USITC, *India: Effects of Tariffs and Nontariff Measures*, November 2009 and USITC, *China's Agricultural Trade*, March 2011.

At present, the agricultural trade policy regimes in both China and India are restricting the flow of imported agricultural goods. However, as gaps between food demand and domestic food production grow, pressure will mount on policymakers to liberalize import barriers, particularly those affecting land intensive products in China, and high value/high quality products demanded by the increasingly wealthy in both countries. Moreover, relaxing self-sufficiency goals could have major implications for global agricultural trade given the size of the domestic markets of both China and India. In the past, relaxing such goals led to an increase in Chinese soybean imports from virtually zero in 1990 to more than 50 million metric tons in 2010, accounting for 57 percent of total global soybean trade. Future relaxation of self-sufficiency in production could have even greater market repercussions—for example, if Chinese production of pork fell by just 10 percent, the amount of imports required to meet Chinese demand would be equivalent to 92 percent of total global pork trade, potentially leading to large price increases and pork shortages in other import markets.

Regardless of how China and India confront resource constraints in producing primary agricultural products, import demand for processed final food and agricultural products in these countries is likely to continue growing. Nonetheless, tariff and NTM trade barriers such as those documented above are likely to persist in the short term (and become increasingly ad hoc) as the governments of China and India continue the balancing act of protecting selected domestic sectors, including farmers and nascent food processors, through these transitions.

BIBLIOGRAPHY

FAOSTAT Database. *China Country Profile*. *http://faostat.fao.org* (accessed August 1, 2012).

FAOSTAT Database. *Food Balance Sheets*. *http://faostat.fao.org* (accessed August 1, 2012).

FAOSTAT Database. *India Country Profile*. *http://faostat.fao.org* (accessed August 1, 2012).

FAOSTAT Database. *United States of America Country Profile*. *http://faostat.fao.org* (accessed August 1, 2012).

FAOSTAT Database. *Value of agricultural production*. *http://faostat.fao.org* (accessed August 1, 2012).

Global Trade Information Services (GTIS). Global Trade Atlas database. *http://www.gtis.com/gta/usitc/* (accessed August 1, 2012).

Hazell, Peter B.R. "The Asian Green Revolution." IFPRI (International Food Policy Research Institute) Discussion Paper 00911, November 2009.

Narayanan, B., and T. Walmsley (eds.). *Global Trade, Assistance, and Production: The GTAP 7 Data Base*. W. Lafayette, IN: Center for Global Trade Analysis, Purdue University, 2008.

U.S. Department of Agriculture (USDA). Foreign Agriculture Service (FAS). Production, Supply, and Distribution (PSD) Database. *http://www.fas.usda.gov/psdonline* (accessed August 1, 2012).

U.S. International Trade Commission (USITC). *China's Agricultural Trade: Competitive Conditions and Effects on U.S. Exports*. USITC Publication 4219. Washington, DC: USITC, March 2011. *http://www.usitc.gov/publications/332/pub4107.pdf.*

U.S. International Trade Commission (USITC). *India: Effects of Tariffs and Nontariff Measures on U.S. Agricultural Exports*. USITC Publication 4107. Washington, DC: USITC, November 2009. *http://www.usitc.gov/publications/332/pub4107.pdf.*

U.S. Trade Representative (USTR). *2010 Report on Sanitary and Phytosanitary Measures*. Washington, DC: USTR, March 31, 2010. *http://www.ustr.gov/sites/default/files/SPS%20Report%20Final(2).pdf.*

World Bank. World Development Indicators database. *http://databank.worldbank.org* (accessed August 1, 2012).

World Trade Organization (WTO). *World Tariff Profiles 2011*. Geneva, Switzerland: WTO, 2011. *http://www.wto.org/english/res_e/booksp_e/tariff_profiles11_e.pdf.*

World Trade Organization (WTO) Secretariat. "Data Day at the WTO: Trade and Market Access Data for Policy Makers," May 18-19, 2009. *http://www.wto.org/english/res_e/statis_e/data_day_may09_e/brochure_dataday_may09_e.pdf.*