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THE CAPITAL SOURCES OF CHINA'S INDUSTRIALIZATION

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I. INTRODUCTION

CHINA'S industrial output grew at an annual rate of 11.8 per cent in the period 1953–88. While the rapid growth of industry is evident, the question who provided industrialization funds remains controversial.

After Preobrazhensky [12] put forward the hypothesis of "socialist primitive accumulation" in the 1920s, the Soviet Union and some other socialist countries adopted a policy of underpricing agricultural products so as to extract agricultural resources for rapid industrialization. China was one of these countries, and Chinese economists generally believe that agriculture provided a substantial amount of funds for industrialization in China. Some Western scholars hold a similar view.[1] Having examined intersectoral resource flows (IRF) in China for the period 1952–57, however, Ishikawa [3] concludes that the agricultural sector provided resources for the nonagricultural sector only in 1952–54, if calculated at current prices, and only in 1952–53, if calculated at 1952 prices. For the remaining years, the agricultural sector actually received resources from the nonagricultural sector. Furthermore, he believes that after 1957 the net resource flows from the nonagricultural sector to the agricultural sector increased over time. Recently, Nakagane [10] also argues that Chinese agriculture did not generate much surplus and that it was the urban industrial sector itself with its low-wage workers that provided funds for industrialization in China.

The main reason for these contrary results is because the approaches employed in these studies are very different. In addition, the data and the definitions of sectors and resources used in these studies are somewhat different. In Sheng [13], the approaches used in previous studies of IRF are surveyed, previous studies of the Chinese experience are discussed, and an empirical study of the case of China for the period 1952–83 is carried out. This paper attempts to make a further contribution to the clarification of this controversial issue.

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[1] See Lardy [4] and Watson [22].

In this paper the period studied is extended to 1988 and the saving surplus approach to IRF, which is different from that used in Sheng [13], is employed. When IRF are calculated, we are concerned with the relationship between the agricultural sector and the nonagricultural sector. For this purpose, an economy is assumed to be divided into the agricultural sector and the nonagricultural sector. However, the data from the Chinese statistics are not consistent with this demarcation. Direct and complete data on these two sectors and the economic activities between them do not exist in most cases. Therefore, it is desirable to employ various methods for calculating IRF, which conceptually lead to an identical result but empirically use different data, so that necessary checks can be made to avoid or identify errors in estimation caused by datum faults.[2] In Sheng [13], the balance of intersectoral trade and the amount of net intersectoral financial transfers are used to measure IRF at current prices. This paper tries to calculate IRF by using the saving surplus approach which examines the issue from a different perspective.

Section II briefly explains the different approaches to IRF. Section III calculates the saving surplus of the agricultural sector and compares the result with those produced by the methods of the intersectoral trade balance and the accounting for financial transfers in Sheng [13]. Section IV attempts to estimate the market clearing price for the agricultural produce. And Section V examines the socialist accumulation mechanism and the sources of China's industrialization.

II. APPROACHES TO THE MEASUREMENT OF IRF

In a closed economy, the two-sector model has the following equations:

$$O_1 = C_{11} + C_{12} + I_{11} + I_{12},$$

$$O_2 = C_{21} + C_{22} + I_{21} + I_{22},$$

where subscripts 1 and 2 indicate agricultural sector and the nonagricultural sector and Os the outputs of the two sectors, respectively;[3] C_{ij} represents the consumer goods produced in sector i and consumed in sector j, and I_{ij} measures the investment goods and intermediate goods produced in sector i and used in sector j.[4]

Let P_1 and P_2 represent prices of agricultural and nonagricultural products respectively. $P_1(C_{12} + I_{12})$ is the sum of agricultural resources used by the nonagricultural sector and $P_2(C_{21} + I_{21})$ is the sum of nonagricultural resources used by the agricultural sector. When $P_1(C_{12} + I_{12}) - P_2(C_{21} + I_{21}) > 0$, i.e., $P_1(C_{12} + I_{12}) > P_2(C_{21} + I_{21})$, there are resource flows out of agriculture, and when $P_1(C_{12} + I_{12}) - P_2(C_{21} + I_{21}) < 0$, i.e., $P_1(C_{12} + I_{12}) < P_2(C_{21} + I_{21})$, there are resource flows into agriculture. In the two-sector model, P_1 and P_2 are relative to each other.

[2] There have been different methods for calculating IRF in previous studies, but conceptually they do not lead to an identical result. See Sheng [13, Chap. 1], for more detailed discussion.

[3] Here the outputs include commodities and services.

[4] The investment goods include the goods used in new investment and the replacement of capital goods.

By setting $P_2 = 1$, P_1 represents the relative price of agricultural produce in terms of P_2, i.e., P_1/P_2 and P_2 can be dropped from the equations.

In terms of intersectoral commodity exchange, $P_1(C_{12} + I_{12})$ represents the exports of the agricultural sector to the nonagricultural sector, $P_2(C_{21} + I_{21})$ represents the imports of the agricultural sector from the nonagricultural sector, and the balance of intersectoral trade indicates the import (or export) excess of the sector. When one sector exports its products to the other sector, it receives income which entitles the sector to command a certain amount of the other sector's products, which has an equivalent value. In a closed economy, a sector may have a certain amount of import excess only when it has obtained this amount of extra funds from the other sector through financial transfers. These transfers include capital transfers, private transfers (e.g., gifts, remittances), and government transfers (e.g., subsidies, relief funds). In other words, the balance of intersectoral trade is financed by net financial transfers between the sectors. While the balance of intersectoral trade measures net commodity flows, the account of intersectoral financial transfers calculates financial flows. They are two indicators, from different perspectives, of IRF. Therefore, they are identical and both can be used to measure IRF.[5]

So far we have only considered the case in which there is no price distortion. When price structure is distorted by non-market factors, however, resources flow between sectors not only through commodity exchange and financial transfers but also through price mechanisms. The trade balance and financial account calculated at current prices can only measure the IRF through non-price mechanisms but cannot measure the IRF through price mechanisms.

For example, when agricultural products are underpriced by a government policy of exploiting agriculture, the ruling prices are P'_1 and P'_2. In this circumstance, the relative price of the agricultural produce P'_1 is lower than P_1. Therefore,

$$P'_1(C_{12} + I_{12}) - P'_2(C_{21} + I_{21}) < P_1(C_{12} + I_{12}) - P_2(C_{21} + I_{21}).$$

The difference is the part of IRF, which is transferred through price mechanisms.

Let us simplify $P_1(C_{12} + I_{12})$, $P_2(C_{21} + I_{21})$, $P'_1(C_{12} + I_{12})$, and $P'_2(C_{21} + I_{21})$ as A_1, A_2, A'_1, and A'_2, then we have

$$A_1 - A_2 = [A'_1 - A'_2] + [(A_1 - A'_1) + (A'_2 - A_2)].$$

$[A'_1 - A'_2]$ is the part of IRF through non-price channels and $[(A_1 - A'_1) + (A'_2 - A_2)]$ is the part of IRF through price mechanisms. There are different calculating methods for both $[A'_1 - A'_2]$ and $[(A_1 - A'_1) + (A'_2 - A_2)]$. The commodity flows and financial transfers are two calculating methods for $[A'_1 - A'_2]$ and have been briefly explained in this section so far.[6] Another calculating method for $[A'_1 - A'_2]$ to be used in this paper is discussed in more detail below.

[5] However, they are not considered identical in most previous studies. They are not identical mainly because in the intersectoral trade, services are not dealt with in the same way as commodities. See Sheng [13, Chap. 1], for further discussion.

[6] These two methods are discussed in detail in Sheng [13, Chap. 1].

A. *The Saving Surplus Approach to* $(A'_1 - A'_2)$

In the two-sector model, the part of IRF through non-price mechanisms can also be approached from the perspective of the agricultural saving surplus so that it can be calculated by using data on agricultural income and its uses. Agricultural income (Y_a) is spent on agricultural consumption (C_a) and agricultural investment (I_a), and only the residue can be transferred to the nonagricultural sector. ($Y_a - C_a$) is known as agricultural savings (S_a), therefore, we have the following equation:

$$\text{Agricultural transfers } (T_a) = Y_a - C_a - I_a = S_a - I_a.$$

($S_a - I_a$) can be called the agricultural saving surplus (SS_a). When there are some financial transfers from the nonagricultural sector to the agricultural sector (T_n), net agricultural transfers are ($S_a - I_a$) less T_n. ($S_a - I_a - T_n$) can be called the agricultural net saving surplus ($ANSS$). T_n is spent on agricultural consumption and investment. In this case, total agricultural consumption (TC_a) is larger than C_a and total investment in agriculture (TI_a) larger than I_a. We have the following equation:

$$\begin{aligned} ANSS &= Y_a - TC_a - TI_a, \text{ or} \\ &= Y_a - C_a - I_a - T_n. \end{aligned}$$

Only $ANSS$ can be transferred to the nonagricultural sector. The concept of $ANSS$ is used in this paper to measure $(A'_1 - A'_2)$.[7] The result should theoretically be identical to that obtained from the methods of intersectoral trade and intersectoral financial transfers. The empirical result of this method will be compared with those obtained in Sheng [13] by using the other two methods in order to reach a more accurate estimate of $(A'_1 - A'_2)$.

B. *Estimation of* $[(A_1 - A'_1) + (A'_2 - A_2)]$

Because agricultural and nonagricultural products are physically different, a set of prices must be used in calculating IRF. Real IRF must be calculated at "real" prices rather than current prices. $[(A_1 - A'_1) + (A'_2 - A_2)]$ is the part of IRF caused by the deviation of current prices from the "real" price. What is the "real" price? This is the most controversial issue in the study of IRF. Some researchers employ Ishikawa's following formula to calculate $[(A_1 - A'_1) + (A'_2 - A_2)]$:

$$(1/P_m)M - (1/P_e)E = (1/P_m)R + (1/P_e)E[(P_e/P_m) - 1],$$

where M, E, and R are the current value of imports, exports, and trade balance and P_m and P_e the price indexes of the import and export commodities, respectively. The item $\{(1/P_e)E[(P_e/P_m) - 1]\}$ is called invisible IRF, i.e., $[(A_1 - A'_1) + (A'_2 - A_2)]$. This method assumes that the "real" price is a base-year price and

[7] The concept of agricultural saving surplus has been used by some economists in the relevant literature. However, its connotation is somewhat different among the studies by different authors, and in quantity terms it is not identical with the trade balance and the net financial transfers. This issue is not discussed here.

the part of IRF through price mechanisms is caused by changes in the terms of trade.[8] Others believe that the price set according to the labor theory of value is the "real" price and the deviation of current prices from the "real" price should be estimated in order to calculate IRF through price mechanisms. The different theoretical backgrounds of these approaches and their effects on the estimation of IRF are examined in Sheng [13].

In this paper, the market clearing price is considered the "real" price.[9] The real price is estimated through the equation between demand and supply in a general equilibrium framework.[10] This method will be briefly explained in Seciton IV.

