

AGRICULTURE AND TRADE IN THE NORTHEAST ASIAN SOCIALIST COUNTRIES IN TRANSITION: A COMPARATIVE VIEW*

Il-Young Lee

Korea Rural Economic Institute

Introduction

The most notable phenomenon in global agriculture in the latter half of the 20th century is the coexistence of starvation and satiation. Advanced market economies faced a problem of overproduction, while less developed countries suffered from low productivity and food shortages. Advanced market economies have tried to resolve the problem of overproduction and financial burden caused by subsidies through freer international trade. The Uruguay Round trade negotiations reflected the need and, in the end, the World Trade Organization system emerged. The impact of the Uruguay Round agreement on the world agricultural production and trade will be immense.

On the other hand, the socialist economies appeared as a large grain importer in the world market since the 1970s. Lack of motivation for higher productivity and the remains of the "command economy" are key factors for their low agricultural production. However, fundamental changes have also been occurring in socialist economies. The change is from the traditional centrally-planned economy toward a market system. In this process, collective and state farms are being dismantled, and direct control in food marketing is diminishing. These changes would significantly influence the world economy.

In Northeast Asia, China and the former USSR, which used to be the most influential socialist countries, are undergoing profound reforms. North Korea, a classic centrally-planned autarkic economy, is facing new circumstances in the rapidly changing world economy as a U.S.-North

*This paper was presented for international symposium on *Agricultural Trade and Development Cooperation in Northeast Asia* (1995.8.18, Seoul). The author appreciated comments and advice from professor Keun Lee.

Korea rapproachment has just begun recently.

This paper examines agricultural institutions, production and trade in Northeast Asian socialist countries in transition. The scope of this study includes China, the former USSR, and North Korea. This paper proposes that the apparent difference in the process of institutional reforms and patterns of agricultural production and trade among these economies can be explained largely, though not wholly, by the differences in industrialization and agrarian structures (Pei 1994; Wädekin 1988). In addition, the performance and limitations of North Korea's agricultural reform in the future can be inferred from a comparative analysis of these three countries.

Section II of this paper reviews institutional reforms in China and the former USSR. Section III and IV outline the situation of agricultural production and trade in the two countries. In section V, differences in the impacts of reforms on agricultural production and trade between the two countries are compared. Factors influencing differences are also examined. This paper concludes with an assesement of the future prospects of North Korea's agriculture in Section VI. The analysis is based on the comparative analysis of the size of the rural population and the basic institutions of the countries.

Institutional Reforms in China and the Former USSR

China

Important changes have been made in China's agriculture by the end of 1978. The first change was in farm organization. Before 1978, all decisions in production, crop varieties, rotation system, and techniques were made by authorities higher than the production team. In 1978, the government promoted a new management system called the "production responsibility system", in which a more flexible remuneration scheme was allowed within the production team. When the new system was first introduced, however, it was not designed to dissolve the team system. Dividing land and other resources down to the individual household level was actually prohibited. Nevertheless, a few production teams began to experiment with the system of contracting farm responsibility (i.e., land, other resources and output quotas) to individual households.

When the "household responsibility system" (HRS) reform began, two variants of household farming emerged simultaneously. The first is

Table 1. Percentage of Production Teams in China Adopting Household Responsibility System (%)

	management by collective	management by household		
		total	baochan daohu	baogan daohu
1980.1.	83.1	1.046	1.0	0.02
1980.12.	75.9	14.9	9.4	5.0
1981.6.	63.2	28.2	16.9	11.3
1981.10.	49.0	48.8	7.1	38.0
1982.6.	24.7	74.1	4.9	67.0
1983	—	98.3	—	98.3
1984	—	99.1	—	99.1

Source: *Jingjixue Zhoubao*, 1982.1.11, vol. 2; Liuxueyi, *Lianchan Chengpao Cerenzhi Yanjiu*, 1986; *Hongqi*, 1987, vol. 14; cited from Kayamura (1989: 41).

“baochan daohu”, in which production is carried out independently by each household in the production team but output is pooled together and distributed to each household according to its contribution. The second variant is “baogan daohu”, in which production is the responsibility of each household and output belongs to the individual household.

Experiments with contracting the farm responsibility to individual households were originally limited to a few areas. By the end of 1981, thirty-eight percent of management units had adopted the full household contracting system (*baogan daohu*), while the remainder continued to operate under the old system. In 1982 and 1983, “baogan daohu” became the most prevalent type. By the end of 1984, about 99 percent of total rural households were involved in “baogan daohu” (Table 1).

At the same time, the commune had been dissolved. In 1983, the local township government (*xiang*) was restored, which removed the governing function from the commune. The central government had previously prohibited anyone from giving direct orders to the production teams and peasants. In 1984, 249 communes (about 4.6 percent of 54,352 in 1982) were still functioning as combined government-economic units (Statistical Yearbook of China 1986).

Some important changes have also taken place in procurement and marketing. In 1979, the base procurement process for grains were raised by an average of 21 percent, while the premium for sales in excess of base quotas was raised from 30 percent above the base price to 50 percent. Quota (above-quota) prices for cotton, soybeans, peanuts, rapeseed, sugar cane, sugar beets, tobacco, and live hog also have risen.

The procurement of grain increased along with production. But, the amount procured under the quota declined and the share of above-quota procurement increased. So the average procurement price increased steadily.

Other changes in grain procurement took place in early 1985. Due to a bumper harvest, record state outlays to purchase above-quota grains and strains on state grain storage and transportation capabilities, the government's commerce department abolished compulsory purchasing quotas and purchased only a fixed amount of crop at a single price. The purchase price represented a weighted average of earlier above-quota and below-quota prices.

Since 1990, another important reform has developed in grain marketing. The authorities introduced policy measure of the indirect control, such as the special reservation and wholesale markets. Efforts were made to set up perfect wholesale grain markets which are standard, legal and modern. The government hiked retail grain prices from 50 to 200 percent in 1991. Consequently, direct control in grain marketing has been crowded out. The planned supply system, which guaranteed grain and edible oil rations to urban residents, was abandoned in most areas. On April 1, 1993, the government implemented a national grain price deregulation policy. Sales of the government-owned grain stocks dropped dramatically since then (USDA 1994: 13-14).

