Changing Patterns of Wheat Production and Consumption in China: Trade Implications [1]

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Abstract

In the 1980s and early 1990s, wheat imports accounted for about four-fifths of China's import of cereals, and imported wheat accounts for about 30 percent of wheat supply. As a result of the many recent developments in Chinese government's policy on wheat production and marketing as well as China's WTO accession negotiations, how the Chinese wheat market will evolve presents an interesting and important area for policy makers and major wheat trading companies both within and outside China. In this paper, we highlight recent changes in China's wheat production and consumption patterns and marketing arrangements. We then, by taking into account of likely government policy scenarios, analyse implications of such changes on wheat market development in China and on wheat trade in the international market.

1. Introduction

Wheat is a major cereal in China, accounting for about 30 percent of China's cereal output. Despite a remarkable growth in wheat production since the late 1970s, domestic supply was still unable to meet the growing demand for wheat. In the 1980s and early 1990s, wheat imports accounted for more than four-fifths of China's import of cereals, and imported wheat accounted for about 30 percent of supply.

There have been some major changes in the Chinese grain market in recent years. The production-oriented policies, which were in response to soaring grain prices during 1994-95,

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have resulted in a significant increase in grain output. After bumper harvests in 1995-96, import of wheat and other cereals declined sharply. In spite of the comfortable grain availability in the country, the government allowed, for the first time, the state procurement prices to be higher than those in the free market and in the international market, resulting in more grains available in the market. As the largest grain producer and consumer in the world, China's choice of grain policies tends to have important implications on the world market as well as on China's domestic market. In this paper, we examine recent changes in China's wheat production and consumption patterns and reforms in the grain marketing arrangements. We then, by taking into considerations of likely government policy scenarios, discuss the implications of such changes on China's wheat trade both within China and in the international market.

In the next section, we describe wheat production and consumption patterns and wheat marketing and trade in China. Section 3 addresses major policy and institutional issues affecting the wheat industry and market. The impacts of likely policy options on future wheat market development are discussed in Section 4. The last section concludes the paper.

2. Patterns of Wheat Production, Consumption and Trade

2.1 Production

China's wheat output has been growing continuously since 1990 (see Table 1). Winter wheat production has shown a strong upward trend. Spring wheat production is on the declining. While the total sown area fluctuates without a clear trend, yield increase is the main contributor to the output increase.

[Table 1 here.]

There was a major drop in wheat output in 1998. In this year, while sown area to spring wheat continued to decrease, sown area to winter wheat continued to increase. The reduction in total output was due to the drop in winter crop yield. There was a severe drought in northern China which affected the yield. In addition, over-stock in government storage and sale price below procurement price made it increasingly difficult for SGCs to purchase all the delivered wheat. This, plus the fact that both procurement and market prices for wheat declined in 1997, might have sent a signal to the farmers and thus led the farmers to reducing their input into the 1998 winter crop. It is expected that total wheat output is to slightly decline in the coming years, primarily due to the reduction in inferior quality wheat production.

In the 1990's, wheat achieved a faster yield improvement than other major cereals. This is partially due to favourable government policies, including higher procurement prices. Yield improvement is more impressive in winter crop, from 3.28 tonnes to 4.27 tonnes per ha (30%). In contrast, spring wheat yield only rose from 2.75 tonnes to 3.04 tonnes per ha (11%). Slow yield improvement in spring wheat is attributed to its inferior quality and thus poor marketability.

Regional distribution of wheat production is relatively stable during 1990-98. Output increased in Yellow River Plain, Huaihe River Plain and Haihe River Plain, where over half of China's wheat output is produced. Those regions with reduced wheat output include Heilongjiang and all northwest provinces, where spring wheat is planted.

2.2 Consumption

There is no strong evidence to indicate that the rising income and urbanisation may result in an increased substitution of wheat for rice, as so happened in Hong Kong, Taiwan, and some other overseas Chinese communities. According to survey data by SSBb (1997), wheat replaced coarse grains in the early stage of reforms in the rural areas. However, per capita consumption of wheat at home has become stable since 1990 (see Figure 1). In the urban areas, per capita consumption in fact has declined. Cross-income group data also failed to reveal any noticeable positive correlation between income and per capita consumption of wheat flour for urban residents (SSBb 1997).

