The United Nations University

WIDER

World Institute for Development Economics Research

Working Papers No. 186

June 2000

Price Scissors, Rationing, and Coercion

An Extended Framework for Understanding Primitive Socialist Accumulation

Laixiang Sun

UNU World Institute for
Development Economics Research
(UNU/WIDER)

Working Papers No. 186

Price Scissors, Rationing, and Coercion

An Extended Framework for Understanding Primitive Socialist Accumulation

Laixiang Sun

June 2000

This study has been prepared within the UNU/WIDER project on Property Rights Regimes, Microeconomic Incentives and Development, which is directed by Dr Laixiang Sun.

Laixiang Sun is affiliated with UNU/WIDER, Helsinki, and the International Institute for Applied Systems Analysis (IIASA), Laxenburg.

UNU World Institute for Development Economics Research (UNU/WIDER) was established by the United Nations University as its first research and training centre and started work in Helsinki, Finland in 1985. The purpose of the Institute is to undertake applied research and policy analysis on structural changes affecting the developing and transitional economies, to provide a forum for the advocacy of policies leading to robust, equitable and environmentally sustainable growth, and to promote capacity strengthening and training in the field of economic and social policy making. Its work is carried out by staff researchers and visiting scholars in Helsinki and through networks of collaborating scholars and institutions around the world.

UNU World Institute for Development Economics Research (UNU/WIDER)
Katajanokanlaituri 6 B
00160 Helsinki, Finland

Camera-ready typescript prepared by Lorraine Telfer-Taivainen at UNU/WIDER
Printed at Pikapaino Paatelainen Oy, Helsinki

ISSN 0782-8233
ISBN 952-455-062-8 (printed publication)
ISBN 952-455-063-6 (internet publication)

CONTENTS

LIST OF FIGURES

ACKNOWLEDGEMENTS

I am grateful for the valuable comments, suggestions and discussions of George Irvin, Ashwani Saith, Marc Wuyts, and seminar participants at the Institute of Social Studies in The Hague.

Laixiang Sun
Helsinki, March 2000

ABSTRACT

This paper re-examines the current debate on price scissors based on an extended framework, in which the production and trade of industrial consumer goods within the rural sector is incorporated. It confirms that in the economy considered by Preobrazhensky, consumer rationing, especially of industrial goods in rural areas, is prevalent. Under the binding rationing the price response of agricultural surplus cannot be determined theoretically. This finding reopens the field for empirical investigation. The paper identifies the conditions that guarantee the validity of Preobrazhensky's two propositions: (1) the state can increase its capital accumulation by moving the terms of trade against peasants, and (2) the urban workers need not necessarily suffer therefrom. It demonstrates that in order to ensure the validity of these two propositions, besides the need to assume positive price response of agricultural surplus and of labour force input, food rationing in urban areas and the rationing of major industrial consumer goods in rural areas are essentially required. As a consequence, the paper suggests that the price-scissors type of regulation would induce the state's coercion on peasants to collect their food surplus.

Key words: Price scissors, rationing, coercion, primitive socialist accumulation

I INTRODUCTION AND SUMMARY

How to raise the resources required to finance industrialization has been a central issue for poor developing and/or socialist economies. The famous 'price scissors' strategy, i.e. to squeeze resources out of the rural sector by lowering agriculture's terms of trade with industry, was first suggested and hotly debated in the Soviet Union during the 1920s, when Preobrazhensky (1926, translated in 1965) was the seminal contributor to this strategy.

In recent years, the famous Soviet Debate has been renewed by formalized theoretical analysis (see, Sah and Stiglitz, 1984, 1986, 1992; Blomqvist, 1986; Carter, 1986; Baland, 1993; and Knight, 1995, among others). The key subject is to test Preobrazhensky's two main propositions: (1) The state can increase its capital accumulation by moving the terms of trade against peasants, and (2) the urban workers need not necessarily suffer therefrom. Grounded on the assumption of market clearing equilibrium, Sah and Stiglitz construct a simple but insightful model to assess the validity of Preobrazhensky's claims, and conclude that lowering agriculture's terms of trade with industry does increase the surplus that can be invested into industry by the socialist state, but at a cost for the industrial proletariat, since it reduces (in the short-run) the urban workers' welfare. They point out that the Soviet debate over-emphasizes the price squeeze of peasants as a source of the accumulation, and under-emphasizes the possibility of increasing the savings through a wage squeeze of the industrial workers. Furthermore, the debate does not pay attention to the behavioural responses of peasants. However, the formalized analysis indicates that the peasants' behavioural responses are central to the economics of the price scissors (Sah and Stiglitz, 1992: 83).

The critical comments on Sah and Stiglitz's model (SSM) come from two directions. The first one is related to the literature of 'intersectoral resource flows'. As summarized in Karshenas (1995: 50), the scholars in this area criticize that SSM is over-simplified due to its ignorance of capital in the specifications of agricultural production function. SSM concentrates on only the price scissors mechanism, therefore, cannot serve as a theoretical underpinning for analysing the comprehensive patterns of the intersectoral resource flows. However, a large body of inconclusive empirical literature, which deals with the resource flows between agriculture and industry in a poor socialist country like China, reveals a common and interesting finding: the sign and size of the net resource flow are very sensitive to assumptions

about the 'undistorted' terms of trade.[1] In fact, a key assumption behind the comprehensive resource flow accounting framework is also market-clearing equilibrium. Therefore, one would not be surprised at the inherent consistency between these two different research strands.

The second criticism points out that the SSM ignores one key characteristic of the economic system considered by Preobrazhensky, that is, consumer rationing. As Baland (1993) highlights, in the economy considered by Preobrazhensky and his comrades, consumer rationing, especially of industrial goods in rural areas, is the rule, market clearing the exception. Based on the assumption of perfect rationing controlled by the state, i.e. without free market and handicraft production of industrial goods, Baland shows that the price elasticity of the agricultural surplus can be easily determined theoretically, as being negative and equal to -1, which, in turn, ensures the validity of both Preobrazhensky's propositions in most cases.

This paper re-examines this debate based on an extended framework, in which the production and trade of non-agricultural goods within the rural sector is incorporated. It first demonstrates that in the economy considered by Preobrazhensky and his comrades, as they emphasized, the rural sector does produce a significant portion of total non-agricultural goods in terms of craft and cottage production; and in the urban sector the industrial output produced by small private enterprises is also sizable. Furthermore, in terms of the production and trade of consumer goods, the most important role is played by the private sector in general and small artisans, merchants, and traders in rural areas in particular. Therefore, it is reasonable to assume that these non-state sectors can produce effective substitutes for major industrial consumer goods which can be produced by the state sector (Assumption 1).