III. AGRICULTURAL NET SURPLUS SAVINGS

In Sheng [13], the agricultural sector is defined to include all economic activities (cropping, forestry, animal husbandry, fishing, and subsidiary and handicraft production) of peasant households. In pre-1979 China, while every peasant household undertook its own production activities on the family plot, and subsidiary and handicraft production within the family, its main production activities were collectively organized and carried out under the system of people's communes and production teams. Therefore, all the activities of peasant households, both within the families and under the organization of the commune and production teams, are included in the agricultural sector. Communes and production teams also run nonagricultural enterprises, which were called commune/team enterprises before the reform and the current rural/township enterprises. These enterprises are excluded from the agricultural sector. In addition, state-owned farms are included in the agricultural sector. Because of the exclusion of rural/township enterprises and the inclusion of state farms, this study is more consistent with our purpose and some of the statistical data used. To be comparable, the agricultural sector in this paper is defined in the same way.[11]

A. *Agricultural Income*

Agricultural income (Y_a) is the income generated in the agricultural sector, which can be used for final consumption and investment. There are three concepts in the Chinese official statistics, which are relevant to Y_a. The most complete time series is Agricultural Income (AI). Statistically, AI consists of incomes from

[8] See Ishikawa [2, pp. 297–98].

[9] This argument is made in detail in Sheng [13, Chap. 3].

[10] This method is developed in Sheng [13, Chap. 4]. One point which should be explained here is that in the book, the term sub-equilibrium rather than equilibrium is used. Because there is some confusion about using the term equilibrium, the concept of sub-equilibrium is introduced to indicate a state which is not as perfect as required by the purely theoretical definition of equilibrium. In view of the fact that the concept of sub-equilibrium has not been accepted and it is usually mixed together with the concept of equilibrium, this paper, following the convention, calls sub-equilibrium equilibrium, in order to avoid a complicated theoretical discussion. This change will not alter the results of the estimation procedure.

[11] More recently, some peasants started to run private or cooperative nonagricultural enterprises. In this paper the more recent years are examined and these enterprises are also excluded from the agricultural sector.

cropping, forestry, animal husbandry, fishing, and subsidiary and handicraft production. It does not include incomes from the services provided by production factors of the agricultural sector, and its statistical coverage changed from including incomes from rural/township industries before 1984 to excluding them afterwards. When the income from factor services is added to *AI*, we obtain a time series called *AI**. It overestimates Y_a for two reasons. First, this series includes incomes from nonagricultural rural/township enterprises in 1952–83 and the separate data are not available. Second, *AI* is usually calculated by deducting material cost from Total Agricultural Output (*TAO*).[12] There is double counting in *TAO* because: (a) it includes intermediate goods, and (b) it includes semi-finished products. The inclusion of semi-finished products results in double counting in *AI*.[13]

After the agricultural reforms in 1979, the concept of Net Rural Income (*NRI*) was established in the Chinese statistics. *NRI* includes incomes from both products and services. This is suitable for our purpose. On the other hand, however, it is the net incomes of collective economic organizations and peasants in rural areas. Therefore its statistical coverage is the rural sector rather than the agricultural sector. This is inconsistent with our purpose and thus adjustment is needed. Supposing that per capita income of the rural population equals that of the agricultural population, we have the following equation:

$$Y_a/NRI = \text{agricultural population } (P_A)/\text{rural population } (P_R).$$

If the relationship between P_A and P_R is known, we know the relationship between Y_a and *NRI*.

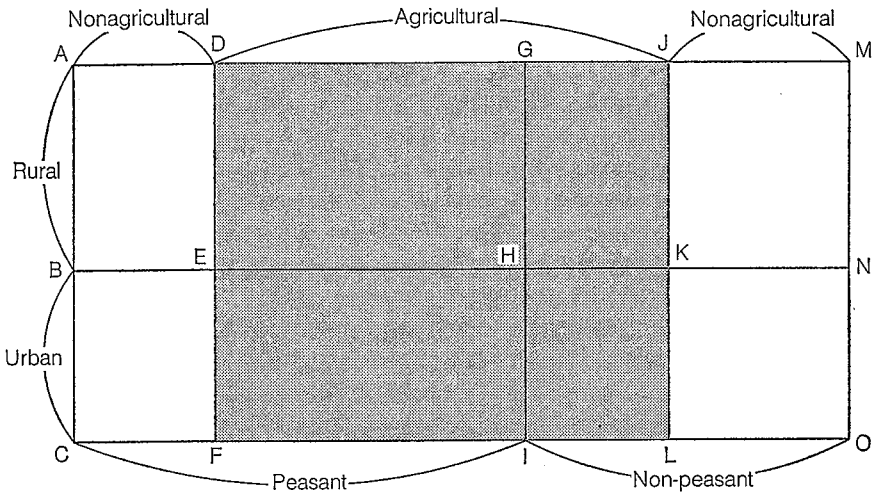
The relevant Chinese population statistics has two types of classification: one divides total population into Rural Population (*xiangcun renkou*) and Urban Population (*chengshi renkou*), and the other divides total population into Peasant Population (*nongye renkou*) and Non-Peasant Population (*feinongye renkou*). The first classification is quite straightforward: the population living in rural areas is Rural Population and the population living in urban areas is Urban Population. Its problem is that the criteria of city and town have been changed several times.[14] Some time series follows these changes, for example, the time series of Rural

[12] Material cost includes intermediate goods used in production (i.e., raw materials, fuel, electricity, seeds, feed, etc.), depreciation of capital stock, and expenditures on productive services in the production process. See Xiong and Yan [23, p. 114].

[13] To explain this point, let us take beef cattle as an example. We suppose that a beef cow is mature in two years time. The value of a semi-matured one-year cow (V_1) is counted in when *TAO* is calculated at the end of the first year. Let C_1 and C represent the material cost of the one-year cow and the total material cost of the two-year matured cow, respectively. (V_1-C_1) is counted in when *AI* is calculated at the end of the first year. The total value of the matured cow (V) is counted in when *TAO* is calculated and $(V-C)$ is counted in when *AI* is calculated, at the end of the second year. Obviously, $(V-C)$ includes (V_1-C_1). Therefore (V_1-C_1) is counted in twice: once in the first year and once in the second year.

[14] The criteria and the changes are not consistent in the relevant literature. For details, see, for example, Li [5, p. 544], Tian [21, pp. 3–5], Zhang [25, pp. 3–4], *Zhongguo tongji nianjian* (hereafter cited as *ZGTJNJ*) [14, 1989 edition, p. 97], and Zhon [26, pp. 9–12].

Fig. 1. Population Classifications



Population in demography,[15] and some time series do not follow these changes, for example, the time series of town/village population in agricultural statistics.[16] The second classification is confusing. *Nongye renkou* means agricultural population and *feinongye renkou* means nonagricultural population. However, this classification does not divide people by the trades in which they are engaged. *Nongye renkou* includes people who do not hold urban residence booklets and *feinongye renkou* includes people who hold urban residence booklets. Moreover it does not mean either that *nongye renkou* is simply Rural Population. In China, there are some people who do not hold urban residence booklets but live in urban areas, while there are some people who hold urban residence booklets but live in rural areas. In view of the fact that in China it is peasants who do not hold urban residence booklets, *nongye renkou* is termed Peasant Population rather than agricultural population. By so doing, we also distinguish this concept from the concept of the agricultural population which is defined in this paper as the population engaged in agricultural production and traditional peasant household activities.

Now we have three kinds of classification: Rural Population vs. Urban Population, Peasant Population vs. Non-peasant Population, and Agricultural Population vs. Nonagricultural Population. The relationships between the three are described in Figure 1. Rectangle ACOM represents total population; BN divides total population into two parts: rectangle ABNM is Rural Population and rectangle BCON is Urban Population; GI divides total population, from a different dimension, into two parts: rectangle ACIG is Peasant Population and rectangle GIOM

[15] See *ZGTJNJ* [14, 1989 edition, p. 87].
[16] Ibid.

is Non-peasant Population.[17] Peasant Population is further divided by DF into two groups: the peasants engaged in the agricultural sector, represented by rectangle DFIG, and the peasants engaged in the nonagricultural sector (i.e., the peasants engaged in rural/township, private, and cooperative nonagricultural enterprises), represented by rectangle ACFD; Non-peasant Population is also further divided into two groups: the non-peasants engaged in the nonagricultural sector, represented by rectangle JLOM, and the non-peasants engaged in the agricultural sector (i.e., some non-peasant population on state farms), represented by rectangle GILJ. People of all four groups are scattered in both rural and urban areas. The shaded rectangle DFLJ represents the agricultural population and the sum of ACFD and JLOM is the nonagricultural population.

What is the population covered by *NRI*? It is not clearly stated in the literature. After comparing the definitions of *NRI* and Gross Output of Rural Society (GORS), we consider that the population coverage of *NRI* is about the same as GORS'.[18] The population coverage of GORS can be roughly represented by rectangle ACLJ. Obviously, it is larger than DFLJ which represents the agricultural population. Therefore, *NRI* is an overestimate of Y_a.

Recently, gross national product (GNP) is also calculated in Chinese official statistics for the period 1978–88. GNP calculates not only the value of final products but also that of services. The concept relevant to Y_a is the part of GNP generated in agriculture (GNP_a). The coverage of GNP_a is the agricultural sector. GNP includes the depreciation of capital, i.e., the amount of the capital stock worn out, or depreciated, in the production of goods and services. Therefore GNP_a is more appropriate than *AI* and *NRI* for estimating *ANSS*, as agricultural investment data in Chinese statistics include both investment expenditures on new capital goods and the investment of replacing worn-out capital.

In Table I, one can see that both *AI** and *NRI* are larger than GNP_a. We mentioned when discussing their definitions that both *AI** and *NRI* overestimate Y_a. Although GNP_a is an appropriate estimate of Y_a, the problem is that the time series of GNP_a is available for 1978–88 only. Therefore, the time series of *AI** has to be used as an estimate of Y_a for the period 1952–77, bearing in mind that it is an overestimate.

B. *Agricultural Consumption*

The relevant data on total agricultural consumption (TC_a) is the time series of Peasants' Consumption (C_p). C_p can be divided into three parts: self-supplied consumer goods (C_{ss}), purchased consumer goods (C_{ps}), and the sum of housing depreciation and expenditures on service and recreation (C_{he}) (see Table II). C_{ps} include the goods purchased by peasants both within the agricultural sector and from the nonagricultural sector, and therefore it should at least equal the purchase from the nonagricultural sector or the sales of the nonagricultural sector to peasants. From Table II, however, one can find that C_{ps} is significantly smaller

[17] The sizes of all the divided areas in the figure are not necessarily proportional to the populations they represent.

[18] See *ZGTJNJ* [14, 1989 edition, p. 248 and p. 250].

TABLE I

AGRICULTURAL INCOME, CHINA, 1952–88

(Current price, 100 million yuan)

Year	*AI* (1)	Service Income (2)	*AI** (1)+(2)	GNP_a	*NRI*	Y_a
1952	340	6	346	n.a.	n.a.	346
1953	374	10	384	n.a.	n.a.	384
1954	388	12	400	n.a.	n.a.	400
1955	417	12	429	n.a.	n.a.	429
1956	439	21	460	n.a.	n.a.	460
1957	425	21	446	n.a.	n.a.	446
1958	440	26	466	n.a.	n.a.	466
1959	376	35	411	n.a.	n.a.	411
1960	332	40	372	n.a.	n.a.	372
1961	432	25	457	n.a.	n.a.	457
1962	444	17	461	n.a.	n.a.	461
1963	488	23	511	n.a.	n.a.	511
1964	549	25	574	n.a.	n.a.	574
1965	641	28	669	n.a.	n.a.	669
1966	692	35	727	n.a.	n.a.	727
1967	703	37	740	n.a.	n.a.	740
1968	714	35	749	n.a.	n.a.	749
1969	722	39	761	n.a.	n.a.	761
1970	778	46	824	n.a.	n.a.	824
1971	808	57	865	n.a.	n.a.	865
1972	808	62	870	n.a.	n.a.	870
1973	886	66	952	n.a.	n.a.	952
1974	922	70	992	n.a.	n.a.	992
1975	946	78	1,024	n.a.	n.a.	1,024
1976	940	84	1,024	n.a.	n.a.	1,024
1977	913	100	1,013	n.a.	n.a.	1,013
1978	986	124	1,110	1,018	1,133	1,018
1979	1,226	153	1,379	1,259	n.a.	1,259
1980	1,326	196	1,522	1,359	1,501	1,359
1981	1,509	224	1,733	1,546	n.a.	1,546
1982	1,723	263	1,986	1,762	n.a.	1,762
1983	1,921	323	2,244	1,961	2,559	1,961
1984	2,251	399	2,650	2,296	3,101	2,296
1985	2,492	543	3,035	2,542	3,457	2,542
1986	2,720	551	3,271	2,764	3,791	2,764
1987	3,154	678	3,832	3,204	4,372	3,204
1988	3,818	893	4,711	3,831	5,190	3,831

Sources: [14, 1987 edition, p. 210; 1989 edition, pp. 28–29, p. 239, p. 596, p. 599] [17, 1985 edition, p. 189] [13, Table 6-3] [11, p. 561].