However, a large price increase (24 percent) and reduction in grain production in 1994 hindered market reforms. The authorities have begun to implement sweeping regulatory measures. A new Provincial Responsibility System, for example, requires governors to guarantee increased grain acreage, higher yields, stable prices and state control of 70 to 80 percent of grain marketing. In December 1994, the government announced an immediate ban on corn and rice exports. In 29 out of 35 largest cities in China, grain or edible oil rationing has been reintroduced in order to provide stable supplies to state workers (*Newsweek*, 15 May, 1995).

The Former USSR

In most of the states of the former USSR, independent family farms were abolished by forced collectivization in the 1930s. Until very recently, all agricultural activities in the USSR were carried out by large collective farms. The collective farms (*kolkhoz*) were formally co-operatives in which non-land productive assets were collectively owned, while the state farms

(*sovkhoz*) were directly owned by states. In 1987 there were 27,000 collective and 23,300 state farms in the USSR. The average *kolkhoz* had 6,300 hectares of agricultural land with some 450 workers, while the average *sovkhoz* had 15,600 hectares of agricultural land with about 540 workers (OECD 1995: 114). These farms were so large as to be almost unmanageable.

Since 1990, reformers in the former Soviet republics were in favor of re-establishing private farms. Former collective and state farms were to determine equal shares of land for all their employees and pensioners as well as workers in such "social assets" as schools, clubs, and medical clinics on the farm's territory. Most of the former collective and state farms have been reorganized into "joint-stock farms", where land and asset share have been formally, but not physically, determined.

The reorganized farms are likely to pursue economic strategies akin to those of worker-owned enterprises in other societies. Most notably, this means an attempt to maximize security of employment tenure and stabilize income for current workers than maximizing profit. In the longer run, these new corporate farms could not survive, however, since they still have all the structural disadvantages of the former collective and state farms they replaced. A more significant farm restructuring process is inevitable (OECD 1995: 114).

The private sector in the former USSR agriculture has grown in the past few years (Table 2). The number of private farms in the former USSR totaled over 680,000 as of July 1, 1994. This is more than three times compared to that in 1992. Private farms occupy nearly 21 million hectares, or 10 percent of total arable land in the former USSR. In mid-1994, private farms in Russia totaled 286,000 on 12 million hectares (an average 42 hectares per farm), occupying nearly 20 percent of total crop sown areas (USDA, *Former USSR Update*, 1994, 11. 10).

However, most farms were severely undercapitalized. Like the large farms, the private farms depended heavily on state subsidies for their start-up costs and initial production capital. Increasing difficulties in funding and competition for cheap credit have made it more difficult for individual farmers to operate. Working private farms, moreover, have been subject to the same problems as the large farms, such as non-payment for crops and input increases. As a result, by late 1994 the number of private farms have actually started declining as farmers abandoned their land (OECD 1995: 141).

Most importantly, the marketing of agricultural products is still predominantly in the hands of the states through state procurements.

Table 2. Private Farms in Russian Federation

	Number (1,000 units)	Area (1,000 ha)
1991.1.	4.4	214.4
1992.1.	49.8	2,014.1
1993.1.	183.7	7,715.4
1994.1.	269.9	n.a.
mid-1994	286	12,000

Sources: USDA RES 1993b: 15; USDA ERS 1994b: 13; USDA ERS, Former USSR Update, 1994. 11. 10.

Table 3. Marketing Channels as a Percentage of Total Production Marketed by Commodity, Russian Federation (%)

Commodity	1991	1992	1993 ¹
Grains			
State & cooperative	63	64	76
Market	14	13	11
Other ²	24	23	13
Cattle, poultry			
State & cooperative	84	80	81
Market	7	8	7
Other	9	12	12
Milk & products			
State & cooperative	98	96	97
Market	n.a.	n.a.	n.a.
Other	n.a.	n.a.	n.a.
Eggs			
State & cooperative	94	86	91
Market	4	9	6
Other	2	5	3

Note: 1. January–September.

2. Other includes barter, direct sales, etc.

Source: USDA ERS 1994b: 14.

Table 3 shows the dominant position of the state in agricultural procurement in Russia. Specially, grains are procured by the single state procurement organization at the federal and local levels. Each farm generally sells to one buyer. Local administrations seek to limit food exports outside their region so as to prevent exports of local subsidies. There are many limitations in the development of grain markets.

Agricultural Production in China and the Former USSR in the Era of Reform

China

Since 1978, China's grain production has increased at a much faster rate than before, although the area devoted to grains has actually declined. Total grain production was 304.8 million tons in 1978. It reached a record 407.3 million tons in 1984, achieving a 34 percent increase in six years. This growth rate from 1979 to 1984 was significantly higher than the long-run growth rate of 2.5 percent between 1952 and 1978. Production of other crops and animal husbandry products rose by even larger margins. For instance, cotton output rose by 88 percent for 1978-84. Also, edible oilseed production grew 128 percent during the same period (Table 4).

Traditionally, China's livestock sector was dominated by household production units for whom hog and poultry raising was a sideline, which took full advantage of surplus resources (labor and crop by products). Under this traditional system, meat production had been closely determined by the availability of feed in the rural areas. Following the collectivization in 1958, and through 1984, hog procurements from farm households were compulsory and authorities made little direct use of the price instrument (The World Bank 1987: 6). However, due to several bumper grain harvests, total meat production grew at 10.5 percent annually (or 79.9 percent during 1978-84).

In 1985, the authorities proclaimed change grain purchasing policies in order to facilitate commercialization of agriculture. However, the results of this reform were a step away from, not toward, commercialization of trade for the most important food grains. Grain production dropped sharply in 1985, when the total output was only 379.1 million tons. Production stagnated at annual average of 391.9 million during 1985-88, and returned to its 1984 level only in 1989.

Grain production was raised considerably in 1989 not because of market incentives but as a result of administrative methods. Due to favorable weather and growing conditions, in addition to increased use of inputs, higher yields, and increased area planted, grain production in 1990 reached to 446.2 million tons, up 9.5 percent from the previous year's output. China produced 456.5 million tons in 1993 and reaped the best grain crop on record.