Second, the paper confirms that in the economy considered by Preobrazhensky, consumer rationing, especially of industrial goods in rural areas, is prevalent, in the form of either direct bureaucratic rationing or indirect market rationing. In the market rationing case, although no direct

---

[1] For example, using the current prices given by official statistics, the estimates of the intersectoral resource flow between agricultural and non-agricultural sectors indicate that the net flow in the period of 1952-88 was generally into, not out of, the agricultural sector (e.g. Ishikawa, 1988; Nakagane, 1989; Sheng, 1993a, 1993b; and Karshenas, 1995). In contrast, Sheng (1993a, b), using surrogate market prices, showed a net resource outflow from agriculture over the period 1952-85. The literature in Chinese as summarized in Sheng (1993a: 103-7), employing prices grounded on the labour theory of value, suggests generally the same result as Sheng's.

bureaucratic control, there is the coexistence of fixed or stable prices and goods shortage or even 'goods famine' (Benassy, 1982). When re-examining the theoretical determination of the sign of peasants' price response based on the extended framework, it is found that this sign cannot be determined theoretically. This finding is in opposition to one suggested in Baland (1993) and re-opens the field for empirical investigations.

Third, the paper identifies the conditions which guarantee the validity of Preobrazhensky's two propositions under the more realistic background. Two groups of conditions are found to be essential for this validity: the rationing of rural demand for industrial goods plus food rationing in urban areas; and the positive price response of agricultural surplus plus the non-negative price response of labour force input. With respect to the second group of conditions, while the assumption of positive price response of agricultural surplus is directly supported by the empirical evidences given in Lin (1993) and Antel and Gregory (1994), the assumption of non-negative price response of the labour force input may requires a little more than positive price response of output or yield.[2]

Fourth, the paper highlights that the price scissors type of regulation would induce the state's coercion on peasants to collect agricultural surplus from them. The reason for this is relatively straightforward. Since the rationing price cannot be greater than the market price for a binding rationing regime, if the state purchases the goods for rationing on the market, the state has to bear the commercial cost at least. It is clearly against the purpose of the Soviet Debate. Hence, in the case that an essential part of rationed goods has to be purchased by the state from the market, because the state does not want to bear the commercial cost and the independent producers do not want to sell

---

[2] Lin (1993) suggests both positive price responses of agricultural surplus and of output and yield for the case of the dual-track price system in China's agriculture during 1953-89. Antel and Gregory (1994) suggest a positive price response of agricultural surplus in the Soviet agriculture during 1923-5. They show that this positive response is dominated by production and substitution effects, and income effects appear less important. In addition, they also show that the absolute value of the price elasticity of substitution effect is quite small, about 0.049, as compared with the elasticity of grain marketing, about 0.291, figured at sample means. These together may imply positive or non-negative price response of agricultural production. Given land possession and traditional farming techniques, and assuming that the personal effort level of each farmer has been close to maximum following the famous 'efficient-but-poor' hypothesis (Schultz, 1964; Ghatak and Ingersent, 1984), positive or non-negative price response of production implies positive or non-negative price response of labour force input. However, direct empirical work on this issue is absent and would be more difficult.

their products at a price level lower than the market one, such coercive measures as increasing taxation, imposing quota delivery, and compulsory procurement at a lower price level than the market one become desirable for the state. At the same time, the monopoly power of the socialist state makes the coercive desire enforceable. The coercive measures in turn require powerful and coercive institutional arrangements to secure its constant enforcement.

One implication of the re-examination is related to the issue of measuring intersectoral resource flow. The prevalent resource flow accounting has been based on trade balances and capital accounts, and therefore it may be unable to take into account the extra profit of the industrial sector arising from depressing wage rates and low-priced agricultural products as inputs, both of which are secured by coercion in the agricultural sector in the history of socialist economies. This extra profit may have provided a very significant share of finance for industrialization.

Finally, the paper compares Preobrazhensky's theory with the primitive socialist accumulation in practice. The real process of the primitive socialist accumulation had shown much stronger coercive nature than Preobrazhensky's economic theory may imply. Political and ideological interpretations of socialist coercion seem to have stronger explanation power than the economic one, however, they all move in the same direction.

II THE ESSENTIAL CONTRIBUTION OF THE NON-STATE SECTOR IN INDUSTRY

The economy considered by Preobrazhensky's *New Economics* is clearly corresponding to the starting years of socialist transition before the collectivization of the rural sector (Sah and Stiglitz, 1992), when the 'informal' production of industrial goods by the non-state sector was an important component of the economy. The fact that during those years the rural sector in the Soviet Union produced a significant portion of non-agricultural goods, in terms of craft and cottage production, is well documented as 'Tugan-Baranovsky's factories in the countryside' in the relevant literature (see, among others, Gregory and Stuart, 1990; Antel and Gregory, 1994). According to Prokopovich's estimation which was cited by Preobrazhensky (1922, translated in 1980), in 1913, the last year before World War I, craft and cottage industrial output accounted for 35 per cent of

the total in European Russia.[3] During the 1920s, despite a lack of statistical data on cottage production, taking the Soviet Union as a whole, the industrial output produced by small private enterprises (employed an average of two workers) alone accounted for 20, 17, and 13 per cent of the total in 1925-6, 1926-7, and 1927-8, respectively (Baykov, 1946: 107, 124).

Preobrazhensky's *New Economics* was written in Marxian terminology and seems to be dominated by theoretical analysis and heavily spiced with jargon. However, the above characteristic of Soviet economy had been emphasized in the book: 'The peculiarity of our Soviet economy consists precisely in the fact that post-capitalist forms of production confront 22 million peasant holdings, together with craft and artisan industry, while purely capitalist or state-capitalist forms are comparatively weak. Under such conditions, the law of value and the planning principle enter into competition in an extremely distinctive setting…' Though '80 per cent of industry belongs to the state,' 'our state economy between 1918 and 1925 was weaker than our pre-war large-scale capitalist industry, … Inside the country private industry is weaker only because it is not allowed equal conditions for struggle.' 'The extent of the competition of private economy in production and sale is quite obvious from a mere enumeration of the various branches. Take the food industry, … the sugar industry, … The same very great role is played by petty production in the processing of hides, wool, wood, hemp, and the manufacturing of clothes. The largest branch of the state economy, manufacturing industry, also comes up against a considerable amount of competition by petty production,' and so on (Preobrazhensky, 1965: 160, 176, 127-8, 175-6).

The limitation in Preobrazhensky's theoretical analysis is that he employed dualism to characterize the transitional economy towards socialism: an economy comprises a socialist sector corresponding to state-owned manufacturing industries and a capitalist sector consisting of the agricultural sector and the informal manufacturing production. Within the simple framework of dualism there is no room to take into account the peasants' opportunities for shifting from agricultural activities to non-agricultural manufacturing activities and the existence of manufacturing goods market independent of state rationing system.

---

[3] The figure is generated based on Preobrazhensky (1980: 27-8). The year 1913 was treated as a base year by almost all of the participants in the Soviet Debate (see, i.e. Preobrazhensky, 1980; Erlich, 1960).

