State Grain Purchases, Relative Prices, and the Soviet Grain Procurement Crisis*

PAUL R. GREGORY

University of Houston

AND

MANOUCHEHR MOKHTARI†

University of Maryland

This paper reexamines the Soviet grain procurement crises that preceded the collectivization decision. It uses regional cross-section data to study the effects of extraordinary measures and of relative state/private purchase prices on the "private grain surplus"—the amount of grain retained by peasants or sold to private markets. We find that the peasant economy was extremely sensitive to relative state/private grain prices as long as marketing decisions were relatively free. This price sensitivity rendered the system of private agriculture, private markets, and administrative state pricing incompatible. The state could not set arbitrary grain prices below market without resorting to administrative resource allocation. The model identifies the growing force of administrative measures, which, by 1927/1928, dominated the agricultural economy. The evidence in this paper clearly supports the view that the grain collection crisis was induced by state pricing policy. It therefore questions Stalin's rationales for forced collectivization. In fact, very strong administrative measures were applied before 1927/1928 to prevent the decline in official procurement from being even greater. The experience of the late 1920s underscores the difficulties inherent in combining private market decision making with the planners' desire to administratively control the flow of resources. When private markets are asked to coexist with administrative resource direction, the private sector typically is able to divert resources away from planned activities. © 1993 Academic Press, Inc.

INTRODUCTION

The experiences of the late 1920s provide lessons for contemporary Soviet reform. They show the problems inherent in any economic system in which nonequivalent state and private prices coexist. As private firms are legalized and accorded the right to buy and sell in private markets, competition for resources between the controlled state sector and the uncontrolled private sector begins. The prices offered by the state tend to be rigid for administrative or income-distribution reasons; hence the private sector typically offers higher prices. These higher prices, unless restrained by "extraordinary measures," divert resources away from their "planned tasks" into the private economy outside the control of planners. The leadership, alarmed by the loss of resources, takes action to reduce the economic freedom of the private sector.[1]

The Soviet leadership has been schooled in a "balance mentality."[2] Balances of supplies and demands are to be brought about by administrative actions, not through automatic adjustments of relative prices. The Soviet leadership's actions in the late 1920s can be interpreted as being motivated by fears of agricultural imbalances. In their view, the state was supposed to ensure adequate food supplies for urban dwellers and raw materials for industry. Agricultural balances, in their thinking, were assured as long as the state was the dominant purchaser of agricultural products. They were skeptical about the ability of private markets to supply the priority needs of the economy. Agricultural goods that disappeared into the private economy were regarded as lost to the economy.

This paper reexamines the Soviet grain procurement crises that preceded the collectivization decision. It uses regional cross-section data to study the effects of extraordinary measures and of relative state/private purchase prices on the "private grain surplus"—the amount of grain retained by peasants or sold to private markets. The private grain surplus constitutes all grain *not* sold to the states. We find that the peasant economy was extremely sensitive to relative state/private grain prices as long as marketing decisions were relatively free. This price sensitivity rendered the system of private agriculture, private markets, and administrative state pricing incompatible. The state could not set arbitrary grain prices below market without resorting to administrative resource allocation. The model identifies the growing force of administrative measures, which, by 1927/1928, dominated the agricultural economy.

The evidence in this paper clearly supports the view that the grain collection crisis was induced by state pricing policy. The Stalinist version

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[1] The contemporary example is provided by the Soviet cooperative movement. Cooperative restaurants, transportation services, and the like divert resources from the state sector (food, gasoline) by being able to sell in private markets.

[2] Gregory (1990, pp. 156–158).

of 1929—that collectivization was inevitable because of organized peasant boycotts of the market—is hence challenged by this paper. Very strong administrative measures were applied before 1927/1928 to prevent the decline in official procurement from being even greater. The experience of the late 1920s underscores the difficulties inherent in combining private market decision making with the planners' desire to administratively control the flow of resources. When private markets are asked to coexist with administrative resource direction, the private sector typically is able to divert resources away from planned activities.

