

The economics of price scissors: Reply

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The Economics of Price Scissors: Reply

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The question of how the funds required for the capital accumulation associated with industrialization are to be raised has a long history. Since the industrial sector is relatively small in the early stages of industrialization, there has been a presumption that funds must primarily come from the agricultural sector. The issue has been how best to extract these funds, what are the effects of such a resource transfer, what is the nature of the limits on the amounts to be extracted, and whether, in this process, it is desirable or necessary to squeeze simultaneously the urban proletariat.

In our 1984 paper, we presented a simple model of a closed socialist economy in which the instruments at the disposal of the government are the *terms of trade* (the relative price of the agricultural good in terms of the industrial good) and the industrial wage, which we believe sheds some light on these questions, particularly in the context of the Soviet industrialization debate. This model is part of a larger research program, in which we have examined similar questions in the context of economies under a variety of trade regimes, with a variety of institutional structures, with and without heterogeneity among individuals within a sector, with and without the disaggregation of commodities produced in each of the two sectors, with and without migration, where the government has at its disposal other policy instruments, where wages in the urban sector are determined in a variety of ways, and in which wages and prices may affect the productivity of workers.¹

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¹See our studies (1983, 1984, 1985a,b,c, 1986). An empirical framework for analyzing urban-rural pricing issues in a multiperson, multicommodity context was developed in Sah (1982); related models have been employed by Avishay Braverman et al. (1984), and others.

The reason for examining a variety of economic structures is obvious: as the past experience of economic development has shown, there is an enormous diversity in the salient features of developing countries and in the set of policy instruments that a government can or cannot employ. Among our objectives have been (i) to examine a range of models emphasizing different sets of structural features, in part to ascertain which features are central to answering the questions at hand, and (ii) to develop general reduced-form relationships to describe specific parts of the economy (for instance, to represent the migration mechanism and the urban wage determination), and to show that the central results depend only on the properties of these reduced-form relationships.

The issues raised by Ake Blomqvist and Michael Carter in their comments (1986) are primarily interpretative. They contend that our simple model of a socialist economy is not an appropriate vehicle for examining certain propositions which the Soviet economist Evgeny Preobrazhensky advanced during the Soviet debate. Instead, Carter argues for an open economy specification, and for a particular type of wage-productivity effect. Blomqvist, on the other hand, favors a specification in which the government can set different prices in two sectors (we have referred to the problem of analyzing differential prices, or taxes, in the two sectors as that of *urban-rural pricing*; in contrast to the *price scissors* problem, where both sectors face the same prices). As the commentators are aware, we have analyzed these (and more general specifications) in our 1985a and 1983 papers, respectively. Since it is not possible to present a full analysis within this short reply, we briefly describe some of the qualitative features of price scissors within a simple framework, so that one can see certain implications of alternative assumptions. We then turn to the more doctrinal and

interpretative issues: What did Preobrazhensky *really* mean? Which model provides a better description of the Soviet Union at the time of the debate? We remain convinced that our original interpretation was correct.

I. Price Scissors²

A. *An Economy Closed at the Margin*

In an economy facing binding constraints in external trade (and which cannot borrow against the future), a lowering of the price of the rural good—which reduces the supply of rural surplus available to the urban sector—must be accompanied by a lowering of the urban wage to reduce the demand for the rural good, and hence to balance the supply and demand of the rural good. Thus: *The terms of trade cannot be altered if the government cannot (or does not) alter the urban wage.*

If the urban wage is altered then, though urban workers benefit from the lowered price of the rural good, the required reduction in their wage always turns out to be sufficiently large that *the urban workers end up being hurt from a lowering of the terms of trade.* This result does not depend on the direction (or volume) of external trade, or on the nature of the wage-productivity effects (i.e., on the overall effect of a decrease in the price of the rural good as well as in the urban wage on the *net* output of urban workers). If wage-productivity effects are not significant, then a lower urban wage increases the investable surplus; therefore: *A lowering of the terms of trade increases the investable surplus.* Wage-productivity effects are ambiguous in general.³ One of the special cases under which the above result continues to hold is where the net output of a worker

depends on his level of utility;⁴ provided a dollar increase in a worker's income yields less than a dollar's increase in his net output (which is what we would typically expect).

B. *Open Economy*

Since in an open economy the demand and supply of the rural good is balanced by adjusting the externally traded quantities, *the terms of trade and the urban wage can be set independently of one another in an open economy.* A lowering of the terms of trade, keeping the urban wage fixed (in terms of the numeraire, industrial good) increases the investable surplus if currently the rural good is not being taxed too heavily (i.e., the domestic price of the rural good is not too low compared to its international price), or if it is being subsidized.⁵ This is in part because a typical developing economy is a net exporter of the rural good, and a lower terms of trade implies a higher tax revenue on exports. On the other hand, if the current tax on the rural good is large, then a further reduction in the terms of trade reduces the investable surplus because the revenue loss from the induced reduction in the rural surplus is sufficiently large to offset other potential gains.