The lack of income-induced changes in the composition of grains consumed at the national level may be partially attributed to the high stability of region-specific grain consumption patterns. Apart from underdeveloped marketing system, especially in the rural areas, regional grain consumption patterns have cultural heritages, which prevent rapid changes of preferences. Consequently, substitution effect between different grains is small. If any substitution as a result of an income increase, it more likely takes a form of shifting towards higher quality varieties and fine processed products, rather than non-conventional cereals.

However, it is noted that income growth does seem to have an impact on demand for wheat-based processed products. SSB data show that per capita consumption of bread, cakes and biscuits by urban consumers is positively related to their incomes. For instance, in 1997, the top 10 percent consumers purchased 1.23 kg of bread and 4.22 kg of cakes and biscuits. This was twice as much as the consumption level of the bottom 10 percent of consumer. The same pattern is found for rural consumers, although the average level of consumption was only about 40 percent of their urban counterparts. However, in terms of quantity, demand for wheat for producing bread, biscuits and cakes is insignificant, being less than 10 percent of total wheat consumption.

According to Li (1999), the present baking need for wheat in China is about 10 million tonnes. In practice, processors often mix certain proportion of ordinary wheat with high quality wheat. The share is about 40 percent high quality wheat as an industrial average. Thus the total demand for baking quality wheat is about 4 million tonnes. Currently, China's output of good quality wheat is about 4 million tonnes, indicating a nominal balance between supply and demand. However, the current marketing arrangements cannot adequately channel such good quality wheat through to processors (All mixed up with ordinary wheat during the marketing process). As a result, the gap had to be met through import. During 1990-95, China's average annual import of wheat amounted to 10 million tonnes, which was sufficiently large to meet the demand.

Good harvests in 1996-97 resulted in low domestic prices. To ensure stable production and producers' income, the government introduced a guaranteed procurement scheme with a state-set floor prices in 1997. In the meantime, import was restricted. Wheat import declined sharply from 1996's 8.2 million tonnes to 1.9 million tonnes in 1997 and 1.5 million tonnes in 1998. This forced processors to use ordinary wheat as substitutes in their production.

2.3 Marketing and Trade

The traditional wheat production and consumption patterns lead to low volume interregional trade within China. At present, the Plains of Yellow River, Huaihe River and Haihe River are

the major wheat producing areas with a surplus while three municipalities and the northeast and the southern coastal provinces have deficits. Since the total surplus is constantly less than total deficit, the gap must be met through import.

Since the early 1990s, China's wheat import fluctuated, so did the sources of import (see Figure 2). Canada has been a major supplier with the USA being the other till 1996. While the export enhancement program helped US to increase its competitiveness over other exporters in the Chinese wheat market, economic and political conflicts between the two countries sometimes disturb the trade pattern. Another notable feature in China's wheat trade in recent years is the increasing share of high quality hard wheat (see Table 2).

[Figure 2 here.]

[Table 2 here.]

Imported wheat is allocated according to government's plan. Regions with consistent deficit, such as the three municipalities and Liaoning and Heilongjiang, are given quotas based on planned needs to ensure supply. All imports must go through the National Cereals, Oil and Foodstuffs Import and Export Corporation, who serves as an agent to negotiate contracts with foreign suppliers. If imported wheat is insufficient, the deficit regions may have to purchase from surplus regions within China.

3. Issues Related to Wheat Market Development

3.1 Government Policy Objectives

How China's wheat market will develop in the future depends critically on policy choice by the government. At present the policy makers have less concern about impacts of rising grain prices on urban consumers since the expenditure share on cereals has already been small (SSBb 1998). Instead, they tend to devote more attention to ensuring appropriate growth of producers' income. With regard to grain trade, foreign exchange is no longer an important constraint in deciding how much to import. Import decisions are increasingly based on perceived needs for meeting diversified demand and for ensuring a desirable price level. National food security concerns, however, still remain to be a major factor that influences policy choices.