As the greatest follower of the Soviet accumulation model, China's case is also a good reference for our analysis. According to the understated official statistics of China, the industrial output produced by family handicraft (mainly in countryside) accounted for 15-26 per cent of the total, and that produced by private and half-private firms accounted for 26-50 per cent of the total during 1949-56, a period just before the compulsory collectivization. A more interesting historical fact is that even during the period of collectivization in China, once finding the comparative advantage in industry, the peasants are certainly taking the opportunity both formally (Commune and Brigade Enterprises) and informally (family craft and cottage production, and informal market) by a significant margin (*Statistical Yearbook of China, 1993*: 414; Perkins, 1977; Riskin, 1978; and Wiemer, 1994). These fundamental facts indicate that if the rationing quota is below the peasants' effective demand, and/or the state price is higher than one they expect, some peasants (artisans) will take the opportunity to conduct manufacturing production to meet local demand and for cost-saving or profit-making. It implies that no rationing regime can cover the peasants' total demand for, and the overall transaction of, industrial goods if the rationing is binding.

Returning to the Soviet case, what is more instructive to the research is the fact that in the areas of production and trade of industrial consumer goods, the private sector in general and small artisans, merchants, and traders in rural areas in particular had played the most important role until the late 1920s, despite the growing weight of the state sector. For example, by 1925-6, millions small artisans still produced as much as 70 per cent of all clothing and footwear and 43 per cent of all processed foodstuffs. They were also important in some producer goods industries such as metalworking and brick manufacture. Meanwhile, countless small merchants and traders continued to play an essential part in retail trade, and more relevantly, to play a dominant part in rural retail trade (Carr and Davies, 1969-71, Vol. I: 390; Cohen, 1973: 271; Nove, 1969: 103; *Voprosy istorii KPSS*, No. 7, 1971: 83-4). Against this background, it is reasonable to make the following assumption:

> **Assumption 1:** in the economy considered by Preobrazhensky, the non-state sector can produce effective substitutes for major industrial consumer goods which can be produced by the state sector.

The notion of 'effective substitutes' used above includes the case that the non-state sector may simply use low quality input to produce cheap and poor quality goods to meet the corresponding demands which are not met by the supply of the state sector. With regards to the empirical context, an interesting

example about the production and trade of private economy during the pre-reform period in Wenzhou, China, is well presented in Forster (1990) and Parris (1993).

> **Corollary 1:** under binding consumer rationing the rationing price cannot be greater than the market price if the supply quantity is pre-determined and Assumption 1 holds.

For a more accurate understanding of Corollary 1, we put it in details. First, in the case where the rationing part of a good is directly produced by the state and the remaining demand for the good is supplied by private and household firms, if a rationing price p_0^i is greater than equilibrium market price p^i, the consumer with the ration quota would buy i-good in the market rather than in the rationing shop, and thus there will be no rationing.

Second, in the case where the state needs to purchase an essential part of rationing goods from independent producers,[4] if a rationing price p_0^i is greater than equilibrium market price p^i, as just discussed, the consumer with the ration quota would buy i-good in the market rather than in the rationing shop. At the same time, the producers could increase their income only by buying i-good for a low price on the market and selling it to the state for a higher price if the state procurement price is also greater than the market price. As a consequence, on the one hand, the state would buy more than it sells and thus end up holding unsold inventories, which is opposite to the purpose of the Preobrazhensky's propositions. On the other hand, such activities would drive up the market price until it is exactly equal to the state rationing price if the following three conditions are met: the output is pre-determined, the rationing good belongs to the necessities as in usual case, and Assumption 1 holds. The arguments above show that for goods whose rationing prices are strictly less than their market prices, all ration quotas are binding. For any good whose rationing price is greater than market price, the market price will be driven up to equal the state price and the excess supply associated with the higher price will be absorbed by the state as an unsold inventory.

---

[4] This case is fundamentally corresponding to the procurement of major agricultural products by the state, and likely relevant to the state purchase of some processed and semi-processed agricultural goods. 'An essential part' here means that the corresponding state purchase accounts for an influential share of the market, and the relevant market parameters, mainly price, can be revised by the purchase.

The readers familiar with the history of socialist economy will find that the logical analysis above is consistent with the history of rationing regimes in all socialist countries (see, among others, Kornai, 1992; Qian, 1994).

> **Corollary 2:** coercive measures and the induced institutional arrangement are a logical consequence of binding consumer rationing if the state has to purchase an essential part of rationing goods from independent producers and the supply quantity is pre-determined.

Note the central issue of the Soviet Debate is how to raise the resources for financing investment in the state-sector. We have shown that the rationing price cannot be greater than the market price for a binding rationing regime. When the state has to purchase the goods for rationing on the market, it has to bear the commercial cost at least. It is clearly against the purpose of the Soviet Debate. Hence, in the case where an essential part of rationed goods has to be purchased by the state from the market, because the state does not want to bear the commerce cost and, no independent producer is willing to sell his products at a price level lower than the market one, some coercive measures such as increasing taxation, imposing quota delivery, and compulsory procurement at a price level lower than the market prices become desirable for the state. On the other hand, the monopoly power held by the socialist state makes the desire enforceable, and the constant enforcement of such coercive measures in turn requires powerful and coercive institutional arrangements.

The collectivization, in addition to its political desire such as bringing in effective political and organizational control by the state and party, appeared to solve the recurrent grain procurement crises of the 1920s in Soviet Union once and for all (Nove, 1965: xiii-xvi; Kuromiya, 1988: 4-11), although it did not solve the conflicts of interest and incentive and further, it created new problems whose adverse consequences are now widely recognized (Swarup, 1954; Sah and Stiglitz, 1992: 88-9)[5].

---

[5] For the economic interpretation of collectivization, besides those given in this paper, Brown and Koont (1995) added an alternative argument that 'one critical factor leading to the decision to collectivize may have been the party's inadequate appreciation of a crucial linkage between town and countryside'—to establish the state's credibility through sales of agricultural implements to poor peasants. When the bulk of agricultural marketings were in fact being sourced from *bednyak* (poor and middle peasants), a preoccupation with perceived *kulak* (rich peasants) power led the Party to mistake lower marketings as a *'kulak* strike', and to overlook the economic measure to limit *bednyak* dependence on *kulak* means of production through the state's increasing sale of machinery to poor peasants. However,

III CONSUMER RATIONING IN THEORY AND IN PRACTICE

The concept of consumer rationing has two interpretations in the literature. The narrower one stands for the bureaucratically controlled distribution of goods. The broader one refers to the case that the existence of excess demand leaves no choice but application of some procedure on the 'short' side, that is, in the distribution of supply. Both direct administrative and indirect market forms of rationing are included in this interpretation. The most typical feature under market rationing of consumer goods is the coexistence of fixed or stable prices and shortage of certain goods (Benassy, 1982; Kornai, 1992).[6]

In the Soviet Union in the 1920s, as Baland (1993) identifies, the 'goods famine' characterized the market rationing of industrial goods in rural areas. Preobrazhensky (1980: 42-7) also indicated the existence of market rationing of those industrial goods in countryside which were supplied by the state sector: 'By nationalizing industry we have restricted the operation of the law of value in the state economy.' However, 'In the sector of private trade—that is, above all in retail and wholesale-retail trade—prices of commodities in short supply are rising sharply.' 'Our trusts have fixed and stable disposal prices, ... grain prices are rising in the private economy; prices are increasing for industrial raw materials over which we have little control; and the private economy is getting more in paper money for its entire output. The state economy, on the other hand, is selling its entire output at fixed prices, ...' Preobrazhensky identified this market rationing as a key cause of the lasting 'goods famine' and suggested to lower the agriculture's terms of trade with the state sector in a way without the cost of high inflation.

