Terms of Trade Between Agriculture and Industry

--Thirty Years Experience in China

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TERMS OF TRADE BETWEEN AGRICULTURE AND INDUSTRY - THIRTY YEARS EXPERIENCE IN CHINA

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CHAPTER I

INTRODUCTION

The relationship between agriculture and industry is very important in any economic development. The whole process of development can be understood in the context of the relationship between agriculture and industry and its evolution. This is because first, agriculture and industry are usually the biggest and primary material production sectors in the economy, they provide physical goods (like food, clothing, shelter) for a society's survival and the foundation for any further development. Second, it becomes more and more clear that one sector cannot develop properly without the other. Considerable literature and theoretical analysis have been devoted to the interactions between them and the mechanisms through which the interactions occur. There are a number of books and articles specific to China, for example Xu Yi's Price Problems of Socialism, Economic Publishing House, Beijing, 1982; Sichuan Price Society, Price Problems in Transition Period of our Economy, Chengdu, China, 1981; China Price Society, Selections of Articles on Price, Beijing, 1981; just to name a few.

The importance of agriculture and industry in China can be seen from Tables 1 and 2.

TABLE 1

SECTORIAL COMPOSITION OF GNP IN CHINA

TOTAL GNP 100%

	1952	1965	1980
Industry	19.5	36.4	46.8
Agriculture	57.7	46.2	40.3
Construction	3.6	3.8	3.9
Transportation	4.3	4.2	3.5
Commerce	14.9	9.4	5.5

SOURCE: Shen Shangching, Sectoral Structure in China, People's Publishing House, Beijing, 1981.

TABLE 2

SECTORIAL EMPLOYMENT PERCENTAGE IN CHINA - 1979

Agriculture	74
Industry	15
Service	11

SOURCE: World Bank, China Socialist Economic Development, 1983, Vol. I, p. 74, Washington.

Agriculture and industry accounted for 87.1% of the GNP in 1980, and this figure has never been below 75%. Employment is even more concentrated in agriculture and industry and accounted for 89% of all employment in 1979. The importance of agriculture and industry has aroused a lot of intellectual interests in the relationship between them and their impact on the whole of the economy. Influenced by Marx's theory, the concept of "coordinated and proportional development" - somewhat like "balanced growth" - has been emphasized in China. But throughout the 1950's government policies were biased toward industry; industry got a push at the expense of agriculture. This emphasis culmulated in the "Great Leap" of the late 1950's. These policies[1], coupled with natural disaster, led to a great reduction of agricultural production during the late 1950's and early 1960's. Agricultural output decreased by 19.9% from 1957 to 1962, a rate of 4.4% per year.[2] In the early 1960's, the government promoted the slogan of "agriculture as foundation, industry as guidance," presenting a compromise between industrial and agricultural interests. But this slogan has never been fully practised, indicating the actual ambiguity in the Chinese leaders' understanding of the relationship between agriculture and industry.

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[1]Policies in the Great Leap period include heavy investment in industry, especially steel industry, transferring great numbers of laborers from agricultural sectors to industrial sectors, mobilizing every resource in countryside to support the steel industry, like cutting the woods to produce steel, etc.

[2]Source: Policy Research Division, Chinese Agricultural Ministry (CAM), Outline of Chinese Agricultural Economy, Agricultural Publishing House, 1981, Beijing.

The purpose of this paper is to explore the agriculture-industry relationship from the point of view of the intersectoral terms of trade (TOT)[3], which is considered as the most important factor in agriculture-industry relationship because the connection between the two sectors is mainly through products exchanges. Efforts are made to answer the question: How has the TOT between the two sectors changed over the past 30 years and why? It is a simple question, but may not have a simple answer.

The construction of the paper follows these basic lines: in chapter II, we will review the history of agricultural price changes in China mainly since 1949. In chapter III, the price TOT is calculated, and its changes are analyzed. In chapter IV, the weakness of price TOT are pointed out and the double factorial TOT is proposed and calculated. In chapter V, industrial goods are divided into means of production and consumer goods, and factorial TOT calculations are done separately for each. The reasons for the behavior of the various TOT's in china are examined in chapter VI, and in chapter VII the two-market and two-price system for China's agriculture is analyzed, including implications for evaluation of changes in the TOT. In chapter VIII, the final chapter, the conclusions are drawn and some policy proposals are made.

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[3] TOT is defined as follows:

a. The price terms of trade = $\frac{PA}{PI}$; PA Price index of farm products; PI Price index of industrial goods.
b. The single factorial terms of trade = $\frac{PA}{PI}$ ZA ZA, productivity index in agriculture; Z_I, productivity index in industry.
c. The double factoral terms of trade = $\frac{PA}{PI} \frac{Z_A}{Z_I}$

CHAPTER II

SITUATION AND PROBLEMS

In China, prices of both agricultural and industrial products are under government control and determined by the government. According to Marxian theory, the price of a product is determined by the material and labor consumed in producing it. Deterioration of the terms of trade against agriculture which is translated as the deviation of price from value in Marx's terminology, was a commonplace before 1949 when agricultural prices were suppressed and industrial prices were maintained artificially high to favor the young, ambitious and politically powerful bourgeoisie class. A special term "scissors differential" was given to this situation which came to peak in the years immediately before the Liberation. Taking the average from the years 1930-1936, as a base, during which time the prices were relatively stable, by 1950, the purchase prices of agricultural products increased by 101.8%, while the prices of industrial commodities sold in countryside increased by 165.9%, in other words, in 1950, peasants could buy only 75.9% of the industrial commodities they could in 1930-1936 with the same amount of agricultural products. This phenomenon continued through most of the 1950's. In 1957, the price indice were 275.1 and 283.8 respectively for agriculture products purchased and industrial goods sold in the countryside. Because of a dramatic increase in agricultural product price of 21% in 1952 compared with 1950, the TOT in 1957 was pretty close to that of the 1930-1936 period.[4]

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[4] Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agriculture Publishing House, 1982, Beijing.

The newly born communist government pledged to eliminate the inequality between the two sectors. There were great jumps in the agricultural product purchase prices in years 1952, 1957, 1962, 1979, 1981 with the most prominent increases occurring in 1979 and 1981, coupled with reductions in the price of industrial goods sold in countryside. From 1961 to 1978 the price of agricultural machinery was reduced on ten occasions, there were six reductions for chemical fertilizer, nine for pesticides, three for agricultural diesel oil and plastic membrane.[5]

R. Lardy has conducted a detailed study on the price changes (see Table 3).

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[4] Policy Research Division, Chinese Agricultural Ministery. Outline of Chinese Agricultural Economy, Agriculture Publishing House, 1982, Beijing.

[5] IBid

TABLE 3

FREQUENCY AND MAGNITUDE OF ADJUSTMENTS IN AGRICULTURAL PRODUCT PURCHASE PRICES, 1950-79

	Number of Adjustments		Index of Total Change (1950=100)
	upward	downward	
Cereals			
Rice	9		183
Wheat	9	4	222
Corn	12	2	236
Millet	12	1	259
Sorghum	10	3	256
Soybeans	13	3	379
Cash Crops			
Cotton	12	5	150
Peanuts	10	3	314
Rapeseed	10	4	353
Hemp	12	2	354
Sugarcane (since 1952)	12	1	202
Sugar beet (since 1952)	9	1	127
Jute	9	7	110
Hemp	21		280
Lemon Hemp (? ningma)	11	2	247
Silkworm cocoons (since 1952)	12	2	182
Tussah silk cocoons (since 1952)	9	2	244
Flue cured tobacco	15	5	159
Red Tea	14	1	253
Green Tea	20	1	241
Jilong Tea	9	0	177
Jinya Tea	9	2	184
Apples	7	6	123
Oranges	13	5	161
Animal Products			
Pigs (since 1952)	23	2	236
Sheep (since 1952)	17	4	259
Beef cattle (since 1952)	15	2	191
Eggs (since 1952)	14	3	276
Ox hides	10	4	215
Cattle hides	9	5	255
Sheep hides	13	4	135
Goat hides	13	6	152
Wool of improved varities of sheep (since 1952)	6	6	91
Fine native wool	0	6	172
Coarse native wool	8	6	163

Source: Nicholas R. Lardy, Agricultural Price in China, World Book Staff Working Paper., World Book, 1983, Washington.

He found that the frequency of price adjustment for agricultural products is greater than had been thought, and most of the adjustments were in an upward direction. With few exceptions the prices of the most important commodities have been changed a dozen or more times. The price of pigs was changed every year. In general, agricultural prices have been increasing while industrial prices have been decreasing, in both senses of nominal price and real price. Price TOT of agriculture has obviously improved.

But this does not eliminate the possibility that the peasantry is still an exploited class because the price TOT does not say anything about the fairness or unfairness of the base price used to make the comparison. This possibility is enhanced by the following factors:

1. The influence on government policy by the historical heritages. The old "scissors differential" might be too big to turn over to its "fair" state, (the price determined by supply and demand) taking into account the cost of political, economic, institutional adjustment that had to follow.
2. The desire of the government to expedite industrialization by transferring real income from agriculture to industry is deeply rooted in the Marxist belief that the industry is the guarantor of the economic and political success of a country. Mao himself states the role of agriculture to subsidise industraialization.
3. Government policy regarding the relationship between agriculture and industry over the 30 years after 1949 was characterized by making light of agriculture and overemphazising

industry, especially heavy industry.[6] This reflects a misunderstanding by the Chinese leadership about the TOT between agriculture and industry and the lack of consistant and agreed upon understanding of the roles these sectors play in the economic development.

The fact is that the peasants' state was getting worse compared with urban population while their price TOT was constantly improving. The increase of peasants' real income was almost unobservable. In the 20 years from 1957 to 1977, the average income of a commune member from the collective increased only 24 yuan, although that represents an increase of 60% from 1957, it amounted to an increase of only 1.23 yuan per year. Cash income actually declined during this period. (Table 4).

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[6] As we will see, the price policy has favored agriculture. But price policy only reflects one aspect of the relationship between the two sectors. Industry gets more benefit through government investment, government subsidies, government expenditure, etc.

TABLE 4

AVERAGE INCOME OF COMMUNE MEMBER

(in Yuan)

Year	Average Income of a Commune Member	Cash Income
1957	40.5	14.2
1962	46.1	--
1965	52.3	14.5
1970	59.5	--
1975	63.2	12.4
1976	62.8	12.0
1977	65.0	12.8

Source: Policy Research Divsion, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agricultural Publishing House, Benjing, 1982.

TABLE 5

AVERAGE FOOD GRAIN AVAILABILITY PER COMMUNE MEMBER

(in jin (o.5 ,kg)

Year	Average Food Grain from the Collective
1957	406
1975	414
1977	416
1978	463
1979	488

Source: Policy Research Divsion, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agricultural Publishing House, Beijing, 1982.