Table 4. China's Agricultural Production (million tons, million heads)

	Grain	Cotton	Oilseed ¹	Redmeat ²	Hog inventory
1978	304.8	2.17	5.22	8.56	301.3
1979	332.1	2.21	6.44	10.62	319.7
1980	320.6	2.71	7.69	12.05	305.4
1981	325.0	2.97	10.21	12.61	293.7
1982	354.5	3.60	11.82	13.51	300.8
1983	387.3	4.64	10.55	14.02	298.5
1984	407.3	6.26	11.91	15.41	306.8
1985	379.1	4.15	15.78	17.61	331.4
1986	391.5	3.54	14.74	19.17	337.2
1987	403.0	4.25	15.28	19.86	327.7
1988	394.1	4.15	13.20	21.94	342.2
1989	407.6	3.79	12.95	23.26	352.8
1990	446.2	4.51	16.13	25.14	362.4
1991	435.3	5.68	16.38	27.24	369.7
1992	442.7	4.51	16.41	29.14	384.2
1993	456.5	3.74	18.04	32.26	393.0
1994	445.1	4.34	19.90	36.93	414.6

Note: 1. Includes peanuts, rapeseed, sesameseed, sunflowerseed, huma, and miscellaneous oilseed crops.

2. Includes pork, mutton, and beef, which are in carcass weight, excluding head, hooves, and offal.

Source: *A Statistical Survey of China* 1995.

Production of other staple crops stagnated in the latter half of 1980s. The output of oil-bearing crops dropped by nearly 18 percent from 15.78 million tons in 1985 to 12.95 million tons in 1989. They exceeded their record 1989 output level by over 24.6 percent in 1990, and that performance continued up to recently. Cotton production declined from the peak of 6.26 million tons in 1984 to 3.79 million tons in 1989. They fluctuated severely since 1990. On the other side, production of non-staple crops such as tobacco, fruit, sugarcane, tea all grew more or less steadily.

Abandonment of quota grain procurement and tight rationing of feed grains were matters of opportunity for livestock sector. In 1985, the procurement prices of livestock products were raised and compulsory deliveries of hogs to state procurement stations were abolished. Farmers were induced to find alternative ways to dispose of surpluses.

The reported effects of the 1985 reforms on livestock production are impressive. The year-end inventory of hogs rose 8 percent from 306.8 million head to 331.4 million head, ending six years of stagnation. And, total red meat production rose 14.3 percent to 17.6 million tons. The nine

year (1985-1994) average growth rate in meat production is 9.2 percent per year. This rapid growth in the livestock sector is in contrast with the slower pace of growth in grain production.

The Former USSR

Grains continue to be the most important agricultural raw material for all socialist economies and thus crop production centers on grains. Although grain is produced in all 15 states of the former USSR, most of the grain is grown in the Russian Federation, the Ukraine and Kazakhstan, which together account for almost 90 percent of gross production. The Russian Federation alone accounts for about 60 percent of the former USSR area and 55 percent of the harvest.

Although the fluctuations in grain yields and harvests, which are still mainly due to weather conditions, had been somewhat reduced through the greater use of intensive cultivation methods, there were extreme swings. For example, between the 1981 gross harvest of 140.8 million tons and that of 206.6 million tons in 1990, there was a difference of 65.8 million tons. The grain area has been steadily declining, resulting in 26.1 percent drop between 1977 and 1994. During 1980s, the grain area was reduced in order to expand the feed-crop area, and the fallowed land area has fallen as well. Increasing input costs may have influenced farmers to reduce their total sown area.

As the USSR was dissolved, a sudden decline in grain output and yields appeared in 1991. Grain output in 1992 recovered for a while, but both dropped again in 1993, 1994. The total grain output in the former USSR was forecast by USDA at 151.5 million tons in 1994, which was about 26.7 percent less than the 206.6 million tons harvested in 1990 (Table 5).

The production of cotton is by far the most important fiber crop in the former USSR agriculture. The former USSR's cotton production is concentrated in the Central Asian republics and in Transcaucasion Azerbaijan, but processing of cotton is concentrated in Central Russia. Central Asian cotton production had been stagnating in 1980s. However, as the textile industries of Russia and other cotton import republics (Ukraine and the Baltics) were operating at much less than capacity by the disintegration of the Soviet economy, Central Asian cotton production declined rapidly, especially in 1990-92. However, cotton production in the former USSR rebounded after 1993 because of increased international demand and favorable weather conditions.

Edible oils are of great importance in the diet of the former USSR

Table 5. The Former USSR's Agricultural Production

(million tons, million heads)

	grain ¹	seed cotton	lint	oilseed ²	meat ³	cattle inventory
1981-85	157.4	8.31	2.45	10.69	16.22	117.7
1986	184.3	8.23	2.66	11.19	18.06	120.9
1987	182.7	8.08	2.50	12.14	18.93	122.1
1988	170.1	8.69	2.76	12.86	19.68	120.6
1989	185.8	8.57	2.66	13.86	20.14	119.6
1990	206.6	8.31	2.59	13.28	20.01	118.4
1991	153.7	7.78	2.45	11.65	18.40	115.7
1992	186.2	6.47	2.02	10.60	18.40	115.7
1993	179.7	6.62	2.09	10.40	14.70	106.9
1994	151.5	na	na	na	na	na

Note: 1. Official grain data as reported by the former USSR countries, include; wheat, barley, corn, oats, millet, buckwheat, unmilled rice, and pulses. But, USDA data here don't include buckwheat, pulses, and misc.

2. USDA data for total oilseeds only include sunflowerseed, cottonseed, soybean, and rapeseed.

3. Carcass weight, including fat.

Source: USDA RES 1994b.

population. The most important oil crop is the sunflower which accounts for more than about 60 percent of world production. The other main oil crops are soybeans, cotton, flaxseed and groundnuts. Oilseed production in the former USSR dropped dramatically in 1991, 1992, and output in 1993 was about 25 percent below that of 1989.

The livestock sector accounted for 55 percent of the gross value of agricultural production at the end of 1980s, as calculated by official statistics. However, 88 percent of the agricultural land area is devoted to livestock production, absorbing over 70 percent of agricultural labor inputs. The inefficiency of animal production has therefore long been the biggest problem in the former USSR's agriculture (OECD 1991: 117). The radical reforms placed great hopes on the market-induced downsizing of the former USSR's livestock sector. Animal inventories and livestock-product output have fallen markedly since 1990. Overall output of meat in the former USSR contracted by 27 percent during 1989-93.