THE GRAIN COLLECTION CRISIS: THE SOVIET VERSION

Stalin used the grain procurement crises of 1927/1928 and 1928/1929 to justify forced collectivization of agriculture in 1929.[3] The grain procurement crises were evidenced by reductions in the amount of grain purchased by state grain procurement agencies.[4] According to official statistics of the period, state grain purchases fell from 10.6 million tons in 1926/1927 to 10.1 million in 1927/1928 to 9.35 million tons in 1928/1929.[5] Reductions in state grain procurement forced the Soviet state to import grain for the first time in Russian economic history.[6]

The grain procurement crises provided Stalin with ammunition to move against the more prosperous peasants—the kulaks. Stalin, in a May 1928 report to the Communist Party, put forward data showing that grain output had regained prewar levels by 1926/1927 but that grain marketings were only half their prewar level.[7] Stalin blamed the decline in the marketed share of grain output on the kulaks, whose marketings had declined sharply while those of the lower and middle peasants had remained stable. Stalin used this information as proof that the kulaks were seeking to undermine Soviet power.

The party leadership's fear of an organized marketing boycott prompted the application of extraordinary measures (*chrezvychainye metody*) for procuring grain in October of 1927. Party officials were dispatched to grain-producing regions to collect grain by administrative measures which included force. Regional and local party authorities were made personally responsible for grain procurement, roadblocks were set up, grain sold on local markets was confiscated, and prison sentences were handed down for grain burning and for private grain trading.[8] Stalin personally supervised the extraordinary measures applied in the Urals and Siberia and

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[3] In this period, Soviet statistical authorities used the agricultural year concept. An agricultural year spanned the two agricultural growing seasons.

[4] The main state purchasing agency was Tsentrosoiuz.

[5] Davies (1980, p. 427).

[6] Lewin (1968, pp. 214–244).

[7] Karcz (1967, pp. 399–402).

[8] Merl (1981, pp. 313–367).

came away from this experience convinced that force was required to assure orderly deliveries of grain to the city.[9]

CRITICS OF THE SOVIET CRISIS MODEL

Western thinking on the rationale for collectivization was initially influenced by the Stalinist version of the grain collection crises. The influential writings of Maurice Dobb (first published in the 1930s) accepted the Stalinist version of NEP agriculture as crisis-ridden and of the resulting inevitability of collectivization.[10]

Starting in the 1960s, Western economists began to question the official version of events. Jrzy Karcz argued that Stalin's figures on 1926/1927 grain marketings (which appeared to show a peasant marketing boycott) were distorted.[11] In fact, Karcz disputed whether there had indeed been a decline in the grain marketing ratio between 1913 and the late 1920s. A more likely explanation, according to Karcz, was that Stalin simply doctored the data to bolster the case for forced collectivization and a movement against the kulak.

Second, Karcz argued that the procurement "crisis"—if it existed at all—was limited to *government grain* procurement, not to agricultural marketings in general. In 1926/1927 the government lowered the prices that it was prepared to pay for grain. The lower official grain prices encouraged peasants to market grain through the private channels which still existed at that time. Moreover, the low official grain prices encouraged peasants to shift production and sales to uncontrolled products, such as meat and technical crops. Karcz claims that, while peasant marketings of grain to the state may have declined, sales of agricultural products in general through all channels (state, collective, and private) remained quite healthy throughout the so-called procurement crises.

Karcz's analysis has been supported by a number of Western researchers. Stephan Merl determined that state grain procurement prices from 1926/1927 on failed to cover average costs.[12] State prices were so low that many peasants chose to burn grain rather than turning it over to the state. Davies agrees that official grain procurement prices were set too low relative to industrial crops and to meat and dairy products so that peasants had little to gain by marketing their grain.[13]

We have two versions of the grain procurement crises that preceded collectivization. The Stalinist version claims that the procurement crises reflected a political action, masterminded by the wealthier peasants, to

[9] Davies (1980), Chaps. 1 and 2).

[10] Dobb (1960). This book was first published in 1928.

[11] Karcz (1967, pp. 399–402).