The average food grain available per commune member from the collective is also illustrative. (Table 5). Significant increases occured only in the most recent years when the policy had largely changed. While from 1957 to 1977, peasants' per capita food grain availablity increased only 10 jin, an annual increase of 0.5 jin (0.25 kg). More and more counties and production teams fell into the rank of "poor county" or "poor team." Hailun County in Heilongjang Province was ranked "upper class" among the collective economies in the whole country in 1979 with average income of 111 yuan per person. But even so, only 10% of the teams in the county had the economic ability to expand production, 20% of the teams could bearly maintain the existing production level, while 70% of the teams had to depend on loans to continue the production. Taoyuan county of Hunan Province was also a "rich county" in that year; but 77.4% of the teams were living on loans for survival, only 6.7% of the teams were able to continue expanded production. Total agriculture loans reached 27.47 million yuan in 1979, which was 1.1 times of the whole collective capital accumulation. [7,8].

But all of these were not open to discussion and criticism until after 1979, when "thought emancipation" aroused a lot of interest in the practical economic and political problems in the country. Some surveys and studies were conducted during these years that produced a number of astonishing findings.

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[7] Source: Chinese State Economic Commission, China Economic Year Book, 1984, p. 223. People's Publishing House, Beijing.

[8] Good use of loans is justified when they are used to expand production. Otherwise, if they are used to maintain the production level or even for the people to survive, it is an indication that farming is a losing proposition.

TABLE 6

PRODUCTION COST AND PROCUREMENT PRICE

(Yuan per Kg)

	Cost	Price*
Cereal Production		
Survey of 2162 production teams 1976	0.256	0.2176
Survey of 1296 production teams 1976	0.232	0.2148
Cotton Production		
Survey of 302 production teams 1977	2.18	2.138

*Price difference reflects the composition of grain production of surveyed teams.

Source: Nicholas R. Lardy, Agricultural Price in China. World Bank Staff Working Paper, World Bank, 1983, Washington.

In one major survey of cereal production in 1296 production teams in 1976, production cost plus taxes were found to average 11.6 yuan per 50 kg while the purchase price for the same mixture of output was only 10.74 yuan.

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[7]Source: Chinese State Economic Commission, China Economic Year Book, 1984, p. 223. People's Publishing House, Beijing.

[8]Good use of loans is justified when they are used to expand production. Otherwise, if they are used to maintain the production level or even for the people to survive, it is an indication that farming is a losing proposition.

For 300 teams specialized in cotton production, cost plus taxes total are 109 yuan per fifty kg. while the purchase price was 106.7 yuan. (See Table 6).

A survey conducted by the State Price Bureau came out with the results in Table 7.

TABLE 7

COMPARISON OF PRICES AND COST OF PRODUCTION
OF 100 JIN (50Kg) OF VARIOUS AGRICULTURAL PRODUCTS IN 1979
(Yuan)

Item	Current Price	Material Expenses*	(Labor cost)** Standard Working Days	Value	Cost of 100 jin
Grain	12.86	5.19	6.33	8.80	13.99
Rice	11.50	4.71	6.24	8.67	13.38
Wheat	15.72	8.03	9.75	13.55	21.58
Oil Crops	47.39	12.10	18.69	25.98	38.08
Cotton	147.80	44.36	69.76	96.97	141.33
Pigs	62.53	41.26	15.65	21.75	63,01

*Material expenses include capital, land, and all other costs than labor cost.

**Labor cost is calculated by the standard of 1.39 yuan per working day.

Source: Chinese Agricultural Ministry, Agriculture Year Book of China, 1980, Agricultural Publishing House, Beijing.

Except oilcorps and cotton, the purchase price of agricultural products were all below their cost of production. This may not help very much for our TOT analysis, but at least it provides an impression of how seriously the price might have been distorted by the purchase system.

Obviously the low purchase price is one of the major causes of rural poverty. Agricultural prices have been increased over time, but still not enough to cover the increasing production cost, of which industrial commodities account for a great proportion.[9] This thus justifies the inquiry into the TOT between agriculture and industry.

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[9]Although the prices of industrial commodities have not increased very much, the quanity sold to farmers have greatly increased.

CHAPTER III

THE PRICE TOT

The term "terms of trade" may sound alien to most Chinese, but the problem has drawn some academic and bureaucratic attentions. The following tables show the official purchase price of some major agricultural products in China.

As we can see, the price increase for farm products was quite substantial over the 31 year period between 1952 and 1982. But the increase was not homogenous; the prices for oil-bearing crops, tea, timber, vegetable, and native produce increased the most, while the producers of cotton and sugar were in a relatively disadvantaged position. That is why the complaints from these producers are most pronounced.

On the other hand, information on prices of industrial commodities sold in rural areas is incomplete. Tables 10 and 11 show price changes for some major industrial products sold in countryside.

Of these commodities, only cigarette, cotton cloth, rubber shoes and thermos bottles experienced price increase, and even so, these price increases were far behind the increases of farm product prices (with the exception of cigarettes).

Cigarettes and liquor are heavily taxed. The price of agricultural inputs, like chemical fertilizer and chemical pesticides, were constantly decreasing, with the exception of recent years, which was a period of general inflation.

The price TOT between agriculture and industry can be easily calculated (Table 12). It is shown graphically in Figure 1.

TABLE 8

MIXED AVERAGE PURCHASE PRICE OF FARM PRODUCTS

(Yaun)

Year	Grain* (ton)	Edible Oil (ton)	Feeder pig (head)	Tea (100kg)	Sugar Cane (ton)	Sugar Beets (ton)	Cotton (100kg)	Tobacco (100kg)	Mulberry Cocoons (100kg)
1952	138.4	605.6	32.6	88.0	21.4	26.6	183.0	69.8	143.2
1953	157.2	678.2	36.9	105.0	21.2	30.2	173.0	68.0	132.0
1954	157.0	689.2	38.4	112.0	21.3	30.2	175.8	70.4	135.2
1955	157.0	685.6	38.4	117.0	21.7	30.2	179.6	71.8	135.4
1956	160.2	706.2	41.4	134.4	24.9	30.2	179.6	72.0	144.2
1957	162.0	940.0	47.7	137.4	25.0	32.0	179.6	72.6	154.8
1958	168.0	940.0	45.0	145.6	28.0	36.0	178.0	73.4	185.8
1959	164.0	1000.0	42.4	146.2	28.0	38.1	178.0	73.4	190.4
1960	170.0	1100.0	34.0	146.2	28.0	39.5	178.0	74.6	190.4
1961	213.0	1300.0	55.0	164.2	26.6	52.0	182.0	87.8	189.6
1962	214.0	1314.0	56.7	171.0	27.8	53.0	182.0	100.0	187.4
1963	229.2	1420.0	60.0	172.0	27.0	53.0	200.0	96.0	190.0
1964	229.2	1474.0	60.0	161.4	29.2	54.0	200.0	100.0	194.0
1965	229.2	1450.0	60.0	182.0	30.0	54.0	204.0	101.0	262.0
1966	236.2	1434.0	60.0	192.0	30.0	54.0	204.0	110.0	262.0
1967	243.2	1410.0	60.0	192.0	30.0	54.0	204.0	110.0	262.0
1968	241.2	1384.0	60.0	192.0	30.0	54.0	204.0	110.0	262.0
1969	240.8	1386.0	60.0	192.0	30.0	54.0	204.2	110.0	262.0
1970	241.2	1387.0	63.0	192.0	30.0	54.0	204.2	110.0	262.0
1971	240.8	1613.2	63.0	194.0	38.0	54.0	210.0	110.0	262.0
1972	256.0	1599.4	63.0	192.0	38.0	61.0	204.0	110.0	262.0
1973	253.8	1666.0	68.0	196.0	37.0	63.0	210.0	110.0	262.0
1974	252.0	1679.4	69.0	206.0	36.0	61.0	207.0	120.0	256.0
1975	254.4	1691.8	71.0	229.6	36.1	57.8	201.6	126.2	264.0
1976	255.6	1609.0	69.6	234.8	35.0	58.2	208.0	125.4	264.0
1977	256.6	1672.8	70.3	234.0	36.2	62.0	227.8	126.0	226.0
1978	263.4	1746.4	74.5	239.4	36.2	60.5	227.8	124.0	276.8
1979	330.7	2458.2	102.1	306.0	44.9	81.8	268.0	126.0	326.0
1980	360.6	2640.8	115.7	315.6	50.3	85.2	317.4	140.2	340.0
1981	381.7	2818.8	120.7	323.8	54.0	87.0	311.6	159.6	339.0
1982	392.2	2772.9	123.8	354.8	50.0	85.4	323.6	153.2	345.6

*Grain includes rice, wheat, corn, millet, sorghum, soybean, sweet potatoes. (The latter converted to grain equivalent at a ratio of 5:1). Source: Chinese State Statistics Bureau, China Statistic Year Book, 1984, Statistic Publishing House, Beijing

TABLE 9

PURCHASE PRICE INDICE OF FARM PRODUCTS

(1950=100)

Item	1952	1957	1965	1978	1980	1982
General Index	121.6	146.2	185.1	207.3	251.2	257.7
Grain	121.4	141.4	190.9	224.4	271.8	283.5
Economic crops	113.0	126.4	152.8	174.0	210.8	215.2
1. oil crops	108.2	167.9	246.7	321.3	398.5	398.9
2. cotton	113.3	111.1	122.9	138.8	178.0	179.0
3. hemps	131.0	139.9	170.3	188.0	209.6	208.0
4. tobacco	116.5	124.0	174.0	176.6	184.7	215.5
5. sugar	87.2	102.9	135.3	151.5	189.3	199.3
6. tea	154.7	241.6	304.1	330.4	365.1	372.8
Animal products	105.7	145.5	192.1	201.8	255.8	259.4
1. meat	103.7	142.9	193.2	200.2	255.3	256.9
2. eggs	104.7	152.5	188.5	217.4	262.5	284.6
3. skin	136.8	150.2	163.1	182.6	229.9	239.2
Other sideline products	160.6	210.2	251.4	279.8	317.9	330.7
1. timber	115.1	105.9	141.7	173.3	230.8	310.4
2. cocoons	115.9	122.0	163.8	176.4	214.9	214.9
3. fruit	130.7	160.2	183.1	205.1	220.1	228.5
4. vegetables	179.0	237.2	235.0	259.3	302.7	315.3
5. medical herbs	136.7	222.3	279.2	272.0	279.7	287.3
6. native products	177.4	234.3	306.0	350.7	375.7	382.2
7. aquatic product	105.0	145.0	175.2	182.6	215.5	217.7

Source: Chinese State Statistic Bureau, China Statistic Year Book, 1984. Statistic Publishing House, Beijing

TABLE 10

MIXED AVERAGE RETAIL PRICE OF PRINCIPLE INDUSTRIAL COMMODITIES

(Yuan)