3.2 Supply Growth

Ministry of Agriculture (1999) has worked out a plan to rationalise regional distribution of wheat production and optimise the output structure. Special attention will be given to the Plains of Yellow River, Huaihe River and Haihe River, which covers 80 percent of China's irrigated wheat areas. The technologies that will be used include the supply of commercial seeds, seed coating, precision and semi-precision sowing and water-saving irrigation. Plastic mulching technology will be extended in northern regions, particularly in Shaanxi, Shandong and Shanxi, where a large proportion of wheat is planted on dry land.

Research has also been undertaken to extend winter wheat area from its current northern boundary of 39°N to 42°N in parts of Liaoning, Inner Mongolia and Heilongjiang. By shifting production from spring wheat to winter wheat, both yield and quality can get improved. It is expected that, if successful, extension of this technology can help to increase domestic supply of high quality wheat and thus reduces the need for import.

In the mind of government planners, extension of the above technologies serves for multi purposes. Expansion of wheat production will increase total supply of grains so as to help enhance food security and to raise producers' income. Production of wheat with desirable baking quality will be increased, which will subsequently reduce reliance on import. In fact, a strategy of import substitution has been built into the development programs for wheat. Ministry of Agriculture intends to establish high quality wheat production bases in central and northeast China and raise the output to 15 million tonnes by 2005. If successful, domestic supply will meet the demand by processing industry and thus China may no longer need to import high quality wheat (Li 1999).

There does not seem to be much technical difficulty for China to produce such an amount of high quality wheat. The limiting factors are likely related to economic returns and marketing channels. Whether producers are willing to plant high quality varieties depends on their relative returns to conventional varieties. In general, quality is negatively related to crop yield. Assuming that inputs on a unit land are similar, high quality varieties can offer a better economic return only if the price margin is sufficiently high to compensate income loss due to lower yield.

Problems related to marketing may be more limiting. The current grain marketing system, which is still a government monopoly at the procurement stage, is incapable of handling speciality products at small amounts. Most Chinese farmers produce grains for home consumption and the surplus sold to the marker is small. Further, different farmers may plant different varieties. Consequently, the operational costs to handle separately grains of individual variety (and grade) will be very high. In addition, there are no storage facilities designed for such kind of operations. Therefore, in practice, different varieties are mixed together when procured and there is no quality premium paid to high quality wheat. Under such arrangements, there are no incentives for producers to adopt a variety with higher quality but lower yield.

While there exists potential for improvement of wheat yield, the changing comparative advantages between crops and industries may not be neglected. Otherwise, further expansion of wheat production may result in welfare losses. There have been a number of studies which examine this issue (e.g., Zhang1997; Li 1998; Tian and Wan 1999) and some find that China's comparative advantages in wheat production tend to decline (e.g., Zhang 1997; Li 1998).

3.3 Reforms of the Grain Marketing System

The current marketing arrangements are largely responsible for structural imbalances of China's grain supply and demand, especially the high quality wheat. The reforms of the grain marketing system in recent years have brought conflicting policy objectives. Starting from 1994, the government tried hard to increase grain production and to halt the rising grain prices. When significant increases of grain production in 1995-96 led to a decline of grain prices, the government shifted its priority to supporting producers' income so that the farmers' enthusiasm in grain production could be maintained. However, the agents authorised for carrying out such policy functions, those state grain companies (SGCs), tend to pursue their own interest more than carrying out government policy. Rent seeking behaviours by these SGCs resulted in not only ineffectiveness of income protection for producers, but also huge government's financial losses.

In early 1998 the government took action to reform the marketing arrangements. Initially, a package of "four-separation and one-perfection" was devised (i.e., separate SGCs' policy

functions from commercial functions, separate national reserves from commercial stocks, separate central and regional governments' responsibility in managing grains markets, and separate old bank debts from new debts, and perfect the approach of price determination). Lately, it was developed into "three policies" (i.e., purchase at floor prices all grains that producers want to sell (*chang-kai-shou-gou*), sell purchased grains at prices covering all operating costs (*shun-jia-xiao-shou*), and ensure an enclosed circulation of working funds within designated state bank (*feng-bi-yun-xing*). To implement this policy package, the government gives SGCs a monopolistic right to procure grains from producers but forbids them to engage in commercial businesses. They can open their accounts only in China Agricultural Development Bank (CADB), a newly established policy bank.