Notes: 1. Service income includes income from labor service and interest income.
2. *AI* stands for Agricultural Income and *NRI* stands for Net Rural Income.

TABLE II

AGRICULTURAL CONSUMPTION

(Current price, 100 million yuan)

Year	Peasants' Consumption (C_p)				$TC_a(1)$	SL_r	SL_p	C_p*	$TC_a(2)$
	C_{ss}	C_{ps}	C_{he}	Total					
1952	198	96	4	298	298	137	134	336	336
1953	209	118	5	332	332	161	158	372	377
1954	210	132	6	348	348	177	174	390	390
1955	237	145	7	389	389	181	177	421	421
1956	236	153	8	397	397	197	194	438	438
1957	244	160	8	412	412	203	201	453	453
1958	232	195	8	435	396	225	219	459	418
1959	123	208	8	339	308	233	228	359	328
1960	135	202	9	346	325	225	222	366	345
1961	233	176	9	418	405	187	188	430	417
1962	256	194	9	459	450	229	231	496	482
1963	257	221	9	487	482	240	240	506	501
1964	281	246	12	539	539	249	255	548	548
1965	321	247	13	581	581	251	255	589	589
1966	356	268	13	637	631	270	274	643	637
1967	374	292	13	679	672	298	302	689	681
1968	385	270	13	670	663	276	281	679	672
1969	393	298	14	705	691	305	313	720	706
1970	432	323	15	770	755	329	337	784	768
1971	455	334	15	804	788	341	347	817	801
1972	457	351	16	824	799	358	364	837	812
1973	496	382	20	898	871	386	393	909	883
1974	486	408	21	915	888	407	415	922	894

than the sales of the nonagricultural sector to rural areas (SL_r). Statistically, C_p and its component are calculated by the income-expenditure balance method or the direct method. Both methods are based on individual investigation reports and sample data.[19] SL_r is one of the items included in Total Retail Sales and it is the sum of the sales of various shops to rural areas so that it is based on the reporting statistics of these shops. Total Retail Sales is derived from a complete statistical system, in which monthly and quarterly data, individual commodity data, and breakdown data by sector, by use, by customer (rural and urban), and by ownership are all available.[20] In view of this fact, one should therefore conclude that the series of SL_r is more reliable than C_{ps}.

The problem with SL_r is that its coverage is the rural sector rather than the agricultural sector and there is no explanation of how the shops calculate the sales to rural areas. Presumably, it consists of all the consumer goods sales by the shops in rural areas. The coverage of SL_r should therefore be generally con-

[19] See Li [5, pp. 629–31] and Xiong and Yan [23, pp. 119–20].

[20] See *Zhongguo maoyi he wujia tongji ziliao, 1952–83* [20, pp. 63–108].

TABLE II (Continued)

Year	Peasants' Consumption (C_p)				$TC_a(1)$	SL_r	SL_p	C_p^*	$TC_a(2)$
	C_{ss}	C_{ps}	C_{he}	Total					
1975	495	429	22	946	908	439	450	967	928
1976	500	443	22	965	926	454	464	986	947
1977	478	472	24	974	920	485	499	1,001	946
1978	516	499	28	1,043	970	516	530	1,074	999
1979	567	613	32	1,212	1,115	661	680	1,279	1,177
1980	565	773	46	1,384	1,273	844	869	1,480	1,362
1981	639	879	54	1,572	1,440	976	1,010	1,703	1,561
1982	691	980	66	1,737	1,589	1,091	1,136	1,893	1,733
1983	754	1,112	75	1,941	1,757	1,247	1,288	2,117	2,008
1984	802	1,345	85	2,232	1,955	1,522	1,549	2,436	2,134
1985	858	1,769	96	2,723	2,341	2,013	2,015	2,969	2,553
1986	n.a.	n.a.	n.a.	2,994	2,581	2,280	2,285	—	—
1987	n.a.	n.a.	n.a.	3,381	2,738	2,645	2,636	—	—
1988	n.a.	n.a.	n.a.	4,166	3,400	3,317	3,286	—	—

Sources: [18, p. 23] [16] [14, 1989 edition, p. 88, p. 101, p. 240, p. 600] [17, 1985 edition, p. 10; 1987 edition, p. 12; 1989 edition, p. 44].

Notes: 1. C_p and SL_r are Chinese source data. $TC_a(1)$, SL_p, C_p^*, and $TC_a(2)$ are my own estimates.

2. C_{ss} stands for self-supplied consumer goods, C_{ps} purchased consumer goods, and C_{he} stands for housing depreciation and expenditures on services and recreation.

3. $TC_a(1)$ and $TC_a(2)$ are two estimates of total agricultural consumption. The calculation procedure is explained in the Appendix.

4. SL_p stands for sales of the nonagricultural sector to peasants. The calculation procedure is explained in the Appendix.

5. C_p^* stands for peasants' consumption. $C_p^* = C_{ss} + SL_p + C_{he}$.

sistent with the demographic definition of the rural sector.[21] For our purpose, we need the time series of sales to peasants (SL_p), of which the coverage is consistent with C_p. SL_p is calculated and shown in Table II and the calculation procedure is explained in the Appendix.

Replacing C_{ps} with SL_p in C_p, we obtain another time series of peasants consumption (C_p^*). Both C_p and C_p^* include the consumption of the workers in rural nonagricultural enterprises (C_{rn}).[22] By deducting C_{rn} from C_p and C_p^*, we obtain $TC_a(1)$ and $TC_a(2)$ respectively as two estimates of TC_a. The difference between $TC_a(1)$ and $TC_a(2)$ is significant in 1952–57, but minor in 1958–78 and becomes significant again in 1979–85. We consider $TC_a(2)$ is more reliable than $TC_a(1)$ because SL_r is more reliable than C_{ps}.

[21] SL_r may not exactly equal rural consumption of nonagricultural goods as some rural residents may go shopping in urban areas. On the other hand, however, some urban residents may pass rural areas and buy goods there. It is impossible to make adjustments for these activities.

[22] The calculation of C_{rn} is explained in the Appendix.

C. *Agricultural Investment*

Data on agricultural investment (I_a) are even more problematic. Investment in agriculture consists of peasants' agricultural investment (I_{pa}) and government agricultural investment (I_{ga}), i.e., $I_a = I_{pa} + I_{ga}$. There are three statistical concepts which are relevant to I_{pa}: Commune Accumulation (*CA*), Rural Collective and Other Accumulation (*RCOA*), and Rural Investment in Fixed Assets (*RIFA*). All include not only I_{pa} but also peasants' investment in nonagriculture (I_{pn}). Only *RIFA* has separate data for agricultural investment. *CA* is the accumulation funds of communes for investment in fixed assets (I_{cf}) and incremental circulating assets (I_{cc}).[23] It does not include peasants' private accumulation. Meanwhile *RCOA* includes peasants' total accumulation, collective and private. *RIFA* comprises all collective and private investment in fixed assets by peasants (I_{cf} and I_{pf}).[24] The three time series are displayed in Table III. They are quite different as their coverages are different. By definition, the statistical relationships between these three concepts should be:

$$
\begin{aligned}
CA &= \text{collective accumulation,} \\
&= I_{cf} + I_{cc}, \\
RIFA &= \text{peasants' investment in fixed asset} \\
&= I_{cf} + I_{pf}, \\
RCOA &= \text{collective accumulation + private accumulation,} \\
&= I_{cf} + I_{cc} + I_{pf} + I_{pc}, \\
&= CA + I_{pf} + I_{pc}, \text{ or} \\
&= RIFA + I_{cc} + I_{pc},
\end{aligned}
$$

where I_{pc} represents increment of private circulating asset.

Apparently, *RCOA* is the appropriate estimate of peasants' investment. The coverage of *RCOA* is larger than both *CA* and *RIFA*, and therefore it is expected that *RCOA* is larger than both *CA* and *RIFA*. But it is smaller than *CA* in 1958–61 and much smaller than *RIFA* in 1981–85. From these comparisons one may suspect that *RCOA* underestimates peasants' investment for some reasons that are unknown. On the other hand, by definition, *RCOA* includes peasants' investment in agriculture and nonagriculture so that it overestimates peasants' investment in agriculture (I_{pa}). Overall, we conclude that *RCOA* should overestimate I_{pa} for 1984–85 because it is much larger than the sum of I_{pc} and *RIFA* in agriculture ($RIFA_a$) displayed in column 6 in Table III. The overestimation caused by the inclusion of peasants' investment in nonagriculture should decrease to a minor amount as the time series goes back to the pre-1979 period. The reason is that peasants' investment in nonagriculture was strictly restrained before 1979. Comparatively, the sum of I_{pc} and $RIFA_a$ is a more accurate estimate of I_{pa}, but the data are available for 1984–88 only. Therefore we have to use *RCOA* as an estimate of I_{pa}, because it is the only relevant and complete series for the long perod 1952–85. The estimated time series of I_{pa} is displayed in column 10

[23] See Statistical Section for Balance of National Economy [18, p. 41].

[24] See *ZGTJNJ* [14, 1989 edition, p. 477].