Year	Cigarette (case)	Cotton cloth (meter)	Bike (unit)	Kerosene (ton)	Rubber shoes (pair)	Thermos bottle (unit)	Aluminum pots & pans (piece)	Sewing machine (unit)	Chemical Fertilizer (ton)	Chemical Pesticides (ton)
1952	377	1.03	180	900	4.2	2.7	6.5	160	370	2240
1954	415	1.08	177	887	4.1	2.4	5.3	170	332	2240
1956	433	1.07	148	1007	4.3	2.5	4.8	145	341	2120
1958	443	1.11	152	966	4.6	2.4	5.0	145	300	1670
1960	375	1.20	152	966	4.6	2.5	5.0	145	270	1670
1962	396	1.54	160	990	5.1	4.5	6.0	145	270	1780
1964	500	1.50	180	960	4.5	3.5	5.9	150	240	1700
1966	480	1.50	155	864	4.5	3.2	5.4	146	228	1500
1968	500	1.50	155	864	4.5	3.3	5.4	146	228	1500
1970	500	1.50	155	864	4.5	3.4	5.4	146	228	1500
1972	500	1.50	155	710	4.5	3.5	5.4	146	222	1370
1974	606	1.60	159	710	4.6	3.6	5.4	146	226	1262
1976	617	1.60	160	710	4.8	3.9	5.7	147	233	1217
1978	629	1.60	159	715	4.9	4.0	6.0	146	231	1358
1980	673	1.58	161	701	4.8	4.3	6.2	147	237	1423
1982	902	1.60	163	710	4.7	4.5	5.9	149	260	1709

Source: Chinese State Statistic Bureau, China Statistical Year Book, 1984, Statistics Publishing House, Beijing

TABLE 11

INDEX OF MIXED AVERAGE RETAIL PRICE OF PRINCIPLE INDUSTRIAL COMMODITIES

(1952=100)

Year	Cigarette (case)	Cotton cloth (meter)	Bike (unit)	Kerosene (ton)	Rubber shoes (pair)	Thermos bottle (unit)	Aluminum pots & pans (piece)	Sewing machine (unit)	Chemical Fertilizer (ton)	Chemical Pesticides (ton)
1952	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1954	110.1	104.9	98.3	98.6	97.6	88.0	81.5	106.3	89.7	100.0
1956	114.9	103.9	82.2	111.9	102.4	92.6	73.8	90.6	92.2	94.6
1958	117.5	107.8	84.4	107.3	109.5	88.9	76.9	90.0	81.1	74.0
1960	99.5	116.5	84.4	107.3	109.5	92.6	76.9	90.6	73.0	74.6
1962	105.0	149.5	89.9	110.0	107.4	166.7	92.3	90.6	73.0	79.5
1964	132.6	145.6	100.0	106.7	107.1	129.6	90.8	93.8	64.9	75.9
1966	127.3	145.6	86.1	96.0	107.1	118.5	83.1	91.3	61.6	67.0
1968	127.3	145.6	86.1	96.0	107.1	122.2	83.1	91.3	61.6	67.0
1970	132.6	145.0	86.1	96.0	107.1	125.9	83.1	91.3	61.6	67.0
1972	132.6	145.6	86.1	78.9	107.1	129.6	83.1	91.3	60.0	61.2
1974	160.7	155.3	88.3	78.9	109.5	133.3	87.7	91.3	61.1	56.3
1976	163.7	155.3	88.9	78.9	114.3	144.4	92.3	91.9	63.0	54.3
1978	166.8	155.3	88.3	79.4	116.7	148.1	92.3	91.3	62.4	60.6
1980	178.5	153.4	89.4	77.9	114.3	159.3	95.4	91.9	64.1	63.5
1982	239.3	155.3	90.6	78.9	111.9	166.7	90.8	93.1	70.3	76.3

Source: Calculated from data in China Statistical Year Book, Chinese State Statistic Bureau, 1984, Statistics Publishing House, Beijing

TABLE 12

PRICE TOT BETWEEN AGRICULTURE AND INDUSTRY IN CHINA

(1950=100)

Year	Index of Purchase Price of Farm Products	Index of Retail Price of Industrial Products in Country	TOT
1951	119.6	110.2	1.08
1952	121.6	109.7	1.10
1953	132.5	108.2	1.22
1954	136.7	110.3	1.23
1955	135.1	111.9	1.20
1956	139.2	110.8	1.25
1957	146.2	112.1	1.30
1958	149.4	111.4	1.34
1959	152.1	112.4	1.35
1960	157.4	115.5	1.36
1961	201.4	121.2	1.66
1962	200.1	126.6	1.58
1963	194.4	125.3	1.55
1964	198.5	122.9	1.54
1965	187.9	118.4	1.59
1966	195.8	115.0	1.70
1967	195.5	114.1	1.71
1968	195.2	113.8	1.71
1969	194.9	112.1	1.74
1970	195.1	111.9	1.74
1971	198.3	110.2	1.79
1972	201.1	109.6	1.83
1973	202.8	109.6	1.85
1974	204.5	109.6	1.87
1975	208.7	109.6	1.90
1976	209.7	109.7	1.91
1977	209.2	109.8	1.90
1978	217.4	109.8	1.98
1979	265.5	109.9	2.41
1980	284.4	110.8	2.56
1981	301.2	111.9	2.69
1982	307.8	113.7	2.71

Source: Chinese State Statistic Bureau, China Statistical Year Book, Statistics Publishing House, 1984, Beijing

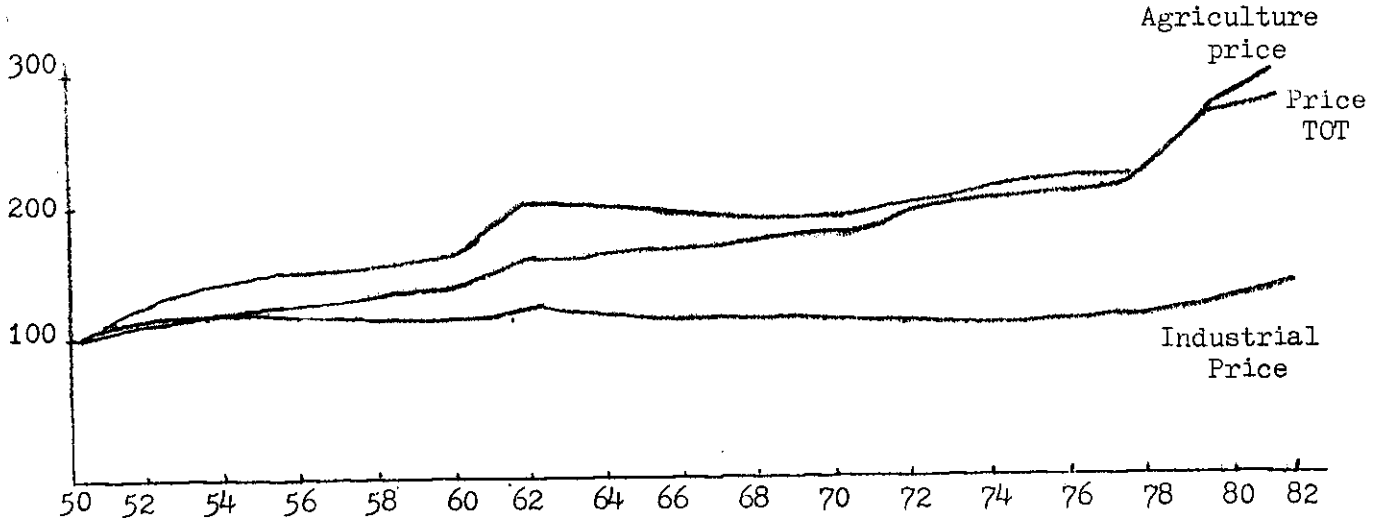

Figure 1. Price TOT Between Agriculture and Industry in China

As can be seen, the price of industrial commodities stayed fairly stable, with modest increases of 10.2% and 11.1% in 1950-52 and 1960-62, respectively. So the change in the price TOT was almost completely dominated by the changes in agricultural product prices. From 1950 to 1982 the purchase price of farm products increased 207.8%, while the TOT of agricultural product increased by 171% with the difference being the effect of price increases for industrial products. But the changes were not homogeneous, big jumps are conspicuous, which divide the whole period into four stages.

1. Economic renaissance from 1950 to 1952. Policy during this period was to greatly increase farm product purchase prices while only moderately increasing industrial product retail price in order to reduce the agriculture-industry gap. Compared with 1950, the purchase price of farm products increased by 21.6%, while industrial product prices in rural areas increased only 9.7%. The agriculture TOT increased by 10%, an average of 5% per year.

2. First and Second Five Year Plan period from 1952 to 1962. Policy in this period emphasized on stabilizing agricultural prices, while also not increasing industrial prices. In these ten years,

the purchase price of agricultural products increased by 61.9%, but this is accounted for by 27.2% increase in the last two years of this period, in the rest of this period it was quite stable. The price of industrial products in rural areas increased by 14.7%. TOT of agriculture improved by 43.6%, an annual average of 3.7%.

3. From 1962 to 1978. In this period, the price TOT of agriculture was mainly improved by reducing the price of industrial products sold in the countryside while stabilizing agricultural product price. But because of the adverse influence of the Cultural Revolution, the effect did not seem prominent.[10] Agricultural price increased by 9%, and industrial prices were reduced by 13.3%. The TOT of agriculture increased by 25%, 1.4% per year.

4. The period from 1979 to 1982. In 1979, the prices of eighteen main agricultural products were increased by 18%. The price index of all agricultural products increased by 22.1%, which was the biggest change in a single year. There were also upward adjustments in the ensuing years which pushed the agricultural price to new highs. The agricultural price index increased by 41.2% in four years. The TOT of agricultural products increased by 36.9%, an average 8.2% per year.

Except for the period after 1979, increases of agricultural price were generally moderate, the agricultural prices TOT increased constantly relative to industrial prices. But this does not necessarily deal with the question of rural poverty.

[10] During the Cultural Revolution, many government agencies ceased to function so a lot of planned adjustments of the economy were suspended or postponed.

CHAPTER IV

DOUBLE FACTORIOL TOT

The TOT analysis above is misleading at least in two senses.

1. The price TOT does not take into account the quantity of product involved in the trade, so it does not reflect the total revenue or benefit from trade. This problem is further worsened in China, where the price and quantity are not interrelated. Price is not determined by demand and supply in market, but to some degree arbitrarily by the government price agency. Because selling and buying at a given price are compulsory on both parties, price is exogenous to the system. So, a change in price in favor of agriculture may not necessarily mean the same change in revenue compared with industry if the increase of sales volume in the two sectors is different. Table 13 will clarify this fact.

Sales to the state as a percent of production for all food products has declined over time. There are slight increases in recent years but it is still lower than the peak years in the period. So far as grain is concerned, production increased by 115.6% from 1952 to 1982, but sales only increased by 95.1%. At the same time, agricultural machinery sold in the countryside increased by 592.8 times and fertilizer by 229.1 times.[11]

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[11] Source: Chinese State Statistic Bureau, China Statistical Year Book, 1984. Statistics Publishing House, Beijing.