Trends of Agricultural Trade in China and the Former USSR's Reform Era

China

Exports of Chinese agricultural commodities have exceeded agricultural imports for most years since 1949. This net export surplus is an important source of financing for high priority nonagricultural imports. China's agricultural trade surpluses increased rapidly in the mid-1980s, as the country sharply cut imports and expanded exports when crop production peaked in 1984. However, these surpluses were gradually reduced in the latter half of the decade because commodity production, particularly grain and cotton, stagnated and domestic demand expanded. But, due to succession of good harvests since 1989, agricultural exports increased continuously, agricultural imports dropped in 1990 and 1993, and the agricultural surpluses increased again (Table 6).

China's agricultural exports cover a wide range of commodities. Live animals, meat and animal products, fruits and vegetables, textile fibers, and grain are the leading agricultural export categories.

China's grain exports consist mostly of corn and rice, which have been the large bulk export items. In the first phase of reform (1978-84), China shipped more corn, oilseeds and meals such as soybeans and soymeal, and cotton. According to Ministry of Foreign Economic Relations and Trade (MOFERT) statistics, total grain exports, increased from 1.25 million tons

Table 6. China's Agricultural Trade Balance (billion dollar)

	Export	Import	Balance
1984	5.23	2.73	2.48
1985	6.28	2.45	3.86
1986	7.12	2.74	1.38
1987	8.03	3.89	4.14
1988	9.46	5.83	3.63
1989	9.70	6.71	2.99
1990	9.77	5.47	4.30
1991	10.55	6.07	4.48
1992	15.26	8.65	6.61
1993	15.87	7.73	8.14

Source: USDA ERS 1994a: 5.

Table 7. China's Grain Trade and Utilization

	Trade (1,000 tons)			Utilization (million tons)		
	Imports	Exports	Net Import	F.S.I. ¹	Feed	Total
1983	13,520	1,150	12,370	129.4	38.5	167.9
1984	10,410	3,190	7,220	133.9	44.1	178.0
1985	5,970	9,330	-3,360	131.9	52.5	184.4
1986	7,320	9,420	-2,100	132.9	56.4	189.3
1987	16,280	7,080	9,200	134.2	58.9	193.1
1988	15,330	7,180	8,150	134.0	60.1	194.1
1989	16,580	6,570	10,010	132.9	61.6	194.5
1990	13,720	5,830	7,890	140.2	61.6	201.8
1991	13,450	10,860	2,590	142.8	65.4	208.2
1992	11,620	12,020	-400	139.9	68.6	208.5
1993	7,330	13,270	-5,940	144.4	74.3	218.7
1994	9,010	10,840	-1,830	na	na	na

Note: 1. F.S.I = food, seed and industrial use.

Source: *China's Customs Administration Statistics; A Statistical Survey of China 1995*; USDA FAS *World Grain Situation and Outlook*.

in 1982 to 8.9 million tons in 1985. But, the pace of growth in grain exports slowed down during 1985-90, by China customs statistics, so that grain exports in 1990 totaled at 5.8 million tons. Again, good harvests in 1990-93 extended grain exports to 13.3 million in 1993 (Table 7).

On the other hand, a significant decline in the relative importance of livestock product exports was accompanied by an increase in the shares of grain. China's live hog exports, almost solely to Hong Kong, have declined or remained steady since the mid-1980s, hovering between 2.7 and 3.0 million head. Fresh or frozen pork exports increased slightly in 1993 and 1994, but are still far below the 1990 peak of 124,000 tons (Table 8).

On the import side, there was a very substantial fall in the share of cereals and cereal products. The relative importance of other traditional imports, such as textile fibers and oil crops also declined (Chai 1993: 362). Grain imports showed the reverse trend of exports. As a result, there were net imports of grain during the five years in 1987-91. The bulk of these imports was wheat: the volume of wheat imports was subject to substantial year-to-year fluctuations, with shift of 5 to 10 million tons not uncommon.

In December 1994, China returned to purchase significant quantities of U.S. corn and wheat, as well as record-setting quantities of rice from

Table 8. China's International Trade in Agricultural Commodities

(million tons, million heads)

	Wheat	Corn	Rice	Soybeans	Cotton	Hog ¹	Pork ²
1985	-5.4	6.2	0.8	1.139	0.347	3.0	0.111
1986	-6.1	5.1	0.6	1.079	0.558	3.1	0.105
1987	-13.2	2.3	0.5	1.437	0.749	3.0	0.100
1988	-14.5	3.4	0.4	1.328	0.433	3.0	0.063
1989	-14.9	3.4	-0.7	1.249	-0.247	3.0	0.088
1990	-12.5	2.5	0.3	0.939	-0.249	3.0	0.124
1991	-12.4	7.8	0.6	1.109	-0.171	2.9	0.117
1992	-10.6	10.3	0.9	0.539	-0.135	2.9	0.050
1993	-6.4	11.1	1.3	0.270	0.140	2.7	0.060
1994	-7.2	8.7	1.0	0.830	-0.392	2.7	0.100

Note: 1. Live.

2. Fresh or frozen.

Sources: *China's Customs Administration Statistics*; Cited from OECD (1995: 230), USDA ERS (1992: 303-308) and USDA ERS (1994a: 57).

Thailand. These measures are an indication of the seriousness with which China's government views the situation. Recent grain imports are driven by not only poor harvests in 1994 but also by the tremendous expansion of livestock production over the last decade. Utilization of grain as animal feed increased steadily by 68.5 percent from 44.1 million tons in 1984 to 74.3 million tons in 1993.

The Former USSR

In the Soviet era, agriculture's share of total imports did not change much over the last 20 years or so with some variation depending upon domestic agriculture production. Farm commodities accounted for 21 percent of total imports in 1970-89. Agricultural imports accounted for about a quarter of total hard currency imports during that period (OECD 1991: 186).

The former USSR regularly accounted for 15-20 percent of global imports of cereals. The main imports were usually wheat and corn but significant quantities of barley and sorghum were also imported. The former USSR also exported a relatively small amount of grains, mainly to eastern European countries. According to USDA estimates, the total utilization of grains in 1981-90 rose gradually with some growth in the use of grain for animal feed. While food accounted for 20-23 percent of the total utilization, feed accounted for 55-57 percent of that (USDA FAS,

Table 9. The Former USSR's Grain Trade and Utilization¹

(million tons)

	Trade ²			Utilization		
	Imports	Exports	Net Imports	F.S.I ³	Feed & Residual	Total
1987	33.9	2.3	31.6	71.7	137.1	208.8
1988	41.3	3.0	38.3	73.3	134.9	208.2
1989	41.5	3.2	38.3	73.3	145.2	218.5
1990	29.0	2.9	26.1	73.6	153.7	227.3
1991	40.9	1.1	39.8	76.9	130.1	207.0
1992	35.0	8.6	26.4	74.9	124.6	197.5
1993	20.5	7.6	12.9	77.4	115.2	192.5

Note: 1. Grain includes wheat and coarse grain.