The assumption that the urban wage would remain unchanged (in terms of any one of the two goods) is not always compelling. A useful benchmark case is that where it adjusts to keep the welfare of the urban worker unchanged. Then, there exists a critical level of the terms of trade, p^* , which is below the international price, such that: *The investable surplus increases (decreases) with a lowering of the terms of trade if the current terms of trade is above (below) p^* .* Further, since a

²Proofs of the results described in this section are contained in our 1985a paper.

³See our 1985a,c papers for a general (reduced-form) representation of wage productivity effects; special cases of this representation are the hypotheses based on labor efficiency, labor quality, and labor turnover. Carter's interpretation that our reduced-form expression represents a nutrition-based link between wage and productivity is, thus, unnecessarily restrictive.

⁴Carter's specification, in which the net output depends on a particular "real wage" can be seen as an approximation of this case. His treatment of this case (see his equation (1)) is not fully satisfactory, however, because the budget shares (used in defining the real wage) remain unaffected even though wage and prices are changing. Moreover, his assertion that the result $dI/dp < 0$ is a rather special case is ungrounded.

⁵Carter claims (based on his equation (2)), but does not show, that a squeeze with price scissors must lower accumulation. This claim is incorrect.

lower terms of trade hurts rural workers but, by assumption, leaves the welfare of urban workers unchanged, it follows that: *Any price below p^* is Pareto inefficient.*⁶

II. Preobrazhensky's Propositions

Here, we ask, what is the appropriate model to serve as a basis for examining two propositions of Preobrazhensky: (i) the state can increase the accumulation by turning the terms of trade against peasants, and (ii) the increased accumulation is possible without hurting the industrial workers.

If indeed there is a single model which captures Preobrazhensky's construct, then it is obvious that both Blomqvist and Carter cannot be right because they argue in favor of two quite different models; at least one of them must be wrong. We argue below that both miss the central issue involved. On the other hand, the divergence of views between Blomqvist and Carter, as well as their disagreement with us, can be viewed as a consequence of the ambiguities in Preobrazhensky's writings; after all, Preobrazhensky was not only writing a verbal economics tract, but was also fighting a life and death battle (as subsequent events were to prove) of ideology and polemics.

There is no doubt, however, that the key policy instrument in Preobrazhensky's scheme of primitive socialist accumulation was the terms of trade between the agricultural and the industrial goods; although he did mention a multitude of other instruments such as direct taxation, railway freights, credit policy, printing money, etc. The reason (which holds for many of today's less developed countries as well) is simply that an attempt to alter the terms of trade merely requires the government to change the nominal price of the industrial good; this attempt is more feasible than implementing

virtually any other policy instrument. Basing his conclusions on quotations from Preobrazhensky's writings, Alexander Erlich states this point succinctly:

"The concentration of the whole of the big industries...in the hands of the workers' state increases to an extraordinary extent...the possibility of carrying out...a price policy on the basis of monopoly"...Preobrazhensky did not, to be sure, renounce direct taxation as an instrument of the redistribution of income in favor of socialist industry...Taxation through price, however, was in his view the most effective single device—both because of the "extreme convenience of collection which did not require a penny for a special fiscal apparatus" and for reasons of political expediency. "The way of direct taxation is the most dangerous way, leading to a break with the peasants." [1960, pp. 49–50]

In contrast, a model with urban-rural pricing, which is what Blomqvist argues for, entails not only large administrative costs but it also requires the administrative ability (in which the USSR was clearly lacking during 1917–24) to monitor the "tax border" between the two sectors. Therefore, it should not be surprising that the participants in the Soviet debate as well as those who have subsequently analyzed this debate have viewed the terms of trade (and not urban-rural pricing) as the central instrument in Preobrazhensky's scheme. We also note that Blomqvist's use of an urban-rural pricing model to view some of Michael Lipton's analysis of the Soviet debate might be misleading because a central instrument in Lipton's analysis (1976, pp. 128–29) is, once again, the terms of trade. In another context, Lipton states "The 'scissors' discussion always was, and is, mostly about changing the price of the rural good *relative to the urban good*—not about changing the relative price paid by the two sectors for the same good" (personal communication, 1982, emphasis in the original).