In the case of China, administrative rationing of major industrial consumer goods for the whole population had been in place until the mid 1980s. The long-term coupon rationing of cotton cloth had been subject to the central coordination. The coupon rationing of other industrial consumer goods such as sugar, kerosene (which was mainly used for lighting in rural houses), soap, paper, edible soda, matches, etc., was subject to local government

---

the practical barrier to this suggestion is that because of the absence of sufficient productive capacity the state cannot provide sufficient agricultural implements during the early years of primitive socialist accumulation.

[6] The market rationing of credit usually has quite different features and is driven by banks' trade-off between credit rationing and costly monitoring in order to alleviate the moral-hazard problem (see, e.g. Stiglitz and Weiss, 1981).

coordination and their rationing quotas varied across regions and time. Vouchers for the purchase of durable consumer goods such as bicycles, sewing machines, wristwatches, etc., were distributed annually to rural production brigades and urban factories and institutions (see, among others, Han, 1991; Kraus, 1982: 269-72; Lardy, 1983: 157-8).

It is valid for both administrative and market forms of rationing that at least four types of consumer rationing regimes are allowed theoretically in the economic system considered by Preobrazhensky. First one is the all-round rationing which means the rural demand for industrial goods and the urban demand for both agricultural and industrial goods are rationed. The second rationing regime is that the rural demand for industrial goods and the urban demand for agricultural goods be both rationed. The third one arises when the demand for industrial goods from both the rural and urban are rationed. And the fourth situation is that only the rural demand for the industrial goods is rationed.

In terms of market rationing, among the above four regimes the first one is most popular, and appears in both periods of the transition towards socialism and classical socialism. In terms of administrative rationing, the first one had been the case in the pre-reform period in China and has been the case of Cuba and North Korea (Kornai, 1992: 241-3; Cho and Kim, 1995: 61-105). In the following section the discussion will be mainly based on the fourth regime for both its essentiality (it is included in all of the four regimes) and relative mathematical succinctness. The intention is to reveal how the food rationing in urban areas is essentially required and induced in order to secure the simultaneous validity of both Preobrazhensky's propositions (i.e. the second rationing regime). In other words, we will reveal that the rationing of demand for industrial consumer goods alone cannot guarantee the purpose of squeezing resources out of the rural sector without hurting the welfare of urban workers. This conclusion can be generalized to the first and third situations in similar ways but it is clearly more complex mathematically.

IV RE-EXAMINE PRICE SCISSORS UNDER BINDING CONSUMER RATIONING

4.1 The basic model[7]

The basic model considers an economy in which there are two aggregate commodities—food and a generalized industrial good. And three aggregate sectors—the urban, the rural agricultural and the rural industrial. Food and food-related products are produced in the rural agricultural sector (represented by the superscript a). A generalized industrial good, which can be used either for consumption or for investment, is produced in both the formal industrial or urban sector (represented by the superscript u) and the informal rural industrial sector (represented by the superscript i).

The rural agricultural sector consists of homogeneous farm households and the rural industrial sector consists of homogeneous artisan households. In the case where one rural household conducts both agricultural and industrial activities and its agricultural production produces a surplus as well, this household can be treated as two separate households by a proper accounting separation and adjustment.

Let N^a stand for the agricultural population, and L^a for the time spent by each peasant on production activities. Assuming the constant returns to scale and given the agricultural land area, A, possessed by a representative peasant, the output per peasant can be written as $X = X(A, L^a)$. The agricultural surplus is $Q = X - x^a$, where x^a denotes the peasant's own consumption. The peasant's utility function is given by $U^a = U^a(x^a, y^a, L^a)$ and his/her budget constraint can be written as

$$pQ = y_0^a + p^u\left(y^a - y_0^r\right) = p^u y^a - \left(p^u - 1\right)y_0^r \tag{1}$$

and in any case we have $p^u \leq 1$ because of corollary 1. In eq. (1) p and p^u are the market prices of food and the industrial good, respectively, relative to the state price of the rationed industrial good; y_0^r is the ration quota of the industrial good for the peasant (for each resident in the rural sector in fact); y^a

---

[7] The basic model here is grounded on Sah and Stiglitz. For the purpose of this paper, I only extend the basic model in Sah and Stiglitz (1984). Other models can be found in Sah and Stiglitz (1992).

is the amount of the industrial good he/she consumes, and thus $y^a - y_0^r$ is supplied by the rural industrial sector.

Let N^i stand for the artisan population, and L^i for the time spent by each artisan on the informal industrial production. Under the given traditional technology and predetermined capital stock (K_0), the output per artisan can be written as $Z = Z(K_0, L^i)$. The marketable part of Z is $Y^i = Z\left(y^i - y_0^r\right)$, where y^i denotes the total demand of the artisan for the industrial good. The artisan's utility maximization programme can be presented as follows: $Max\ U^i = U^i(x^i, y^i, L^i)$, subject to $p^u Y^i = y_0^r + p\left(x^i - x_s^i\right)$, in which x^i represents the artisan's demand for the agricultural good, x_s^i stands for the self-supplied amount of the agricultural good, and the others are the same as before.

For the urban workers, the representative utility maximization programme can be presented as follows: $Max\ U^u = U^u(x^u, y^u, L^u)$, subject to $px^u + y^u = wL^u$, in which w stands for the industrial wage per hour (in terms of the industrial good), L^u for the number of hours worked per day and is assumed to be fixed by the government for technological reasons, and x^u and y^u represent the urban worker's demand for the agricultural and industrial goods, respectively. An obvious simplification here is that the urban workers buy all their demanded industrial good directly from the state retail shops at the state price. In a logical sense this simplification already assumes some types of coercion such as the urban and rural markets are effectively separated to prevent private resale of rationed goods, and the urban informal market of industrial goods does not exist. It, nevertheless, is not an essential assumption and can be removed with more mathematics only.

The balance between supply of and demand for the agricultural good requires

$$N^a\left(p, p^u\right)Q\left(p, p^u, L^a\right) = N^u x^u(p, w) + N^i\left(p, p^u\right)\left(x^i\left(p, p^u\right) - x_s^i\left(p, p^u\right)\right) \qquad (2a)$$

where N^u is the urban population, and the others are the same as before.

The equilibrium equations for the rural-produced industrial good and for reallocation of the labour force between the rural agricultural and artisan sectors can be presented as

$$N^i\left(p, p^u\right)Y^i\left(p, p^u, L^i\right) = N^a\left(p, p^u\right)\left(y^a\left(p, p^u, L^a\right) - y_0^r\right) \qquad (3a)$$

$$N^r = N^a\left(p, p^u\right) + N^i\left(p, p^u\right) \tag{4a}$$

in which N^r represents the total rural population.