2. Includes inter-republic and extra- the former USSR trade.

3. F.S.I = food, seed, and industrial use.

Sources: Data for 1987-90 are cited from USDA ERS (1993b: 59), for 1991-93 are cited from USDA ERS (1994b: 58).

World Grain Situation and Outlook, Dec. 1991). These facts reflect the greater emphasis being placed on the livestock sector in government policy in the 1980s.

The former USSR import demand for grain has dropped substantially from traditional levels by an annual average of 40 million tons during the 1980s. This decrease has followed the demise of the USSR and the introduction of market reforms. Significant decreases in grain for feed use, caused by market-based downsizing of the livestock sector, led to reduced import demand. The former USSR imported less grain, including inter-republic trade, by about 23 million tons between 1991 and 1994. Here, utilization of grain as animal feed and residual dropped by 38.5 million tons from 1990 to 1993, while grain for food, seed, and industrial use increased by 3.8 million tons in same period (Table 9).

Additionally, hard currency and other financial constraints have been a major factor behind reduced import demand. Several republics have also moved to discourage imports by eliminating import subsidies, and imposing import barriers (USDA 1994: 46).

On the other side, with reduced consumer demand of meat, decreased subsidies on meat imports, and growing tariffs on meat imports, total meat imports in the former USSR have declined. According to CIS statistics, meat and meat product imports in 1992 from the outside and within the former USSR substantially decreased from 1991 just over 1 million tons compared with 1.8 million tons in 1991 (USDA 1993: 69). The

Table 10. The Former USSR's Meat and Dairy Imports^{1,2} (1,000 tons)

meat and meat products					
	Russia	Ukraine	Belarus	Kazakhstan	Uzbekistan
1990	1,500.8	-290.3	-176.2	-160.1	205.9
1991	1,465.2	-216.3	-164.7	-134.9	147.3
1992	702.4	na	-102.3	-43.7	81.2

milk and milk products					
	Russia	Ukraine	Belarus	Kazakhstan	Uzbekistan
1990	7,087	-1,582	-1,510	148	1,117
1991	6,147	-1,276	-1,303	99	587
1992	-205	na	-276	211	198

Note: 1. Includes inter-republic and extra- the former USSR trade.

2. On calendar-year basis.

Source: USDA ERS 1994b: 74-75.

Russian Federation's net imports of meat and meat products in 1992 were estimated at 0.7 million tons, down about 50 percent from the 1990 level (Table 10).

Comparison of Patterns and Factors Influencing Differences

In the initial (pre-reform) state, excess demand was assumed for most commodities in both country. In Figure 1, the quantity supplied of commodity OQ_s is less than the quantity demanded OQ_d . Consumers pay price OC , while the state pays farms a procurement price of OD . The cost of this policy to the state budget is given by rectangle $ABCD$. This supply curve in the pre-reform situation is different from a true supply curve in the market economy. In both cases, point A is the quantity supplied at price OD . It could be the case that there is no unique relationship between prices paid and quantity supplied in the pre-reform situation.

From 1949 until 1978, China's overall economic strategy adhered to the standard Soviet or Stalinist pattern in many respects. Transforming a substantially agrarian economy into an industrial one was the foremost goal. Within this strategy, agriculture's role was to supply food and raw materials to industry. To do this, low prices were assigned to agricultural products while purchasing industrial products at high prices. Collectivization of agriculture fit into the strategy as a tool to facilitate this coercion by making it easier for the state to intervene in planting and labor

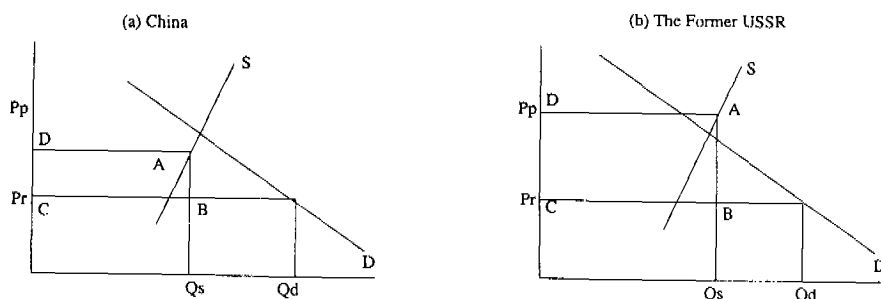


Figure 1. Pre-reform Situation

employment decision.

The classical Stalinist strategy was implemented in the Soviet Union after 1928, but after Stalin's death in 1953, there was a dramatic turn in agricultural policy. As a result, for the first time in the Soviet period, there was a resource inflow into agriculture. Farm purchase prices of major products were increased, and additional price premiums for procurements in excess of planned targets and for financially weak farms. Because the absence of a land market took away the information base necessary for assessing rent, prices based on average nonland costs of production and differentiated by zones were a rough instrument for taxing returns to land. Many farms received more payments, for sales as they merged into higher price zones.

As a result, Soviet procurement prices were higher than the shadow equilibrium price, in contrast to China's case. And the cost of the multiple-tier price system to the state budget in the USSR was greater than in China.

Figure 2 illustrates the short-run effects of institutional reform in two countries. In China's case, the supply curve is defined by a lateral shift outward from point A to point E. This reflects greater production efficiency after reform. Greater flexibility in the system is reflected by a more elastic supply curve, S_2 , in comparison with the conceptual pre-reform supply curve, S_1 . If the market is fully operational, the equilibrium will be determined at price OP_m and quantity $OQ_s = OQ_d$. With the possibility of a shift in the demand curve, production and consumer's price will increase while the producer's price is uncertain. The supply curve, however, will be able to shift upwardly in the future as the effects of the "responsibility system" diminishes cropland washes away or converts to non-farm use, and recentralizing policies reintroduced.

