
China's Interests and Their Foundation in Reform

China is immersed in economic transformation, and its interests in international agricultural trade are evolving rapidly. By managing its way through the costs of adjustment toward an economic structure that reflects its comparative advantage in industry—foremost, that which is labor-intensive—China has claimed the sobriquet of the “world’s factory” in little more than two decades of reform.

The conditions of China’s accession to the World Trade Organization underscore the role of domestic market mechanisms and international competition in industry and manufacturing. However, many observers believe that China’s confidence in industrial-sector liberalization is offset by insecurity in the agricultural sector and corresponding protectionism—or at least foot-dragging—on further agricultural opening.

Evidence suggests that this is not generally the case, despite residual distortions and barriers and some ongoing disputes. Agricultural-sector adjustment is well under way in China and will likely continue, as did the industrial-sector adjustment in the past, despite the costs and challenges. Agricultural adjustment is being driven not simply by command and control allocation of capital and labor, but by investment and by breakthroughs in research and development and in marketing. Therefore, China’s agricultural transformation has both depth and breadth. China’s accession to the WTO, seen earlier by some to portend a catastrophe for Chinese farmers, in fact will enhance their welfare in the aggregate. China’s leadership is fully behind this transformation. Document No. 1 issued in 2004 by the Central Committee of the Communist Party of China (CCCCP), effectively the highest power in the nation, supports farmers’ rights to take decisions that are in their own

interest, such as cultivating those crops that they believe will provide them the highest possible standard of living.

Many trade negotiators from wealthy countries who have been involved in talks since the 2003 Cancún ministerial—which assessed progress under the WTO’s Doha Round of multilateral trade talks—may consider analysis of the reforms and trends that affect China’s 250 million farming households as irrelevant to their concerns. But this view is misguided. China’s growing comparative advantage in important, high value-added, and tradable agricultural products, its increasing willingness to import large volumes of land-intensive commodities, and its progressive WTO commitments in agriculture give reason to believe that China will be pulling other nations along rather than holding them back in the years ahead. China is expected to account for nearly 20 percent of marginal world growth in agricultural production and up to 25 percent of consumption in the near future, largely as a function of overall economic growth driven by the nation’s industrial development and urbanization. Each of the major agricultural interest “camps” in the WTO—the United States, the European Union, and the Cairns Group—is quietly but urgently courting China to side with its point of view. The position China eventually takes on world agricultural trade will be one of the most significant new weights in the slow-moving calculus of WTO talks on agriculture.

This chapter sets out the context of China’s evolving agricultural interests as they pertain to the international economy. The analysis first reviews the extent of past policy reform and its impact on China’s agriculture sector. From this baseline, the present state of reforms and adjustments is assessed in light of China’s obligations as a result of joining the WTO. Finally, the chapter looks to where China’s agricultural policy based on its interests will likely take it in the WTO Doha Round talks.

Chinese Reforms Before Joining the WTO

From the start of the reform process in 1979 to the eve of WTO accession in late 2001, China introduced profound changes to its agricultural sector. It is important to recall that there were broader economic reforms over this period as well. Deng Xiaoping’s reform era began with agricultural initiatives, but absolute gains in farming were overshadowed by even larger relative gains in industry and services. From 1980 to 2000, agriculture fell from 30 to 16 percent of China’s GDP, 70 to 50 percent of employment, and 50 to 10 percent of exports.

China’s reforms have touched almost every aspect of the economy and society. In the early years, reformers encouraged local leaders in rural areas to start township- and village-run enterprises to fill the gap between the supply of and demand for consumer goods. The rural reforms were

quickly followed by policies that encouraged the first reforms of the nation's state-owned enterprises. Top leaders partially liberalized the banking and fiscal systems as well as monetary policy. Planning gave way to markets, gradually at first and then with increasing depth and intensity. Output markets for consumer goods developed initially, then those for producer goods and machinery, and finally for inputs and other goods and services such as housing, banking services, and insurance. Gradually during the 1980s and 1990s—and often without benefit of a clear model—China's leaders systematically liberalized to some degree nearly every dimension of the economy.

Selective and gradual but steady external opening also played a key role in reform, with foreign trade expanding more rapidly than GDP. Annual foreign trade growth rates reached nearly 15 percent in the 1980s and the early 1990s. Even during the Asian financial crisis, foreign trade grew at nearly 10 percent annually, and in 2000 and 2001 the average rate reached 19 percent.¹ In 2003 and 2004, imports and exports were growing at 30 to 40 percent annually.

A number of policy initiatives drove this external boom (Lardy 2002). Leaders allowed the entry of thousands of foreign trade companies and reduced the dominance of state trading. Exchange rate policies, currency markets, and convertibility regulations were reformed. With tariff reductions, China shifted from being one of the most protected economies (with nominal protection rates reaching nearly 100 percent) to one of the most open (with rates of just 15.3 percent in 2001).² Tax rebates, duty-free importation in bonded export processing zones, and regulations to encourage exports all played important roles in Chinese policy. Most tellingly, China's trade-to-GDP ratio increased from less than 13 percent in 1980 to 45 percent in 2001 (NBS 2002).

Agricultural Growth, Structural Change, and Reform Policies

While the overall effect of reform favored growth of the industrial sector, Chinese agriculture did well over the reform period in absolute terms. In trade, the total value of China's primary-goods trade (mainly agriculture) increased from \$16.1 billion in 1980 to \$72.1 billion in 2001, an annual growth rate of 7.4 percent (NBS 2002). The nation's agricultural GDP during this period rose 4.6 percent annually, from RMB513 billion (in 2001 prices) in 1980 to RMB1.5 trillion in 2001 (or \$177 billion).

