

Seminar Paper No. 281

CENTRAL PLANNING AND THE "SECOND ECONOMY"  
IN SOVIET-TYPE SYSTEMS

by

Stanislaw Wellisz

and

Ronald Findlay  
Columbia University

Findlay's work on this paper was completed at the Institute for International Economic Studies, Stockholm. He is grateful to the Institute for its hospitality.

Seminar Papers are preliminary material circulated to stimulate discussion and critical comment.

June, 1984

Institute for International Economic Studies  
S-106 91 Stockholm  
Sweden

## "Central Planning and the 'Second Economy' in Soviet-type Systems"

Our profession has developed two polar idealizations of the economic system of socialism, in the sense of collective ownership of the "means of production". One is that of hierarchical planning, with information flowing up from factories and farms to a central planning agency, where it is fed into computers, processed for consistency and perhaps even optimality relative to some objective function of the planners, and then becomes the basis for directives that are binding on all managers and ultimately on all workers in the system. An authoritative exposition of the pure theory of this approach to socialist economies is the work of L.V. Kantorovich (1965), Member of the Soviet Academy and Nobel Laureate.

At the other extreme is the vision of decentralized market socialism, associated with the names of Lange (1936) and Lerner (1934), in which the role of the central planning agency is merely that of a Walrasian auctioneer, guiding the economy to a Pareto-efficient equilibrium with consumer sovereignty. Sophisticated hybrids of the two polar cases, such as "two-level planning", have been developed by Kornai (1967), Malinvaud (1967) and others.

Reality in the Soviet Union and the East European satellites deviates considerably from either of these theoretical constructs. The actual operational mechanisms and outcomes of the Soviet system have been intensively studied by Western economists for the last forty years following the pioneering work of Alexander Gerschenkron and Abram Bergson. Various experiments in Yugoslavia, Hungary and Czechoslovakia have been identified with "market socialism", though none appear ever to have approached close to the pure Lange-Lerner scheme.

A phenomenon that is drawing increasing attention from scholars of Soviet-type economies is what has come to be known as the "Second Economy" or "Parallel Market". In the major article on the subject, Grossman (1977) defines the "Second Economy" as all production or trade for private gain, whether legal or illegal<sup>1</sup>. He gives a fascinating account of the phenomenon, with many examples from agriculture, industry, transport, construction and retail distribution, concluding that its quantitative and qualitative significance for the Soviet system is large and growing. His account depicts the allocation of resources in these economies as being the outcome of an interaction between official planning and the "invisible hand" guiding the activities of agents operating on their own account, frequently using their official roles as "covers", with graft and corruption on an extensive scale keeping the whole system going.

Our intention in this paper is to present the simplest possible general equilibrium model of this "parallel" interaction of an official plan binding on a "First Economy" and "Second Economy" activities of the type described, with the allocation of resources between the two economies determined endogenously. Needless to say our model will be highly stylized, abstracting from all aspects except those that we deem essential to bringing out the logic of the situation depicted in rich detail by Grossman and others. Readers may note suggestive analogies with the work of Becker (1968) on crime and punishment, the analysis of smuggling by Bhagwati and Hansen (1973), and the political economy of rent-seeking by Kreuger (1974).

## I

The economy is represented by the now familiar "specific factors" model, expounded by Jones (1971). There are two goods, A and B, and three factors, each of which is in fixed supply. One of the factors is labor, which is used in both sectors, while each of the other inputs is entirely specific to a particular sector. The production functions for the two goods are

$$Q_i = f_i(L_i) \quad i = A, B \quad (1)$$

$$f'_i > 0, f''_i < 0$$

and the constraint on labor is given by

$$L_A + L_B = \bar{L} \quad (2)$$

In (1) we have suppressed the fixed inputs of the specific factors but they do of course make a productive contribution and will have scarcity rents, equal to their marginal productivities, associated with them. It is convenient to think of these inputs as specialized capital equipment or land. Equations (1) and (2) define a social production-possibilities frontier (PPF) between A and B that is concave to the origin, depicted as TT in Figure 1.

The demand side of the model has now to be introduced. To do this we need to specify the institutional arrangements in the economy. The "means of production" in the model are the specific inputs to each sector. We assume that these are owned exclusively by the state. There is a free labor market with perfect mobility between both sectors.