These policy measures were well intended but ill designed. They were intended to serve multiple policy objectives. (1) With guaranteed purchases at floor prices, producers can get higher incomes and have incentives for grain production. (2) The SGCs would sell purchased grains at full costs so that no further financial losses would incur, which would help to reduce fiscal burden to the government and reduce bad debts in the state banks. (3) With restrictions that all SGCs' transactions are under surveillance of CADB, the government would be able to supervise their operations and to prevent malpractice. (4) While all grain processors and traders can only purchase grains from county-level wholesale markets but there are no other limitations imposed on their operations so that the later stages of marketing would be undertaken in a competitive market environment. However, the actual implementation of these measures proved it was too good a dream and has encountered a number of problems.

First, prohibiting private dealers from purchasing grains from producers is not in line with protecting producers' income and interest. As long as the SGCs guarantee purchases at floor prices, producers can judge whether their sales to other buyers can gain a higher income or better utility. Compared with SGCs, private traders are much more flexible. They often collect grains at farmers' convenience and provide timely payment. In comparison, SGCs, with their granted monopolistic position in local markets, often abuse their power to reject or downgrade grains using various excuses and make purchases based on their own interests.

Second, without appropriate price differential for quality, the guaranteed purchase encourages production and delivery to SGCs high yield but low quality cereals. With respect to wheat, this problem is obvious in the northeast and southern provinces. While purchased wheat stockpiled in SGCs' facilities, these regions need to import high quality wheat in large amounts to meet local consumption demand. Stockpile of low quality products presents a major problem in reforming the SGCs. While the quality of stored grains deteriorates over time, the cost to keep them continues to increase.

Third, these measures were adopted in a market condition that is fundamentally different from the past. Figure 3 shows the world price for wheat was lower than China's market price during 1990-98 with 1992-93 being exceptions, and in 1997 the state price exceeded the world price and market price. As such, China has to resort to import restriction in order to ensure *shun-jia-xiao-shou*. Furthermore and unavoidably, this leads to even further oversupply of grains, which is now the case in China's grain market.

[Figure 3 here.]

Fourth, due to high surveillance costs, it is difficult for the governments at both the national and regional levels to effectively monitor SGCs' operations. This leaves room for SGCs to pursue their own interests by cheating the governments and CADB with fake records. An SGC may over-report the amounts of stored grains to demand for more subsidies. Even worse, local

governments and CADB branches may have common interests with regional SGCs in cheating, which makes surveillance of SGCs' operations virtually impossible.

In a National Working Conference on Reforms of the Grain Marketing System held in May 1999, the government decided to remove spring wheat produced in some northern provinces and winter wheat in southern provinces from coverage of guaranteed purchase scheme (Economic Daily May 19, 1999). Guaranteed prices for these low quality wheat varieties was first reduced in 1999. These varieties will be then phased out from the protection program by year 2000. State procurement prices are also reduced. Price margins are allowed to better reflect quality differences and seasonal handling costs. Worth noting in particular is that the government allowed some food-processing firms to sign grain purchase contracts directly with producers so that grains in line with required quality attributes are produced. This, however, by no means is a move towards giving up SGCs' monopoly. Nonetheless, it will help to allow a better play of market mechanism in guiding grain production in response to demand.

3.4 Trade Policy

At present, international trade of grains is still subject to planning. The major means that the government uses to manage domestic market balance of grains in general and wheat in particular is to set an annual import quota, which is implemented via a state trading scheme. In 1996's reform of the customs regulation, China introduced the tariff-quota-rate (TRQ) system. Apart from major grains, this system is also applied to oilseeds and vegetable oils. TRQ in nature is a measure to facilitate transition from the planning scheme to a tariff-based trade management. However, quota determination and allocation are not made transparent, and therefore the TRQ system is not effective.