1. Although the growth rate of China's agricultural exports declined during this period, so did those of all other Asian countries. Most observers attribute the decline to depressed world commodity markets and the general slowdown of the world economy (ADB 2002).

2. See Lardy (2002, 65). Ianchovichina and Martin (forthcoming) cite nominal protection rates as high as 21 percent, and the Ministry of Agriculture has reported a 17 percent rate for agricultural products.

Productivity also rose rapidly during the reform period. McMillan, Whalley, and Zhu (1989) calculate that productivity grew by nearly 7 percent annually from 1978 to 1984. Despite concerns about the slowdown in total factor productivity (TFP) growth in the late 1980s (Wen 1993), China's productivity for major staple crops increased by more than 2 percent annually over the entire reform era, a growth rate considered healthy by international standards (Jin et al. 2002; Fan and Pardey 1997). The rise in productivity contributed to the 5 percent average annual increase in real per capita rural incomes during the 1980s and 1990s. The sharp rise in agricultural output, productivity, and income largely account for the oft-repeated World Bank finding that China has lifted more than 250 million people above the poverty line over the past two decades.

The areas of domestic agricultural reform most relevant to these achievements were institutional reforms and incentive policies, pricing and marketing policies, investment policies (especially for R&D), and trade policy reforms. The section that follows summarizes key developments in each of these areas before examining their effect on the economy.

Institutional Reform to Restore Incentives

Deng Xiaoping began agricultural policy reform with institutional reforms to restore incentives to farmers. These same types of reforms would soon play a key role in transforming the nation's overall economy. Foremost was the Household Responsibility System (HRS) initiated in 1979 and the process of decollectivization that dismantled communes and contracted land to households based on the size of the household's labor force. Under the HRS reforms, individual farmers could make crop choices and retain additional income from their increased effort, while land ownership remained collective. By the time HRS reforms had been completed in 1984, nearly every household in rural China had a piece of land.³

Agricultural output and yields grew as a direct result of decollectivization and there were improvements in food security and poverty alleviation. The policy-induced rights given to farmers to retain income and control decisions on crop choices contributed significantly to growth in agricultural production and productivity in the early 1980s (Lin 1992, Huang and Rozelle 1996). However, policy on land rights has been complicated and variable (Brandt et al. 2002). Although local leaders were supposed to have given farmers land for 15 years in the early 1980s and for 30 years starting in the late 1990s, collective land ownership instead often resulted in reallocation of village land. As a result, China passed the

3. Cultivated farm size, however, was only 0.6 hectares on average. Due to regional variations in land endowments, household farm size ranged from more than one hectare in the northeast and nearly one hectare in the north to about half a hectare in the southwest and 0.2 to 0.3 hectares in the south. Such a highly fragmented scale has led to inefficiencies.

2003 Rural Land Contract Law to clarify rights for the transfer and exchange of land and to permit the inheritance of land rights during the contracted period.

The concern of policymakers today is to facilitate access to sufficient additional land and income so that farming can remain economically viable. In other words, the government is seeking to define the mix of government fiat and market forces that will rationalize agricultural market structures and provide farmers access to sufficient resources. Increasingly, land is rented among farmers even though formal legal structures for doing so are underdeveloped (Deininger, Jin, and Rozelle 2004).⁴

Beyond decollectivization and farm restructuring, central planners in the late 1970s began to allow localities to make more of their own production decisions (Lardy 1983, Sicular 1988a). Production plans downplayed the importance of targets for sown areas, and local producers were given more latitude in making their own production and marketing plans. Instead of specifying the type of crops in terms of sown area and even the technology to be used, planners began to give regional authorities more control. In addition, mandatory delivery quotas were reduced, although almost all sales, both mandatory and voluntary, were still made to the state.

Even though they began later than the Household Responsibility System, decollectivization, decentralization of planning policies, and changes in rural employment opportunities also affected agriculture. By the mid-1980s, reformers had mostly liberalized off-farm and on-farm labor market rules (Perkins 1994). The flow of rural labor off the farm and into the nonfarm rural labor pool began almost immediately, rising from less than 30 million in the early 1980s to more than 200 million by 2000 (deBrauw, Huang, and Rozelle 2002). By 1984, policymakers had launched fiscal reforms in towns and villages that encouraged entrepreneurs to invest in family-run and larger-scale enterprises in the rural sector (Oi 1999). Millions of household enterprises emerged during the 1980s as a result (Rozelle et al. 2000). Township and village enterprises appeared and quickly boomed in number, transforming rural China. The rural industrial sector became the engine of employment growth during the 1980s. In the 1990s, many of these township and village enterprises converted into private enterprises (Li and Rozelle 2003). Though their recent overall performance has slipped both in number and employment, these enterprises have already had a dramatic impact on the rural economy. The emergence of a real nonfarm economy in rural China raised the opportunity cost of staying on the farm, and encouraged remaining farmers to focus on higher returns.

4. Deininger, Jin, and Rozelle (2004) show that rental transactions are leading to larger farm size, which should help China's farmers compete better in world markets.