Consider first a Lange-Lerner setup in which a central planning

agency merely plays the role of Walrasian auctioneer and managers in each sector are told to make marginal cost equal to prices that they take as given. Under these circumstances supply curves for both goods could be traced out by equating the marginal rate of transformation (slope of the PPF) to the relative price of the two goods, varied parametrically. At each relative product price-ratio the demand for factors will be determined in each sector, and equality with the fixed supply will determine the real return to the three factors, equal in each case to the marginal productivity. This determines the wage income, equal to total personal income, of all individuals and the income occurring to the state, which is the rents to the specific factors.

We assume that the demand pattern is for total income (private plus state) to be spent on the two goods in a manner determined by a "homothetic" utility function convex to the origin, i.e. demand varies inversely with the relative price of each commodity while income-elasticities are unitary. Supply and demand thus being determined for any price-ratio the unique (under the conditions assumed) price-ratio that clears the goods markets can be found. It is indicated in Figure 1 by the common tangent to the PPF and the homothetic indifference map of the society as a whole at the point  $L^*$ , which we will refer to as the Lange-Lerner or L-equilibrium.

How would the Lange-Lerner equilibrium differ from the competitive equilibrium of the same economy with private ownership of the "means of production"? The only difference as far as resource allocation is concerned would be associated with the way in which the state disposes of property income as compared with private owners, who could be the individuals in the socialist economy to

whom the state distributes the rents on the specific factors as a "social dividend". If we identify Good A with "heavy industry" or "future" goods and Good B with "light industry" or "present" goods, then it is reasonable to expect that the Lange-Lerner equilibrium would have an output-mix more favourable to Good A than would be the case under private ownership. This follows from the well-known obsession of Soviet-type planners with capital accumulation, both for reasons of growth and of defense<sup>2</sup>.

Soviet-type economies, however idealized, do not conform to the Lange-Lerner model, even one allowing for a strong bias towards accumulation. The main departure would appear to lie in the persistent discrepancy between demand and supply induced by plans which create an excess demand for "light industry" or "present" goods, which we identify with Good B. The state, in other words, is not satisfied with accumulation out of its own income from the rents of "means of production" but instead engages in further "forced saving" by deliberately providing less consumer goods than would be produced in an L-equilibrium.

A more appropriate initial equilibrium concept for a Soviet-type economy is what we call a Kantorovich or K-equilibrium. The central planning agency chooses a proportion  $\underline{k}^*$  in which the two goods are to be produced i.e.

$$\frac{Q_A}{Q_B} = k^* \quad (3)$$

which defines a homothetic indifference map with L-shaped indifference curves along a "Kantorovich ray" with a slope equal to  $\underline{k}^*$ . Tangency of the PPF with this map is at the point where it is intersected by

the Kantorovich ray, at  $K^*$  in Figure 1. The slope of the PPF at  $K^*$  defines the shadow price-ratio  $p^*$  of the two goods associated with the given plan proportions, and this price-ratio in turn determines as duals the shadow prices of all three inputs. Using these shadow prices the central planning agency can in principle guide enterprises in the two sectors to the equilibrium point  $K^*$ . Thus the K-equilibrium is characterized by "productive efficiency" in the usual sense i.e. production is on the boundary of the PPF.

In keeping with the observation that the planners desire a more future-oriented output-mix than at  $L^*$  we assume that the proportion  $k$  is such that  $K^*$  is to the left and above  $L^*$  on the PPF, i.e. the planners deliberately create a shortage of Good B in order to expand the production of the favored Good A. With consumers free to spend or save as they choose, however, it is clear that the output-mix at  $K^*$  will not clear markets at the price-ratio  $p^*$  equal to the slope of the PPF at that point. If the supplies corresponding to  $K^*$  are to be cleared the equilibrium price-ratio will have to be  $\Pi^*$ , equal to the slope of the convex indifference curve passing through that point. The relative price of Good B must rise to reflect the excess demand for that good at  $p^*$ , so  $\Pi^* > p^*$ .