[12] Merl (1981, pp. 137–139).

[13] Davies (1980, pp. 39–41).

TABLE 1
Output, State Purchases, and Prices of Grain

	Year		
	1926/1927	1927/1928	1928/1929
Grain production (million tons)	74.6	72.8	72.5
Grain collection (million tons)	11.6	11.1	9.4
Price of wheat in private market (kopeks per centner)	861	892	1120
State wheat prices (kopeks per centner)[a]	648	622	611
Ratio of state to private grain prices[b] (1913 = 100)	0.89	0.79	0.45

Source. Davies (1980), and *Statisticheski Spravochnik* (1929).

[a] Central USSR.

[b] Consuming region (Central and North Central USSR).

sabotage the Soviet regime. By arbitrarily holding back grain supplies, the wealthier peasants sought to topple the communist regime. The Western version claims that the so-called procurement crises were the result of the economic mismanagement by a fledgling Bolshevik regime that poorly understood economic incentives. By setting state grain procurement prices below costs of production, grain sales were diverted to private markets, and agricultural production was diverted to uncontrolled markets (such as technical crops and livestock).

A STATISTICAL OVERVIEW OF THE GRAIN COLLECTION CRISES

Official data on grain purchases and on state and private grain prices shed preliminary light on the grain collection crises. Table 1 shows that the decline in state grain procurements during the two grain collection crises was quite actually quite modest and was consistent with trends in grain production. The percentage of grain production finding its way into state purchases remained at about 15% from 1926 through 1929. Throughout the late 1920s, most grain was consumed in the countryside.[14] Government purchase prices as percentages of market prices declined sharply throughout the late 1920s. By the 1928/1929 agricultural year, state grain procurement prices had fallen to less than half of prices offered in private markets. For the period as a whole, state grain procurement prices declined slightly in nominal terms, while inflationary forces pushed up nominal market prices in nongovernmental markets.

The procurement figures in Table 1 do not provide direct evidence of

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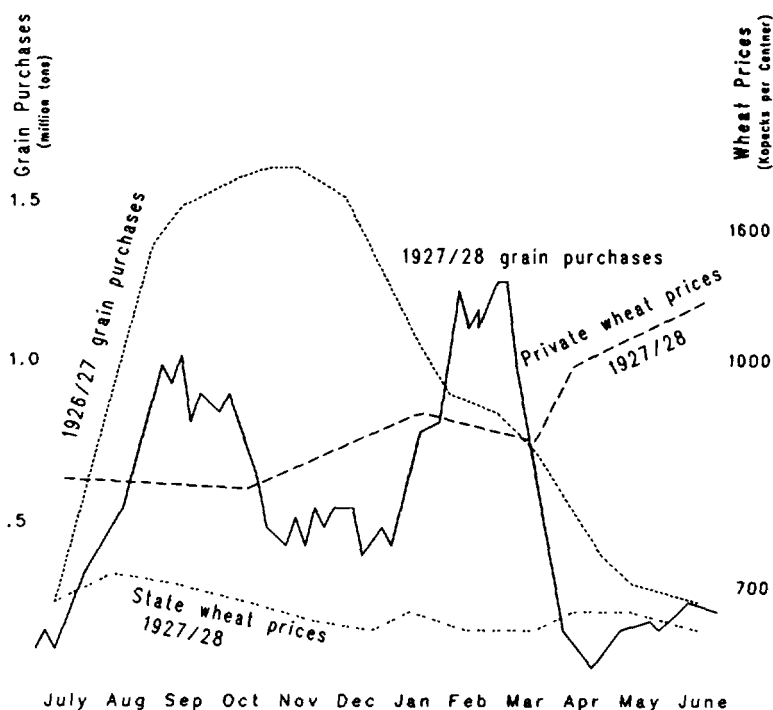[14] The phenomenon is to be expected in a country more than 75% rural.

FIGURE 1

grain procurement crises. In fact, given the growing disparity between state and private prices, it is surprising that state grain collections did not drop more sharply. In this context, one can understand the role of extraordinary measures. With official prices falling relative to market prices, administrative force was required to stabilize state grain procurement.