Pricing and Marketing Policies for Commodities and Inputs

The key change to agricultural commerce in the early 1980s in China centered on increasing the purchase prices of crops (Sicular 1988b). While it increased production and profits, the decision to raise prices was *not* a move to liberalize markets per se. Ministry of Commerce planners administratively made the price changes, which were then executed by a national network of grain procurement stations acting under the direction of the State Grain Bureau. China's leadership in the early 1980s had little intention of letting the market play anything but a minor and supplemental guidance role.⁵

Beyond the administrative price rises, there were limited policy efforts in the early 1980s to free up prices and reduce marketing restrictions. Farmers were given more discretion to produce and market crops in 10 planning categories, such as vegetables, fruits, and coarse grains, and by 1984 the state tightly controlled only 12 commodities. However, those controlled commodities included rice, wheat, maize, soybeans, cotton, sugar, and several other cash crops that accounted for more than 95 percent of sown area (Sicular 1988b). In policy and practice, planners still directly influenced the output and marketing of almost all sown area. Although free markets were approved in 1979, restrictions on the distance over which trade took place remained through 1984.⁶ Markets did not start to appear in urban settings until 1982 and 1983.

Although the marketing reforms were implemented gradually, once they took off, market activity exploded. In urban areas there were only 2,000 markets in 1980, rising to 6,000 by 1984 (deBrauw, Huang, and Rozelle 2002).⁷ But after 1985, the number of newly opened markets accelerated substantially and the pace of marketing reforms quickened. Changes in the procurement system, further liberalization of commodity trade, moves to commercialize the state grain trading system, and calls for the expansion of markets in both rural and urban areas also contributed to the surge in market-oriented activity (Sicular 1995). Whereas in 1980 there

5. In contrast to the former Soviet bloc nations of Eastern Europe and the former Soviet Union, China did not dismantle the planned economy in the initial stages of reform in favor of liberalized markets (Rozelle and Swinner, forthcoming). Sicular (1988a; 1988b; 1995), Perkins (1994), and Lin (1992) all discuss the early intentions of the Chinese reformers. Lardy (1983) found a greater role of market forces, if not a formal intention to marketize, but the fact remains that there was little reform of markets at this stage relative to later.

6. Sicular (1988b) and Skinner (1985) point out that the dominant marketing venue at the time was occasional local rural markets, so these distance restrictions had limited importance.

7. In Beijing in the early 1980s, there were only about 50 markets transacting around RMB1 million (about \$500,000 in 1980 dollars) of commerce per market per year. Each market would have had to serve, on average, about 200,000 Beijing residents, each transacting only RMB5 (about \$2) of business for the entire year.

were only 241,000 private and semiprivate trading enterprises registered with the State Markets Bureau, by 1990 there were more than 5.2 million (deBrauw, Huang, and Rozelle 2000). During the same period, the per capita volume of commercial transactions in Beijing food markets rose almost 200 times over. By 1990, private traders handled more than 30 percent of China's traded grain, and more than half of the rest of the country's marketed grain was bought and sold by commercialized state grain trading companies, many of which had begun to behave as private traders (Rozelle et al. 2000).⁸

The story is similar for input markets (Stone 1988; Ye and Rozelle 1994). During the prereform era, the state distributed all key inputs such as chemical fertilizer through a government-controlled network of agricultural input supply stations. At a time when many inputs in most regions were scarce, local officials were issued coupons that gave communes the right to purchase at least part of the inputs they needed.

In the initial years of reform that involved decollectivization, leaders did virtually nothing to limit the role of the state in input allocation. Indeed, the state restricted private sales of nitrogen fertilizer and controlled all interprovincial chemical fertilizer distribution. This situation continued even after the start of liberalization in both output and input markets in 1985, with only start-and-stop efforts at reform (Sicular 1995). For example, fertilizer market liberalization in 1986–87 led to perceived instability in the rural economy in 1988 and a sharp retrenchment (Ye and Rozelle 1994). Officials only decontrolled fertilizer marketing and private trade again in the early 1990s,⁹ and it was not until the mid-1990s that private traders sold more than 50 percent of fertilizer. By 2000, however, a survey of 1,200 households in six provinces found the private sector exclusively handling almost all fertilizer sales.

The evolution of grain markets is a similar story. Despite failed attempts to commercialize the grain system in the early 1990s and severe (and unsuccessful) retrenchment in 2000 and 2002, the State Grain Bureau was beginning to commercialize its remaining grain trading divisions by 2001. As a consequence, grain trade today is dominated by tens of thousands of private traders. According to a survey by Xie (2002), there were more than 2,000 private rice wholesalers trading in Beijing in 2001, more than 3,000 in Shanghai, and more than 5,000 in Guangzhou. Nearly all rice moves through their hands, completely bypassing the state. China's markets have become more integrated, transaction costs have fallen, and there

8. About 55 percent of grain production, however, is directly consumed by farmers rather than sold to markets.

9. Lin, Cai, and Li (1996) argue that leaders were mainly afraid of potential disruption if the institutions through which leaders controlled such items as fodder, grain, and fertilizer were eliminated before institutions were in place to support more efficient market exchange.

are far fewer unexploited arbitrage opportunities (Park et al. 2002; Huang, Rozelle, and Chang 2003).

Investment in Technology

The achievements and size of China's current agricultural research system are ample evidence of its track record on agricultural technology and its commitment to research. Historically, China has had the largest and one of the most successful agricultural research systems in the developing world (Stone 1988). More than 100,000 scientists are engaged in developing new crop varieties and other agricultural research, by far the largest system in the world in terms of research staff. China's scientists have made a number of historic breakthroughs, including the development of semidwarf rice varieties in the 1950s, hybrid rice in the 1970s, and thousands of varieties of high-yield, pest-resistant, and high-quality grain and cash crop cultivars in the 1980s and 1990s. These innovations drove the nation's growth in yields and total factor productivity during the past two decades (Huang and Rozelle 1996; Fan and Pardey 1997).