Measured in terms of Good A national income at factor cost is the distance OM, evaluated at the planner's price-ratio  $p^*$ . National expenditure, however, is the distance ON, evaluated at the market-clearing price-ratio  $\Pi^*$ , which exceeds national income at factor cost by the distance MN. This gap is absorbed by the famous "turnover-tax", collected by the state. Thus the K-equilibrium, while displaying productive efficiency, deliberately violates the Paretian condition that requires marginal rates of transformation

in production to equal marginal rates of substitution in consumption. The difference is made up by the "turnover tax"  $t^*$ , which satisfies  $\Pi^* = (1 + t^*) p^*$ . The K-equilibrium is therefore characterized by

$$\text{MRS} = \Pi^* \quad (4)$$

$$\text{MRT} = p^* \quad (5)$$

$$t^* = \frac{(\Pi^* - p^*)}{p^*} \quad (6)$$

While  $L^*$  is the "first best" optimum from the standpoint of consumer's preferences  $K^*$  is presumably the "first best" optimum from the perspective of the central planners.



## II

We now introduce the activities of the "Second Economy". As we have seen the K-equilibrium at  $K^*$  is characterized by a "wedge" between  $\Pi^*$  the relative price of Good B facing consumers and  $p^*$  the relative price facing producers in the official or "First Economy", the difference being absorbed by the turnover tax  $t^*$ . If anyone in the economy can somehow obtain a unit of Good B he could sell it to consumers for  $\Pi^*$ . He would be able to make a profit even if the costs incurred in obtaining this unit were greater than  $p^*$ , since neither he nor the consumer would have to pay the turnover tax in this transaction, which would be illegal in the context of the Soviet-type economies that we are considering. The turnover tax rate  $(\Pi^*/p^* - 1)$  is precisely the rate of "protection" that this potential source of obtaining a unit of Good B outside of the "First Economy" is afforded.

Let us now be more explicit about the technology of the Second Economy. The simplest assumption to make is that a unit of Good B can be obtained at a constant cost in terms of labor in the Second Economy. In other words the production function for the Second Economy is

$$Q_B^2 = \alpha L_B^2 \quad (7)$$

where  $L_B^2$  is the amount of labor participating in the Second Economy and  $Q_B^2$  is the total amount of Good B that is produced there. The Second Economy does not produce Good A at all. The labor allocation equation for the economy as a whole is altered from (2) to

$$(L_A^1 + L_B^1) + L_B^2 = \bar{L} \quad (8)$$

i.e. participation in the Second Economy involves an equal reduction in employment in the First Economy since the total supply of labor in the economy as a whole is assumed to be fixed. We may define  $L^1 = (L_A^1 + L_B^1)$  as total employment in the First Economy and  $L^2$  as total employment in the Second Economy, which is of course identical with  $L_B^2$  since  $L_A^2$  is always zero by hypothesis. Both  $L^1$  and  $L^2$  are of course endogenous variables<sup>3</sup>.

Suppose that there is perfect labor mobility between the First and Second Economies i.e. there is no intrinsic cost or risk associated illegal activity. This is of course unrealistic, and such costs and risks will later be introduced explicitly. It is instructive, however, to take this as a clear-cut limiting case providing a sharp focus on the determinants of the size and role of the Second Economy.

We assume that the First Economy continues to operate under the Kantorovich proportions  $k^*$ , with  $Q_A$  and  $Q_B$  in (3) now replaced by  $Q_A^1$  and  $Q_B^1$ , i.e. Second Economy production of  $Q_B$  is excluded from consideration since it is completely outside the purview of the planning authorities. The First Economy now operates with a labor force of  $L^1$ , yet to be determined, subject to the Kantorovich ray  $k^*$ . Productive efficiency continues to hold in the First Economy, so that production will take place on the boundary of a shrunken PPF corresponding to  $L^1$ , at the point where it is intersected by the Kantorovich ray. Producer prices within the First Economy will be equal to the slope of the shrunken PPF at this point. To achieve productive efficiency in this sense the First Economy will of course have to equate the marginal value product of officially employed labor (at the specified producer prices) in Good A and Good B.

Perfect labor mobility in the economy as a whole, i.e. between the First and Second Economies and also between the two departments of the First Economy itself implies that

$$\frac{\partial Q_A^1}{\partial L_A^1}(p, L^1) = p \frac{\partial Q_B^1}{\partial L_B^1}(p, L^1) = \Pi\alpha = w \quad (9)$$

where  $w$  denotes the real wage in terms of Good A.

In (9) we are using the fact that the Second Economy producers sell directly to consumers at "market" prices while First Economy producers and workers have their output valued at "planning" prices  $p$ .