Figure 1 shows the impact of extraordinary measures on state grain collections by contrasting the "normal" periodicity of state grain purchases in 1926/1927 with the crisis collections of 1927/1928. The grain procurement process of 1926/1927 shows that, in normal circumstances, most grain was purchased between August and December. The state announced a reduction in nominal grain procurement prices in late August 1927, which immediately widened the gap between state and market prices. These actions prompted a sharp drop in state procurement during the very period when grain purchasing was normally at its peak.

Extraordinary measures were adopted in late October to counter the decline in state procurement. Police and party commisars were sent to the country side to organize collection. Action was taken against peasants who sold to private traders; grain "speculators" were arrested. The effects of extraordinary measures began to be felt in January 1928. The result

was a partial recoupment of procurement lost between September 1927 and January 1928.

Figure 1 implies a sensitivity of peasant grain sales to relative prices in state and private markets. A widening of the gap apparently causes sales to be diverted from state to private purchasers. Although this price sensitivity could be interpreted as an effort to undermine Soviet power, it was most likely a normal behavioral response to economic circumstances.

MODELING THE GRAIN COLLECTION CRISES

Figure 1 provides the chronology of the first "grain collection crisis." The second grain collection crisis of the 1928/1929 agricultural year is less well documented statistically. By this time, the average price paid by official purchasers had dropped to less than one-half the private price. Stronger administrative measures were required to bring in even smaller quantities of grain procurement.[15] Private economic activity was in the process of being strangled. Statistics on grain sales became even more cloudy. Time series data, therefore, do not offer sufficient degrees of freedom to model peasant marketings under the conditions that prevailed in the late 1920s. We must turn to regional evidence to obtain further answers, but first we supply some thoughts on modeling peasant behavior.

If we define the "private surplus" of gain (S) as the difference between grain production (Q) and grain sales to state organizations (G), we are left with a residual that consists of the sum of private grain sales (P) and grain consumed or retained by peasant grain producers (R):

$$S = Q - G \tag{1}$$

$$= P + R. \tag{2}$$

It should be emphasized that S, or the private surplus, is an artificial construct. In normal circumstances, it would make little difference whether grain is being sold to a private or state purchasing organization. In typical studies of peasant behavior, peasant retained consumption (R) or marketings ($P + G$) are the subjects of analysis. The Soviet regime, for whatever reasons, used official grain purchases as a success criterion, rather than grain marketings to both public and private buyers. We use the notion of private surplus as the dependent variable simply because of its importance in official Soviet thinking.

In the absence of administrative grain collections, the relationship between the private surplus (S), the state procurement price of grain (p_s), and the market price of grain (p_m) would be as follows: A reduction in the state procurement price relative to the market price (p_s/p_m) diverts

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[15] The most detailed account of the 1928/1929 crisis is provided by Davies (1980), Chap. 2).

grain sales from the state (G) to the private market (P), thereby raising S. Peasants divert sales to the private market until transactions costs are equal to the price differential at the margin.[16] An increase in the market price (p_m), holding p_s/p_m constant, should increase the quantity of grain offered to both private and state purchasers. It also makes grain expensive relative to other goods and may reduce R through substitution effects. The sign of p_m, therefore, is ambiguous.[17]

Modeling the grain procurement crisis is complicated by one simple fact evident in Fig. 1: Observed marketing behavior during the so-called procurement crises is the consequence of both market behavior and administrative actions. In the absence of administrative measures, peasant marketing reactions to prevailing state and private prices could be measured empirically. However, the state's use of coercive measures—in response to reduced procurement—to force grain deliveries muddies the waters considerably. If administrative measures fail to deliver results, the functional relationship between relative prices and the private surplus could be determined from an empirical data set. The more successful the administrative intervention, however, the more difficult to determine peasant market behavior from observable data.