Historically, much of China's research focused on grain and other staple crops (Fan and Pardey 1992). Through the 1980s and even into the early 1990s, most of the nation's research funds went to rice, wheat, and maize. Agricultural research administrators supported national goals by focusing funds and scientific resources on such staples. Even after the radical self-reliance policies of the Socialist Period (1950–78) were phased out, food self-sufficiency remained high on the list of priorities. Horticulture and livestock—higher value-added products more suited to a labor-intensive economy like China—played only a small role in China's agricultural development strategy.

Economic growth, the rise of markets, and the opening up of the economy have since resulted in a sharp shift in government policy, with producers making more of their own decisions. The research system evolved by the mid-1980s toward better supporting horticulturists and consumers. These reforms attempted to increase research productivity by shifting funds to competitive grants for research explicitly tied to economic development (as opposed to food security). Applied research institutes were encouraged to support themselves by commercializing their technology.

By the mid-1990s, top research administrators were allocating more funds to nontraditional crops. Commercialization policies allowed researchers to work on a broader array of crops that the market demanded, including horticulture. Some groups, such as the Horticulture Research Institute in the Chinese Academy of Agricultural Sciences, became extremely successful. Private and quasi-private seed and research firms emerged in the late 1990s.

Despite the largest and most successful agricultural research system in the developing world, however, China's research in modern plant

biotechnology did not begin until the mid-1980s (Pray, Huang, and Rozelle 1997). Scientists now apply advanced biotechnology tools to plant science, regularly working on the synthesis, isolation, and cloning of new genes and the transformation of plants with these genes. With the initiation of a research program on rice functional genomics in 1997, Chinese researchers began using Ac/Ds transposons and T-DNA insertion methods to create rice mutagenesis pools (Huang, Pray et al. 2002). Biotechnologists also have initiated functional genomics research for Arabidopsis, a model plant specimen used as a research platform for plant genomics. A survey of China's main plant biotechnology labs reported in Huang, Pray et al. (2002) identified over 50 different plant species and more than 120 functional genes that scientists are using for the genetic engineering of plants. Such advances clearly show China's capability to be a global leader in the production of genetically modified plants. In the summer of 2003, Chinese officials overruled antiforeign domestic interests and started encouraging foreign enterprises to invest in plant biotechnology projects.

Despite these advances, it is important to note that China's biotech spending has been relatively small in comparison with that of the developed world. China's total of between \$2 billion and \$3 billion is less than 5 percent of total expenditures in industrialized countries (Byerlee and Fischer 2000). Such an assessment changes, however, when comparing China to the *public* research spending of other countries, and when considering its future plans. Globally, the public sector accounts for about 45 percent of research expenditures on plant biotechnology. China currently accounts for more than 10 percent of this amount, but in 2001 China's officials announced plans to increase research budgets for plant biotechnology by 400 percent over the next five years. If this plan is carried out, China could account for nearly one-third of the world's public spending on plant biotechnology. As of early 2003, China's Ministry of Science and Technology announced that it had exceeded its funding plans.

Agricultural Trade Policy Reforms

Prior to China's agricultural reforms, the giant state-owned Chinese National Cereals, Oils and Foodstuffs Import & Export Corporation (COFCO, originally named CEROILS) monopolized the foreign trade of most agricultural products. China implemented measures to reform foreign trade shortly after overall economic reforms began. The highly centralized and monopolized foreign trade system was partially decentralized by establishing more new trade ports and by granting more producers the right to import and export directly. More than 2,200 foreign trade corporations were established between 1979 and 1987. In 1985, mandatory planning of the foreign trade system was replaced by a more flexible "guidance plan" that included market adjustments to address trade trends. Quotas and licenses were introduced to replace the need for direct government

approvals or plans for agricultural imports and exports. Other new policies included export tax rebates and the first phase of the foreign trade contract responsibility system (1987), which provided profit incentives to trade more efficiently. By the early 1990s, the government had extended that system nationwide.

Starting in 1979, the right to retain a share of foreign exchange earnings had been gradually expanded so that traders could apply the earnings to imports on their own accounts. Profit-sharing arrangements were also offered to managers of the agricultural firms involved in trade. Under the planned foreign trade regime, foreign trade corporations had not been responsible for profits or losses incurred from trade. The government took all profits and covered all losses, and provided all working capital for foreign trade corporations as well. Because of the distorted domestic pricing system, implicit export subsidies were a common phenomenon due to mispricing. China fixed its export subsidy for 1988–90 to a level equal to about 4 percent of the total export value in 1987 in order to curb the trend. In 1991, the government decided to phase out export subsidies to all foreign trade corporations and make them completely responsible for profits and losses.

To increase the competitiveness of China's exports, China applied export tax rebates to 17 commodities on an experimental basis starting in 1983. This policy was then extended to cover almost all exports. After export, foreign trade corporations were refunded all product taxes, value-added taxes (after this tax was instituted), and business or special consumption taxes.

China's government began aggressively reducing tariffs long before the country's entry into the WTO. Although historically the sector had not always enjoyed such protection, tariff levels for many products in the 1980s were above 100 percent, primarily in response to the opening of the external economy, the concomitant exchange rate adjustments, and the sharp planned price rises in the 1980s. Since then, however, there has been a slow and steady reduction in protection for agriculture.¹⁰ By 1991, China's average import tariff rate had fallen, although at 47.2 percent it remained one of the highest average protection rates in the world (World Bank 1997). Between 1990 and 1996, the average import tariff rate was reduced to 39.6 percent, and in April 1996 China reduced its rates for more than 4,900 items, which reduced the simple average tariff rate from 35.9 percent to 23 percent. In October 1997, import tariff rates were reduced for another 4,800 items, bringing down the country's simple

10. While this trend is unique to China, it does not rule out the nation's again turning to such protectionism some time in the future. China's WTO commitment limits its scope for legally protecting agriculture, but as the country develops it could shift from agricultural taxation to subsidization, a form of protectionism that some other Asian and developing nations have adopted.

average tariff rate to 17 percent. The rate for agricultural products followed this general trend and reached 23.6 percent in 1997.