2. The price TOT does not take into account the marginal product of all imputs and labor in agriculture, ignores the cost and benefit ratio in agricultural production and ignores the increase of surplus labor in agriculture, which has much to do with growth of agricultural population. These are all very important in determining the real per capita income in agriculture. So the price TOT does not reflect the real income of the agricultural sector and per capita income of farmers. During these thirty years, increase in the cost of agricultural production outstripped the price increase; this has made farming in some areas a profitless business. Population growth, which concentrated in rural areas greatly aggravated the problem of disgusied unemployment in agriculture that acutely conflicts with the economic goal of increasing per capita income in agriculture. This problem was not in the least alleviated until recent years when peasants were allowed to find their subsistance in urban areas. This problem will be discussed later.

So, for the reasons mentioned above, the price TOT is unable to demonstrate the real gains and losses of the two sectors in the market place and hence fails to reveal the fact that underlies the low per capital income and miserable living stands in countryside compared with industrial urban sectors.

TABLE 13

SALES TO THE STATE AND OTHER SECTORS AS A PERCENTAGE OF TOTAL PRODUCTION

(10,000 ton)

Year	GRAIN			EDIBLE OIL			COTTON		
	Production	Purchase by State and other Sectors	% in Production	Production	Purchase by State and other Sectors	% in Production	Production	Purchase by State and other Sectors	% in Production
1952	16391.5	2819.0	17.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1955	18339.5	3617.5	19.7	182.5	157.9	86.5	151.8	128.2	84.5
1957	19504.5	3387.0	17.4	170.6	134.5	78.8	164.0	141.9	86.5
1959	17000.0	4756.5	28.0	175.8	144.8	82.3	170.9	147.3	86.2
1962	16000.0	2572.0	16.1	79.0	48.4	61.3	75.0	66.0	88.1
1966	21400.0	3824.0	17.9	166.6	105.7	63.4	233.7	218.9	93.7
1969	21097.0	3382.5	16.0	146.1	82.7	56.6	207.9	185.9	89.4
1971	25014.0	3982.0	15.9	171.3	96.9	56.5	210.5	189.9	90.2
1974	27527.0	4397.5	16.0	188.4	98.1	52.1	246.1	229.3	93.2
1977	28272.3	3756.0	13.3	165.9	87.6	52.8	204.9	192.7	94.0
1980	32055.5	4797.0	15.0	274.5	195.3	71.1	270.7	268.1	99.0
1982	35342.5	5502.0	15.6	4285.0	310.0	72.3	359.8	347.5	96.9

Source: Chinese State Statistic Bureau, China Statistical Year Book, 1984. The Statistical Publishing House, Beijing

It is reasonable to consider some weights that can be added to the price TOT to improve its workability. Productivity in the two sectors is obviously the most conceivable. That is the double factorial TOT. Its formula:

$$\frac{P_A Z_A}{P_I Z_I}$$

where the P is the price and the Z is the productivity. Z is defined as $\frac{\text{output}}{\text{input}}$.

The formula has certain merits:

1. It indicates the quantity of sales of products in both sectors into TOT calculation. Generally, the higher the productivity, the greater the quantity of sale. It is very clear in the case of China, places where productivity is higher is more commercialized, and enjoy higher commodity ratio (percent of purchase in production).

2. Productivity itself represents the cost-benefit comparison, hence the cost problem which is very important can be incorporated into TOT. In China, production teams with high unit cost do not have high productivity.[12]

3. Productivity directly reflects the marginal product of agricultural labor, reflecting the extent of disguised unemployment and surplus labor. Disguised unemployment reduces productivity. Surplus labor is affected by the growth of rural population. So productivity is a general index that reflects the per capita income, living standards and welfare in the rural areas.

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[12]Productivity and cost are interrelated. High cost can lead to low productivity, low productivity also can lead to high cost.

Because of data limitations complete information on productivity of all resources is not available. Fortunately, labor productivity is justified as a good proxy for total input productivity. (Table 14).

TABLE 14

COST OF PRODUCING 100 JIN (50Kg) OF VARIOUS PRODUCTS IN 1979
(Yuan)

Item	Total Cost	Labor Cost *	% of LC in TC
Rice	11.23	6.38	56.8
Wheat	17.93	10.79	60.2
Corn	11.36	6.74	59.3
Soybean	23.48	15.05	64.1
Papeseed	39.79	26.6	66.9

*Labor cost is calculated by the stipulation of the Agriculture Ministry of 1.39 yuan per working day.
Source: Calculated from China Agricultural Year Book, Chinese Agricultural Ministry, 1981. Agricultural Publishing House, Beijing.

For these crops, labor cost accounts for more than half of the total cost. Labor cost is by far the largest single cost in total cost.

So, in $\frac{P_A Z_A}{P_I Z_I}$, Z_A is the index of labor productivity in agriculture, and Z_I is the index of labor productivity in industry. But one point is worth noting here. Since labor input is used in the index in place of all inputs, the Z calculated in this way may deviate from the total input productivity, where the input index is the average of all inputs used, if changes in labor input are not proportional to total inputs. If the change in labor input is more than proportion to the change in total input use, the Z tends to understate the changes in total input

productivity; if the change in labor input is less than proportion to the total input use it tends to exaggerate the total input productivity. Or put in another way, if labor cost increases faster than other costs in total cost, the productivity is understated; if it increases more slowly than other costs, the productivity is exaggerated. In extreme cases, the increase in productivity may be a mere reflection of a reduction in labor cost while the total cost may be unchanged or even increase (under the condition that the output remains unchanged). But in the calculation of terms of trade, only the ratio between the productivity of industry and agriculture is concerned, If the labor cost in total costs increase in the same proportion in both industry and agriculture, or in other words, if the productivities are distorted in the same direction and the same degree, no problem will arise (the productivity ratio does not change). While it is commonly accepted that capital inputs may increase faster than labor inputs in industry (there is no data available), it is true that it has the same tendency in agriculture (see Tables 20, 21, and 22). There is no evidence to suggest that total input productivity is more or how much more exaggerated in industry than is in agriculture. Nonetheless, it is important to remember that our calculated Z is only an approximation of an index based on the productivity of all inputs.

The data on labor productivity in the two sectors are not readily available. The existing data are different and in some cases inconsistent. In order to avoid this problem, calculation is done directly from original statistics, as shown in Table 15. Double factoral TOT for selected years is shown in Table 16.

TABLE 15

LABOR PRODUCTIVITY IN AGRICULTURE AND INDUSTRY IN CHINA

Year	Value of Industrial Production Bin Yuan	Industrial Labor in 10000 Person-Years	Industrial Productivity Yuan/ Person-Years	Value of Agricultural Production Bin yuan	Agricultural Labor 10000 Person-Years	Agricultural Productivity Yuan/ Person-Years
1952	343.3	1246	2755.0	484.0	17317	279.5
1954	548.7	1400	3919.3	555.0	18493	298.5
1958	1214.6	4416	2751.5	614.0	15492	396.3
1962	938.7	1705	5505.6	483.5	21278	277.2
1965	1547.9	1828	8467.7	663.6	23398	283.6
1968	1538.0	2092	7351.8	713.9	26065	273.9
1972	3245.9	3496	9284.6	828.1	28286	292.8
1975	4063.6	4284	9485.5	978.1	29460	332.0
1978	5213.6	5009	10408.5	1111.3	29426	377.7
1982	6802.0	5930	11470.5	1483.9	32013	463.5

Rural industry run by communes is included in agriculture.

Source: Calculated from data in China Statistical Year Book, Chinese State Statistic Bureau, 1984, Statistics Publishing House, Beijing.

TABLE 16

DOUBLE FACTORIAL TOT BETWEEN AGRICULTURE AND INDUSTRY IN CHINA

(1952=100)

Year	Purchase Price of Farm Product	Labor Productivity in Agriculture	P_AZ_A%	Retail Price of Industrial Goods	Labor Productivity in Industry	P_IZ_I%	TOT
1952	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1955	111.1	106.8	118.7	102.0	142.3	145.1	81.8
1958	122.9	141.8	174.3	101.5	99.8	101.3	172.1
1962	164.6	99.2	163.3	115.4	199.8	230.6	70.8
1965	154.5	101.5	156.8	107.9	307.3	331.6	47.3
1968	160.5	98.0	157.3	103.7	266.8	276.7	56.8
1972	165.4	104.8	173.3	99.9	336.9	336.6	51.5
1975	171.6	118.8	203.9	99.9	344.4	343.9	59.3
1978	178.8	135.1	241.6	100.1	377.8	378.2	63.9
1982	253.0	165.8	419.5	103.6	416.0	431.0	97.3

Source: Calculated from data in China Statistical Year Book, Chinese State Statistic Bureau, 1983, Statistics Publishing House, Beijing.

During the thirty years from 1952-1982, the price of farm products increased by 153%, but the labor productivity in agriculture increased only 65.8%, totaling to an increase of 319.5% in the P_AZ_A value. While the industrial price remained almost the same within those years, the labor productivity showed an increase of 316%. The P_IZ_I value increased 331%, outstripping that of agriculture. This underlies the basic picture of the factorial TOT between the two sectors. The changes of TOT over years can be seen from Figure 2.

Figure 2. Double Factorial TOT Between Agriculture and Industry in China

The year 1958 shows a big jump of the agriculture double factoral TOT and is the single year when the agriculture TOT is above the initial level. But this year is abnormal, an exception rather than a rule. This year was characterized by the boasting, exaggeration and inefficiency of the "Great Leap". From 1955 to 1958, more than 30 million people joined the industrial labor force, most of them from the countryside, an increase of 215%, while the increase in industrial production was only 121%, leading to a decline in productivity. On the other hand, that year coincided with particularly good weather, enabling the peasants to enjoy a bumper harvest with a 16.7% reduction in labor force, though the lack of labor in rural areas was obvious. This contributed to the increase of agricultural productivity in a distorted way, which unfortunately encouraged the Chinese leaders to continue the wrong policy by further depriving the agriculture, finally leading to a decline of agricultural production in the ensuing years.[13]

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[13] Feng Lanriu, Employment and Wages in China's Urban Areas, People's Publishing House, 1982, Beijing.

If 1958 is omitted, Figure 2 presents an explainable, smooth curve. It first decreases, then increases. From 1952 to 1965, agricultural price increased by 54.5%, but the agricultural productivity hardly increased. Because industrial labor productivity was advancing by leaps and bounds, with an increase of 207.3%, the agriculture double factorial TOT was constrantly declining. And agricultural prices were not always increasing. In the ten years from 1962 to 1972, agricultural prices were almost unchanged, and from 1962 to 1968, agricultural price even decreased. This also contributed to the decline of the double factorial TOT in this period. After 1954, the agricultural double factorial TOT slightly increased, with the big boom in the 1980's. This increase is due partly to a 15.7% increase in agricultural price, but mainly due to a 33.1% increase in agricultural labor productivity, in addition a 7.8% reduction in industrial product prices occurred. From 1978 to 1982, agricultural prices increased by 41.5% and because the responsibility system stimulated agricultural production, productivity also showed a great increase, so the double factorial TOT shot up by 52.3%.