In the absence of state intervention in grain marketings, the "notional" private surplus would be modeled as

$$S = f(p_s/p_m, p_m, X),\qquad(3)$$

where X captures factors other than prices that affect the private surplus.

S, however, is not directly observable. It denotes the notional surplus that the private economy wishes to hold given the system of relative prices established by the state and by private markets. What is actually observed is

$$S^* = S + E,\qquad(4)$$

where

S^* denotes the observed private surplus,
S denotes the notional private surplus in the absence of extraordinary measures; and
E denotes grain gathered as a consequence of state intervention.

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[16] Transactions costs include transportation costs, fines and penalties imposed for selling to private traders, the loss of credits, and so on.

[17] As noted above, the dependent variable—the private surplus—is an artificial construct. This fact is seen in the modeling of the S, p_m relationship. One can make theoretically sound predictions about the effect of p_m on R or on $P + G$, but not about its effect on S. The effect on S depends on how peasants distribute their sales to state or to private buyers. In normal economic models, this would be an uninteresting question because both would pay the same price.

Hence, the model to be estimated is

$$S^* = S^*(p_s/p_m, p_m, X) + E. \tag{5}$$

E is an exogenous administrative variable determined by political decision makers, not by market forces.

DATA AND ESTIMATION

We do not have enough time series observations to estimate Eq. (5). We can, however, apply cross-sectional data (three cross sections from the agricultural years 1925/1926, 1926/1927, and 1927/1928 for 13 regions of the USSR).[18] The cross-section data used in this study were gathered from official statistical publications of the period.[19]

There has been no independent evaluation of the agricultural output and price statistics of this period. However, we have no reason to suspect that they were distorted for political reasons. Most of the figures used in this study were gathered by *N. Kondratiev's Konjuncture Institute*, an organization noted for its professionalism.

The dependent variable S^* is the difference between region i's production of grain and government purchases of grain from region i in time t ($t = $ 1925/1926, 1926/1927, 1927/1928). The market price of grain (p_m) is the unweighted average market (*bazarny*) price of wheat and rye in the ith region in year t. The ratio of the state procurement price to the market price (p_s/p_m) is for wheat.[20]

The three cross-section years include the grain collection crisis of 1927/1928 as well as two pre-grain collection crisis years—1925/1926 and 1926/1927. Regional data for the second grain collection crisis (1928/1929) are too incomplete to generate a fourth cross section. The period 1925/1926 to 1927/1928 was characterized by a growing gap between state procurement and market wheat prices. The unweighted average ratio of state to market wheat prices for the 13 regions was 0.76 in 1925/1926, 0.68 in 1926/1927, and 0.60 in 1927/1928. Although extraordinary measures were not officially used on a wholesale basis prior to 1927/1928, there was state pressure on peasants to sell grain to the state prior to that date. The substantial price differentials that were present throughout

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[18] The regions are Ukraine, Belorussia, consumer region, black-earth region, middle Volga, lower Volga, Crimea, northern Kazakhstan, Kazakstan-Kirgizia, Urals, Siberia, Far North, and Mongolia.

[19] *Statisticheski Spravochnik* (1928); T.S. U. (1926).

[20] These price ratios are available only for 6 of the 13 regions. Rather than using average values for the available regions, we constructed an instrumental variable estimation where rural population and the prices of meat, wheat, and barley were utilized as instruments. This allows consistent coefficient estimates of the price ratio.

the period would have required administrative inducements to market to state procurement agencies.[21]

We must add regional dummies (denoted by R_i) and time dummies (denoted by T_t) to the price variables to complete the specification of the model. The 13 regional dummies hold constant regional differences in size, yield, density, climate, and other region-specific factors that affect the private surplus. They constitute the X variable in Eq. (5). Time dummies are included to capture the increasing use of administrative measures and the lesser role of market forces in each successive agricultural year. The literature provides detailed descriptions of the extraordinary measures applied in 1927/1928 and 1928/1929. It pays less attention to the less severe restrictions on private sales in 1926/1927. In effect, the time dummies capture the effect of E on the observed private surplus.