In November 1999, China and the USA reached an agreement on agricultural market access as part of China's entry into WTO negotiations. No details on the agreement have been released yet. However, it has been alleged that, in the agricultural area, there was no major difference between the contents of this agreement and what was released by US Trade Representative Office (1999), following Premier Zhu's visit. If that is the case, China would open a wide range of its agricultural market. With respect to wheat, China commits to set an initial import quota of 7.3 million tonnes on accession, which will be raised to 9.3 million tonnes by 2004. This also includes a provision that private sector will initially receive 10% of this quota with all unused quota by state trading company (STC) being reallocated among those whoever wish to use the quota in the later months of a year. In addition, China agrees to lift the ban on imports of wheat from the Pacific Northwest of US, which is imposed on the ground of preventing introduction of TCK smut.

Compared with the historical records of China's wheat import, the committed quota is not very large even in year 2004. If implemented, this commitment does, however, have an impact both internally and externally.

Internally, the commitments will reduce the government's ability to influence wheat market. With quota reallocation, it will be to the advantage of both STC and private traders to import at full quota as long as domestic market price is higher than the world price. An immediate effect in the near future is that SGCs will be unable to sell their domestically purchased grains at prices to cover all the costs, which may worsen SGCs' financial status. In the longer term, this arrangement may prevent the government from using state pricing as an instrument to support producer incomes.

Externally, the Sino-US agreement will alter comparative competitiveness of major traders in the Chinese wheat market. The removal of the ban on TCK wheat import will allow US to ship its wheat products from pacific ports, rather than from the Gulf ports. With a shortened distance of marine shipment, transport cost is likely to be reduced by as much as 30 to 40 percent. This, together with quota reallocation mechanism, will raise the competitiveness of US products in China's market.

However, the implementation of the Sino-US agreement with respect to agricultural market access depends on whether China can join the WTO. For China to join the WTO, there still remain some 20 countries with each of which China has to reach a bilateral agreement. In addition, the approval of the Sino-US agreement by the US Senates and the House of Representatives remains crucial as to if China can successfully join the WTO. Whether and how the opinions and concerns of the US public, particularly those of labour unions, on the effects of free trade, as expressed during the Seattle WTO conference in November 1999, will affect this approval, remains to be seen.

4. Prospect of China's Wheat Market Development

At present the wheat supply and demand in the Chinese market is roughly in balance in terms of quantity. This balance is largely achieved through restrictions on import, which has resulted in domestic prices being higher than the world prices. It is expected that per capita direct consumption of wheat (flour) may decline slowly in the future as a result of income growth and urbanisation, but consumption of baking products may grow at higher rates. Consequently, while total demand for wheat may not grow as fast as in the 1980s, demand for high quality wheat is likely to exceed domestic supply capacity, thus leading to continued import. While it is possible to increase production of high quality wheat, the SGCs need to be reformed fundamentally before they are able to perform the required marketing operations.

Imbalance in regional markets is another important aspect to keep an eye on. At present, regions with great shortages of wheat are municipalities and coastal provinces. They have prosperous economy and demand for high quality. They have easy access to port facilities and enjoy cost advantages to get supply from abroad. Following the reforms in the early 1990s, interregional transfer of grains has been turned essentially from planned allocation into commercial contracts agreed by surplus and deficit regions. This leads to inferior products gradually losing their market in these regions.

Thus a question arises: will an import-substitution strategy in wheat, either total or just the high quality import, be successful, particularly given that such a strategy will be implemented under a freer trade environment? A decline in domestic prices due to increased import is likely to result in lower input into production by producers and smaller contribution to the research activities by the government and agribusiness firms, in turn, lower output.

Using the GTAP world trade model (Hertel 1997), a research group at the College of Economics and Management of China Agricultural University carried out simulation exercises to assess China's options of agricultural trade policies (Tian et al. 1999). Their results suggest that, under a freer trade system, China's wheat import will increase substantially. China's increase in wheat import will raise the world market price. The impact on domestic price and production tends to be strong, leading to income loss of wheat producers. China's self-sufficiency rate in wheat will decrease.