From the preceding analysis, it is clear that it is not true that the double factorial TOT is changing in favor of agriculture all the time as shown by the price TOT. Before 1965, the double factorial TOT was constantly decreasing, and by 1965, it declined to 52.7% of the initial level. Although it increased from 1965 to 1980, it was still below the 1952 level. Agricultural prices have increased since 1952, but its effects on the double factorial TOT, hence on the relative benefit to the farmers, compared with that to the industrial workers, is more than offset by the effects of the big increase in industrial productivity and low-productivity in agriculture. This is the real picture

of TOT between agriculture and industry in China, it helps define the question posed by rural poverty.[14]

Even this factorial TOT of agriculture is overstated in this calculation for two reasons. First rural industry run by communes is incorporated in agriculture. Rural industry includes all of the industries that are a part of the commune economy, like textiles, milling, small mines, power plants, and so on. Therefore Z_A tends to exaggerate the agricultural labor productivity. In 1981, rural industry accounted for 28.3% of the total value of agricultural production,[15] and workers in rural industry have much higher labor productivity than peasants working in the fields. Secondly, the agricultural labor force is very difficult to calculate with an accuracy. For example, school children often help their parents in their off-school time, and it is difficult to estimate how much this labor amounts to. If these factors are considered in the calculation of productivity, the TOT of agriculture will be still lower.

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[14] It is only relative poverty compared with industrial urban sectors. It is not absolute poverty because farmers' income has been increasing, though slowly.

[15] Source: Chinese State Statistic Bureau, China Statistical Year Book, 1983. Statistic Publishing House, Beijing.

CHAPTER V

DIFFERENCE IN TOT OF AGRICULTURAL INPUTS AND CONSUMER GOODS

Further study of the TOT can be conducted by dividing industrial products sold in rural areas into two groups: agricultural inputs and consumer goods, to see what the TOT will be if the two groups are considered separately. This consideration is based on the fact that the price changes and labor productivities are different over the years for inputs and for consumer goods. As information is highly incomplete, some data has to be estimated. (Table 17)

TABLE 17

DOUBLE FACTORIAL TOT OF AGRICULTURE AND MEANS OF AGRICULTURAL PRODUCTION

(1952=100)

Year	$P_A Z_A$	Price index of means of Production**	Productivity of Industries Producing Means of Production***	$P_M Z_M$	$TOT(\frac{P_A Z_A}{P_M Z_M})$
1952	100.0	100.0	100.0	100.0	100.0
1955	118.7	101.2	138.1	139.8	85.9
1958	174.3	102.4*	190.6*	195.2	89.3
1962	163.3	104.2	254.1	264.8	61.7
1965	156.8	106.0	338.8	359.1	43.7
1968	157.3	102.5	355.3	364.2	43.1
1972	173.3	98.1	378.6	371.4	46.7
1975	203.9	94.9	397.1	376.8	54.1
1978	241.6	92.5	416.8	385.5	62.7
1982	419.5	97.0	484.5	469.9	89.3

P_A: Agricultural Price

Z_A: Agricultural labor productivity

P_M: Price of means of production

Z_M: Labor productivity in sectors producing agricultural means of production

*They are data for 1957

**Data of 1955, 1962, 1972, 1975 are calculated by average growth rates of 1952-58, 1958-65, 1968-78 respectively.

***This column is obtained by the average of the labor productivity index in electricity, petroleum, chemical and manufacturing industry.

Source: Calculated from data in China Statistical Year Book, 1984, Chinese State Statistic Bureau, Statistics Publishing House, Beijing.

Graphically:

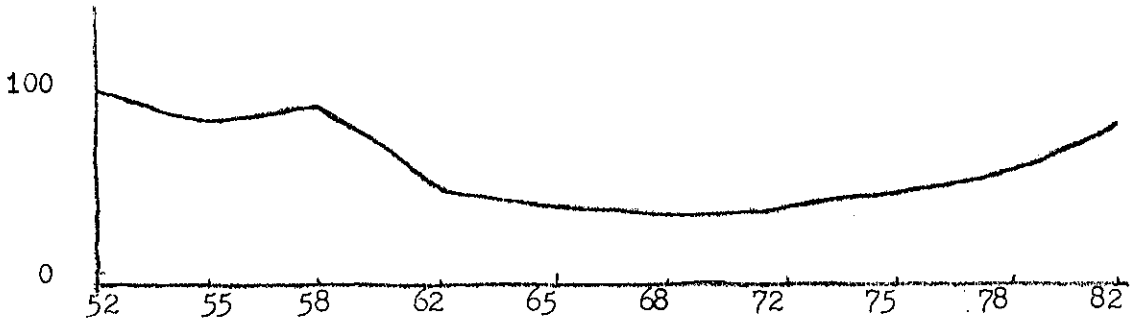

Figure 3. Double Factorial TOT of Agriculture and Means of Agricultural Production.

Figure 3 looks very much like the result we got before, except the TOT of agriculture falls further down into the valley. Compared with 1952, the double factorial TOT of agriculture dropped by 56.9% at the lowest point in 1958. It was largely restored by 1982, but was still 10.7% lower than the 1952 level. This is due to the fact that although the price of means of production declined 3% over the thirty years, the labor productivity in production of means of production rose by 384.5%, a rate higher than the average in the whole of industry.

We will now examine the situation in industrial consumer goods in Table 18. The obvious difference is that the price of consumer goods was not falling but rising, and the productivity in that sector increased not as much as in the sectors producing agricultural means of production.

In Figure 4, the TOT curve is just like the curve in Figure 3 but is shifted up a little bit. The trade between industrial consumer goods and farm products is the only place where the TOT of farm products increased from 1952, but still in half of the years for which the agriculture TOT is lower than in 1952. Before 1958, which accounts for

more than half of the time period, it was falling, after 1958, it was constantly increasing, mainly because of price increase of farm products, but it did not surpass its 1952 level until after 1978.

TABLE 18

DOUBLE FACTORIAL TOT OF FARM PRODUCT AND INDUSTRIAL CONSUMER GOODS
(1952=100)

Year	$P_A Z_Z$	P_C**	Z_C****	$P_C Z_C$	TOT$(\frac{P_A Z_A}{P_C Z_C})$
1952	100.0	100.0	100.0	100.0	100.0
1955	118.7	104.3	113.2	118.1	100.5
1958	174.3	108.8*	128.1*	139.4	125.0
1962	163.3	114.0	145.9	166.3	98.2
1965	156.8	119.4	166.2	198.4	79.0
1968	157.3	119.2	170.0	202.6	77.6
1972	173.3	118.7	175.3	207.9	83.4
1975	203.9	118.6	179.3	212.5	96.0
1978	241.6	118.4	183.5	217.3	111.2
1982	419.5	130.0	194.6	253.0	165.8

P_C: Price Index of industrial consumer goods

Z_C: Labor productivity of sectors producing industrial consumer goods

* They are data for 1957

** 1955, 1962, 1972, 1975 is calculated by the average growth rate of periods 1952-58, 1959-1965, 1968-78.

***This column is calculated by the average indice of labor productivity in food processing and textile industry.

Source: Calculated from data in China Statistical Year Book, Chinese State Statistic Bureau, 1984, Statistics Publishing House, Beijing.

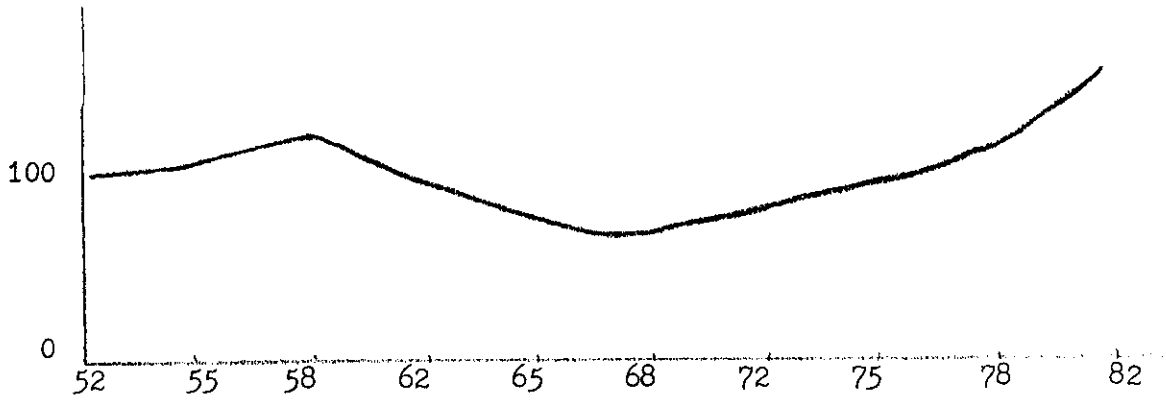

Figure 4. Factorial TOT of Farm Productivity and Industrial Consumer Goods

The situation faced by the peasants in terms of the double factorial TOT is not so bad as in the other two cases because labor productivity of the consumer good industry (light industry) is much lower. Just contrary to the case of the means of production, the price of consumer goods increased by 30%, but the productivity in sectors producing consumer goods grew much slower than in other industrial sectors, only 94.6% in the whole period, not much higher than the 65.8% of the agriculture sector. In a farm household expenditure on consumer goods is larger than on means of production. (Table 19)

TABLE 19

AVERAGE EXPENDITURE PER PERSON ON COMMODITY
(Yuan)

Item	Total Expenditure	On Consumer Goods	of which					On Means of Production
			On Food	On Cloth	On Fuel	On House	Other	
Yuan	153.97	121.57	50.61	24.36	2.80	21.70	22.10	32.40
%	100.00	78.90	32.90	15.80	1.80	14.10	14.40	21.10

Source: Calculated from data in China Statistical Year Book, Chinese State Statistic Bureau, 1983, Statistic Publishing House, Beijing.

Expenditure on means of production is only 21.2% of the total expenditure of a farm household, while that on consumer goods is 79%. From the point of view of price TOT, this expenditure pattern means that farmers are adversly affected, larger proportion of their income are spent on consumer goods whose price has increased more than that of means of production. This may partly explain why poverty lingered in the countryside while the commodity prices and labor productivity in agriculture are increasing. Farmers are made worse off in an absolute sense than otherwise, if the expenditure pattern is reversed. But on the other hand, from the point of view of the double factorial TOT, although in light industry the prices of products increased 33% compared with sectors producing means of production, the cost is much, much higher then in heavy industry - the increase of productivity in light industry is only 24% of that in heavy industry.[16] So, under this consumption pattern, farmers are made worse off because of the high price of consumers good; industrial workers are made even worse off because of the high cost of production. This might have helped retard the polarization of peasantry and urban working class.

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[16] Heavy industries are mainly those sectors producing means of production; light industries are mainly those sectors producing consumer goods.