As the 1990s progressed, China also took actions to eliminate or convert into tariffs myriad import quotas and licensing regulations used to control foreign trade. Early in the reform period, only officially designated state traders had been able to import soybeans and soybean oil, but by the mid-1990s a large number of companies could import under license. Licensing requirements were dropped in 2000 and any foreign trade company could import soybeans, although this did not exempt the shipments from possible quarantine inspections that have continued to periodically hold up shipments even since China joined the WTO. In general, products subject to quotas, licensing, and other import control measures accounted in 1998 for less than 5 percent of the total import tariff lines and 8.45 percent of the value of imports (Lardy 2002, 39). This is largely the same today, with tariff rate quotas (TRQs) largely replacing the informal quotas from the pre-WTO days (see box 3.1).

Results of Reform Policies

While past reform efforts show the extent to which China's interests are evolving, the *results* of these reforms are even more illuminating. This section looks at the determinants of agricultural output and productivity growth, structural adjustment (both between sectors and within agriculture), market integration, and trade.

Output and Productivity Growth

Growth in China's agricultural economy has been remarkable over the entire two decades of reform: 4.6 percent growth in annual output (real gross value of agricultural output over 1980–2001) and more than 2 percent growth in productivity (table 3.1). China's agricultural reforms and new technology policies contributed significantly to both of these increases. Though gains were greatest in the earliest years of reform, average annual agricultural output growth was nearly 5 percent and productivity more than 1.5 percent from 1985 to 2000—growth rates that would be considered high in most developing countries.

Empirical studies have quantified the simultaneous contribution of a number of factors to agricultural output growth during the reform period. The earliest studies (McMillan, Whalley, and Zhu 1989; Fan 1991; Lin 1992) found that most of the initial rise in productivity was a result of institutional innovations—particularly the Household Responsibility System (HRS)—that gave individual farmers rights to manage their crops and incomes.

Huang and Rozelle (1996) also attribute a significant part of growth in the early reform period to HRS, but show that technological change was

Box 3.1 Shifting priorities on food security

With such a large population and limited resource base, China has always placed a high priority on food security. These efforts have brought remarkable progress. On a per capita basis, China's population currently consumes an average of more than 3,000 calories per day, 14 percent more than the average developing country and 8 percent more than the world average. China also produces more grain than it consumes. Fueled by strong productivity growth, China's supply has risen at a rate that exceeds the increase in domestic demand. In fact, since 1983 China has been a modest net food exporter, a significant achievement given the concern with sufficiency (Huang and Chen 1999). Looking to the future, even if the nation were to completely liberalize all trade (which is beyond its current trade commitments), China's own economists forecast that by 2020 major food grains, rice, and wheat would still be produced almost completely in China and, in the case of rice, exported, according to Huang and Chen (1999). Trading freely, China would still be a net importer in 2020 of certain feed grains (e.g., maize), oil seed crops (e.g., soybeans), and cash crops (e.g., sugar), but it is predicted that production and export by then of specialty crops such as horticulture, livestock, and aquatic products will grow faster and, on average, China will maintain a net agricultural export balance.

Successes in the food economy appear to be encouraging China to shift its policy priorities. Given the improvement in agricultural productivity and the government's emphasis on raising rural incomes, China's leaders show signs of moving toward a fundamental policy shift on national grain self-sufficiency. China is in the midst of a debate that the proponents of a new food security policy appear to be winning. Document No. 1 issued in 2004 by the Central Committee of the Communist Party of China (CCCCP) encouraged farmers to continue activities—such as planting those crops that they believe will give them the highest returns—that are facilitating China's structural change.

This debate has gone back and forth for a long time. However, those in favor of moving away from the "grain-first" mentality that has dominated agricultural policy for many decades believe that China no longer needs to pursue policies that promote the cultivation of grain to the exclusion of higher-value alternative crops. This faction is pushing policies—some of them recently enacted—that promote

(box 3.1 continues next page)

just as important. Since completion of the HRS in 1984, the primary engine of agricultural growth has been technological change (Huang and Rozelle 1996; Fan 1997; Fan and Pardey 1997). Price policy, other investments, and education also have been shown to influence the growth of both grain and cash crops.

Although there was concern about a slowdown in the growth of TFP and rural income growth in the late 1980s (Wen 1993), the growth rates of both stayed relatively high in the early 1990s, especially in comparison with

Box 3.1 *(continued)*

crop diversification. This marks a continuation of reformist policies based on the principle that decisions to shift crops should be made by households themselves in response to signals from the market.

Border policies such as artificially restricting grain imports are also perceived as less critical for national food security. Protectionist trade measures not only create international tensions but also cause inefficiencies and slow government efforts to promote structural adjustment. "Grain-first" trade policies also reduce exports of labor-intensive and higher-valued products, since other countries will keep their borders more closed if they perceive that China is not allowing imports of more land-intensive commodities. And, of course, if at some future time China needs more grain, the land is still there and grain can be grown at any time.

The new policy approach also focuses on redefining food security in China. Instead of viewing national food security in the traditional sense, leaders are shifting their attention to measures that promote household food security for China's poor. Tens of millions of people still live below the poverty line, and most of these poor families suffer from poor nutrition and lack proper health care and education. Proponents of the new approach view the interests of China's farming households as best served by policies that improve livelihoods not through isolation from domestic and international competition but rather through improved competitiveness, better investment, and more liberal measures that facilitate structural change.