The state's surplus of the industrial good, I, which is available to the government for investment, can be written as

$$I = N^u Y - N^u Y^u - N^r Y_0^r \tag{5a}$$

in which Y denotes the average labour productivity in the formal industry run by the state, that is also predetermined.

4.2 Price response of agricultural surplus

Here we can easily discuss the price response of agricultural surplus based on the peasant's utility function and budget constraint (1), without any additional assumption. In the situation where the rationing price of the industrial good is strictly less than the market price, directly deriving eq. (1) with respect to p in the condition of utility maximization,[8] we obtain

$$\varepsilon_{Qp}^a = \frac{\left(y^a - y_0^a\right)}{Q}\frac{dp^u}{dp} + \alpha_y^a \varepsilon_{yp}^a - 1 \tag{6a}$$

Where $\varepsilon_{Qp}^a = \partial lnQ/\partial lnp$ is the price elasticity of Q, α_y^a stands for the peasant's budget share of the industrial good as measured by the market price, and $\varepsilon_{yp}^a = \partial lny^a/\partial lnp$.[9]

Here, the signs of both dp^u/dp and ε_{yp}^a are theoretically ambiguous. Look at dp^u/dp first. Note that both p and p^u are the relative market prices of food and the industrial good in terms of state price of the rationed industrial good, therefore an exogenous increase of the rationing price directly decreases both p and p^u, i.e. $dp^u/dp \geq 0$. In addition, the decrease of p results in a fall of

---

8 $$\frac{p}{Q}\frac{dQ}{dp} + 1 = \frac{y^a - y_0^r}{Q}\frac{dp^u}{dp} + \frac{p^u y^a}{pQ}\cdot\frac{p}{y^a}\frac{dy^a}{dp}$$

9 Both ε_{Qp}^a and ε_{yp}^a account for the full impact of p on Q and y^a in the form of composite function such as $f(p, \cdot) = f[p, p^u(p, \cdot), L^a(p, \cdot), \cdot]$, as usually done in empirical research.

peasants' cash income, inducing a declined demand for and thus decreased price of the rural-produced industrial good, means that $dp^u/dp \geq 0$ again. However, on the other hand, the rise of the rationing price makes the rural-produced industrial good cheaper, which will stimulate peasants' demand for the good and induce a rise in p^u, that is, $dp^u/dp \leq 0$. With regard to ε^a_{yp}, the situation is similar. The lowered p induces declined income and then declined demand for y, indicating $\varepsilon^a_{yp} \geq 0$. On the other hand it also makes the rural-produced industrial good become relatively cheaper, leading to an increased demand and thus $\varepsilon^a_{yp} \leq 0$. In brief, with the only exception of $\varepsilon^a_{yp} = 0$ and $dp^u/dp = 0$ we cannot theoretically judge whether the sum of the first two terms on the right-hand side of eq. (6a) is positive or negative, and is greater or less than one or equal to a constant. It means that we are unable to determine theoretically the sign of ε^a_{yp} unless in the case of $\varepsilon^a_{yp} = 0$ and $dp^u/dp = 0$.

In the situation where the state price is exactly equal to the market price, i.e. $p^u = 1$, eq. (1) reduces to $pQ = y^a$. Deriving the reduced equation with respect to p, we get

$$\varepsilon^a_{Qp} = \alpha^a_y \varepsilon^a_{yp} - 1 \tag{6b}$$

Because of the same reason given above, we cannot determine the sign of ε^a_{Qp} theoretically as well excepting $\varepsilon^a_{yp} = 0$.

The case that $\varepsilon^a_{yp} = 0$ and/or $dp^u/dp = 0$ hardly appears in the economy considered by Preobrazhensky and goes beyond our interest. For example, dp^u/dp will be equal 0 in the case where only urban workers know how to produce a substitute for the industrial good, and it can be produced by them at a constant marginal cost (in terms of food) after working hours or when they are unemployed; and then they sell a certain amount of what they produce to the peasants on the free (black) market. It is clearly a logical possibility rather than the reality we discuss in the last section. ε^a_{yp} will be zero if the unified ration quota can exactly covers the full demand of every peasant for the industrial good, but it is even logically impossible because there is no way to unify demand across different persons.

4.3 Re-examine Preobrazhensky's two propositions

For convenience of interpretation, it helps to make a simplified assumption first. Because the peasant's adjustment to demand for and supply of the rural-

produced industrial good is induced by p alone according to our concern in this paper, we can treat p^u as determined by p alone and assume all the other factors to be predetermined. Based on this assumption, eqs. (2a) to (4a) can be reduced to

$$N^a(p)Q(p, L^a) = N^u x^u(p,w) + N^i(p)x_m^i(p) \tag{2b}$$

$$N^i(p)Y^i(p, L^i) = N^a(p)(y^a(p, L^a) - y_0^r) \tag{3b}$$

$$N^r = N^a(p) + N^i(p) \tag{4b}$$

with $x_m^i(p) = x^i(p) - x_s^i(p)$ standing for the artisan's demand for the agricultural good from the market. A little bit different from the situation in Section 4.2, because all equations from (1) to (5) and the other two budget constraints hold for $p^u \leq 1$, we do not need to distinguish the cases of $p^u < 1$ and $p^u = 1$ in the following discussion.

Substituting three budget constraints of the representative farmer, worker, and artisan as well as eqs. (2b) to (4b) into (5a), we obtain

$$I = N^u(Y - wL^u) \tag{5b}$$

Totally differentiating eq.(2b) with respect to p and w yields[10]

$$\varepsilon_{wp}^u = \left(\varepsilon_{Qp}^a + \varepsilon_{Np}^a + \beta_x^u \varepsilon_{xp}^u + \beta_x^i(\varepsilon_{xp}^i - \varepsilon_{Np}^i)\right) / \beta_x^u \varepsilon_{xm}^u \tag{7}$$

with $\varepsilon_{xm}^u = \dfrac{\partial ln x^u}{\partial ln(wL^u)} > 0$, $\varepsilon_{xp}^u = -\dfrac{\partial ln x^u}{\partial ln p} \geq 0$, $\varepsilon_{xp}^i = -\dfrac{\partial ln x_m^i}{\partial ln p} \geq 0$, $\varepsilon_{Np}^a = \dfrac{\partial ln N^a}{\partial ln p}$, $\varepsilon_{Np}^i = \dfrac{\partial ln N^i}{\partial ln p}$, $\varepsilon_{Qp}^a = \dfrac{\partial ln Q}{\partial ln p}$ as before and $\varepsilon_{wp}^u = \dfrac{\partial ln w}{\partial ln p}$;[11] where β_x^u and β_x^i stand for

---

[10] $N^a \dfrac{\partial Q}{\partial p}dp + Q\dfrac{\partial N^a}{\partial p}dp = N^u\left(\dfrac{\partial x^u}{\partial p}dp + \dfrac{\partial x^u}{\partial(wL^u)}d(wL^u)\right) + x_m^i \dfrac{\partial N^i}{\partial p}dp + N^i \dfrac{\partial x_m^i}{\partial p}dp$

$\Rightarrow N^a Q(\varepsilon_{Qp}^a + \varepsilon_{Np}^a)\dfrac{dp}{p} = N^u x^u\left(-\varepsilon_{xp}^u \dfrac{dp}{p} + \varepsilon_{xm}^u \dfrac{dw}{w}\right) + N^i x_m^i(\varepsilon_{Np}^i - \varepsilon_{xp}^i)\dfrac{dp}{p}$, leading to

$\varepsilon_{wp}^u = \left(\dfrac{\varepsilon_{Qp}^a + \varepsilon_{Np}^a}{\beta_x^u} + \varepsilon_{xp}^u + \dfrac{\beta_x^i}{\beta_x^u}(\varepsilon_{xp}^i - \varepsilon_{Np}^i)\right) / \varepsilon_{xm}^u$, and then to eq. (7).

the market shares of urban workers and rural artisans in the agricultural good market, respectively.