TABLE III

AGRICULTURAL INVESTMENT

(Current price, 100 million yuan)

Year	CA	$RCOA$			$RIFA$		I_{pc}	$RIFA_a+I_{pc}$	I_{pa}	I_{ga}	I_a $(I_{pa}+I_{ga})$
		Total	Fixed Asset	Circulating Asset	Total	$RIFA_a$					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1952	n.a.	15	11	4	n.a.	n.a.	n.a.	—	15	4	19
1953	n.a.	12	9	3	n.a.	n.a.	n.a.	—	12	6	18
1954	n.a.	13	10	3	n.a.	n.a.	n.a.	—	13	5	18
1955	n.a.	11	9	2	n.a.	n.a.	n.a.	—	11	6	17
1956	n.a.	35	31	4	n.a.	n.a.	n.a.	—	35	14	49
1957	n.a.	25	10	15	n.a.	n.a.	n.a.	—	25	11	36
1958	41	13	15	−2	n.a.	n.a.	n.a.	—	13	30	43
1959	40	28	29	−1	n.a.	n.a.	n.a.	—	28	30	58
1960	11	2	9	−7	n.a.	n.a.	n.a.	—	2	45	47
1961	17	10	7	3	n.a.	n.a.	n.a.	—	10	12	22
1962	19	27	15	12	n.a.	n.a.	n.a.	—	27	9	36
1963	23	44	30	14	n.a.	n.a.	n.a.	—	44	18	62
1964	35	51	39	12	n.a.	n.a.	n.a.	—	51	26	77
1965	35	53	44	9	n.a.	n.a.	n.a.	—	53	24	77
1966	n.a.	63	50	13	n.a.	n.a.	n.a.	—	63	24	87
1967	n.a.	48	44	4	n.a.	n.a.	n.a.	—	48	22	70
1968	n.a.	47	48	−1	n.a.	n.a.	n.a.	—	47	12	59
1969	n.a.	48	46	2	n.a.	n.a.	n.a.	—	48	18	66
1970	48	79	62	17	n.a.	n.a.	n.a.	—	79	23	102
1971	46	85	65	20	n.a.	n.a.	n.a.	—	85	33	118

TABLE III (Continued)

Year	CA	$RCOA$			$RIFA$		I_{pc}	$RIFA_a+I_{pc}$	I_{pa}	I_{ga}	I_a $(I_{pa}+I_{ga})$
		Total	Fixed Asset	Circulating Asset	Total	$RIFA_a$					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1972	46	84	77	7	n.a.	n.a.	n.a.	—	84	31	115
1973	56	94	89	5	n.a.	n.a.	n.a.	—	94	37	131
1974	64	118	108	10	n.a.	n.a.	n.a.	—	118	37	155
1975	69	142	124	18	n.a.	n.a.	n.a.	—	142	36	178
1976	64	134	127	7	n.a.	n.a.	n.a.	—	134	40	174
1977	63	152	143	9	n.a.	n.a.	n.a.	—	152	36	188
1978	75	169	150	19	n.a.	n.a.	n.a.	—	169	51	220
1979	87	178	151	27	n.a.	n.a.	n.a.	—	178	62	240
1980	56	141	133	8	133	n.a.	n.a.	—	141	49	190
1981	48	144	127	17	250	n.a.	38	—	144	24	168
1982	n.a.	197	148	49	330	n.a.	43	—	197	29	226
1983	n.a.	226	180	46	416	n.a.	361	—	226	34	260
1984	n.a.	330	265	65	554	122	109	231	231	34	265
1985	n.a.	325	314	11	677	58	137	195	195	38	233
1986	n.a.	n.a.	n.a.	n.a.	820	48	84	132	132	35	167
1987	n.a.	n.a.	n.a.	n.a.	1,061	131	132	263	263	42	305
1988	n.a.	n.a.	n.a.	n.a.	1,322	206	329	535	535	46	581

Sources: [18, p. 41] [14, 1983 edition, p. 209; 1987 edition, p. 149 and p. 151; 1988 edition, p. 559; 1989 edition, p. 477] [17, 1986 edition, p. 252; 1987 edition, p. 235] [16].

Notes: *CA* stands for Commune Accumulation, *RCOA* Rural Collective and Other Accumulation, *RIFA* Rural Investment in Fixed Assets, $RIFA_a$ *RIFA* in agriculture, I_{pc} increment of private circulating asset, I_{pa} peasants' investment in agriculture, I_{ga} government investment in agriculture, and I_a total investment in agriculture.

in Table III. This series overestimated peasants' investment in agriculture for 1978–83.

The data relevant to I_{ga} are those on Government Agricultural Investment in Capital Construction (*GAI*) and Financial Allocation for Agricultural Circulating Capital (*ACC*). *GAI* is located to various projects directly related to agriculture, such as harnessing rivers, constructing large- and medium-scale water conservancy facilities and hydropower stations, meteorological projects, foresting, and capital construction in agricultural scientific research and education institutions and in state farms.[25] Obviously, these projects greatly contribute to agricultural development, but they are also beneficial to the nonagricultural sector. For example, large- and medium-scale water conservation projects are designed to supply water to urban households, to facilitate water-borne transportation and communication, and to promote urban construction and industrial development, though they also have the functions of serving agriculture. But it is extremely difficult to separate the benefits of the investment into functionally different categories. By using the sum of *GAI* and *ACC* to estimate I_{ga}, I_a is overestimated, but generally the degree of the overestimating should not be high as the total I_{ga} in 1952–88 accounts for only about one-fifth of the total I_a.[26]

D. *Agricultural Savings*

From Table IV we find that calculated at current prices agricultural saving rate (S'_a) was generally very low in the whole period. If the time series of $C_a(2)$, which is considered more reliable, is employed to calculate S'_a, it was negative in several years and much lower than 15 per cent in most of the other years (except 1959 in which the saving rate was 20 per cent). The nonagricultural sector's saving rate (S'_n), which is observable in Table VIII (p. 202), was higher than S'_a by from 2 to 29 times. Even if the time series of $C_a(1)$ is employed to calculate S'_a, it is also from as low as 2 per cent to less than 15 per cent (except 1959 in which the saving rate was 25 per cent), and S'_n is higher than S'_a by from 1 to 11 times.

By deducting investment in agriculture (I_a) from the two series of agricultural savings ($S_a(1)$ and $S_a(2)$), we obtain two series of agricultural net saving surplus (*ANSS*), which are displayed in column 8 and 9 in Table IV. The second series ($ANSS_2$) is considered more reliable as it is calculated from $C_a(2)$. Figure 2 shows that as a proportion of income, agricultural saving rate (both $S_a(1)$ and $S_a(2)$), fluctuated sharply in 1953–68, relatively stabilized in 1969–77, and fluctuated again in 1978–88. It is noticed that the reform did not result in significant changes in agricultural saving rate, because calculated at current prices, agricultural consumption $C_a(1)$ increased by about 2.51 times over 1978–88 while Y_a increased by 2.76 times. However, agricultural net saving rate (both $ANSS_1$ and $ANSS_2$) registered a trend of increase after the reform. This is because the ratio of agricultural investment to agricultural income decreased from 22 per cent to 15 per cent in this period (see Table IV).

[25] *GAI* does not include the investment in meteorological projects after 1985. See *ZGTJNJ* [14, 1989 edition, p. 487].

[26] It may be significant for a couple of years around 1960, as I_{ga} accounted for a major portion of I_a in these years.

TABLE IV

AGRICULTURAL SAVING SURPLUS

(Current price, 100 million yuan)

Year	Y_a	$TC_a(1)$	$TC_a(2)$	$S_a(1)$	$S_a(2)$	I_a	*ANSS*		Financial Account	Trade Balance
							$S_a(1)-I_a$	$S_a(2)-I_a$		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1952	346	298	336	48	10	19	29	−9	n.a.	n.a.
1953	384	332	377	52	7	18	34	−11	n.a.	n.a.
1954	400	348	390	52	10	18	34	−8	6	−12
1955	429	389	421	40	8	17	23	−9	n.a.	n.a.
1956	460	397	438	63	22	49	14	−27	−57	−45
1957	446	412	453	34	−7	36	−2	−43	n.a.	n.a.
1958	466	396	418	70	48	43	27	5	n.a.	n.a.
1959	411	308	328	103	83	58	45	25	n.a.	n.a.
1960	372	325	345	47	27	47	0	−20	n.a.	n.a.
1961	457	405	417	52	40	22	30	18	n.a.	n.a.
1962	461	450	482	11	−21	36	−25	−57	−81	−100
1963	511	482	501	29	10	62	−33	−52	−90	−91
1964	574	539	548	35	26	77	−42	−51	−99	−84
1965	669	581	589	88	80	77	11	3	−82	−52
1966	727	631	637	96	90	87	9	3	n.a.	n.a.
1967	740	672	681	68	59	70	−2	−11	n.a.	n.a.
1968	749	663	672	86	77	59	27	18	n.a.	n.a.
1969	761	691	706	70	55	66	4	−11	n.a.	n.a.
1970	824	755	768	69	56	102	−33	−46	n.a.	n.a.
1971	865	788	801	77	64	118	−41	−54	n.a.	n.a.

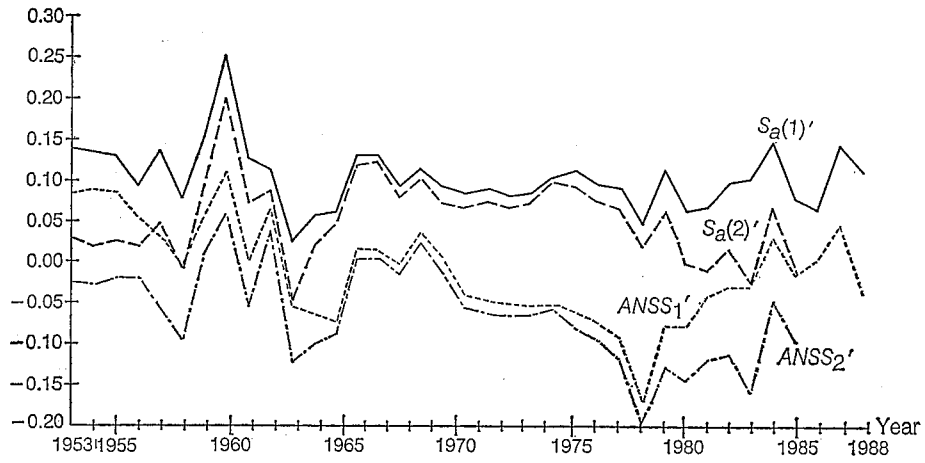
TABLE IV (Continued)

Year	Y_a	$TC_a(1)$	$TC_a(2)$	$S_a(1)$	$S_a(2)$	I_a	*ANSS*		Financial Account	Trade Balance
							$S_a(1)-I_a$	$S_a(2)-I_a$		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1972	870	799	812	71	58	115	−44	−57	n.a.	n.a.
1973	952	871	883	81	69	131	−50	−62	n.a.	n.a.
1974	992	888	894	104	98	155	−51	−57	n.a.	n.a.
1975	1,024	908	928	116	96	178	−62	−82	n.a.	n.a.
1976	1,024	926	947	98	77	174	−76	−97	−141	n.a.
1977	1,013	920	946	93	67	188	−95	−121	−131	n.a.
1978	1,018	970	999	48	19	220	−172	−201	−208	−288
1979	1,259	1,115	1,177	144	82	240	−96	−158	−268	−298
1980	1,359	1,273	1,362	86	−3	190	−104	−193	−283	−342
1981	1,546	1,440	1,561	106	−15	168	−62	−183	−246	−334
1982	1,762	1,589	1,733	173	29	226	−53	−197	−279	−352
1983	1,961	1,757	2,008	204	−47	260	−56	−307	−321	−452
1984	2,296	1,955	2,134	341	162	265	76	−103	−376	−281
1985	2,542	2,341	2,553	201	−11	233	−32	−244	−309	−357
1986	2,764	2,581	n.a.	183	n.a.	167	16	n.a.	−374	−393
1987	3,204	2,738	n.a.	466	n.a.	305	161	n.a.	−231	−406
1988	3,831	3,400	n.a.	431	n.a.	581	−150	n.a.	n.a.	−463

Sources: Tables I, II, and III in this paper; Table 6-3 and 6-4 in Sheng [13]. [14, 1986 edition, p. 221; 1987 edition, p. 210; 1989 edition, p. 239, p. 487, p. 596, p. 600, p. 612, p. 666, p. 671, p. 679, p. 725, p. 743] [6, p. 150 and p. 154] [16] [17, 1988 edition, p. 187] [11, p. 561].

Notes: 1. $S_a(1)$ and $S_a(2)$ are two estimates of agricultural savings, $S_a(1)=Y_a-C_a(1)$ and $S_a(2)=Y_a-C_a(2)$.
2. *ANSS* stands for agricultural saving surplus.
3. The estimation method of the trade balance and the financial account for the period 1984–88 is largely the same as that used in Sheng [13] for 1952–83.