RESULTS

Table 2 provides an OLS estimate of Eq. (5). The S^*, p_s/p_m, and p_m variables are in natural logs. The price coefficients are therefore elasticities. We assume that the effect of market prices on S^* is uniform throughout the sample period.[22] However, the effect of the ratio of state to market prices is allowed to vary in each successive cross section.

The regression results conform closely to expectations. The market price variable (p_m) shows that a *ceteris paribus* increase in the market price of grain tended to raise the private surplus. For every percentage point increase in p_m, the peasant surplus increased by 3.2 percentage points. This result shows that the effect of higher prices on general grain marketings outweighs any substitution effects that cause peasant households to consume less grain.

For the 1925/1926 cross section, a reduction in the state price relative to the market price raises the private surplus (diverting sales from the state into private markets as expected). In fact, the 1925/1926 cross section shows the extreme sensitivity of the direction of peasant marketings to relative prices in state and private markets. A 1% change in the p_s/p_m induces a 12% change in the private surplus in the opposite direction. In the second cross section (1926/1927), the private surplus is less sensitive to changes in relative prices: a 1% change in the relative price induced a change in the opposite direction. By the 1927/1928 agricultural year (the first grain collection crisis), relative prices no longer move the private surplus in the expected direction. Administrative measures so dominated economic behavior by 1927/1928 that a drop in the relative state price was accompanied by a reduction in the private surplus.

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[21] Merl (1981, Chaps. 2, 4, and 5).

[22] Testing this restriction by a Chow test (i.e., an $F_{(2,18),0.05}$ test) yields a 0.9 value, hence supporting the uniform response of S^* to the effect of market prices.

TABLE 2
Soviet Peasants' Surplus Model, Dependent: ln S^*_{it}

Variable	Parameter estimates	Variable	Parameter estimates
Price variables		Cross-section dummies	
ln P_{mit}	0.74	R_1	−0.74
	(5.51)		(6.44)
ln $(P_s/P_m)_{i1925/1926}$	−11.78	R_2	1.92
	(85.22)		(10.41)
ln $P_s/P_m)_{i1926/1927}$	−3.74	R_3	1.85
	(25.12)		(45.01)
ln $(P_s/P_m)_{i1927/1928}$	0.69	R_4	−0.32
	(4.44)		(2.12)
Time dummies		R_5	−0.58
			(3.66)
$T_{1925/1926}$	4.17	R_6	−0.66
	(56.04)		(5.77)
$T_{1926/1927}$	−0.59	R_7	−1.53
	(7.61)		(9.29)
$T_{1927/1928}$	−3.00	R_8	−1.16
	(4.00)		(9.65)
		R_9	−0.78
			(3.75)
		R_{10}	−0.19
			(4.32)
		R_{11}	−0.45
			(11.63)
		R_{12}	−0.82
			(4.49)

Note. Numbers in parentheses are White's (1980) heteroskedasticity-consistent t statistics.

The time intercept dummies also show the growing role of administrative measures. The private surplus/market price function shifts down in each successive cross section. As administrative measures are applied with greater severity in each successive year, the private surplus falls for a given market price level.

Table 2 shows that it no longer makes sense to use models of economic behavior after 1927/1928. By this time, administrative measures outweigh economic behavior. Agricultural resources are being allocated by plan and not by market.

CONCLUSIONS

Our findings support the revisionist Western view of the Soviet grain collection crises of the late 1920s. They show that the crisis of state grain procurement was induced by the growing gap between market prices and state prices. If the agricultural year 1925/1926 is taken to represent normal behavior, the peasant economy reacted to every percentage point reduc-

tion in the relative state/private grain price by reducing its marketings to the state by 12 percentage points. When the state decided in late 1927 to lower its nominal grain procurement price, it is no wonder that sales to state agencies dropped sharply. In fact, our results show that administrative measures were raising state grain procurement already in the 1926/1927 agricultural year (as judged by the substantial decline in the relative price coefficient).