Total national income,  $Y$ , can be defined as the sum of  $Y_I$ , the total income of individuals, and  $Y_S$  the total income of the state, so that we have

$$Y = Y_I + Y_S \quad (10)$$

$$\text{where } Y_I = \frac{\partial Q_A^1}{\partial L_A^1} L_A^1 + p \frac{\partial Q_B^1}{\partial L_B^1} L_B^1 + \Pi\alpha L_2 \quad (11)$$

and

$$Y_S = (Q_A^1 - \frac{\partial Q_A^1}{\partial L_A^1} L_A^1) + p (Q_B^1 - \frac{\partial Q_B^1}{\partial L_B^1} L_B^1) + (\Pi-p) Q_B^1 \quad (12)$$

i.e.  $Y_I$  is the sum of the wage-bill in the First Economy and the output of the Second Economy valued at market prices while  $Y_S$  is the sum of profits in the First Economy, valued at planning prices, and the revenue from the turnover tax, which is the last term in (12). Addition of (11) and (12) yields

$$Y = Q_A^1 + \Pi Q_B^1 + \Pi Q_B^2 \quad (13)$$

which simply indicates that total national income is the value of

output in the First and Second Economies, valued in both cases at market prices.

The budget constraint for the economy as a whole can be written as

$$Y = Q_A^d + \Pi Q_B^d \quad (14)$$

where  $Q_A^d$  and  $Q_B^d$  are the total demands for Goods A and B respectively.

The demand function for Good B can be specified as

$$Q_B^d = Q_B^d (\Pi, Y) \quad (15)$$

and there will be equilibrium in the commodity markets when

$$Q_B^d (\Pi, Y) = Q_B^1 (p, L^1) + Q_B^2 (\Pi, L^2) \quad (16)$$

i.e. the market demand for Good B is equal to the sum of the supplies from the First and Second Economies.

The system that we have specified consists of fourteen unknowns which are the three output levels, the three associated labor inputs, the market demands for the two goods, national income together with its individual and state components, the two price-ratios  $p$  and  $\Pi$  and the turnover tax. To determine them we have the three production functions specified in (1) and (7), the modified Kantorovich equation (3), the three income equations (10), (11) and (12), the budget constraint (14), the demand function for Good B (15), the market clearing condition (16), the labor demand equal supply condition (8) and finally the two independent equations on equalization of the marginal productivity of labor both within the First Economy and between the First and Second that are specified in (9).

This determinate system constitutes what we define as the

"parallel" or P-equilibrium, since it depicts the simultaneous equilibrium of the First and Second Economies and therefore of the system as a whole. They constitute interdependent parts, neither of which can be solved separately from the other.

Figure 2 offers a convenient graphical illustration of the "parallel" equilibrium. Starting at the K-equilibrium point  $K^*$  on TT, the PPF when all labor is employed in the First Economy, we construct the curve  $K^*V^*$  which shows the PPF for the economy as a whole in the presence of Second Economy activities, given that the First Economy is operating according to the Kantorovich proportion  $k^*$ . The curve  $K^*V^*$  is constructed as follows. Withdraw successive units of labor from the First Economy. Allocate the remaining labor in the First Economy between A and B in the proportion  $k^*$ , the labor withdrawn producing B in the Second Economy according to production function (7). As production in the First Economy contracts along the Kantorovich ray  $OK^*$  the marginal productivity of labor in the First Economy is rising in terms of both goods, by a standard property of the "specific factors" model. Since the marginal product of labor in producing Good B in the Second Economy is a constant  $K^*V$  must be concave to the origin. Furthermore it will lie strictly within the corresponding segment of TT, reflecting the fact that Second Economy production of Good B is technologically inferior to the First Economy because of its "underground" character.

At  $K^*$  the producer price-ratio  $p^*$  is tangential to TT but the market price-ratio  $\Pi^*$  is steeper than  $p^*$  and cuts TT from above. The slope of  $K^*V$  at  $K^*$  is between  $p^*$  and  $\Pi^*$  so that we have

$$\frac{\partial Q_A^1}{\partial L_A^1} [L_A^1(p^*, \bar{L})] < \Pi^* \alpha \quad (17)$$