Fig. 2. Agricultural Saving Rates



$ANSS_2$ roughly tallies with the financial account and trade balance (estimated in Sheng [13] and displayed in column 10 and 11 in Table IV). It is not surprising that they do not accurately tally with each other, as we know that there have been some errors involved in each of the three series. During the process of estimation, the errors that might be involved in the estimation were pointed out. We know that the estimated series does not accurately measure the actual IRF, but it cannot be improved any further given the currently available data. Having discussed the magnitude of the errors and compared the estimation with the trade balance and financial account, however, we feel confident that the estimate shows the general trend of IRF. $ANSS_2$ registers minor resource flows into agriculture for only six years out of the thirty-seven-year period, but the general trend it shows is consistent with that shown by the financial account and trade balance, that is, calculated at current prices, there were substantial resources flowing from the nonagricultural sector to the agricultural sector in 1952–88.

This finding is basically consistent with Ishikawa's [3] and Nakagane's [10] findings for many of the years they study though the estimated results are not identical. It is not consistent with the latter two in some other years. The methods and data used in their work are somewhat different from that reported here. A detailed comparison between my estimation of IRF and Ishikawa's is made in Sheng [13, Chap. 5]. Nakagane's definition of the agricultural sector in the narrow sense includes all agricultural production activities and private (i.e., households') sideline production [10, pp. 149–50]. It is the same as the definition used in this paper. Nakagane's calculation of the major items of agricultural trade balance and income distribution are based on the same data as used in this paper, while some minor items and revision of the statistics are different from those used

in this paper. However it is not possible either to clarify the difference between my estimation and his or to make any comments on his adjustment and calculation of the minor items as the explanation of the procedures is not available to me.

IV. ESTIMATION OF THE REAL PRICE AND REAL RESOURCE FLOWS

The above analysis shows that in the long period 1952–88 the nonagricultural sector had transferred resources to the agricultural sector through non-price mechanisms, i.e., $[A'_1 - A'_2] < 0$. Then, what is the direction of the IRF through price mechanisms, i.e., is $[(A_1 - A'_1) + (A'_2 - A_2)]$ positive or negative? To answer this question, the real price must be defined and calculated. In this paper, as mentioned in Section II, the market clearing price is considered to be the real price. The estimation of the market clearing price is extremely difficult as China is a centrally planned economy in which market mechanisms are fundamentally different from that in a market economy.

In the pre-reform Chinese economy, pricing and marketing were largely controlled directly by the central government. Under the compulsory purchasing system, prices for major agricultural products are fixed and compulsory quotas are imposed on the agricultural sector. On the other hand, prices of main agricultural production inputs, such as machinery, and chemical fertilizer, are also controlled by the government. Furthermore, the pricing and marketing systems are integrated with various other social controls over peasants. In these circumstances, the relative price of agricultural produce is effective manipulated by the government to serve its development strategies.

One of the important strategies is the policy of high accumulation for industrialization. The high accumulation mechanisms are based mainly on the practice of underpricing agricultural products. From Table V and Figure 3 one can see that the state purchasing price for agricultural produce is always considerably lower than the free market price in 1952–88. The market clearing price (P_c) should lie somewhere between the free market price (P_m) and the state purchasing price (P_p).[27] This fact suggests that the state extracted agricultural resources through price distortion in state purchases, i.e., $[(A_1 - A'_1) + (A'_2 - A_2)]$ is positive, in the whole period 1952–88. This raises two questions: (i) why there were resource flows out of agriculture through price distortion (i.e., $[(A_1 - A'_1) + (A'_2 - A_2)] > 0$), while there were resource flows into agriculture through financial channels (i.e., $[A'_1 - A'_2] < 0$), and whether there is a link between the two; (ii) whether net real resource flows were out of or into agriculture, i.e., whether the absolute value of $[A'_1 - A'_2]$ is larger or smaller than that of $[(A_1 - A'_1) + (A'_2 - A_2)]$. The first question will be discussed in the next section. Let us look at the second question now.

$[A'_1 - A'_2]$ is known, but $[(A_1 - A'_1) + (A'_2 - A_2)]$ can be calculated only when the real price has been estimated. In Sheng [13], the intersectoral financial

[27] The argument is made in Sheng [13, Chap. 1].

TABLE V

PRICE INDEXES OF AGRICULTURAL PRODUCTS

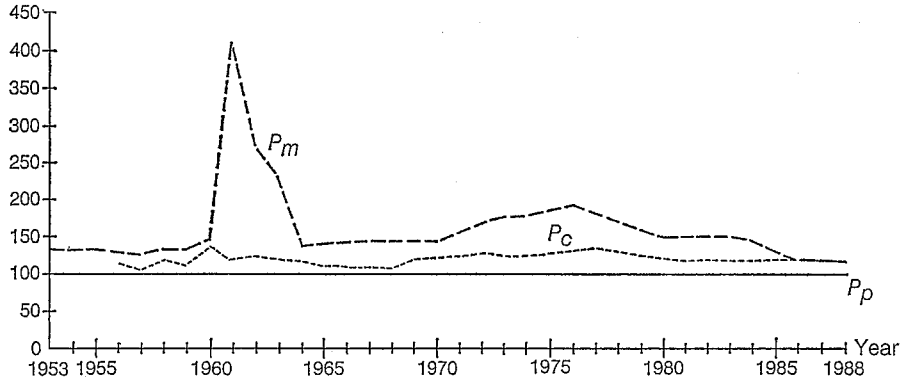
Year	P_m (1952=100)	P_p (1952=100)	P_m/P_p (%)	P_c/P_p (%)	Agricultural Sector's Trems of Trade
1952	100.0	100.0	139.0	—	100.0
1953	103.9	109.0	132.6	—	110.5
1954	106.3	112.4	131.5	—	111.8
1955	106.1	111.1	132.8	—	108.9
1956	105.9	114.5	128.6	114	113.4
1957	108.9	120.2	125.9	106	117.6
1958	117.5	122.9	133.0	118	121.1
1959	119.0	125.1	132.3	112	122.0
1960	136.6	129.4	146.7	135	122.9
1961	491.8	165.6	412.8	118	147.3
1962	319.6	164.6	270.0	122	140.3
1963	241.2	159.9	229.0	118	137.9
1964	167.8	155.8	136.0	115	138.9
1965	173.2	154.5	140.0	109	143.7
1966	175.3	161.0	141.0	108	154.7
1967	178.2	160.8	143.0	108	155.9
1968	178.2	160.5	143.0	106	156.3
1969	178.1	160.3	142.0	118	158.6
1970	178.1	160.4	142.0	120	158.9
1971	193.8	163.1	154.0	122	163.2
1972	209.6	165.4	167.0	125	166.2
1973	220.7	166.8	175.0	122	167.2
1974	224.8	168.2	177.0	123	168.2
1975	233.8	171.6	184.0	125	168.7
1976	243.1	172.5	190.0	130	168.7
1977	237.2	172.0	179.0	132	168.6
1978	221.6	178.8	169.0	128	173.3
1979	211.6	218.3	157.0	122	202.8
1980	215.8	233.9	148.0	120	208.2
1981	228.3	247.7	149.0	116	211.1
1982	235.8	253.1	148.0	118	208.2
1983	245.7	264.2	148.0	116	207.8
1984	244.7	274.8	143.0	116	203.2
1985	286.8	298.4	128.0	118	268.3
1986	310.0	317.5	117.0	116	276.6
1987	360.5	355.6	117.0	115	295.6
1988	469.7	437.4	117.0	115	315.5

Sources: [15, pp. 104–5 and p. 127] [14, 1989, p. 687 and p. 703].

Notes: 1. P_m stands for the index of free market prices, P_p the index of state planned prices and P_e the index of estimated market clearance prices.

2. The index of P_m/P_p for 1961–88 is from official statistics and that for 1952–60 is estimated by the author. The estimation method is explained in the Appendix.

Fig. 3. Price Indexes of Agricultural Products



transfer account is examined and it is found that there were no profit-oriented or profit-maximizing capital transfers to the agricultural sector. The financial transfers to agriculture, which financed agricultural import excess, were government capital transfers, government funds for supporting agriculture (including production subsidies and relief funds), and urban residents' private transfers for offering financial assistance to their family members and relatives in rural areas. The government transfers were made because the agricultural sector was so exploited by the policy of undervaluing agriculture that it could not grow at a rate which the rapid industrialization required. The private transfers were made because the life of peasants was much harder than that of urban residents mainly because agricultural prices were set too low. Therefore it is argued that these transfers are actually a kind of financial compensation for peasants' losses caused by the policy of low agricultural prices, or for the extracted agricultural resources through price mechanisms.

If all the resources extracted through price mechanisms are returned through financial channels, i.e., the compensating transfers equal the extracted resources due to price distortion, it is possible to estimate the real price accurately via the general equilibrium equation. For a closed two-sector model without price distortion, general equilibrium of the model means

$$P_1(C_{12} + I_{12}) = P_2(C_{21} + I_{21}) + T,$$

where T stands for net intersectoral financial transfers, including capital transfers and other transfers, which have nothing to do with price distortion and are thus not the compensation transfers. The other symbols are the same as defined in Section II. T is positive when net transfers are from the agricultural to the non-agricultural sector and it is negative when net transfers are in the opposite direction. For simplicity, we firstly considered the case that $T = 0$. Then by setting $P_2 = 1$ and expressing P_1 in terms of P_2, we have

$$P_1(C_{12} + I_{12}) = (C_{21} + I_{21}).$$

We know that P_1 is the market clearing price of agricultural produce, $(C_{12} + I_{12})$ is agricultural exports (nonagricultural imports), and $(C_{21} + I_{12})$ is agricultural imports (nonagricultural exports). This equation suggests that, calculated at the market clearing prices, $(C_{12} + I_{12})$ and $(C_{21} + I_{21})$ should be equal. Based on this argument, the price which can equalize actual agricultural imports and exports is considered the real price, and it can be estimated via the above equation.

When T is not equal to zero, the equation

$$P_1(C_{12} + I_{12}) = (C_{21} + I_{21}) + T$$

can also be used to estimate the real price, so long as T can be identified and distinguished from the compensation transfers.

After examining intersectoral financial transfers in China in 1952–83, Sheng [13] argues that it is reasonable to consider that all financial transfers were made for compensating the losses caused by price distortion.[28] The important transfers which are not compensating transfers are peasants' capital transfers from the agricultural to the nonagricultural sector (rural/township, private, and cooperative nonagricultural enterprises). These transfers were not significant in the pre-1976 period, as these activities were restricted then. Such transfers increased from the second half of the 1970s, since the restrictions were relaxed. Therefore, the argument that T equals zero is stronger for the pre-1976 period and weaker for the post-1976 period. However, the data on these transfers are not available, so that the assumption that all financial transfers were compensating transfers is still followed in this paper, bearing in mind that the real price may be underestimated.

On the assumption that all the extracted resources are returned to agriculture by the financial transfers, the real price is estimated by equalizing the agricultural imports and exports, and the estimated real price (P_c) is shown in Table V. From Figure 3 we see that P_c lies between P_p and P_m in the whole period in question. This indicates that the estimation is consistent with economic reasoning.[29] P_c is higher than P_p by 6 per cent at the lowest and by 35 per cent at the highest. The difference between P_c and P_m is 2 percentage points at the lowest and 71 percentage points at the highest.