Deriving eq.(5b) with respect to p gives

$$\frac{dI}{dp} = - N^u L^u \varepsilon^u_{wp} \frac{w}{p} \tag{8}$$

It is obvious from eqs. (7) and (8) that the sign of *dI/dp* depends on our assumption on ε^a_{Qp} and ε^a_{Np}, noting that ε^a_{Np} and ε^i_{Np} have opposite signs in any case following eq. (4b). From Section 4.2 we know that the sign of ε^a_{Qp} cannot be theoretically determined. The same is true for ε^a_{Np}. Following the arguments in Section 4.2, an exogenous raise of the rationing price directly lowers p^u, reducing the attractiveness of artisan production in the short term and thus leading to $\varepsilon^i_{Np} \geq 0$. A fall of peasants' cash income following the decrease of p may also reduce the demand of peasants for the rural-produced industrial good, inducing $\varepsilon^i_{Np} \geq 0$ as well. On the other hand, raising the rationing price makes the artisan product relatively cheaper. It will stimulate the demand and increase the attractiveness of artisan production, inducing that $\varepsilon^i_{Np} \leq 0$.

Defining V^u as the indirect utility of the urban worker obtained from the maximization of U^u with respect to x^u and y^u and making use of the envelope theorem, eq. (7) and the Slutzky equation,[12] we obtain

$$\frac{dV^u}{dp} = \lambda^u x^u \left(\varepsilon^a_{Qp} + \varepsilon^a_{Np} + \beta^u_x e^u_{xp} + \beta^i_x \left(\varepsilon^i_{xp} - \varepsilon^i_{Np}\right)\right) / \alpha^u_x \beta^u_x \varepsilon^u_{xm} \tag{9}$$

---

[11] As a generalization of Note 8, all ε^k_{fp}'s ($k = a, i, u$; f represents Q, N^a, N^i, x^u, and x^i_m, respectively) in this section account for the full impact of p on function f in the sense of composite function $f(p, \cdot) = f[p, p^u(p), L^*(p, \cdot), \cdot]$ and the corresponding chain rule.

[12] The indirect utility of the urban work is defined by

$$V^u(p, 1, w) = \max_{x^u,\, y^u} \left\{ u^u + \lambda^u \left(wL^u - px^u - y^u\right) \right\}$$

Using envelope theorem: $\frac{dV^u}{dp} = \frac{\partial V^u}{\partial p} + \frac{\partial V^u}{\partial w}\frac{dw}{dp} = -\lambda^u x^u + \lambda^u L^u \frac{dw}{dp} = \lambda^u x^u \left(\frac{\varepsilon^u_{wp}}{\alpha^u_x} - 1\right)$

Using eq. (7) and Slutzky equation we directly obtain eq. (9).

where λ^u is the positive Langrange multiplier of the utility maximization programme associated with the budget constraint, α_x^u indicates the budget share of the agricultural good for the urban worker, and e_{xp}^u presents the compensated price elasticity of the agricultural good in the urban sector and is positive. It is clear from eq. (9) that the sign of dV^u/dp depends on our assumption on ε_{Qp}^a and ε_{Np}^a as well.

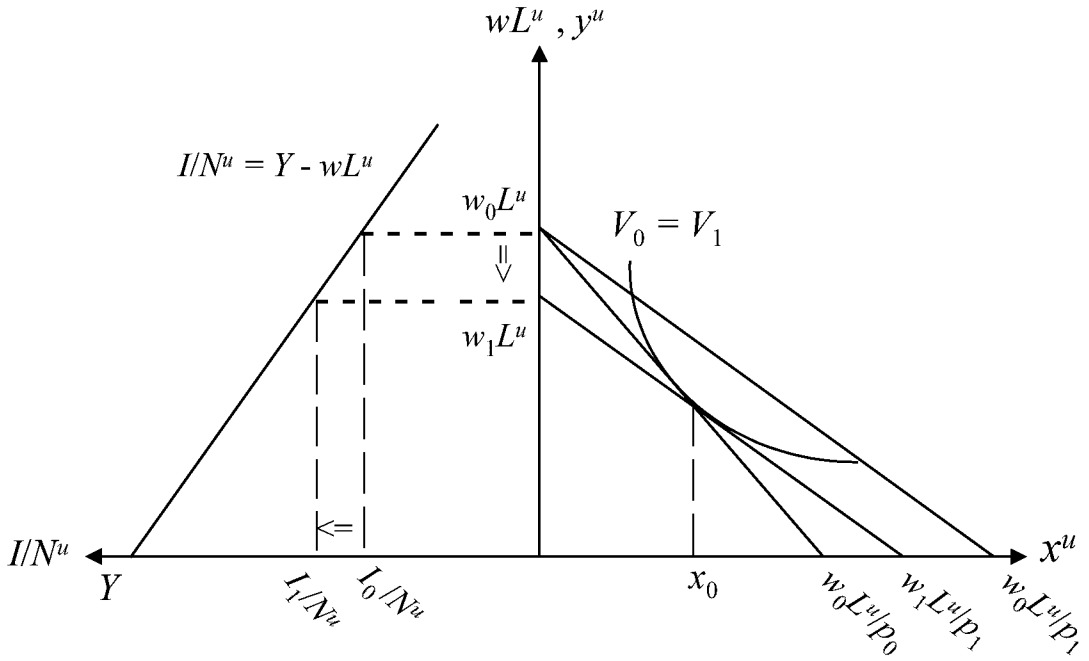
Comparing eq. (8) with eq. (9), it can be found that once the sign of ε_{wp}^u is determined based on certain assumptions on ε_{Qp}^a and ε_{Np}^a, dI/dp and dV^u/dp are bound to have opposite signs. It means that Preobrazhensky's two propositions cannot be simultaneously true in the case that only rural demand for the industrial good is rationed.

If the empirical evidence of Antel and Gregory (1994) and Lin (1993) is accepted, which suggests both a positive price response of agricultural surplus and a non-negative price response of output, we can assume $\varepsilon_{Qp}^a > 0$, and $\varepsilon_{Np}^a \geq 0$ based on the additional assumptions mentioned in Note 2. As a consequence, we have $dI/dp < 0$ but $dV^u/dp > 0$, i.e. Preobrazhensky's first proposition is valid but the second is not.