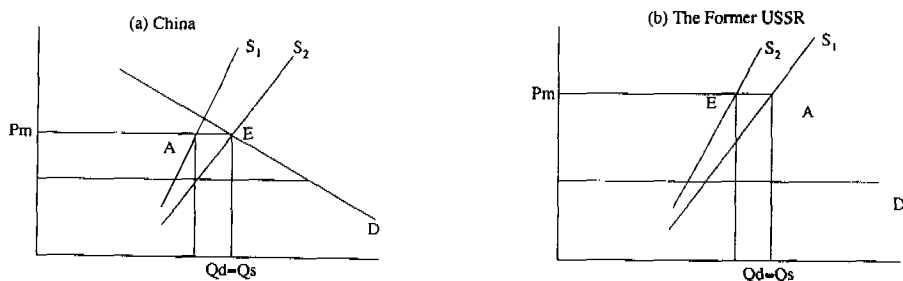


Figure 2. Post-reform Situation (without foreign trade)

On the other hand, in the former USSR's case, the supply curve is defined by an inward shift from point A to point E . Despite the radical reforms, transformation to family farms has been slow, and the marketing of agricultural production remains dominated by state organizations. Therefore, a decline in production and high inflation have appeared.

Figure 3 illustrates the post-reform situation with foreign trade, i.e., China's case of exports and the former USSR's case of imports. China's agricultural exports increased after an outward shift of the supply curve, which resulted from institutional reform; however, the demand curve's shift following increasing domestic demand offsets increases in exports. In the former USSR, there was an inward shift of the demand curve, as well as the supply curve. Since 1991, the sudden rise of previously subsidized and controlled prices caused a substantial drop in real income. This generally reduced consumer demand of livestock products relative to other foods, resulting in a decrease of grain import demand.

However, as of now, there remain factors, interfering with the operation of this ideal foreign trade model. China's agricultural exports have been subject to a lot of influences. Many of these are still relevant in the post-reform era. The need to generate foreign exchange earnings remains a crucial determinant of China's agricultural exports. In view of persistent shortages in the economy, most exports are simply squeezed out of domestic consumption, because foreign exchange is needed. In such circumstances, exports may not be sensitive to changes in world market prices, and may even enable exports to be cut back in favor of domestic consumption (Wolf 1982).

In the former USSR, agricultural imports have always been greater than exports. Of course, these major purchases were partly determined by the inability of agriculture to provide sufficient grains (the deficit was mainly

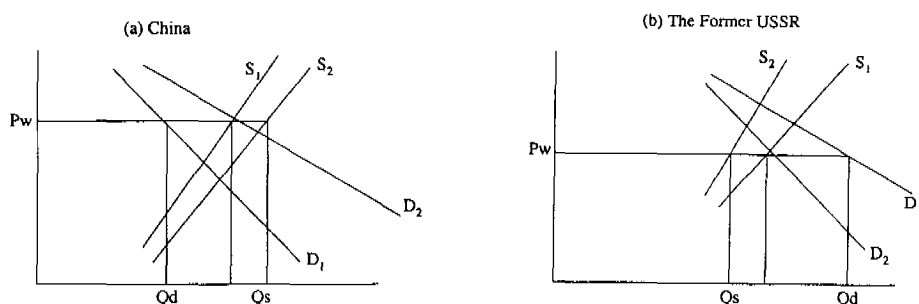


Figure 3. Post-reform Situation (with foreign trade)

in the grains needed for fodder to maintain the livestock numbers). But the decision to import large quantities of grain were also influenced by the relative prices of oil on the world market and the prices for grain. Exporting oil could buy considerable quantities of grain. But by the 1980s, world prices for oil entered a long, depressed period. The attempt to resolve the problem of insufficient investment with cheaper solutions had failed and the crisis of agriculture merged with a general economic and political crisis.

Concerning the reasons for the distinct model of economic transition in China and the former USSR, Pei (1994) focuses on their different degrees of industrialization and different agrarian structures. The determinants of China's relative success are two basic factors: First, the considerable size of the rural population; and secondly, their basic institutions which, without privatization, have enabled the direct generation of massive market-oriented enterprises. In contrast, the nature of transition and growth in the former USSR is determined by their larger urban populations and higher non-agricultural employment which, in combination with their institutions, make their transition much more difficult.

Eighty-two percent of China's population (Table 12), without changing the previous form of ownership and using new forms of organization comprising the HRS in agriculture and "township and village enterprises" (TVEs) in non-agriculture, immediately developed voluntary transactions among themselves, and between them and the state sector in the early reform period. In China, there is no private distribution of original assets, and therefore the situation in which some people gain from the loss of others is not frequent, and there are fewer conflicts among people, and between people and the government.

In the former USSR, there are no such driving forces. There are no voluntary and free transactions between state and state enterprises and

between state enterprises and other organizations, and transaction costs cannot effectively decline. When, as in the former USSR, the state sector is too big, transaction costs in the overall economy are more difficult to lower. A direct change from mainly state ownership to mainly private ownership is too intense, and there is zero or even negative growth during this period of change. Some people gain and some people lose in the redistribution. Reform in the former USSR could be regarded as a process of the destruction of system followed by reconstruction, while the reform in China resembles more the construction of a system.

Prospects of North Korea's agriculture

In recent years, crop production in North Korea appears to have flagged, although data concerned are not available enough to verify this. The growing population and possibly shrinking crop output have required growing imports of wheat, rice, and corn (Table 11) and have virtually ended North Korea's rice exports. North Korea no longer barter with the former USSR for wheat, and imports from China apparently are carried out on a hard currency basis.

Production in 1993 was thought to have fallen dramatically from the already low level of 1992. North Korea's food situation, while not good, does not appear to have worsened in 1994. KREI estimates that North Korea's grain production in 1993 fell to less than 3 million tons from 3,898,000 tons in 1992, but total grain output in 1994 may increase to 3,768,000 tons, because more inputs have been mobilized for agriculture and the weather has been good.

Of course, the state's strategic choice of reform and an open-door policy will have a great influence upon economic performances. However, it was not the different choices made by the state but rather differences in historical heritages that ultimately account for different models of economic transition in China and the former USSR. The state's choice in each case being conditioned by their respective historical heritage.