This estimation is made on the assumption that the absolute value of $[A'_1 - A'_2]$ equals that of $[(A_1 - A'_1) + (A'_2 - A_2)]$. If the financial transfers do not completely compensate peasants for all the extracted resources, i.e., there are unreturned extracted agricultural resources (the absolute value of $[A'_1 - A'_2]$ is smaller than that of $[(A_1 - A'_1) + (A'_2 - A_2)]$), the estimate ($P_c$) obtained by equalizing the agricultural imports and exports underestimates the real price. The validity of the assumption should therefore be examined. From Figure 3 we see that the possible underestimation for the post-1984 period should be negligible as the market clearing price must be lower than P_m and there is very little room between P_m and P_c. Therefore the assumption is believed to be valid for this period. But the underestimation for the other years may be significant as there

[28] See Sheng [13, Sec. 3, Chap. 7].

[29] The possible range of the real price is discussed in Sheng [13, Chap. 1].

TABLE VI

MAJOR AGRICULTURAL PRODUCTS' FREE MARKET PRICE INDEXES AND SHARES IN TOTAL PURCHASE

Year	Free Market Price Indexes[a]				Percentage of Total Purchase[b] (%)				
	Grain	Oil Bearing Crops	Cotton, Tabocco, and Hemp	Meat, Fowl, and Eggs	Grain	Edible Oil	Cotton	Pork	Sub-total
1978	n.a.	n.a.	n.a.	n.a.	23.9	3.5	8.6	14.6	50.6
1979	241.9	235.4	136.0	142.5	28.4	5.1	7.8	19.5	60.8
1980	230.5	217.7	130.0	122.4	26.3	5.9	10.2	19.2	61.8
1983	230.0	188.5	123.7	132.2	32.6	6.1	12.6	13.9	65.2
1984	201.9	188.4	n.a.	130.2	37.8	6.2	12.8	13.2	70.0
1985	187.2	189.1	n.a.	119.8	27.1	7.3	8.9	14.3	57.6
1986	180.0	165.2	n.a.	105.5	25.2	6.7	6.6	13.6	52.1

Source: [20, p. 111, p. 113, p. 116, p. 125, p. 128, p. 398] [15, p. 106].

[a] These indexes are built by setting the state list prices = 100.

[b] The figures for 1984–86 are author's estimation. The method is explained in the Appendix.

is considerable room between P_m and P_c. The underestimation is extremely difficult, if not impossible, to be corrected. Let us look at both demand and supply sides in some detail in order to get a clearer picture of the market clearing price.

Taking the state list prices as 100, the free market price indexes of some major agricultural products are displayed in Table VI. The data are available for 1979–86 only. Although the state list prices were raised by a big margin in 1979 and they have been rising since then, the free market prices of these products are all higher than the state list prices in the whole period. This fact, together with the trend of the general price index of the agricultural produce on free markets shown in Table V, suggests that at state list prices the demand for agricultural products was larger than supply in the whole period 1952–88.

When looking at supply side, we can only examine the costs and profits of four major agricultural products (grain, cotton, oil bearing crops, and pigs), because there are no comprehensive data available. But they should be able to reflect roughly the general trend of costs and profits of agricultural production, as the state purchase of these four products accounted for from 50.6 per cent to 70.0 per cent of total state purchase in the period we examine (see Table VI). In the Chinese official cost accounts for agricultural products, costs consist of physical cost and labor cost. The labor cost is calculated by multiplying labor time (working days) by the wage rate of an agricultural laborer, which is set officially rather than by the market value of an agricultural laborer or by the actual wage rate. The reasons are the following. First, in an economy dominated by central planning, there is no labor market and therefore nobody knows the market value of labor. Second, under the people's commune system, the earnings of labor are calculated as the residual in the distribution of agricultural income.[30] The residual

[30] See Sheng [13, Chap. 7], for more details.

TABLE VII

PROFIT RATES OF MAJOR AGRICULTURAL PRODUCTS

(% of sale income)

Year	Grain		Cotton		Oil Bearing Crops		Pork		Weighted Average		Industrial Profit Rate
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	
1978	6	−66	16	−54	16	−55	−7	−38	4	−55	28
1980	25	−44	40	−21	27	−51	15	−34	24	−37	26
1983	39	0	50	12	42	−1	10	−20	35	−2	24
1984	42	14	49	19	45	14	9	−15	37	9	24
1985	43	8	42	−4	48	11	17	−4	37	4	12
1986	50	13	51	5	48	3	11	−15	40	3	10

Sources: [17, 1985 edition, p. 154, pp. 157–58, p. 169; 1986 edition, pp. 161–62, p. 166; 1987 edition, pp. 161–62, p. 166; 1988 edition, pp. 167–68, p. 172] [14, 1985 edition, p. 375; 1989 edition, p. 138].

Notes: 1. Grain includes six major grain products: paddy, wheat, millet, corn, Chinese sorghum, and soybean.
2. Oil crops include three major oil crops: peanuts, rape seeds, and sesame.
3. In series (a), the profit rate is calculated by setting the average income of an agricultural laborer at 0.80 yuan per working day for 1978 and 1980, at 1.00 yuan for 1983, at 1.50 yuan for 1984–86. This is the official calculation. In series (b), the profit rate is calculated according to the average daily money wage of a nonagricultural worker.

is obtained after deducting production and other expenditures, taxes, and other collective funds from the total income. The total income varies as production conditions change, whereas peasants' actual income varies as the total income varies. Obviously, as a residual, the actual labor earnings cannot be used in cost accounting.

The profit rates (profits as a percentage of sales) of the four major agricultural products in 1978–86 are displayed in Table VII. Two series of profit rate are calculated for each product. The first one is calculated by setting the daily wage rate of an agricultural laborer at 0.80 yuan for 1978 and 1980, at 1.00 yuan for 1983 and at 1.50 yuan for 1984–86. These wage rates are used in official statistics. Calculated at the official wage rates, the weighted average profit rate was increasing in the period. It was lower than industrial profit rate in 1978, close to industrial profit rate in 1980 and much higher than industrial profit rate in 1983–86. The second one is calculated by setting the wage rate at a level equal to the nonagricultural money-wage rate. This series of profit rates is much lower. The weighted average profit rate increased in 1978–84 but decreased afterwards. It was negative in 1978–83 and positive but much lower than industrial profit rate in 1984–85.

It is clear that the calculation of agricultural profitability depends very much on the estimate of the wage. There are no objective criteria for a generally agreed wage rate, as there is no labor market in China. Many Chinese economists have studied the value of an agricultural laborer relative to that of a nonagricultural

laborer. The estimated range for the ratio is from 1.8 : 1 (i.e., the value of 1.8 agricultural laborers equals that of one nonagricultural laborer) to 2.2 : 1.[31] This range is widely accepted by Chinese economists. It is a useful reference, though the estimation methods are still debatable.[32] In the estimation, it is taken into consideration that statistically agricultural laborers include part-time, semi-able-bodied and auxiliary workers, and surplus laborers. The relative value of the standard agricultural laborer should be somewhat higher than the estimate. In the labor cost accounts, labor time is calculated in terms of the standard laborer. On the other hand, nonagricultural workers not only receive a money wage but also have various subsidies which account for a significant part of their total wage.[33] Therefore setting the wage rate of the standard agricultural laborer at the level equal to the money wage of nonagricultural workers does not contradict the widely accepted estimation.[34]

With the wage rate equal to the money wage of nonagricultural workers, the second series of the weighted profit rate shows that at the state purchasing price, agriculture ran losses in 1978–83 and it was much less profitable than industry in 1984–86. Although there may be some debates about whether agricultural production was profitable in 1980–86, nobody should doubt that agriculture was not profitable in the pre-1978 period. Although the data on agricultural cost and profit are not available for the pre-1978 period, the trend shown in Table VII is very clear. Even if calculated at the official wage rate, the weighted average profit rate was only 4 per cent in 1978. The improvement in agricultural profitability in 1980–86 results mainly from the significant increases in state purchasing prices after 1979. It suggests that agricultural production in pre-1978 period was unlikely to be more profitable than that in 1978.[35]

[31] See Yan et al. [24, pp. 47–55], for a survey.

[32] Comments on these methods are made in Sheng [13, Chap. 2].

[33] See Sheng [13, Chap. 7], for more details.

[34] More studies are needed to answer the question whether this widely accepted estimation is the labor market clearing price.

[35] Agricultural output in China had been increasing over the period 1952–86 at a considerable annual rate (especially after the reform), except in several years in which agricultural production was seriously depressed by political factors and natural disasters. How could the considerable increase be compatible with the lower profitability of agricultural production? The compatibility was attributed to the following four factors: (i) hard quotas of agricultural production imposed by the compulsory procurement system; (ii) a considerable annual increase in peasant population; (iii) restrictions on nonagricultural activities of peasants; (iv) improvements in profitability. When hard quotas were imposed, peasants had to fulfill the production quotas, despite the lower profitability. While being required to fulfill the quotas, peasants had to raise enough products for themselves to meet the needs of the continuously increasing peasant population, as they had no other access to food, both domestically and internationally. Even in the late 1980s, the amounts of grain, edible oil, and pork consumed per peasant is still low (see Table IX). In this circumstance, agricultural products were the necessities of life. Although they were undervalued in state purchases, both their use value and real market value were high. On the other hand, the main way for peasants to increase their income was to increase agricultural production (though the return was low), as their nonagricultural activities were restricted. The first three factors resulted in the increase in agricultural production in the circumstance of

Agriculture was less profitable than nonagriculture mainly because agricultural produce was undervalued. When calculated at the money-wage rate of nonagricultural workers and at a profit rate of 20 per cent, the production price (costs plus profits) of these four agricultural products is 94, 71, 28, 14, 20, and 21 per cent higher than the state purchasing price in 1978, 1980, 1983, 1984, 1985, and 1986, respectively. This production price is higher than the free market price in 1978, 1980, and 1986, but lower in 1983–85. Therefore the production price is higher than the market clearing price for 1978, 1980, and 1986, but it should be close to the market clearing price for 1983–85. The production price in 1983–85 is higher than the estimated market clearing price (P_c). These suggest that the estimated real price is an underestimate. They also suggest that there are some agricultural resources which were extracted from agriculture through price mechanisms but not returned to agriculture through financial channels in 1983–85, i.e., the absolute value of $[A'_1 - A'_2]$ is smaller than that of $[(A_1 - A'_1) + (A'_2 - A_2)]$. It is also very likely the case for the period before 1983, because the free market price was higher than P_c by a big margin in this period (see Table V and Figure 3).

The conclusions from the above analysis are: (i) the current price of the agricultural produce had been lower than the real price and $[(A_1 - A'_1) + (A'_2 - A_2)] > 0$, i.e., there were agricultural resources flowing into nonagriculture through price mechanism, in the whole period 1952–88; (ii) the absolute value of $[A'_1 - A'_2]$ is smaller than that of $[(A_1 - A'_1) + (A'_2 - A_2)]$, i.e., there were net real resource flows out of agriculture, in 1952–85; (iii) the reforms lowered the extent to which agricultural produce was underpriced on the one hand, and reduced gradually the amount of unreturned resources extracted from agriculture to zero till 1986 on the other hand.[36]

This result is completely in contradiction with Ishikawa's and Nakagane's results. Ishikawa and Nakagane take the base-year price as the real price. In their cases, the calculation of $[(A_1 - A'_1) + (A'_2 - A_2)]$ is closely related to the terms of

lower profitability in selling agricultural products to the state before the reform. After the reform, the profitability of agricultural production is improved though it is still lower than it should be. The improvement stimulated agricultural production, while the functions of the first three factors weakened but did not vanish. Based on the almost fixed wage rate, the official calculation of profit rate (displayed in column 9, Table VII) shows a continuous improvement. Our calculation (displayed in column 10, Table VII) is based on a significantly increasing wage rate which is higher than the official one. If both wage and profit are taken into consideration, the net income of agricultural production was rising, though the state purchasing price was still lower than the market value. In addition, the retained products after state purchases can be sold on free markets at much higher prices. The income increases provided incentives for agricultural production. This can be better understood if the technical and structural restrictions, which peasants faced in transferring their activities from agricultural production to nonagricultural production, are also considered.