CHAPTER VI

EXPLANATIONS FOR THE LOW DOUBLE FACTORIAL TOT OF AGRICULTURE

Price in China is largely exogenous to the economic system in the sense that it is not determined by the market forces. So, productivity is the only endogenous variable that can influence the double factorial TOT. As we have seen, agricultural double factorial TOT is low compared with industry not because the price but because the productivity is too low in agriculture. The role of productivity in improving the agriculture TOT and changing agriculture's status compared with industry was largely ignored by the Chinese leadership at least in most of the years after 1949. This was reflected in policies that emphasized promotion of agricultural price instead of raising agricultural productivity.

Generally speaking, the performance of double factorial TOT in China can be explained by the following:

1. The cost of agricultural production is too high and increasing, relative to price. Agricultural production cost is not the same nationwide because the labor cost is quite diversified and very difficult to aggregate. But costs must have increased more than production. An estimation done by Anthony M. Tang shows results displayed in Table 20.

   Agricultural production increased by 86% from 1952 to 1977, but use of agricultural inputs increased by 131% in the same period; use of current inputs like seeds, fertilizer, pesticides increased by 559%. Agricultural input use increased more than agricultural production. Compared with output, both material cost and labor cost have increased over the years. This fact is clear from the Table 21 and 22, which were produced by a nationwide survey concerning 3000 production teams.

The labor cost (in terms of labor days) for all of the products except rice have increased. In 1978 compared with 1965, labor cost per 100 jin of product increased by 4.3% for all crops on average, 7.3% for oilbearing crops, for sesame, soybean and cotton, it increased the most.

According to the same survey, of 13 products surveyed, material cost per 100 jin product had increased for all products except sesame and fiber crops. .For tobacco it increased more than 100%, for cotton, peanuts, soybeans, it increased by 70-80%. In material costs, the most important components are fertilizer and machiner, a survey in 1979 showed that fertilizer and farm machinery operation cost accounted for 47% of the total cost.[17]

The same survey concluded that the total cost per 100 jin of product increased from 1954 to 1978: by an average of 35.9% for grain crops, 55.1% for oil bearing crops and for commercial crops, 111.5%, for cotton, 46% for tobacco, and 1% for fiber crops.[18]

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[17] Source: Chinese Agriculture Ministry, China Agricultural Year Book, 1980, P. 365. Agricultural Publishing House, Beijing.

[18] Source: Chinese Agriculture Ministry, China Agricultural Year Book, 1980, p. 365. Agricultural Publishing House, Beijing.

TABLE 20

INPUT AND OUTPUT OF AGRICULTURE IN CHINA

(1952=100)

Year	QVAO* index	land input index	capital input index	labor input index	current input index	aggregate input index**
1952	100.0	100.0	100.0	100.0	100.0	100.0
1954	103.0	103.7	107.7	101.7	118.0	105.0
1956	113.0	111.0	110.1	104.6	161.0	115.0
1958	131.0	109.2	137.5	105.6	204.0	124.0
1960	90.0	104.6	110.3	107.3	235.0	126.0
1962	105.0	104.1	111.6	109.7	198.0	122.0
1964	125.0	107.0	135.6	113.8	224.0	134.0
1966	141.0	109.2	160.3	119.3	290.0	146.0
1968	140.0	109.8	162.9	124.5	321.0	154.0
1970	158.0	110.7	176.2	130.8	367.0	166.0
1972	169.0	112.4	209.9	137.8	435.0	183.0
1974	183.0	114.6	224.4	144.7	506.0	199.0
1976	187.0	116.8	245.0	151.7	596.0	219.0
1977	186.0	117.4	251.2	155.4	659.0	231.0

*Gross Value of Agriculture Output

**Weighted average of the other four input indexes. The weights are 50% for labor, 25% for land, 10% for capital input, 15% for current input.

Source: Anthony M. and Bruce Stone, Food Production in the Peoples' Republic of China, 1980, Research Report 15, International Food Policy Research Institute, Washington.

TABLE 21

LABOR COST PER 100 JIN (50kg) OF PRODUCT
(labor-days)

	1965	1976	1977	1978	Labor day 78 compared w/65 ± labor day	± %
Rice	8.24	7.55	6.59	6.84	-1.40	-17.0
Wheat	9.22	9.79	11.52	9.79	+0.57	+ 6.2
Corn	6.76	7.03	7.24	6.81	+0.05	+ 0.7
Soybean	8.19	13.39	10.63	12.74	+4.55	+55.6
Sesame	11.24	21.32	25.57	27.03	+12.79	+89.8
Cotton	54.60	84.74	86.69	78.67	+24.07	+44.1

Source: Chinese Agricultural Ministry, China Agricultural Year Book. 1981, Agricultural Publishing House, Beijing.

TABLE 22

MATERIAL COST PER 100 JIN PRODUCT
(Yuan)

	1965	1976	1978	1979	79 compared with 65 ± yuan	±%
Rice	3.88	4.41	4.72	4.7	0.82	21.13
Wheat	5.81	6.86	7.06	8.09	2.28	39.24
Corn	3.52	4.34	4.22	4.63	1.11	13.53
Soybean	4.82	6.12	7.62	8.43	3.61	76.9
Sesame	13.78	10.27	12.58	10.59	-3.19	-23.15
Cotton	24.7	47.32	44.14	46.03	21.33	86.36

Source: Chinese Agricultural Ministry, China Agricultural Year Book, 1981, Agricultural Publishing House, Beijing.

2. Increase of labor cost in production has another aspect. It reflects not only the managerial inefficiency, but also the population pressure on scarce resources. China is a large country, but the agricultural resource base compared with the huge population is quite limited. Table 23 compares arable land with other countries.

TABLE 23

ARABLE LAND PER PERSON IN 1978

(ha)

Country	Arable land per person	Arable Land per agricultural population	Arable Land per agricultural labor
China	0.104	0.123	0.338
U.S.	0.859	23.420	47.614
USSR	0.890	4.925	9.761
Japan	0.043	0.354	0.677
France	0.353	3.701	8.680
W. Germany	0.131	2.841	0.116
U.K.	0.125	5.773	12.475
Hungry	0.507	2.632	5.893
Romania	0.481	0.985	1.777
Yugoslavik	0.363	0.911	1.977
India	0.256	0.397	1.025
Brazil	0.341	0.859	2.725

Souce: Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economics, Agricultural Publishing House, Benjing 1982.

Arable land per person in China is lower than those of all the other countries shown in Table 23, except Japan. Arable land per agricultural laborer is only 0.7% of that of the U.S., and half of that of Japan. Disguised unemployment has long been a phenomenon of China's rural areas, and it was aggravated in the 70's when children of the baby boom in the early 1950's reached work age. Some people suggest that one-third of the Chinese agricultural labor force is disguised unemployment.[19] When we were talking about the labor cost, we saw that labor input increase did not increase output, which suggests that the MVP of labor equals zero. This situation is further worsened by the prohibition of migration of rural people to urban areas. People were forced to stay on the farms. Disguised unemployment not only reduces productivity, but also directly affects per capita income. Disguised unemployment has contributed a lot to the low productivity of agriculture.

3. Government financial support in agriculture is limited compared to other sectors. This can be shown in two ways. Government investment in agriculture increased by 893.5% from 5.83 million yuan in 1952 to 57.92 million in 1979, and it was increasing in most of the years during the period of time. But it is much less than government investment in industry. (See Table 24)

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[19] Population has been growing faster in the countryside than in cities, because of the strong traditional force and the welfare need of the elderly people (There is no pension system in countryside, so people have to have children to support them when they are old.)

The highest agricultural investment occurred in 1953; it accounted for 24.5% of the total investment. The lowest, 4.6%, occurred in 1954. Investment in industry was more than half of the total investment in most of the years. In fact, agriculture's contribution to the government budget was higher than the budget share it got from government. The agriculture tax alone was over 10% of the total government revenue before 1957; the highest year was 29%, without taking into account agriculture's contribution through unequal exchange between agriculture and industry.[20] Government investment creates income transfers between sectors. So there is much more income transfer into industry from government sources than into agriculture. The large injections of government investment into industry enhanced the capacity of industry to promote its productivity relative to agriculture.

TABLE 24

GOVERNMENT INVESTMENT IN AGRICULTURE AND INDUSTRY

Year	Investment in Agriculture		Investment in Industry	
	100 ml yuan	% in total	100 ml yuan	% in total
1952	5.83	13.3	17.76	43.4
1957	11.87	8.6	24.48	57.5
1962	14.39	21.3	25.85	59.0
1965	24.97	14.6	24.10	55.0
1975	38.40	9.8	26.15	59.7
1979	57.92	11.6	24.53	56.4

Source: Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agriculture Publishing House, 1982, Beijing.

[20]Source: Chinese State Statistic Bureau, China Statistical Yearbook, 1983. Statistics Publishing House, Beijing

The percentage of agricultural investment in the total value of agriculture production is also low compared with other countries. In 1978 government investment in agriculture was 5,647 billion yuan, 3.9% of the gross value of agriculture product (GVAP) of 145.88 billion yuan. French government agricultural investment in 1977 was 47.3 billion francs, 36.1% of the GVAP of 131.1 billion francs. Its counterpart in West Germany was 13 billion marks, 42.3% of the GVAP of 30 billion marks. That in Denmark in 1978 was 16.7% of the GVAP, while in Japan it was 5.72 times of the GVAP.[21]

Other government budgetary expenditure in agriculture (government expenditure on social welfare, education, etc.) is also very low. In 1960, it accounted for 13.8% of total government budgetary expenditure. It was 15.4% in 1961, 16.2% in 1963. The highest percentage was in 1964, but it was no more than 17%.[22]

Bank credit and loans are very important in many countries to improve agricultural production. Bank credit to agriculture in China has been increasing over time but the information about comparison with credit or loans available to industry is not available. But a comparison with other countries may show the scantiness of the credit to agriculture. U. S. banks provide agriculture loans of 110 billion dollars .

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[21]Source: Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agricultural Publishing House, 1982. Beijing

[22]Source: Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agricultural Publishing House, 1982. Beijing.

every year. In 1978, it approximated the gross value of agricultural production in the U.S. French banks made loans to agriculture of 31.9 billion francs, 24.3% of the gross value of agricultural production. In Japan in 1977, it was 17.6% of the GVAP. While in China, agriculture credit was 11.55 billion yuan, amounted to only 7.9% of the GVAP of 145.88 billion yuan.[23]

4. Agricultural scientific research is far behind that of industry. Official statistics show that natural science research people are fewer in agricultural sector relative to other sectors. (Table 25).

TABLE 25

1982 NATURAL SCIENTIFIC TECHNICAL PERSONNEL
IN STATE OWNED UNITS

	Total	Engineering	Agriculture and Forestry	Public Health	Science Research	Teaching
1000 persons	626.44	235.46	36.18	180.71	37.18	136.91
%	100	37.6	5.8	28.8	5.9	21.9

Source: Chinese State Statistic Bureau, China Statistical Year Book, 1983, Statistic Publishing House, Beijing.

Scientific and technical personnel in agriculture accounted for only 5.8% of the total personnel, the smallest group of all. Neglect of this area will inevitable affect the outcomes of research. In four years from 1979 to 1982, of the average 120 major scientific and technical innovations that received national awards, 104 went to industry, 51 to medicine, while only 11 went to agriculture.[24]

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[23] Ibid.