While China is moving in the direction of economic rationalization on food security, the debate is ongoing, and entrenched grain market interests are holding out for the old mindset. In fact, movements in grain prices in late 2003 and early 2004 prompted renewed calls from some Chinese bureaucrats and academics to revitalize food security as traditionally practiced. For example, a spokesman from the National Grains and Oils Information Center recently called for China to start using fiscal funding up to the 8.5 percent of the aggregate measure of support allowed by China's WTO agreement in order to subsidize the price of grain to increase production. These calls are grounded in traditional thinking on food self-sufficiency, but this time around they have been met by other voices calling for China not to take such action and to instead invest in programs to increase agricultural productivity.

other developing nations (Jin et al. 2002). The determinants of TFP and rural incomes are similar to those that determined the growth of agricultural output. Investment in agricultural R&D contributed significantly to the productivity of rice, wheat, and maize (Jin et al. 2002), with more than 60 percent of China's TFP rise and almost all of the growth in rice yields coming from new technologies (Hu et al. 2000; Huang and Rozelle 1996). Investments in irrigation raised cropping incomes of the poor by up to 50 percent in northern China's maize and wheat areas (Huang, Rozelle et al. 2002).

Table 3.1 China's annual growth rates, 1970–2000 (percent)

	Prereform period, 1970–78	Reform period		
		1979–84	1985–95	1996–2000
Overall GDP	4.9	8.8	9.7	8.2
Agriculture	2.7	7.1	4.0	3.4
Industry	6.8	8.2	12.8	9.6
Services	n.a.	11.6	9.7	8.2
Foreign trade	20.5	14.3	15.2	9.8
Import	21.7	12.7	13.4	9.5
Export	19.4	15.9	17.2	10.0
Output of rural enterprises	n.a.	12.3	24.1	14.0
Population	1.8	1.4	1.4	0.9
Per capita GDP	3.1	7.1	8.3	7.1

n.a. = not available

Note: GDP figure for 1970–78 is the growth rate of national income in real terms. Growth rates are computed using the regression method.

Source: NBS, *China Statistical Yearbook*, various years.

Structural Adjustment

Beyond growth, China's reform policies also shifted the structure of the economy in general and that of the agricultural economy in particular. The share of agriculture in GDP declined significantly from 30 percent in 1980 to 16 percent in 2000. While agriculture made critical contributions to employment, capital accumulation, urban welfare, foreign exchange earnings, and poverty alleviation, industry grew even faster. Agriculture employed 81 percent of the labor force in 1970, but 50 percent in 2000. Sharp structural adjustment in the nature of output, trade, and employment as a result of policy reform helped China shift from a rural to an urban society.

The mix of crops also changed as a result of reform, generally toward commodities in which China's producers hold a comparative advantage. Between 1978 and 1984, grain production, which is somewhat more land-intensive than other crops, increased by 4.7 percent annually. While that is impressive, the record of more labor-intensive crops is even better: the output of fruit rose by 7.2 percent, livestock by 9.1 percent, and aquatic products by 8 percent.

The structure of agriculture continued to change following the early reforms. As the efficiency boost from the shift to the HRS waned in the mid-1980s, the growth rate of the food and agricultural sectors began to decelerate. The declining trend in the rate of growth was most pronounced for grain crops. However, production levels for rice, other grains, and cash crops, while dropping below the growth rate during the prereform and early reform periods, has continued to expand since 1985.

Overall economic growth boosted demand in China for meats, fruits, and other nonstaple foods, which stimulated sharp structural shifts within the agricultural sector (Huang and Bouis 1996). Changes in sown area continued throughout the 1990s. Sown area for grain continued to decline by nearly 5 percent between 1990 and 2001 (NBS 2002). This is because, as markets emerged and matured during the 1990s, farmers reduced their area sown in traditional grain and fiber crops and began to cultivate fruits and vegetables. Fruit area nearly doubled, expanding by 4 million hectares, while vegetable producers added more than 8 million hectares. This expansion of fruits and vegetables virtually added a “new California” every two to three years in China between 1990 and 2002.

The transformation of the agricultural sector occurred even faster outside cropping. For example, the share of livestock output value in total agricultural output more than doubled from 14 percent to 30 percent between 1970 and 2000. Aquatic products rose at an even more rapid rate. The steady rise in the shares of livestock and aquaculture contributed to one of the most significant signs of structural change in the agricultural sector: During the 1980s and 1990s the share of cropping in total agricultural output fell from 82 to 56 percent.

Several studies have found that farmers in different regions of China are shifting into crops in which they have a comparative advantage. Rozelle et al. (1997) found that during the late 1980s and early 1990s, farmers with yield advantages in certain crops expanded their acreage in those crops. Park, Cai, and Rozelle (1994) and Park et al. (1997) reported even more compelling findings. As the relative productivity of crops shifted among regions, farmers in the 1990s shifted into those crops in which they were gaining an increasing advantage. The rise in marketed surplus (Nyberg and Rozelle 1999) and the increase in households moving out of subsistence agriculture during the period suggests that households are specializing in crops that they can produce more productively (deBrauw et al. 2002)

Rise of Domestic Markets

China’s markets are increasingly integrated as a result of reform, as shown in research summarized in table 3.2 (Huang, Rozelle, and Chang 2003). In the middle of the reform era (1989–95), prices moved together in only 20 to 25 percent of markets, while during the late 1990s China’s markets matured considerably (especially for maize and soybeans) and are today remarkably integrated. In the case of maize, prices in one market moved at the same time as in another in 89 percent of cases over 1996–2000, an increase from only 28 percent of the time over 1989–95. The number of market pairs for soybeans and japonica and indica rice show similar increases. A more recent study of maize prices in China’s major producer and consumer markets found that prices moved together among all markets in 100 percent of the periods (Rozelle 2003).