[36] One point should be made here about the third conclusion. The full return of the extracted agricultural resources was not realized by substantial increases in government transfers to agriculture but by dramatic increases in private transfers. This is because more and more peasants have moved into the nonagricultural sector and therefore nonagricultural workers' remittance to the agricultural sector increased rapidly.

trade between the two sectors. The terms of trade had been persistently favorable to the agricultural sector, therefore they find that calculated at 1952 prices, the amount of resource flows into the agricultural sector had been getting much bigger than that calculated at current prices with the passage of time. Consequently, they argue that there was an increasing amount of nonagricultural resources flowing through price mechanisms into the agricultural sector, i.e., $[(A_1 - A'_1) + (A'_2 - A_2)]$ is positive and increasing over time.

The base-year price is meaningful if we look at changes in intersectoral exchange in physical terms, but it is debatable to take the base-year price as the real price when we examine IRF in value terms. In Table V, we find that the changes in the terms of trade had been favorable to agriculture, but they were not as large as required so that the current price of agricultural produce was still lower than the real price. In this circumstance, the use of the terms of trade in examining IRF in value terms could be misleading.[37]

V. THE SOURCE OF INDUSTRIALIZATION FUNDS AND THE SOCIALIST ACCUMULATION MECHANISM

In Section III, we find that, calculated at current prices, agricultural saving surplus was small, in comparison with the investment in agriculture, and therefore agricultural net saving surplus had been negative in 1952–88. In other words, the nonagricultural sector had transferred its saving surplus to the agricultural sector through non-price mechanisms. The result is the same whichever of the three methods is used for calculation.

Arguing that the market clearing price is the real price, we find in Section IV that for the agricultural produce the current price is lower than the real price in the whole period in question, though the terms of trade had been favorable to agriculture. Therefore the net effect is that there are resource flows out of agriculture through price distortion. This finding is not surprising as it is consistent with the government policy of exploiting agriculture for industrialization. Our question is why the government adopted the policy of extracting agricultural resources through price mechanisms but allowed resources to flow through non-price mechanisms in a direction contrary to the policy. Now let us look at the link between the two kinds of resource flows in opposite directions.

We firstly examine the government transfers to agriculture in detail and see whether the simultaneous flows in both directions can be explained by an interpretation that the government extracted agricultural resources through the price system for maintaining the "public goods" supply for peasant agriculture. The government transfers to agriculture include: (1) state agricultural investment in capital construction; (2) expenditures on operating institutions serving agriculture; (3) funds for supporting the rural collective economy; (4) agricultural loans supplied by the Bank of Agriculture and the People's Bank of China;[38] and (5) rural

[37] The comments on the base-year method is made in Sheng [13, Chap. 1].

[38] The reason why these loans are considered as government transfers to agriculture is explained in Sheng [13, Sec. 4, Chap. 6].

relief funds. Among them, only item 1 and item 2 are used in maintaining the "public goods" supply for agriculture. The sum of these two items in 1952–88 is 176.97 billion yuan. This outlay was almost fully funded by agricultural taxes which amounted to 175.18 billion yuan in 1952–88.[39] Therefore there was no excuse for the government to extract agricultural resources through price distortion for funding the "public goods" supply. On the other hand, the government has never interpreted the aim of underpricing agricultural produce as funding the "public goods" supply. All official documents explained without mincing words that the aim was to fund industrialization.[40] The government budget gave priority to industry and tended to cut agricultural funds to be as low as possible. Increases in agricultural funds were made only when agriculture was depressed and it affected the economy as a whole. In addition, the interpretation of the "public goods" supply cannot explain why the government made other transfers to agriculture while bothering to extract agricultural resources through price distortion. The general observation suggests that many of the government transfers to agriculture were forced by the depression of agriculture, which was caused by the policy of underpricing agricultural produce. The mechanisms are explained below.

When a policy of extracting agricultural resources through price mechanisms is put into effect, it cannot reduce the amount of producer goods used in production. When agricultural produce is undervalued, the immediate result is a reduction in the surplus products and/or in labor income. Consequently, the growth rate of agricultural production and/or peasants' consumption declines. When agricultural prices are pressed down so much that the surplus is reduced to zero or even negative, disinvestment occurs, or peasants' consumption levels fall, or indeed both. Agriculture is the foundation of the Chinese economy which was almost closed before the reform and is now still unable to rely on imports of agricultural goods. The agricultural sector plays a very important role in economic growth in a developing economy. Due to the interdependency between sectors, the whole economy cannot grow while agriculture shrinks. On the other hand, the continuous drop in consumption may lead to economic, social, and political instability. In these circumstances, the only way to solve the problem is to transfer some resources into agriculture through financial channels, if the distorted price structure is not to be corrected.[41] Measures which can be used for this purpose are government investment grants, subsidies, and relief funds to agriculture. By using these funds, the agricultural sector is able to purchase more industrial products to compensate for production costs so that the level of production can be maintained. Meanwhile when peasants' consumption is compressed to a level much

[39] See Sheng [13, Table 6-4] and *ZGTJNJ* [14, p. 487 and p. 666].

[40] See, for example, Mao Zedong [7].

[41] The distorted price structure was upheld before the reform as the government did not intend to change the income distribution pattern. The reforms from 1979 onwards were indeed a fundamental shift in this respect. The price of agricultural produce was increased by a big margin, yet the price distortion was not completely corrected, due to political caution. Inflation is very sensitive to increases in agricultural prices and high inflation results in social and political upheaval. These are the basic reasons why the government still leaves the price distortion uncorrected.

lcwer than the others', remittances to peasants by their relatives and other unilateral transfers through private or social channels become common phenomena. This is because social and moral forces tend to correct the unequal pattern of income distribution caused by the distorted price structure. These government and private transfers to agriculture are the results of the policy of exploiting agriculture and should be regarded as the forced return of the extracted agricultural resources.[42]

The Chinese experience shows that squeezing resources from the agricultural sector by undervaluing agricultural produce both blights agricultural production and compresses agricultural consumption. It is impossible for an almost closed developing and agricultural economy to have rapid development and industrialization while agriculture shrinks. Nevertheless compressing consumption does contribute to rapid development and industrialization, as rapid development and industrialization require high accumulation. In fact, compressing consumption is the only way to high accumulation.

In view of his findings, Ishikawa argues that in China (as well as in Asian developing countries) the agricultural sector requires net resource transfers from the nonagricultural sector rather than being a source of net resources for the nonagricultural sector, because the agricultural sector has no such capacity. Similarly, Nakagane considers that the agricultural sector did not produce much savings surplus which could be used for industrialization. But these authors did not pay attention to the intrinsic connection between their findings and the intention of the Chinese government policy. The above discussion about the intrinsic connection is conducive not only to the clarification of the situation of IRF but also to the assessment of the government development policy.

In view of the result that the agricultural sector did not produce much surplus, Nakagane believes that it was the urban industrial sector with its low-wage workers that provided funds for industrialization. This conclusion is similar to that reached by Ellman reached in his study on the case of the Soviet Union.[43] The socialist accumulation mechanism is described by Nakagane as the following: low prices for agricultural products → low wages in the nonagricultural sector → with it low level of consumption → and its high rate of savings. Nevertheless, it is not the whole picture of the socialist accumulation mechanism. From Table VIII, one can see that the consumption of the nonagricultural residents is indeed low, as compared with their net output and savings. Comparing Table IV with Table VIII, one can also see that the saving rate of the nonagricultural sector is indeed much higher than that of the agricultural sector. From Tables VIII and IX, however, one can find that peasants' consumption is much lower than nonagricultural residents', both in value terms and in physical terms. Because agricultural produce is undervalued, peasants' low wage and low consumption do not result in high savings of agriculture but contributes to low input costs in the nonagricultural sector and make possible low workers' wages in the nonagricultural sector.

[42] This argument is made in detail in Sheng [13, Chap. 4], and the case of China is examined in Chapter 7.

[43] See Ellman [1].

TABLE VIII

COMPARISON BETWEEN AGRICULTURAL CONSUMPTION AND NONAGRICULTURAL CONSUMPTION

Year	Nonagric. Income (100 Million Yuan) (1)	Nonagric. Consumption (100 Million Yuan) (2)	Nonagric. Consumption Ratio, (2)/(1) (%) (3)	Per Capita Consumption of Nonagric. Residents (Yuan/Annual) (4)	Per Capita Consumption of Peasants (Yuan/Annual) (5)	Ratio of (4) to (5) (6)
1952	249	179	72	148	62	2.39
1957	483	290	60	205	79	2.59
1962	480	390	81	226	88	2.57
1965	746	401	54	237	100	2.37
1970	1,148	488	43	260	114	2.28
1975	1,557	675	43	324	124	2.61
1980	2,362	1,147	49	468	173	2.71
1985	4,548	2,151	47	747	324	2.31
1988	7,952	3,805	48	1,281	479	2.67

Sources: [14, 1989 edition, p. 29, p. 38, p. 720].

TABLE IX

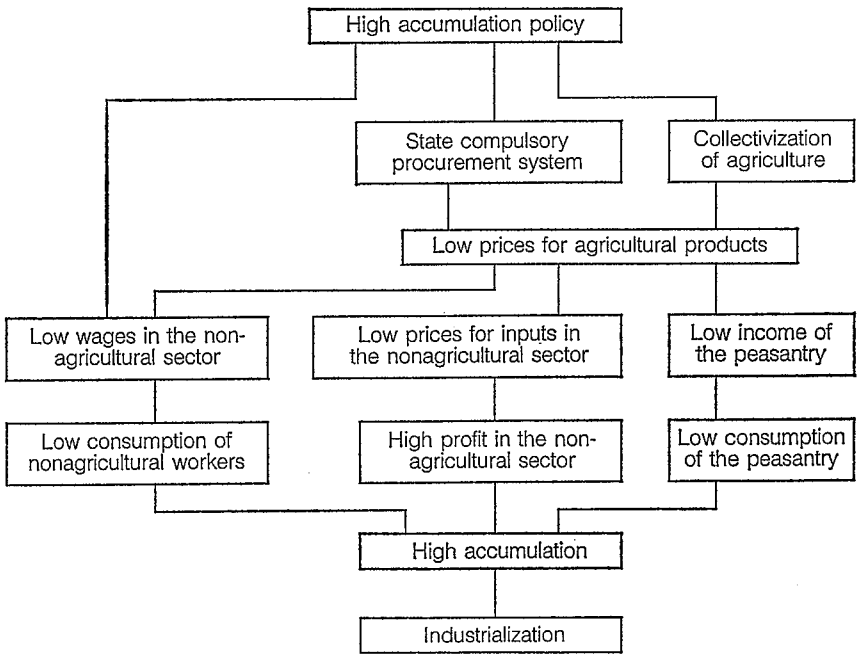
PER CAPITA CONSUMPTION OF BASIC FOOD

(Annual, kg)

Year	Grain		Edible Oil		Pork		Eggs		Sugar	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1952	240.0	191.7	5.1	1.7	8.9	5.5	1.8	0.9	3.0	0.6
1957	196.0	204.4	5.2	1.9	9.0	4.4	2.0	1.1	3.6	1.1
1962	183.8	160.6	2.5	0.8	3.8	1.9	0.7	0.8	3.5	1.2
1965	210.7	177.1	4.8	1.1	10.4	5.4	2.1	1.3	3.5	1.3
1970	201.8	184.4	4.2	1.1	10.8	5.1	1.7	1.3	4.3	1.6
1975	209.3	186.9	4.7	1.2	14.9	6.2	1.5	1.7	5.7	1.6
1980	213.9	213.8	5.5	1.6	19.0	9.4	3.0	2.1	8.9	2.7
1981	215.7	220.0	6.9	2.0	17.0	9.7	3.0	2.3	9.1	2.9
1982	217.3	227.4	8.9	2.3	17.6	10.4	3.2	2.4	9.5	3.2
1983	221.7	234.7	10.0	2.6	18.0	11.0	3.7	2.8	9.5	3.3
1984	240.0	254.0	11.1	3.2	18.7	11.7	n.a.	n.a.	10.5	3.6
1985	240.0	258.0	12.3	3.5	19.7	12.6	n.a.	n.a.	11.8	4.2
1986	242.0	260.0	12.4	3.5	20.5	13.0	n.a.	n.a.	12.2	4.7

Sources: [20, pp. 27–31] [8, pp. 577–79].