In order to induce $dV^u/dp \leq 0$ under the assumptions of $\varepsilon_{Qp}^a > 0$ and $\varepsilon_{Np}^a \geq 0$, food rationing is needed. The simultaneous validity of both Preobrazhensky's propositions under the regime of food rationing in urban areas and industrial goods rationing in rural areas can be intuitively illustrated based on Figure 1. Given the ration quota of the agricultural good per urban worker, x_0^u, the worker's utility maximization programme is drawn in the first quadrant, in which one can easily find the worker's wage rate which should be set for the agricultural good market to clear. In the second quadrant, the investment fund corresponding to per urban worker is depicted as a function of the urban wage rate, w.

For simplicity, in Figure 1 we assume that at the initial levels of the relative price, p_0, and of the urban wage rate, w_0, the food ration quota of urban worker is at the market-clearing level. Because the state guarantees the supply of the ration quota, x_0^u, reducing p from p_0 to p_1 will not lead to a fall of food supply, but induce an increase of the real wage rate measured by the agricultural good: from w_0L^u/p_0 to w_0L^u/p_1. Thus the state can increase its investment fund by reducing w from w_0 to w_1 while keeping the worker's utility level unchanged.

FIGURE 1
INTRODUCING FOOD RATIONING IN THE URBAN SECTOR TO ENSURE THE VALIDITY OF BOTH PREOBRAZHENSKY'S PROPOSITIONS



The cornerstone of the above argument is that the state secures the supply of food ration quota to the urban sector. Because the state has to procure the given amount of agricultural goods from independent peasants, following Corollary 2, compulsory measures to collect agricultural goods by the state becomes necessary. The implementation of year-to-year even season-to-season compulsory measures consequently requires certain institutional arrangements to minimize the implementation costs and avoid the recurring procurement crises.

V PRIMITIVE SOCIALIST ACCUMULATION IN PRACTICE

The primitive socialist accumulation in practice had shown a much stronger coercive nature than the Preobrazhensky's theory may imply. The reasons for such coercion go far beyond simple price scissors consideration as well. However, all major interpretations move in the same direction.

In the starting years of socialist transition, most of socialist countries, particularly, the former Soviet Union and China, inherited a war-torn and backward economy, which was dominated by agriculture. Rapid

industrialization in general and accelerative development of heavy industry in particular would not only provide evidence of socialist superiority, but also help the economy to catch up to the industrialized powers and create a modernized armed force for national security. Based on such urgent pressure, and also thanks to the Marx's theory of 'priority growth of producer goods', after a recovery from war, almost all socialist countries adopted the well-known heavy-industry-oriented development strategy on purpose to build the nation's capacity to produce capital goods and military materials as fast as possible. This strategy was shaped and practised through a series of five-year plans (Kornai, 1992).

As a capital-intensive sector, the construction of heavy industry has three specific features:

- Each project takes a long period of time, maybe five to ten years or more, to be completed.
- Most equipment, at least in the initial stage, needs to be imported from more developed economies.
- Each project requires a lump-sum investment.

In the transitional period, the basic condition of the socialist economies was obviously mismatched with these three features. For example, in China at that time, the available capital was quite limited and, as a consequence, the market interest rate was very high (normally, 2-3 per cent per month, see, Lin *et al.*, 1996: 30); foreign exchange was scarce and expensive because the exportable goods were scarce and primarily low-priced agricultural products; and most importantly, the economic surplus was small and scattered due to the agrarian nature of the economy. It seems to imply that a spontaneous accelerative development of the capital-intensive industry in the economy was impossible. Therefore, a set of distorted macro-policies such as low interest rate, over-valued exchange rate, low inputs prices, and low wage rates, were required for the priority development of heavy industry. The basic assumption behind the policy choice is that the low prices of input factors would enable the industrial enterprises to create large enough profits for state investment and accumulation. If the enterprises were privately owned, the state could not be sure that the private entrepreneurs would invest the policy-created profits in the intended projects. Thus, private enterprises were soon nationalized and new key enterprises were owned by the state to secure the state's control over profits and for directing them to the heavy industry investment. Meanwhile, to make the low-wages policy feasible, the state had to provide urban residents with low-priced food and other necessities, including housing and clothing.

The distorted macro policies would create total imbalances between the supply and demand of credits, foreign exchanges, raw materials, and other living necessities. Non-priority sectors would compete with the priority sectors for the low-priced resources. Hence, plans and administrative controls replaced markets as the basic mechanism for allocating the scarce credits, foreign exchange, labour, raw materials, and living necessities so that the scarce resources could be used for the planned projects.

The industrialization drive and development strategy together with the resultant policy environment and allocation system also shaped the changes in farming institutions in most socialist countries. In order to secure the cheap supplies of grain and other agricultural products for industrial input and urban low-price rationing, a compulsory procurement policy was imposed on the agricultural sector. The policy obliged peasants to sell certain quantities of their products to the state at government-set prices. In addition to providing cheap food and input for industrialization, agriculture was also the main foreign exchange earner. For instance in China in the 1950s, unprocessed agricultural products alone made up more than 40 per cent of all exports (*Comprehensive Statistics of China's Rural Economy, 1989*: 516-19). Foreign exchange was a constraint just as important as capital for the heavy-industry development. Therefore, for a long period the state capacities to import capital goods for industrialization clearly depended on the performance of agriculture.

Agricultural development requires resources and investment as much as industrial development. In order to keep agriculture away from competing for resources with industrial expansion, collectivization of agriculture was imposed. The state also viewed collectivization as an institutional guarantee for the state's low-pricing procurement programme of grain and other agricultural products (Lin, *et al.*, 1996; Sheng, 1993a, b).

It is the distorted macro-policy environment, planned allocation system, and induced institutional arrangements that made the maximum mobilization of resources for the development of heavy industry possible in a capital scarce agrarian economy. Take China as an example again, despite the fact that more than three quarters of the population gained their livelihood from agriculture, the agricultural sector received less than 10 per cent of investments in the period 1953-1985, whereas 45 per cent went to heavy industry (*Statistics on Fixed Investment in China: 1950-1985:* 97). In the first Soviet five-year-plan period (1928-33), the situation was similar. Rural population accounted for

over 70 per cent of the total, and received only 19.4 per cent of capital investment, by contrast, 42.2 per cent of total capital investment was allocated to heavy industry (see, Baykov, 1946: 122, 135, 342, 421).