Their results also suggest that, under a freer trade system, North America's share in China's market will be increased. North America will provide China with over 80 percent of imported wheat under all trade liberalisation scenarios. Other exporters do not gain much from China's opening of wheat market.

While China's national welfare tends to improve notably with trade liberalisation, the change in China's trade position in the world wheat market is not totally desirable from policy makers' point of view. At present the Chinese government gives top priority to ensuring appropriate growth of the national economy by stimulating domestic demand, especially the rural demand. Thus, any measure that may potentially lead to decline in farm income would be thought undesirable, at least in the short term. In the longer term, greater reliance on world market, especially on North America, is perceived to be dangerous in view of China's national food security. The continued international conflicts have caused great suspicion on whether the world will become more peaceful in the new century and on whether multilateral laws and agreements can bind the behaviours of those countries with superior economic and military might. Currently, the belief that China needs to guarantee its food security from chiefly domestic sources is prevalent in China.

In policy simulations, Tian et al. (1999) also considered an option that China may allow freer trade in coarse grains and livestock products, but continue protection on food grains (wheat and rice). The results suggest that China can maintain basic self-sufficiency in food grains while gaining from trade liberalisation. This option is likely to be more desirable than general cuts of tariffs as far as policy makers are concerned.

To sum up, the gap between domestic production and consumption of wheat in China is likely to increase in the long term, leading to a growing demand for import, especially high quality baking wheat. The actual import depends on the approach that China uses to restrict trade. If China can join the WTO and implement its commitment on market access, this will result in a full use of import quota in the short term. However, additional import will still be restricted by high above-quota tariffs.

5. Concluding Comments

With a continued expansion of non-agricultural export, foreign exchange constraint is no longer a binding factor for the Chinese government to decide grain import. Instead, domestic market stability and producers' incomes begin to receive greater weights in policy considerations. Nevertheless, the deep-rooted concern over national food security remains unchanged.

China's grain policies in the future will be determined by both internal and external conditions. Internally, as the expenditure on grains has declined to a relatively small share, political resistance from urban consumers to rising grain prices is weakened. Therefore the policy makers now have a greater freedom to use either domestic or border measures to support grain production. Externally, China's WTO accession negotiation will determine the environment within which China links to the world economy. While many people accept that greater import of grains may help to better meet diversified demand and reduce environmental pressure, greater reliance on import does cause concern over national food security. Suspicions on the ineffectiveness of multilateral system have become stronger. Under such circumstances, political considerations may overwhelm economic rationale, at least in the short run.

Although wheat and other grains have been protected since 1997, it is not an indication that China has decided to follow the approach of Eastern Asian economies. This is due to the recognition of the heavy burden on government budget and of worldwide policy reforms towards a freer trade system. Under the current institution, change from taxing agriculture to assisting farm production via income transfer will impose great financial burden on the government and may potentially lead to political frictions. In contrast, border protection is easy to implement both economically and politically. It is likely that the Chinese government may attempt to retain tariff protection on wheat in the future.

Table 1. Changes in Wheat Production in China 1990-98

Year	Planting Area (1000 ha)			Production (m t)			Share in Cereals (%)	
	Total	Winter	Spring	Total	Winter	Spring	Area	Output
1990	30753	25931	4822	98.2	84.9	13.3	n.a.	n.a.
1991	30948	26125	4823	96.0	83.2	12.7	32.9	24.3
1992	30496	25751	4745	101.6	87.9	13.7	33.0	25.3
1993	30235	25749	4486	106.4	93.7	12.6	34.0	26.3
1994	28981	25077	3904	99.3	89.2	10.1	33.1	25.2
1995	28860	24978	3882	102.2	91.7	10.5	32.3	24.6
1996	29611	25463	4148	110.6	98.0	12.5	32.1	24.5
1997	30057	25967	4090	123.3	110.8	12.5	32.7	27.8
1998	29775	26070	3705	109.7	97.9	11.8	32.3	24.0