Next consider Carter's comment concerning external trade. It is obvious that what is

⁶Analogous conclusions hold in models with different urban-rural prices. For instance, in the model on which Blomqvist's comments are based, one obtains $dI/dp \geq 0$ if $(\hat{p} - p)/p \geq 1/\epsilon_{Qp}$. This, in combination with $d\hat{p}/dp < 0$, implies that: *Lowering the rural price below some level is Pareto inefficient.* See our paper (1983) for a discussion of this and other related results.

important is not whether the country trades or not, but whether the economy can or cannot freely increase its trade *at the margin*. A look at the trade figures of the USSR during the relevant period (i.e., between the October Revolution and the beginning of the industrialization debate in 1924) exhibits an extreme decline compared to pre-World War I period. The trade was negligible until 1920; even in 1923, the import volume was less than 11 percent, and the export volume was less than 15 percent, of the respective 1913 levels (see Paul Gregory and Robert Stuart, 1981, p. 267). Though these (or any other trade figures) could, in principle, be consistent with a model with *or* without constraints on external trade, historical facts suggest the former model. Not only was the USSR facing blockades by the allies during much of this period (augmenting the Soviets' fear of "capitalist encirclement") but, even after the Treaty of Rapallo (April 1922), it was facing significant isolation in trade and current business credit (see Maurice Dobb, 1966, ch. 7).

The importance of these constraints is explicit in Preobrazhensky's views; though he emphasized the *potential* usefulness of external trade to the Soviet state, he clearly noted that "...all kinds of external complications that might not only sever our economic ties with the capitalist countries but will also most effectively retard even that part of socialist construction that is based on the domestic resources of the Republic" (1921, p. 14). Obviously, a fuller understanding of the implications of trade embargoes and interruptions (and of credit constraints) requires an explicit modeling of these phenomena. In stylized aggregate models such as those being discussed here, however, the facts concerning the USSR during 1917-24 (and the understanding that the participants in Soviet debate had of these facts) suggest that a model with constraints on external trade is more plausible than the one without any constraints.

III. Concluding Remarks

A virtue of developing a general theoretical framework is that it enables one to iso-

late the features of the economy which are critical for the issues at hand. Can a manipulation of the terms of trade squeeze the agricultural sector to provide funds for industrial development? If the economy faces constraints on external trade and urban wages cannot adjust, the answer is no. If urban wages do adjust, the answer is yes, but only if the urban workers are made worse off. Further, since wages must adjust more the greater is the sensitivity of agricultural surplus to the terms of trade; the greater this sensitivity, the greater is the increase in the investible surplus from turning the terms of trade against peasants. If the economy does not face trade constraints, or if prices in the two sectors can be set independently, then there is no necessary link between urban wages and the rural prices. Yet, in these cases, we show that it is Pareto inefficient to set the relative price of the agricultural good below some level. That is, a price squeeze of peasants beyond some point is counterproductive, regardless of whether the state cares about the welfare of peasants or not.

REFERENCES

- Blomqvist, Ake**, "The Economics of Price Scissors: Comment," *American Economic Review*, December 1986, 76, 1188-91.
- Braverman, Avishay, Ahn, Choong Yong and Hammer, Jeffrey S.**, "Government Deficit Reduction and Alternative Agricultural Pricing Policies in Korea," mimeo., The World Bank, Washington, 1984.
- Carter, Michael**, "The Economics of Price Scissors: Comment," *American Economic Review*, December 1986, 76, 1192-94.
- Dobb, Maurice**, *Soviet Economic Development since 1917*, London: Routledge and Kegan Paul, 1966.
- Erlich, Alexander**, *The Soviet Industrialization Debate*, Cambridge: Harvard University Press, 1960.
- Gregory, Paul R. and Robert C. Stuart**, *Soviet Economic Structure and Performance*, New York: Harper and Row, 1981.
- Lipton, Michael**, *Why Poor People Stay Poor: Urban Bias in World Development*, Cam-

- bridge: Harvard University Press, 1976.
- Preobrazhensky, Evgeny**, (1926) *The New Economics*, Oxford: Clarendon Press, 1965.
- _____, (1921) "The Outlook for the New Economic Policy," in Donald Fitzer, ed., *The Crisis of Soviet Industrialization*, White Plains: M. E. Sharpe, 1979.
- Sah, Raaj Kumar**, "A Welfare-based Determination of Urban-Rural Prices," paper presented at the World Bank Conference on Public Economics, Washington, D.C., June 1982.
- _____ and **Stiglitz, Joseph E.**, "The Town, the Country, and the Rest of World: Economics of Public Marketing Boards in Open Developing Economies," mimeo., Department of Economics, Princeton University, 1983.
- _____ and _____, "The Economics of Price Scissors," *American Economic Review*, March 1984, 74, 125–38.
- _____ and _____, (1985a) "Price Scissors and the Structure of the Economy," *Quarterly Journal of Economics*, forthcoming.
- _____ and _____, (1985b) "The Taxation and Pricing of Agricultural and Industrial Goods in Developing Economics," in David M. G. Newbery and Nicholas Stern, eds., *The Theory of Taxation for Developing Countries*, Oxford: Oxford University Press, forthcoming 1986.
- _____ and _____, (1985c) "The Social Cost of Labor and Project Evaluation: A General Approach," *Journal of Public Economics*, December 1985, 28, 135–63.
- _____ and _____, *Peasants versus City-Dwellers: Taxation, Pricing and the Burden of Economic Development*, Oxford: Oxford University Press, forthcoming 1986.