Table 3.2 Percent of market pairs in rural China, 1989–95 and 1996–2000

Commodity	1989–95	1996–2000
Maize	28	89
Soybeans	28	68
Rice, Yellow River Valley (mostly japonica rice)	25	60
Rice, Yangtze Valley and south China (mostly indica rice)	25	47

Note: Measures the percent of market pairs that test positive for integration based on the Dickey-Fuller Test. Results for the two periods are from the same data set. Rice results for 1989–95 are for the entire country.

Sources: Results for 1989–95 for maize and rice are from Park et al. (2002) and for soybeans from Huang, Rozelle, and Chang (forthcoming). Results for 1996–2000 are from the authors.

In sum, the analysis shows the extent of integration of China's agricultural markets. In many cases, the markets in which prices moved together were separated by more than 1,000 kilometers, and the Huang-Rozelle-Chang study found that prices were usually integrated between markets in the Shaanxi and Guangdong provinces and between those in the Sichuan and southern Jiangsu provinces.

Studies have documented additional evidence of the emergence of well-functioning markets. During the 1990s, transaction costs of moving agricultural commodities from production to consumption areas fell sharply (Park et al. 2002). Price relations between coastal and inland markets exhibited behavior much like that generated by markets in more developed countries (Huang, Rozelle, and Chang 2003). Input markets, therefore, are catching up with commodity markets in terms of integration and price relations.

Changes in Trade

Changes in agricultural output and structure, shifts in domestic and trade policies, and investments have increased the growth of agricultural trade even more than the growth of agricultural output (table 3.3). Agricultural trade (both imports and exports) more than tripled from 1980 to 2001. Exports rose faster than imports, and since the early 1980s China has been a net food exporter (Huang and Chen 1999).

The expansion continued through the 1990s, albeit at a slower rate. After dropping in the mid-1990s, imports rose rapidly between 1998 and 2001. Much of this increase can be traced to rises in soybean and edible oil imports—soybean imports rose from less than 5 million metric tons (MMT) in 1997 to more than 10 MMT in 2001. At the same time, exports

Table 3.3 Structure of China's food and feed trade, 1980–2001
(millions of dollars)

	1980	1985	1990	1995	2000	2001
Exports						
Live animals and meat	745	752	1,221	1,822	1,628	1,976
Dairy products	71	57	55	61	188	192
Fish	380	283	1,370	2,875	3,705	4,231
Grains, oils, and oilseeds	481	1,306	1,237	1,608	2,667	1,835
Horticulture	1,074	1,260	2,293	3,922	4,367	4,931
Sugar	221	79	317	321	173	156
Total	2,972	3,737	6,493	10,609	12,728	13,340
Imports						
Live animals and meat	6	24	68	115	696	659
Dairy products	5	31	81	60	218	219
Fish	13	44	102	609	1,212	1,319
Grains, oils, and oilseeds	2,472	1,065	2,535	6,760	4,163	5,343
Horticulture	104	92	113	259	677	866
Sugar	316	274	390	935	177	376
Total	2,916	1,530	3,289	8,736	7,143	8,782
Net exports						
Live animals and meat	739	728	1,153	1,707	932	1,317
Dairy products	66	26	-26	1	-30	-27
Fish	367	239	1,268	2,266	2,493	2,912
Grains, oils, and oilseeds	-1,991	241	-1,298	-5,152	-1,496	-3,490
Horticulture	970	1,168	2,180	3,663	3,690	4,065
Sugar	-95	-195	-73	-614	-4	-220
Total	56	2,207	3,204	1,873	5,585	4,558

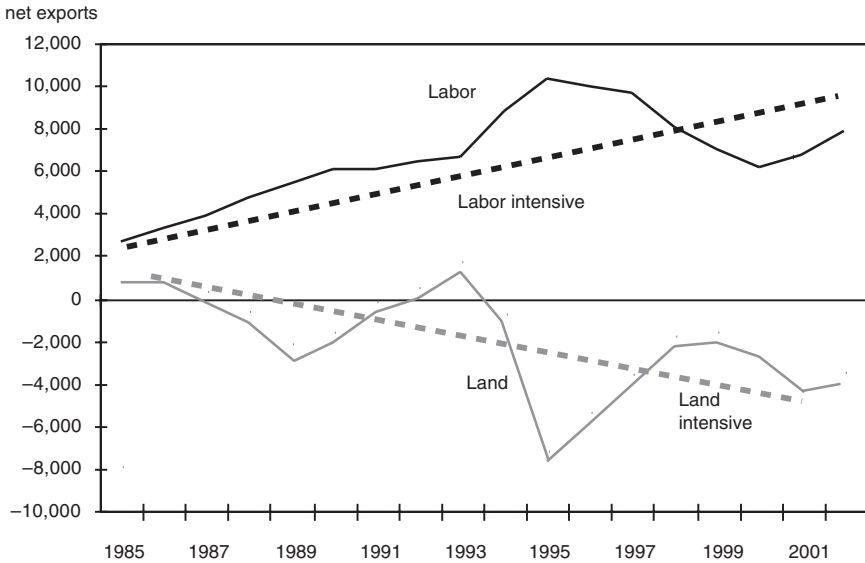
Source: Mathews (2001), based on UN Commodity Trade (COMTRADE) statistical database.

rose steadily, and China was still a net exporter of food in 2001. The rapid growth of food exports slowed after 1995, however, with some key categories declining due to increasing protection against Chinese exports. Maize is a major exception: its export rose significantly in the late 1990s and it ranked as the top crop in terms of agricultural export value in 2001, a ranking that continues today in part due to export subsidies that are inconsistent with China's WTO commitments.