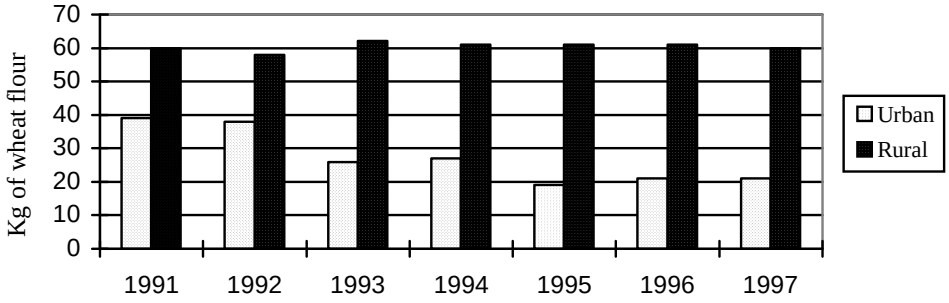
Source: Ministry of Agriculture, *China's Agricultural Statistics*, various issues.

Table 2. China's Wheat Import Composition

	1994	1995	1996	1997	1998
Hard wheat (1000 tonnes)	1822	5604	4512	1509	1275
Share in total import %	25	48	55	81	86

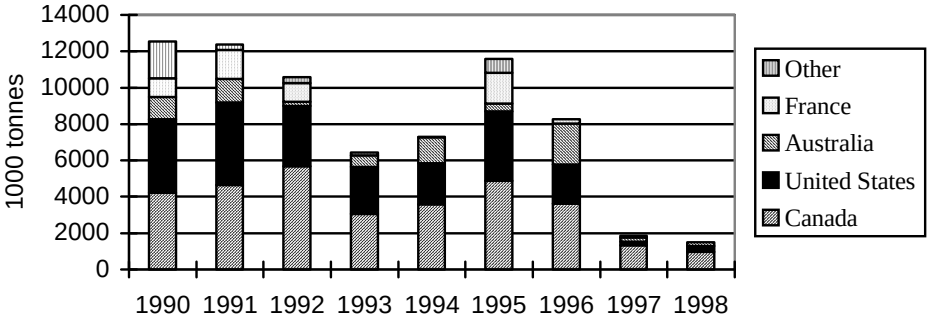
Data source: China General Administration of Customs 1998.

Figure 1: Changes in Per Capita Consumption of Wheat at Home



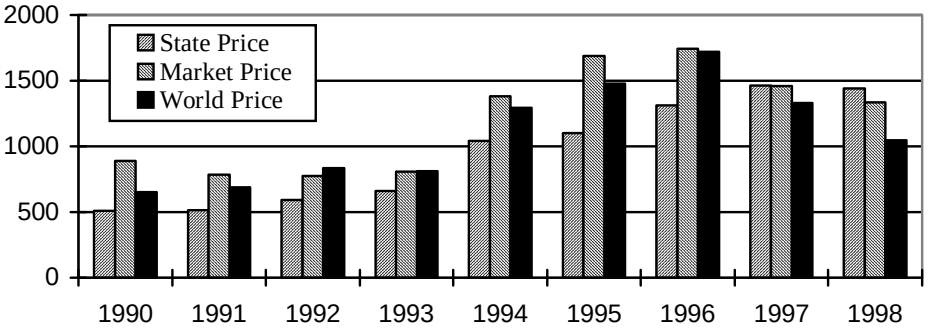
Note: SSB reports rural grain consumption in weight of raw grains. In order to make the data comparable with those of urban residents, rural consumption of wheat is converted into wheat flour equivalent at an assumed milling rate of 75 percent.
Source: SSBb, various issues.

Figure 2. Changes in China's Wheat Import (1990-1998)



Source: China General Administration of Customs 1998.

Figure 3. Changes in Wheat Prices in Domestic and World Markets (1990-98)



Note: The world price is represented by hard red winter wheat fob US gulf port and converted to RMB at China's official exchange rate.
Source: Ministry of Agriculture 1998; USDA 1999.

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