From 1953 to 1987, the rural population in North Korea increased by less than one million people, whereas the urban population grew by more than 10 million. The share of rural residents, accounting for 82.3 percent in 1953, declined to some 40 percent in 1987. KREI (1994) indicates that 11.7 million people lived in towns in 1987 compared to 7.8 million in the country. The entire population of North Korea was estimated at 21 million in 1992, which suggests that there are 8.4 million rural dwellers. According

Table 11. North Korea's Grain Trade¹ (metric tons)

	Imports ²	Exports ³	Net Imports
1975	224,463	328,229	-103,766
1976	441,510	181,412	260,098
1977	483,432	255,352	228,080
1978	259,833	325,727	-65,894
1979	429,109	221,440	207,669
1980	409,440	279,070	130,370
1981	634,441	228,686	405,755
1982	517,992	205,406	312,586
1983	381,956	101,581	280,375
1984	21,030	33,000	-11,970
1985	19,958	2	19,956
1986	352,243	8,814	343,429
1987	695,082	182,415	512,667
1988	1,080,919	240,251	840,668
1989	443,712	74,307	369,405
1990	524,640	43,272	481,368
1991	1,259,893	11,434	1,248,459
1992	923,650	4,920	918,730

Note: 1. As North Korea does not publish its trade data, USDA ERS uses trade data of other nations to estimate North Korea's trade.

2. Include rice, corn, barley, wheat, wheat flour, wheat equivalent, and whole-grain equivalent.

3. Include rice and corn.

Source: USDA ERS 1994c: 48-50.

to the data cited by Eberstadt (1991) for 1987, the number of employed in the agrarian sector in 1987 was 3,167,000 out of 12,141,000 employed in the entire North Korean Economy.

Table 12 indicates how much smaller or bigger were the proportions of North Korea's rural population and agricultural employment compared to those of China and the former USSR. North Korea's level of industrialization is not higher than the former USSR, but perhaps higher than China. China's transition to a market economy is basically an industrialization process which is driven by the modernization of an agricultural sector.

North Korea's economic structure was inherited from Japanese colonialism, i.e., she experienced the construction of heavy industry for the purpose of military expansion toward Manchuria. North Korean leaders have tried to advance the modern industrial sector by following the basic Soviet strategy. As a result, a fairly industrialized economic

Table 12. Rural and Urban Population and Employment in Three Countries (%)

	Population		Employment	
	Rural	Urban	Agriculture	Non-agriculture
China (1978)	82.1	17.9	70.5	29.5
China (1994)	71.4	28.6	54.3	45.6
The Former USSR (1990)	34.0	66.0	18.2	81.8
North Korea (1987)	40.0	60.0	26.1	73.9

Sources: *Statistical Yearbook of China* 1994; KREI 1994.

structure and population composition have been formed in North Korea. Therefore, in the future, North Korea's larger urban populations and higher non-agricultural employment will make her transition much more difficult than China.

Land reform in North Korea was announced in a decree issued on March 5, 1946, and in the process it quickly destroyed the former social classes. The North Korean regime confiscated the land of former Japanese ownership, national traitors, and domestic landlords who owned more than 5 hectares. All of this land was confiscated without compensation and was distributed without charge to landless peasants or peasants with little land. In this process, approximately 1.5 million people fled from North to South Korea during 1946 and 1947. There are similarities between, expulsions of landlords in North Korea and the Soviet Union, while peasants' ownership in North Korea is different from the nationalization of land since Russian Revolution.

The second step of the socialist pattern of land reform was collectivization. One characteristics of collectivization in North Korea was the fast move toward full collectivization on the socialist pattern. In North Korea, individual private farming had been predominant until 1954 when rural collectivization was initiated. With the completion of the nationwide collectivization of agriculture in 1958, all individual peasants were absorbed into the newly created collectives, and North Korea's agriculture has since been undividedly dominated by the cooperative form of property. At that time, there were 3,843 agricultural cooperatives, with 406 hectares of land and 275 households per cooperative on average and less than 200 state farms, mostly in livestock or special production (Chung 1974: 15). State-owned farms accounted for 5 percent of land and approximately as much of production (Trigubenko 1992: 1).

A campaign launched by the state in 1964 and aimed at merging collective farms into a huge state-owned agro-industrial amalgamation.

Table 13. Percentage of Land by Agricultural Organization (%)

	State Farms	Collective Farms	Private Farms
China (1980) ^{1,2}	4.5	95.6	
The Former USSR (1987) ¹	67.8	30.4	1.8
North Korea (1963) ³	8.0	92.0	0.0

Note: 1. Definition of land concept is total agricultural land.

2. Private farmland is minuscule.

3. Definition of land concept is cultivated area.

Sources: Pryor 1992: 100-101.

As of 1987, the total number of state farms are estimated as 220. According to the unofficial sources, the state farms' share of total cultivated land is estimated as 20 percent, but accounts for almost 30 percent of total agricultural output. In the case of livestock products, more than 70 percent is said to come from state farms (Moon 1993: 4). In North Korea, cooperative farms have been the most dominant forms of farm organization. In contrast to China but similar to Soviet Union, state farms have been regarded as one of the foundations of socialist development in agriculture and have been called upon to set an example in the efficient operation of farms, in managerial practices and in the use of technical and cultural means, thus promoting the social attitude toward the reliance on cooperative activities.

Prior to the reform, agricultural land in China was collectively-owned and in the former USSR it was state-owned. North Korea has a larger state sector than China, but her degree of socialization is certainly lower than the USSR (Table 13). If North Korea's state farms are to be reformed through the "big bang" strategy as in the former USSR, those who lose will likely be strongly against the reform. In North Korea, however, the transition will be easier than in the former USSR, because the peasant economy had lasted long before collectivization, contrary to the former USSR.

North Korea has suffered from a decline of crop output and a reduction of barter imports from China and the former USSR. Therefore, North Korea will try to reduce the monitoring cost to increase total agricultural product from farms and seek new suppliers from abroad. However, the outward shift of the supply curve is not easy because of the existing state of industrialization and socialization. Besides, making contact with the outside may shift the demand curve outwardly. It is probable that institutional reforms and an open-door policy will be followed by a

substantial increase of food demand in North Korea.

Summary

In China, a new management system called the "household responsibility system" was introduced and the commune was dissolved in the early 1980s. When independent family farms were revived, reforms in agricultural market were developed simultaneously. The policy measures of direct control, such as the planned or compulsory procurement and supply system, have been crowded out since mid-1980s. On the contrary, the former Soviet republics have had many difficulties in agricultural reform. Since 1990, reformers were in favor of re-establishing private farms. However, by late 1994, the number of private farms have actually started declining as farmers abandoned their land. Moreover, the marketing of agricultural products is still predominantly in the hands of the states.