The increased openness to the external economy brought by China's agricultural trade policy reforms has affected trade patterns (Huang and Chen 1999; Huang, Rozelle, and Chang 2003). The share of primary products (including agriculture) in total exports fell from over 50 percent in 1980 to just 10 percent in 2000. Over the same period, the share of food exports in total exports fell from 17 to 5 percent, and that of food imports fell from 15 to 2 percent, indicating that food was not a large share of primary product trade (oil was much larger, especially early on).

Product-specific trade trends also show sharp shifts and suggest that exports and imports are moving consistent with comparative advantages (figure 3.1). In general, net exports of land-intensive bulk commodities

Figure 3.1 Agricultural trade balance by factor intensity, 1985–2002 (millions of US dollars)



Source: NBS, *China Statistical Yearbook*, various years.

such as grains, oilseeds, and sugar crops have fallen.¹¹ During most of the 1990s, grain exports were less than 10 percent of what they had been in the mid-1980s. Instead, by the late 1990s exports of higher-valued and more labor-intensive commodities such as horticulture, animal, and aquaculture products had risen dramatically to make up 70 to 80 percent of food exports (Huang and Chen 1999). The same trends, albeit stop and start, continued between 1998 and 2001.

Changes in trade were seen least in commodities considered to be of strategic importance, including rice, wheat, and maize (Nyberg and Rozelle 1999). Although nominal import tariffs for these products were low, quotas, licensing, and high out-of-quota tariffs were used to restrict their import. For the entire reform period, the nation's single-desk state trading company for grain was COFCO, which managed trade of all within-quota grain during the 1980s and most of the 1990s and managed imports of edible oils until the late 1990s.¹²

11. Or imports have risen, i.e., the trade balance has moved in a negative direction. In 2003, however, Chinese sugar imports fell, reaching a lower percentage of the quota despite stable or slightly lower world prices.

Another policy that did not fully disappear with reform was export subsidization. China used export subsidies in the years prior to joining WTO to increase exports of maize and cotton. Field interviews in 2001 found that maize exporters, especially those in northeast China, received subsidies averaging 34 percent of the export price. One trader said that for each ton of maize that his company exported in 2001, it received back RMB378 (\$46) after it produced an export bill of sale with the export sales price. There is evidence that export subsidies for maize in this region continued at least during the first two years following China's WTO accession. In early 2004, however, China's leaders announced they were phasing out subsidies.

Although trade reforms have had limits and exceptions, and domestic policies and investments almost certainly have had a greater effect than trade policy, increased foreign trade has significantly affected domestic agricultural production and rural welfare (Huang, Rozelle, and Chang 2003). The impact of trade and nontrade domestic policies, however, differs. Domestic reforms and investments have boosted growth in almost all sectors, but their impact on rural welfare primarily has been to increase the availability of food. Because of rising output, there also has been a large, negative price effect that has benefited both rural and urban consumers (particularly the urban poor). Trade has had both positive and negative impacts. According to Huang, Rozelle, and Chang (2003), trade policy reforms have had a powerful impact in terms of structural change, moving the country toward areas of comparative advantage, improving efficiency, and making Chinese agriculture more competitive. Because trade effects are more commodity-specific, they have had sharp regional and crop-specific impacts. Unfortunately, China's poor are more vested in crops on the losing side of this adjustment, and poor farmers in general are less able to switch crops for economic and technological reasons. Therefore, domestic policy to offset these consequences of trade will be even more important in the future than they have been under domestic reforms in the past.

Cautionary Conclusions on Reform

This chapter has presented a decidedly positive picture of China's agricultural reform. That was indeed the intention, as there is substantial evi-

12. The value of imports (food and nonfood) by China's state trading enterprises (STEs)—and COFCO is among the largest such enterprises in the world—likely exceeds that of all other STEs in all current WTO member countries. Over the past decade, COFCO imported as much as 16 percent of the world's traded wheat and has exported as much as 20 percent of the world's maize (Nyberg and Rozelle 1999). Despite measures in China's WTO agreement designed to limit COFCO's influence, it has continued to act as a key agent in the international grain trade for national and provincial grain trading companies, and has maintained preferential access to import quotas.

dence that progress in China's rural economy during the 1980s and 1990s was remarkable and laudable. The experience of other nations in Asia also suggests that when this type of growth begins, it can quickly gather considerable momentum. Rapid growth gives policymakers time and resources to solve many of the problems and barriers that inevitably arise in the face of domestic and external interests.

However, there are still major challenges facing China's rural economy. The antiquated fiscal system is an artifact of socialism; the rural financial system is weak and does not meet financial intermediation needs; and governance is weak. In short, China is still in need of many structural reforms for which there are no blueprints at the ready. As these reforms take shape, there almost certainly will be intermittent dissatisfaction among segments of the rural population and even attempts to challenge the system.

O'Brien and Li (2004) examine how such discontent can lead to protest against local or even higher-level officials—mostly in the form of letters and meetings, but periodically spilling over into protest and even violence. This need not be taken as a sign of rural deterioration. It can also be seen as evidence that people are better able to express themselves. Violence in rural China is still extremely rare. A survey by Song (2004) suggests that most rural dwellers are generally content with current developments, perceive that their livelihoods have improved over the past 10 years, and believe that life in the coming decade will continue to improve.