By 1927/1928, administrative measures dominated private economic decision making. The model fails to reveal normal responses to relative price incentives. By the 1928/1929 agricultural year, official grain prices were less than one-half of private prices, and extraordinary measures were required to extract grain from an unwilling peasantry.

The experiences of the late 1920s provide lessons for contemporary Soviet reform. They show the problems inherent in any economic system in which nonequivalent state and private prices coexist. As private firms are legalized and accorded to right to buy and sell in private markets, competition for resources between the controlled state sector and the uncontrolled private sector begins. The prices offered by the state tend to be rigid for administrative or income-distribution reasons; hence the private sector typically offers higher prices. These higher prices, unless restrained by extraordinary measures, divert resources away from their planned tasks into the private economy outside the control of planners. The leadership, alarmed by the loss of resources, takes action to reduce the economic freedom of the private sector.[23]

The Soviet leadership has been schooled in a balance mentality.[24] Balances of supplies and demands are to be brought about by administrative actions, not through automatic adjustments of relative prices. The Soviet leadership's actions in the late 1920s can be interpreted as being motivated by fears of agricultural imbalances. In their view, the state was supposed to ensure adequate food supplies for urban dwellers and raw materials for industry. Agricultural balances, in their thinking, were assured as long as the state was the dominant purchaser of agricultural products. They were skeptical about the ability of private markets to supply the priority needs of the economy. Agricultural goods that disappeared into the private economy were regarded as lost to the economy.

Contemporary Soviet accounts of the late 1920s still propound the notion that the last Soviet experience with market agriculture (the NEP period dating from 1921 to 1928) was characterized by a series of crises

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[23] The contemporary example is provided by the Soviet cooperative movement. Cooperative restaurants, transportation services, and the like divert resources from the state sector (food, gasoline) by being able to sell in private markets.

[24] Gregory (1990, pp. 156–158).

that made collectivization inevitable.[25] Although the pace of collectivization is criticized, Soviet authorities appear to accept the inevitability of collectivization because of the recurring procurement crises. In fact, the major criticism of collectivization is that Stalin forced collectivization to consolidate political power. A more even pace of collectivization would have yielded more satisfactory results. Soviet ideology, to the present day, warns of the potential chaos of markets, particularly in agriculture, and doubts that markets can deliver reliable supplies of agricultural products to the city.

This paper casts further doubt on the inevitability of collectivization. It shows that the crisis of grain collections was induced by state pricing policy. The crisis was a crisis of *state* grain purchases, not of total grain purchases. We show that Soviet peasants were merely responding to economic incentives that directed the sales away from the government to private purchases.

REFERENCES

Davies, R. W. (1980), *The Socialist Offensive: The Collectivization of Soviet Agriculture, 1929–1930*. Cambridge, MA: Harvard Univ. Press.

Dobb, M. (1960), *Soviet Economic Development Since 1917*. London: Routledge & Kegan Paul. 5th ed.

Gregory, P. R. (1990), *Reforming the Soviet Economic Bureaucracy*. London: Cambridge Univ. Press. Pp. 156–158.

Karcz, J. F. (1967), "Thoughts on the Grain Problem." *Soviet Studies* 18(4), 399–402.

Lewin, M. (1968), *Russian Peasants and Soviet Power*. London: Allen & Unwin. Pp. 214–244.

Merl, S. (1981), *Der Agramarkt und die Neue Oekonomische Politik*. Munich: Oldenbourg Verlag, Pp. 313–367.

Smirnov, G. L. (1988), "Vremiia trudnykh voprosov." *Pravada*, **Sept. 30; Oct. 3.**

Statisticheski Spravochnik (1928), Sect. III, Tables 5 and 24; Sect. VI, Tables 68 and 71.

Statisticheski Spravochnik (1929), Sect. VI, Table 68.

T. S. U. (1926), *Indeks roznichnykh tsen za vremiia* 1. Okt. 1925 po 1. *Apreliia 1926*. Moscow. Tables 2 and 3.

White, H. (1980), "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica* **48**, 817–838.

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[25] Smirnov (1988). This is the last "official" statement emanating from high party circles that we could find.