Fig. 4. Socialist Accumulation Mechanism



These factors in turn lead to high savings in the nonagricultural sector. The complete picture of the socialist accumulation mechanism is described in Figure 4. The funds financing the rapid industrial growth in China should be attributed to both low peasants' consumption and low nonagricultural residents' consumption. In view of the fact that the agricultural population accounts for about 80 per cent of China's total population, the agricultural sector must have provided a major portion of industrialization funds.

CONCLUSION

In the period 1952–88, the situation of IRF in China was complex. The role of IRF through non-price mechanisms and that through price mechanisms were in opposite directions. There were net resources flowing from the nonagricultural sector through financial channels to the agricultural sector, while there were net resources flowing through price mechanisms in the opposite direction. These are the consequences of the government policy of underpricing agricultural products. Under this policy the current price of agricultural produce was lower than the market clearing price, though the terms of trade changed favorably to agriculture. For the period 1952–85, IRF into agriculture through non-price mechanisms were smaller than IRF out of agriculture through price mechanisms and therefore there was a certain amount of net resource flow out of agriculture. For 1986–88, the difference between the flows of these two ways is very small.[44] Overall the agricultural sector transferred resources to the nonagricultural sector in the period 1952–85.

As agricultural produce was undervalued, agriculture's contribution to industrialization funds was not reflected in high saving rate. The low agricultural price contributed to low costs and a high saving rate in the nonagricultural sector. The policy of underpricing agricultural produce compressed both agricultural consumption and nonagricultural consumption. The funds for the rapid industrial growth were generated by lowering national consumption. Accounting for the bulk of the population, peasants provided a major part of the industrialization funds.

[44] This does not contradict the boom of the nonagricultural sector in this period. The growth of the nonagricultural sector no longer depended largely on the resources from agriculture and it could finance its rapid growth by its own resources, because (a) the nonagricultural sector accounted for 70.3 per cent of GNP in 1985 and (b) the profitability of the nonagricultural sector was higher than that of the agricultural sector.

REFERENCES

1. ELLMAN, M. "Did the Agricultural Surplus Provide the Resources for the Increase in Investment in the USSR during the First Five Year Plan?" *Economic Journal,* Vol. 85, No. 340 (December 1975).
2. ISHIKAWA, S. *Economic Development in Asian Perspective* (Tokyo: Kinokuniya, 1967).
3. ————. "Resource Flow between Agriculture and Industry: the Chinese Experience," *Developing Economies,* Vol. 5, No. 1 (March 1967).

4. LARDY, N. R. *Agriculture in China's Modern Economic Development* (Cambridge: Cambridge University Press, 1983).
5. LI CHENRUI. *Tongji-gongzuo-shouce* [Statistical handbook] (Beijing: Zhongguo-caizheng-jingji-chubanshe, 1986).
6. LIN BAIPENG. *Zhongguo xiaofei jiegou* [Consumption structure in China] (Beijing: Jingji-kexue-chubanshe, 1987).
7. MAO ZEDONG. "On the Ten Great Relationships," in *Selected Works of Mao Tsetung*, Vol. 5 (Beijing: Foreign Languages Press, 1977).
8. Ministry of Agriculture, Planning Section. *Zhongguo nongcun jingji tongji daquan 1949–1986* [Chinese encyclopedia of rural economy, 1949–1986] (Beijing: Nongye-chubanshe, 1989).
9. MUNDLE, S., and OHKAWA, K. "Agricultural Surplus Flow in Japan, 1888–1937," *Developing Economies*, Vol. 17, No. 3 (September 1979).
10. NAKAGANE, K. "Intersectoral Resource Flows in China Revisited: Who Provided Industrialization Funds?" *Developing Economies*, Vol. 27, No. 2 (June 1989).
11. People's Bank of China, Planning Section. *Lilu wenjian huibian* [A collection of documents on interest rate] (Beijing: Zhongguo-jinrong-chubanshe, 1985).
12. PREOBRAZHENSKY, E. *The New Economics*, trans. B. Pearce (London: Oxford University Press, 1928).
13. SHENG, Y. *Intersectoral Resource Flows and China's Economic Development* (Houndmills, Basingstoke, Hampshire: Macmillan Press; New York: St. Martin's Press, 1993).
14. State Statistical Bureau. *Zhongguo tongji nianjian* [Statistical yearbook of China] (Hong Kong: Zhongguo-tongji-chubanshe).
15. ————. *China Trade and Price Statistics, 1988* (New York: Praeger, 1988).
16. State Statistical Bureau, Population Statistical Section. *Zhongguo renkou tongji nianjian, 1989* [Chinese population statistical yearbook, 1989] (Beijing: Kexue-jishu-wenxian-chubanshe, 1989).
17. State Statistical Bureau, Section for Rural Social and Economic Statistics. *Zhongguo nongcun tongji nianjian* [Statistical yearbook of China's rural areas] (Beijing: *Zhongguo-tongji-chubanshe*).
18. State Statistical Bureau, Statistical Section for Balance of National Economy. *Guoming shouru tongji ziliao huibian, 1949–1985* [A corpus of statistical data for national income, 1949–85] (Beijing: Zhongguo-tongji-chubanshe, 1987).
19. State Statistical Bureau, Statistical Section for Investment in Fixed Assets. *Zhongguo guding zichan touzi tongji ziliao, 1950–1985* [Statistical data for investment in fixed assets in China, 1950–85] (Beijing: Zhongguo-tongji-chubanshe, 1987).
20. State Statistical Bureau, Statistical Section for Trade and Price. *Zhongguo maoyi he wujia tongji ziliao, 1952–83* [Chinese trade and price statistics, 1952–83] (Beijing: Tongji-chubanshe, 1984).
21. TIAN XUEYUAN. "Zhongguo chengshi renkou huafen biaozhun wenti yanjiu" [Studies of the criteria in classifying China's urban population], *Renkou yu jingji*, No. 3 (June 1989).
22. WATSON, A. "New Perspective on China's Agricultural Development Strategy," *Asian Studies*, Vol. 11, No. 2 (November 1987).
23. XIONG DAFENG, and YAN RICHU, eds. *Shehui jingji tongji cidian* [A dictionary of social and economic statistics] (Wuhan: Hubei-renmin-chubanshe, 1984).
24. YAN RUIZHEN, GONG DAOGUANG, ZHOU ZHIXIANG, and BI BAODE. *Zhongguo gongnongye chanpin jiage jiandaocha* [China's price scissors in the exchange of industrial products for agricultural products] (Beijing: Zhongguo-renmin-daxue-chubanshe, 1988).
25. ZHANG QINGWU. *Zhongguo chengxiang huafen yu chengzhen renkou tongji wenti* [Problems concerning urban-rural classification and urban demographic statistics in China], *Renkou yu jingji*, No. 3 (June 1989).
26. ZHOU YIXING. "Zhongguo chengzhen de gainian he chengzhen renkou de tongji koujing" [The Chinese concepts of city and town with the statistical approach to the urban population], *Renkuo yu jingji*, No. 1 (February 1989).

APPENDIX

Calculation of the sales to peasants (SL_p):

Assuming that there is no significant difference between the average consumption level of peasants and that of rural population, one can multiply SL_r by the ratio of peasant population to rural population to obtain an estimate of sales to peasants (SL_p). This procedure may slightly overestimate the sales to peasants as there are some non-peasants in rural areas and their consumption level is usually higher than peasants'. But the magnitude of the overestimate should not be substantial, because (a) the ratio of rural non-peasants to total peasants is only under 4 per cent,[a] (b) the average ratio of peasants' consumption to non-peasants' consumption was about 1 : 2.5 in 1952–88,[b] and (c) rural non-peasants' consumption should be lower than the national average level of non-peasants' consumption.

As mentioned in Section III, there were some changes in the demographic demarcation between rural and urban areas in 1984 and they resulted in a sharp drop in rural population. This aroused some debates.[c] Some time series did not follow these changes, as mentioned in Section III. Let us see whether the time series of SL_r follows these changes from the following information. SL_r in terms of per capita rural population increased by 277 per cent in 1983–88, while net income per peasant increased by 76 per cent. C_{ps} accounted for 87 per cent of C_p in 1983. Assuming that there is no significant difference between peasants' consumption level and rural population's consumption level, SL_r in terms of per capita rural population would have increased at most by 202 per cent in the period, even under the extreme circumstances that the percentage of C_{ps} in C_p had increased to 100 per cent in 1988, and that all increased net income of the rural population had been used for C_{ps}. This fact suggests that the population covered by SL_r did not drop and therefore the coverage of SL_r did not follow the changes in the demarcation of the rural sector. Therefore when SL_p is estimated by using the ratio of peasant population to the rural population for the period 1983–88, the official series of rural population should not be used. Rural population for this period is estimated by multiplying the rural population in the previous year by the natural increase rate of population in counties.[d]

Calculation of C_{rn}, $TC_a(1)$, and $TC_a(2)$:

C_{rn} is calculated by multiplying C_p (or C_p*) by the ratio of peasant nonagricultural population to total peasant population.[e] Peasant nonagricultural population

[a] See Population Statistical Section [16].
[b] See *ZGTJNJ* [14, 1989 edition, p. 720].
[c] See Tian [21], Zhang [25], and Zhou [26].
[d] The relevant sources are from *ZGTJNJ* [14, 1989 edition, p. 88].
[e] The official series of agricultural population is in fact that series of peasant population, because it calculates the population with peasants residence booklets rather than that engaged in agriculture. See Tian [21], Zhang [25], and Zhou [26].

is estimated by multiplying the number of workers in rural/township nonagricultural enterprises and peasants' private nonagricultural enterprises by the number of the persons each peasant laborer supports.

The calculation of P_m/P_p for 1952–61:

The official data on the ratio of the free market price (P_m) to the state list price (P_p) are not available for 1952–60, but the free market price index (P_m^{i+1}/P_m^i) and the state list price index (P_p^{i+1}/P_p^i) are available. The ratio (P_m/P_p) is calculated for 1952–61 by using the following equation:

$$P_m^i/P_p^i = [(P_p^{i+1}/P_p^i)/(P_m^{i+1}/P_m^i)] \times (P_m^{i+1}/P_p^{i+1}).$$

All three items on the right hand are known. By using this equation, the result of the calculation for 1961–87 is somewhat different from but very close to the official series.