The analysis above indicates that the fundamental mechanism of the primitive socialist accumulation is not characterized by lowering agriculture's terms of trade with industry alone, and may not be essentially uncovered by constructing trade balances and financial accounts between these two sectors as intensively exercised in the literature.[13] Because with these kinds of accounts it is hard to estimate the extra profit of the industrial sector stemming from depressing wage rates and from low-priced farm and sideline products as inputs. Between 1952-78, the wage rate in China was kept almost constant, increasing by only 12.7 per cent in real terms, while the real National Income per capita nearly tripled (*Statistical Yearbook of China*, 1993: 132, 33-4, 81). Even in 1992, the output value of those parts of light industry that mainly use agricultural products as raw materials still accounted for 68 per cent of the total (*Statistical Yearbook of Rural China, 1993*: 37). Directly or indirectly, this extra profit may have provided the most significant proportion of finance for industrialization. The primitive socialist accumulation mechanism in practice may be stylized as follows: The heavy industry-oriented strategy, distorted macro-policy environment, planned allocation system and induced institutional arrangements all together guarantee low wages and low prices for inputs in the non-agricultural sector. The resultant low income and consumption of both peasantry and workers plus the high profit in the non-agricultural sector contribute to high capital accumulation.

REFERENCES

Antel, J. and P. Gregory (1994) 'Agricultural surplus models and peasant behaviour: Soviet agriculture in the 1920s', *Economic Development and Cultural Change,* 42(2), 375-86.

Baland, J. M. (1993) 'The economics of price scissors: A defence of Preobrazhensky', *European Economic Review*, 37(1), 37-60.

[13] For two intensive surveys on this subject, see Sheng (1993a) and Karshenas (1995). For other surveys, see Knight (1995) and Sheng (1993b).

Baykov, A. (1946) *The Development of the Soviet Economic System*, Cambridge University Press: Cambridge.

Benassy, J. P. (1982) *The Economics of Market Disequilibrium*, Academic Press: New York.

Blomqvist, A. G. (1986) 'The economics of price scissors: Comment', *American Economic Review*, 76(5), 1188-91.

Brown, S. S. and S. Koont (1995) 'Class struggle, price scissors and socialist industrialization', *Economic System*, 19(3), 219-36.

Carr, E. H. and R.W. Davies (1969-71) *Foundations of a Planned Economy*, 2 volumes, Macmillan: London.

Carter, M. P. (1986) 'The economics of price scissors: Comment', *American Economic Review*, 76(5), 1192-4.

Cho, L.-J. and Y. H. Kim (eds) (1995) *Economic Systems in South and North Korea: The Agenda for Economic Integration*, Korea Development Institute: Seoul.

Cohen, S. F. (1973) *Bukharin and the Bolshevik Revolution: A Political Biography, 1888-1938*, Alfred Knopf: New York.

Comprehensive Statistics of China's Rural Economy, 1989 (in Chinese), Agriculture Press: Beijing.

Erlich, A. (1960) *The Soviet Industrialization Debate*, Harvard University Press: Cambridge, MA.

Forster, K. (1990) *Rebellion and Functionalism in a Chinese Province: Zhejiang, 1966-1976*, M. E. Sharpe: Armonk, NY

Ghatak, S. and K. Ingersent (1984) *Agriculture and Economic Development*, The Harvester Press: Brighton.

Gregory, P. and R. Stuart (1990) *Soviet Economic Structure and Performance*, 4th edition, Harper & Row: New York.

Han, A. (1991) 'Shortage and coupons', *Chinese Economic Studies*, 24(4), 69-75.

Ishikawa, S. (1988) 'Patterns and processes of intersectoral resource flows: Comparison of cases in Asia', in G. Ranis and T.P. Schultz (eds), *The State of Development Economics*, Basil Blackwell: Oxford.

Karshenas, M. (1995) *Industrialization and Agricultural Surplus: A Comparative Study of Economic Development in Asia*, Oxford University Press: Oxford.

Knight, J. (1995) 'Price scissors and intersectoral resource transfers: Who paid for industrialization in China', *Oxford Economic Papers*, 47, 117-35.

Kornai, J. (1992) *The Socialist System*, Oxford University Press: New York.

Kraus, W. (1982) *Economic Development and Social Change in the People's Republic of China*, Springer-Verlag: New York.

Kuromiya, H. (1988) *Stalin's Industrial Revolution: Politics and Workers, 1928-1932*, Cambridge University Press: Cambridge.

Lardy, N. R. (1983) *Agriculture in China's Modern Economic Development*, Cambridge University Press: Cambridge.

Lin, J. Y. (1993) 'Government procurement price and agricultural supply response: Theory and empirical evidence from China', typescript, Beijing University: Beijing and Australian National University: Canberra.

Lin, J. Y., F. Cai and Z. Li (1996) *The China Miracle: Development Strategy and Economic Reform*, The Chinese University Press: Hong Kong.

Nakagane, K. (1989) 'Intersectoral resource flows in China revisited: Who provided industrialization funds?', *Developing Economies*, 27(2), 146-73.

Nove, A. (1965) 'Introduction', in E. Preobrazhensky (1965).

Nove, A. (1969) *An Economic History of the USSR*, The Penguin Press: London.

Parris, K. (1993) 'Local initiative and national reform: The Wenzhou Model of development', *China Quarterly* 134, 242-63.

Perkins, D. (ed.) (1977) *Rural Small-Scale Industry in the People's Republic of China*, University of California Press: Berkeley.

Preobrazhensky, E. (1965) *The New Economics*, Oxford University Press: Oxford.

Preobrazhensky, E. (1980) *The Crisis of Soviet Industrialization: Selected Essays*, Macmillan Press: London.

Qian, Y. (1994) 'The theory of shortage in socialist economies based on the "soft budget constraint"', *American Economic Review*, 84(1), 145-56.

Riskin, C. (1978) 'China's rural industry: Self-reliant systems of independent kingdoms', *The China Quarterly*, 73, 77-98.

Sah, R. K. and J. Stiglitz (1984) 'The economics of price scissors', *American Economic Review*, 74(1), 125-38.

Sah, R. K. and J. Stiglitz (1986) 'The economics of price scissors: Reply', *American Economic Review*, 76(5), 1195-9.

Sah, R. K. and J. Stiglitz (1992) *Peasants versus City-Dwellers: Taxation and the Burden of Economic Development*, Oxford University Press: Oxford.

Schultz, T. W. (1964) *Transforming Traditional Agriculture*, Yale University: New Haven.

Sheng, Y. (1993a) *Intersectoral Resource Flows and China's Economic Development*, Macmillan Press: London.

Sheng, Y. (1993b) 'The capital sources of China's industrialization', *Developing Economies*, 31, 173-207.

Statistical Yearbook of China, 1993 (Chinese version), China Statistics Press: Beijing.

Statistical Yearbook of Rural China, 1993 (Chinese version), China Statistics Press: Beijing.

Statistics on Fixed Investment in China: 1950-1985 (1987, in Chinese), China Statistics Press: Beijing.

Stiglitz, J. E. and A. Weiss (1981) 'Credit rationing in markets with imperfect information', *American Economic Review*, 71(3), 393-401.

Swarup, R. (1954) *Communism and Peasantry*, Calcutta, Prachi Prakashan.

Voprosy istorii KPSS (a Russian periodical).

Wiemer, C. (1994) 'State policy and rural resource allocation in China as seen through a Hebei Province township', *World Development* 22(6), 935-47.