Since 1978, China's grain production has increased at a much faster rate than before. Production of other crops and animal husbandry products rose by even larger margins. Grain production stagnated during 1985-88, but livestock and many other crops continued to do well after 1985. On the other hand, production of most crops—including grain, cotton, and edible oils—dropped as the USSR was disintegrated. Radical reformers wanted the market-induced downsizing of the inefficient livestock sector. Animal inventories and livestock product output have fallen markedly since 1990.

China's agricultural trade surpluses increased rapidly in the mid-1980s, however, these surpluses gradually declined in the latter half of the decade. But due to a succession of good harvests since 1989, the agricultural surpluses increased again. China's grain exports consist mostly of corn and rice, the importance of which have risen. Simultaneously, a significant decline in the relative importance of livestock product exports has occurred. On the other hand, the former USSR imported less grain, including inter-republic trade, because of significant decreases in demand for feed use. With a reduced consumer demand for meat, decreased subsidies for meat imports, and growing tariffs on meat imports, total meat imports in the former USSR have declined.

There was no unique relationship between prices paid and quantity supplied in the pre-reform socialist economy. Soviet procurement prices after Stalin's death were higher than the shadow equilibrium price, while China assigned low prices according to the classical Stalinist policy pattern from 1949 until 1978. In China's case, institutional reforms may

shift the supply curve outwardly and increase agricultural exports. However, the demand curve's shift by improved domestic demand could offset increases in exports. In the former USSR, both the supply curve and the demand curve are defined by inward shifts. Reduced consumer demand for livestock products relative to other foods, resulting in a decrease of grain import demand.

Concerning the reasons for the distinct model of economic transition in China and the former USSR, we paid particular attention to Pei (1994) who focused on their different degrees of industrialization and different agrarian structures. North Korea's level of industrialization is not higher than the former USSR, but perhaps higher than China. In the future, North Korea's larger urban populations and higher non-agricultural employment will make her transition much more difficult than China's.

North Korea has a bigger state sector than China, and her degree of socialization is certainly lower than the USSR. If North Korea's state farms are to be reformed, the losers will likely be strongly oppose to reforms.

References

- A Statistical Survey of China*
China's Customs Administration Statistics.
Statistical Yearbook of China
Narodnoye Khoziaistvo SSSR.
 USDA FAS. *Grain: World Markets and Trade.*
 USDA FAS. *World Grain Situation and Outlook.*
- Chai, Joseph C. H. 1993. "Factors Influencing Agricultural Trade," in Y. Y. Kueh and Robert F. Ash (eds.) *Economic Trends in Chinese Agriculture: The Impact of Post-Mao Reforms.* Oxford: Clarendon.
- Chung, Joseph Sang-hoon. 1974. *The North Korean Economy.* Stanford: Hoover Institution Press.
- Eberstadt, Nicholas. 1991. "Population and Labor Force in North Korea: Trends and Implication." presented at International Symposium on *North Korean Economy: Current Situation and Future Prospects.* Seoul: KDI and The Korea Economic Daily.
- Kawamura, Yoshio. 1989. "Development of Household Management." in K. Sakamoto and Y. Kawamura (eds.), *China's Rural Reform: Household Management and Agricultural Marketing.* Tokyo: Asian Economic Press.
- KREI. 1994. *North Korea's Agriculture: Situation.* Seoul: Korea Rural Economic Institute.
- Moon, Pal-Yong. 1993. "Rural Management System." *Economic System in South*

- and North Korea and a Proposal for Economic Integration*. Honolulu: East-West Center.
- OECD. 1991. *The Soviet Agro-Food System and Agricultural Trade: Prospects for Reform*. Paris: OECD.
- OECD. 1995. *Agricultural Policies, Markets and Trade in the Central and Eastern European Countries, Selected New Independent States, Mongolia and China: Monitoring and Outlook 1995*. Paris: OECD.
- Park, Ki Hyuk. 1971. "A Comparative Study of Agrarian Systems of South and North Korea." in W. A. Douglas-Jackson (ed.) *Agrarian Policies and Problems in Communist and Non-Communist Countries*. Seattle: Univ. of Washington Press.
- Pei, Xiaolin. 1994. "Rural Population, Institutions and China's Economic Transformation." *The European Journal of Development Research* 6(1).
- Pockney, B. P. 1994. "Agriculture in the New Russian Federation." *Journal of Agricultural Economics* 45(3).
- Pryor, Frederic L. 1992. *The Red and the Green: the Rise and Fall of Collectivized Agriculture in Marxist Regimes*. Princeton: Princeton Univ. Press.
- Putterman, Louis. 1993. *Continuity and Change in China's Rural Development*. New York: Oxford Univ. Press.
- Surls, Frederic M. 1982. "Foreign Trade and China's Agriculture." in R. Barker and R. Sinha with B. Rose (eds.) *The Chinese Agricultural Economy*. Boulder: Westview Press.
- The World Bank. 1987. *China: The Livestock Sector*. A World Bank Country Study.
- The World Bank. 1991. *China: Options for Reform in the Grain Sector*. A World Bank Country Study.
- Trigubenko, M. E. 1992. "Food Supply and Consumption in North Korea." presented at International Seminar on Agriculture of North Korea and Agricultural Reform in Centrally Planned Economies. Seoul: Korea Rural Economic Institute.
- USDA ERS. 1993. *International Agriculture and Trade Reports: Former USSR*. RS-93-1. May.
- USDA ERS. 1994a. *International Agriculture and Trade Reports: China WRS-94-4*. August.
- USDA ERS. 1994b. *International Agriculture and Trade Reports: Former USSR*. WRS-94-1. May.
- USDA ERS. 1994c. *International Agriculture and Trade Reports: Asian and Pacific Rim*. WRS-94-6. October.
- Wolf, A. T. 1982. "Optimal Foreign Trade for the Price Insensitive Soviet-type Economy." *Journal of Comparative Economics*. March.
- Wädekin, Karl-Eugen. 1988. "Agrarian Structures and Policies in the USSR, China, and Hungary: A Comparative View." in Josef C. Brada and Karl-Eugen Wädekin (eds.) *Socialist Agriculture in Transition*. Boulder: Westview.