[24] Source: Chinese State Economic Commission, China Economic Year Book, 1983. People's Publishing House, Beijing.

Science and technology are the fuel of economic development. Lack of efforts in agricultural scientific research in China also retarded the agricultural development, retarded the rising of agriculture productivity.

5. Prices of agricultural products are still very low. Although agricultural prices rose sharply after 1949, they are still low by some criteria. According to Marx's theory, which is allegedly the basis of the price determination in China, price should correspond to the cost of the production. As shown in chapter II, for a lot of agricultural products the costs exceeded prices even after recent upward price adjustments. There still are some farmers who cannot compensate their production expenditure by their revenue.

Another criterion is the comparison with other countries, or the opportunity cost abroad. In 1978, one jin of grain could exchange for 1.5-2 jin of fertilizer in world market, while in China one jin of grain was worth less than one jin of fertilizer. One jin of cotton could trade for 2-2.6 meter of white cotton cloth, while in China it traded for less than 1.3 meter. One jin of wheat was worth 1.5 jin of kerosene in world market, but in China it was only worth less than 0.4 jin of kerosene. Twenty jin of rice exchanges for a polyester shirt in Tokyo, while it will cost more than 60 jin to get one in Peking, while in Tokyo 7 jin of rice can buy a pair of tennis shoes, in Peking, the same shoes will claim more than 40 jin of rice.[25]

The TOT between agriculture and industry in China also reflects the Chinese leaders' development strategies. Following Marx, they always

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[25]Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agriculture Publishing House, 1982 Beijing.

put industry at the first of their priorities. Industry always outweighs agriculture. Agriculture, however, is a source of funds for industrialization. In all agricultural policies, income policy has little meaning. This is best demonstrated by quoting Mao himself in 1950:

> "Of the fund needed to accomplish the industrialization and agricultural technical transformation of the country, a major part has to be accumulated from agriculture. That means except direct agricultural taxes, we have to develop the production for which the farmers have great demand, use this to exchange grain and light industrial raw materials, meeting the physical needs of both farmers and the state on one hand, accumulating fund for the state on the other."[26]

While "physical need of farmers" is a very ambiguous concept, the idea of "accumulating fund for the state" is quite clear.

China's economic development basically followed the famous Lewis model.[27] It is a closed economy in which the largest economic sectors, agriculture and industry, characterize the dualism. A fragile agriculture on a small resource base is supporting a huge growing population. Marginal labor productivity in agriculture is or approaches zero; farmers' incomes have long been kept on a subsistance level. Wages of workers in industry are usually double the peasants' income. In 1978, the average annual income per person in a industrial worker's family was 316 yuan, while that in a farmer's family was 134 yuan. In 1982, they were 500 yuan and 270 yuan respectively.[28] Because of this, worker's wages could be kept constant for a long time. (Table 26)

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[26] Central Committee of Chinese Communist Party, Collections of Mao's Works, Volume V, pp. 182-183. 1977, People's Publishing House, Benjing.

[27] Ian Little, Economic Development, Basic Books, Inc. Publisher, New York, 1982

[28] Source: Chinese State Statistic Bureau, China Statistical Year Book, 1983, Statistics Publishing House, Beijing.

TABLE 26

AVERAGE WAGE RATE IN STATE OWNED UNITS

(Yuan)

Year	Average Wage Rate Per Year	Year	Average Wage Rate Per Year
1952	446	70	609
1954	519	72	622
1957	637	74	622
1960	528	76	605
1963	641	79	705
1965	652	81	812
1968	621	82	836

Source: Chinese State Static Bureau, China Statistical Year Book, 1983, Statistics Publishing House, Beijing

Except for the adjustment in recent years, the average wage rate remained relatively unchanged. Slight increases occurred in the First Five Year Plan period(1952-1957), with an annual increase of 7.4%, and in 1963-1965, with an annual increase of 3.3%. But during "Great Leap", Second Five Year Plan and the Cultural Revolution period (1957-1976), average wage rates decreased. Between 1957 and 1976, the average wage rate dropped from 637 yuan to 605 yuan, a drop of 5%. If inflation is taken into account, the decline is more dramatic. Inflation during 1957-1979 period was 16.4%, but the increase of wages in the same period was only 10.7%, resulting in a decrease in real wages of 5.7%.[29]

[29] Feng Lanriu, Employment and Wages in China's Urban Areas, People's Publishing House, 1982. Beijing.

Wage rate was kept constant, so that

> industrial growth rockets. Under plausible assumptions, the rate of profit should be high, and most is saved...the growth rate is not merely high but accelerating. Investment rises continuously as a proportion of national income.[30]

Except First Five Year Plan and 63-65 adjustment period during which the saving rate (in national income) was a little lower than 25%, the Second, Third and Fourth Five Year Plan all had high saving rates of 30.8%, 26.3%, 33.5% (average in each period) respectively. Even in the post-Mao period of 1977 and 1978, the saving rates were still as high as 32.3% and 36.5%. The percentage of the capital construction fund in the government budget was 37% in First Five Year Plan period, 46.2% in the Second, 38.7% in the Third, 40.2% in the Fourth.[31]

Most of the savings are reinvested in industry. This greatly stimulated industrial development and promoted industrial productivity. It should not be surprising that in the past 30 years, industry (measured by the total value of industrial product) increased by more than 20 times while agriculture increased only by 2 times; this has largely dominated the double factorial TOT between these two sectors.

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[30] Ian Little, Economic Development, p. 92. Basic Books, Inc. Publisher, New York, 1982.

[31] Xu Yi, Chen Baosen, China's Finance, People's Publishing House, 1982, Beijing.

CHAPTER VII

DUAL MARKET

The analysis of the TOT between agriculture and industry in China is complicated by the two price, two market system in agriculture, namely, compulsory delivery and free market. Free market is a non-negligible part of rural and urban life. The following table (Table 27) shows the scale and size of the free market and its changes over time.

TABLE 27

PURCHASE OF FARM AND SIDELINE PRODUCTS
(100 million Yuan)

Year	Purchase by Commercial Department	Purchase by Industry and others	Purchase by Non-agricultural Residents from Farmers	% of Free Market in Total
1952	90.1	38.9	11.8	8.4
1955	158.0	25.4	11.8	6.0
1959	271.9	3.8	3.5	1.3
1962	161.7	22.3	27.0	12.8
1965	274.2	19.9	13.0	4.2
1968	298.0	21.0	19.2	5.7
1971	330.0	20.4	17.7	4.8
1975	414.6	39.0	25.0	5.2
1978	459.7	67.1	31.1	5.6
1980	677.0	96.2	69.0	8.2
1982	855.6	116.6	110.8	10.2

Source: Chinese State Statistic Bureau, China Statistical Year Book, 1984, Statistics Publishing House, Beijing.

The free market in China has long been subject to political controversy. So its vissiscitude closely corresponds to the political weather. In the early 1950's, when moderate policy toward capitalism was prevailing, farm products channeled to the free market accounted

for a relatively large proportion of the total farm products sold to non-agriculture sectors. It was 8.4% in 1952. In the ensuing "Great Leap" years from 1957 to 1960, free markets were considered "capitalistic", and hence were banned. In 1959, farm products handled by individual farmers was only 1.3% of the total sale, a negligible residual. The economic catastrophe brought on by the "Great Leap" emphasized the failure of "pure socialism," policy shifted to again permit the free market. In 1962, 12.8% of the total sale was handled by the free market, which was the highest in 1952-1982 period. Then came the ten year Cultural Revolution, when radical policy prevailed again. For more than ten years, any inclination toward free economy was constantly criticized, and the free market was under tight government control; private handling was kept in the 4-5% level. After the fall of the "Gang of Four" in 1976, things changed greatly. Policy became more liberal, more realistic, all free markets that were banned during the Cultural Revolution were reopened, and many new ones sprang up. From 1978 to 1982, the number of free markets increased from 33,302 to 44,775, an increase of 34.5%. The volume of transactions rose from 12.5 billion yuan to 32.8 billion yuan, an increase of 162.4%.[32]

But the scale of the free market is still moderate even when the dramatic changes in the recent years are taken into account. It is openly admitted now that the free market is important in coordination of planning and in promotion of farmers' income. It gives a different incentive to the economy and agricultural production. Although the government policy toward the free market has changed over time, the free

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[32]Source: Chinese State Statistic Bureau, China Statistical Year Book, 1984. Statistics Publishing House, Beijing.

market is still considered as a complement to the collective economy. It is basically characterized by:

1. Small scale. The products the peasants can bring to the market are a residual left over from compulsory deliveries to the state and peasants' own consumption. In years of scarcity, they hardly have anything to sell.

2. Local orientation. In most of the rural areas, transportation and communication facilities are not well-developed and the commercial information system hardly exists, which it greatly handicaps the development of a large interregional market. Peasants usually carry ten or twenty kg of wheat travelling to the local periodical fair by foot, so no bulk sales are possible. This in turn limits the scale of the market.

3. Government control. For most of the past 30 years, free market has been under tight government control. The size, location, commodity variety, and volume had to follow the government stipulation. Free markets in urban areas were prohibited in some years. On the other hand, the supply of products to the free market was restricted too. The main sources of supply for free market were the farmers' "reserved plots", which were assigned to individual peasant households by the collective farms. The peasants had the right to use them, and freely dispose the products from them, but had no right to dispose of the land itself. The reserved plots were considered as a "queue of capitalism" and were tightly controlled in scale; in some places reserved plots were eliminated.

Free markets are largely limited to rural areas characterized by the small scale, local orientation and government control. Most exchanges are among peasants themselves, not involving any meaningful exchange between the agricultural and industrial sectors.

There may be some changes in the last two or three years, but this is the picture of free market in most years of the period.

While TOT anaysis based on free market prices may be interesting, unfortunately, persistent statistics on the free market are nonexistant. But the free market at least provides a basis for an estimation of the difference of price in the two markets and hence the magnitude of the income transfer because of the price distortion.

The deviation of government purchase price and market price experienced four stages.

1. From 1953 to 1956. Starting from 1953 the government stepped in to control the agricultural product purchases. The difference between government purchase price and the free market price was generally small in this period. Fourteen billion more jin of grain was purchased by the state in 1954 than the previous year, leading to shortage in countryside, and the price difference between the two markets increased. It decreased again when the purchase was reduced in the later years.

2. From 1957 to 1962. Communization and the "Great Leap" badly hurt agricultural production; this plus three years' successive increase in state purchase of grain in 1957, 1958, and 1959, dearth of food and starvation threatened the country. The price difference between the two markets skyrocketed. Even in grain-surplus provinces like Jangshi, the free market grain price was

unbelievably high; for example the price of rice was 8 yuan per jin (0.5kg), more than 100 times of the government purchase price.

3. From 1963 to 1978. With the relief of the food situation in the countryside after 1963, the grain price in the free market began to fall. Price was largely constant from 1964 to 1970, 1-2 times higher than the state purchase price. After 1970, grain price increased again, reached more than 3 times of the government purchase price in 1976.[33]

4. After 1979. Implementation of the responsibility system stimulated production and coupled with the good harvest in 1979, grain prices in free market plummeted, falling into the level of before 1970. But the market price was still one time higher than the state purchase price. In 1981, the wheat price in rural free market was 0.594 yuan per kg, 39% over the average state purchase price of 0.428 yuan per kg. The gap in the case of rice was even greater. The rural market price of 0.518 yuan per kg was 70% over the price of government purchase. In urban free market in rice growing regions the price was 0.6 to 0.9 yuan per kg., two to three times of the farm delivery price.[34]

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[33] Song Guoqiug, "From State Monopolistic Marketing to Land Tax" Agricultural Forum, 1984 (a restricted publication), Beijing.

[34] Nicholas R. Lardy, Agricultural Price in China, World Bank Staff Working Paper, World Bank, Washington. 1983.

Empiricially it is very difficult to predict what the price would be if all sales were made in the free market. But theoretically the price would rise to the free market price if all of the distortions were eliminated. This is illustrated in the following graph.

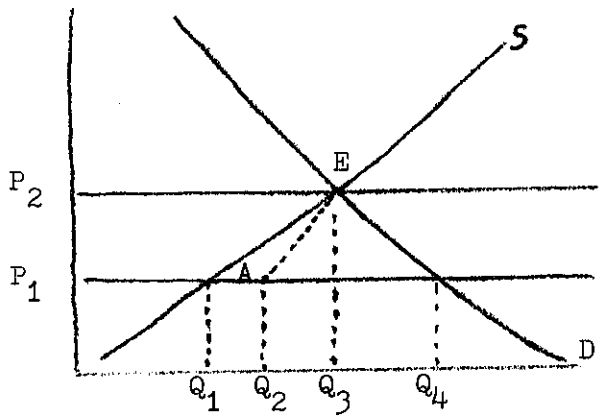

Figure 5. Dual Market Price

D is the total demand, including demand from both urban residents and farmers. P_1 is the state price which is set lower than the equilibrium price P_2 where the demand and supply curves meet. At price P_1, there is excess demand Q_4-Q_1; Q_1 is the maximum the state can get without compulsory delivery. But the state is not satisfied with being supplied with Q_1 at price P_1, instead they require Q_2. In other words, peasants are forced to sell Q_2 to state at price P_1. But there is still an excess demand Q_4-Q_2, and although supply increased, the demand did not decrease because the price remains unchanged. Now, the free market comes to meet the excess demand. Because the state price will not change, farmers are willing to supply the free market at any prices it offers that are higher than the state price, and the excess demand which is not met by the state market will bid the price up in the free market.

So, the supply curve will move along the line AE which is the supply curve in the free market. While the price is increasing, the excess demand is also being reduced. The price will finally increase to P_2, where equilibrium of demand and supply is achieved. So, the total equilibrium point E is also the equilibrium in the free market. The total supply consists of two parts, Q_2 and Q_3-Q_2, namely the supply in state market and supply in free market. And the fact also involved is that, when supply moves from zero to Q_3, the farmers first have to fulfill the state quota Q_2, and then the residual can be sold in the free market at increased price.

Therefore, if the state market did not exist, everything was sold in free market the supply curve would change into its original shape like S in the graph. The demand would equal supply at price P_2 and Q_3 would still be produced. Now, we reached the conclusion that when there is no state market, the price will merge into the free market price.

So, if the market price is twice the state price (in fact it is higher than that sometimes), for one jin of grain the peasants sell to the state, they lose as much as they receive. They lose approximately 12 billion yuan per year by selling grain to the state alone even in the years after 1979 when the situation is generally considered favorable to the farmers. By this calculation, each rural person loses 15 yuan each year by selling grain alone, an amount equal to 6-10% of his or her annual income. From 1953 to 1983, the average government purchase of grain every year was about 100 billion jin (50 million tons), totalling 3000 billion jin (1.5 billion tons) in the 30 years. Even counted on the base of a difference of only 0.10 yuan per jin

between the state market and free market (the difference was larger in most of the years), the peasants' loss due to sale of grain to state alone during the 30 years amounts to 300 billion yuan. Compared with this, the capital construction investment in the whole of light industry during the same period was less than 60 billion yuan. The purchase of grain, a single item in the entire array of farm product purchases accrued to the government and the non-farm sectors a revenue equivalent to five times of their investment in light industry.[35] This helped make rapid development of industry possible.

The TOT analysis does not take this into account. But the inescapable fact is that the farmers would be much better off in terms of trade with the non-farm sectors if all of the products were sold in the free market.

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[35]Source: Song Quoqing, "From State Monopolistic Marketing to Land Tax," Agricultural Forum, 1984. (Restricted publication, not openly published), Beijing.

CHAPTER VIII

CONCLUSIONS AND IMPLICATIONS

The conclusion can be drawn from this analysis that agriculture in China has been cast in an unfavorable position compared with industry as measured by the double factorial TOT. This mainly attributed to the low productivity in agriculture compared with industry. But there are a lot of factors to blame for the low productivity, among them the small resource base, large agricultural population, mismanagement, neglect of agricultural research, and government policy mistakes. The price increase of agricultural products over the years that has caused a lot of objections is not enough to offset the counter-effect of low productivity. The final result is the gap of per capita income and consumption levels between agriculture and non-agriculture sectors. (Table 28).

TABLE 28

PER CAPITA CONSUMPTION LEVELS OF AGRICULTURE AND NON-AGRICULTURE RESIDENTS*
(Yuan/Year)

Year	Average Consumption of all Residents	Average Consumption of Agricultural Residents	Average Consumption of Non-Agricultural Residents	Agricultural Residents As % of all Residents	Agricultural Resident as % of non-agricultural Residents
1952	70	62	148	81.6	41.9
1957	120	79	205	77.5	38:5
1962	117	88	226	75.2	38.9
1965	125	100	277	80.0	42.2
1970	140	114	261	8.4	43.7
1975	158	124	324	78.5	38.3
1977	165	124	361	75.2	34.3
1978	175	132	383	75.4	34.5
1979	200	155	416	77.5	37.3

*In current prices.

Source: Policy Research Division, Chinese Agricultural Ministry, Outline of Chinese Agricultural Economy, Agricultural Publishing House, 1982. Beijing.

The consumption level of peasants is less than half of that of non-agriculture residents, and the gap has increased throughout the period as shown in Table 28. From 1952 to 1979, the per capita consumption of the whole population increased from 70 yuan to 200 yuan, an increase of 185.7%, that of state employees increased by 281.1%, from 148 to 415 yuan, while that of farmers increased from 62 to 155 yuan, or 150%. Compared with the whole population, the consumption of agricultural residents decreased by 4.1% from 1952 to 1979, compared with non-agricultural residents, it decreased by 4.6%. Although farmer's absolute consumption increased over the years, it lagged behind that of non-agricultural workers and residents.

The situation may have greatly changed in the last two or three years. After 1979, the responsibility system was introduced into rural areas under which the means of production of the communes, mainly land, was divided into small units and assigned to farm households. Peasants have more freedom to decide what to produce and how much to produce. The restriction of planning on farmers' decisions was relaxed and plans became more flexible. There also were corresponding changes in management and institutions. Peasants have the right to make decisions under certain "state guidance," which is mainly in forms of provision of technology and commercial information. What the state is actually doing is only to claim a certain amount of agricultural tax and compulsory delivery, in whatever way it may be produced. The commune system has ceased to function; it has no influence on agricultural production. So it has no reason to exist. In some places, it has begun to gradully vanish. In 1981 and 1982, further policy changes were made to allow peasants to organize their own businesses

other than agriculture. They were allowed and encouraged to work and invest in urban areas, in such sectors as transportation, trading, construction, service, manufacturing, whose significance has gone far beyond the conventional concept of "rural industry." This not only reduced the population pressure on the limited land resources, alleviating the disguised unemployment problem, but also has made the land consolidation and large scale agricultural production possible. In 1984, households were first allowed to transfer land to other households under an agreed upon contract, when the one household wanted to pursue another business rather than continue farming. The existence of farms with large areas is not longer big news in today's newspaper. Some farmers have cultivated land of 700 to 1000 mu (55-65 hectares). Privately owned tractors, combines and trucks are being introduced into agricultural production. Specialization is thriving. All of these changes are so profound, and so far-reaching that the traditional concepts of agriculture in China are being completely changed. These changes not only provide the peasants with new economic incentives to produce but also greatly increase the agricultural productivity. Agriculture's TOT may have greatly changed in the last two years. So this study may turn out to be more a summary of the past than a reflection of the present.

As we have seen, there are two ways to improve agriculture's double factorial TOT. One is to increase the farm product price, the other is to promote agricultural productivity. The price of farm products in the past 30 years has been increased by 153%, any further major increase is unlikely. In order to avoid inflation and increasing industrial costs, Chinese leaders are increasing the farm product

price while keeping the retail price of farm products basically unchanged. This has created a big burden on the government budget. For almost all of the farm products sold in the urban market, the retail price does not cover the cost to the state. The state loses 0.1 yuan by selling every jin of grain, and loses 0.8 yuan in selling each jin of edible oil. The subsidies on food consumption were 12.78 billion yuan in 1981, and it rose to 14.1 billion in 1982.[36] Promotion of agricultural price has recently aroused a lot of criticism. It is increasingly difficult for the government budget to absorb further price hikes for agricultural products. So, the policy should continuously be to promote agricultural productivity.

It is important to further relax the restriction on labor mobility. Disguised unemployment accounted for a large part of the low productivity and low income in the countryside. More job opportunity should be offered to the peasants who renounce agriculture. Today in some places two-thirds of the rural labor force is out of farm business. Creation of more jobs for these people may be a challenge in the near future. Informal jobs as well as formal jobs in both the cities and the countryside play a very important role in transfer of labor from the agricultural sector to non-agricultural sectors.

Specialization should continue to be encouraged. Recent experience shows that large scale specialized farms have higher productivity and are more competitive in their farm business. Specialization opens the opportunity of technical improvement, hence promotes productivity.

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[36]Qian Jiaju, Shijie, Jinji daobao, 20, Dec. 1982, China

Price policy should favor specialization; good credit policy also could contribute to specialization. Institutional changes are also needed to facilitate cooperation and coordination among farmers.

New technology is essential in the transformation of traditional agriculture and to increase agricultural productivity. New inputs should be introduced to replace old, traditional, conventional inputs. Government investment in such industries as fertilizer, pesticides and farm machinery are necessary. It is also necessary to invest in agricultural research. Agriculture scientific research and agricultural education are the key elements for the sustained growth of agricultural productivity.

The TOT is not an isolated concept. It has to be associated with increase of percapita income, equality in income distribution and improvement of welfare of rural community if it is to have any meaning. So, improvement of agricultural TOT is not contradictory to and hence should not be disconnected from efforts to make social and institutional changes to facilitate comprehensive rural development.

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