which means that there is an incentive for a unit of labor to leave the First Economy and participate in the Second. Labor will continue to flow into the Second Economy with the economy as a whole moving along  $K^*V^*$  and the First Economy contracting along  $OK^*$  until we reach a point of tangency between  $K^*V^*$  and a curve of the convex indifference map. At this point  $\tilde{P}$  the labor market equilibrium condition (9) and the commodity market equilibrium condition (16) both hold and so we reach the P-equilibrium at  $\tilde{P}$ . The left-hand side of (17) rises as the First Economy slides down the Kantorovich ray  $OK^*$  while  $\Pi$  falls, reducing the right-hand side, as increasing supplies of Good B and falling supplies of Good A reduce the scarcity of the former. Notice from (9) that we must have

$$\frac{\partial Q_B^1}{\partial L_B^1} > \alpha \quad (18)$$

if  $\tilde{\Pi}$ , the market price-ratio in the P-equilibrium, is to exceed the corresponding producer price-ratio  $\tilde{p}$ , to ensure a positive turnover tax rate  $\tilde{t}$ . Thus the technological inferiority of Second Economy production continues to hold in the P-equilibrium, but it is exactly offset by the "protection" afforded by the turnover tax since the ratio of the marginal productivities of labor in Good B in the two Economies must be equal to the ratio of  $\tilde{\Pi}$  to  $\tilde{p}$ .

First Economy equilibrium is at H on  $OK^*$ , with output of Good A equal to HI and of Good B to OI.  $T^*T^*$  represents the PPF for the First Economy with labor force  $\tilde{L}^1$ , and  $\tilde{p}$  is the slope of  $T^*T^*$  at H.

Total production of Good B is ON with IN produced in the Second Economy.

Denoting P-equilibrium values of the variables with a "tilda" and the corresponding K-equilibrium values with a "star" the following results are immediately apparent

$$(\tilde{Q}_A^1) < (Q_A^1)^* \quad (19)$$

$$(\tilde{Q}_B^1) < (Q_B^1)^* \quad (20)$$

$$(\tilde{Q}_B^1) + (\tilde{Q}_B^2) > (Q_B^1)^* \quad (21)$$

$$\tilde{\Pi} < \Pi^* \quad (22)$$

$$\tilde{w} > w^* \quad (23)$$

It is not possible to definitely predict the relation between  $\tilde{p}$  and  $p^*$  since both marginal physical productivities of labor rise in the First Economy and  $\tilde{p}$  is equal to their ratio. The rents of both specific factors will fall in terms of their own outputs as the corresponding labor inputs decline in each case, thus damaging the state which is the sole owner of these resources. The turnover tax rate is also ambiguous since it depends on  $\tilde{p}$  as well as  $\tilde{\Pi}$ , but the volume of sales to which it applies will clearly fall since  $Q_B^1$  declines. Individuals are better off in the P-equilibrium than in the K-equilibrium, since they have higher real wages and more of the preferred Good B available at lower relative prices. The planners on the other hand are clearly worse off since they have been forced back along the Kantorovich ray from  $K^*$  to H.

The K-equilibrium, as we have said, is characterized by "production efficiency" in the sense that it is located on the boundary of the social transformation curve TT, whereas the P-equilibrium is "inside" TT and hence is not efficient in that sense. However, the P-equilibrium is "closer" to the fully Pareto-efficient Lange-Lerner equilibrium at  $L^*$  than is the K-equilibrium. This is a nice illustration of the Lipsey-Lancaster theory of the "second best".



## III

Suppose that the planners react to the frustration of their output target for Good A under the Kantorovich proportion  $k^*$  by raising the planned proportion to  $k' > k^*$ , on the not unreasonable hypothesis that actual output is an increasing function of planned output, even if it should always fall short of the latter. In Figure 3 the Kantorovich ray is raised from  $OK^*$  to  $OK'$ . There will accordingly be a new K-equilibrium defined at  $K'$ , determining  $p'$ ,  $\Pi'$ ,  $t'$  etc. analogously with the original  $K^*$ -equilibrium that we considered. Notice that  $p' < p^*$ , by concavity of  $TT$ , and  $\Pi' > \Pi^*$ , by convexity of the homothetic indifference map. Thus  $t' > t^*$ , the turnover tax rate is higher due to the increased discrepancy between the output-mix specified by the planners and the composition of demand desired by the consumers.

The real wage in terms of Good A is lower at  $K'$  than at  $K^*$  since the output of A and hence  $L_A^I$  is higher at the former point, so that the marginal productivity of labor and hence the real wage are lower in terms of that good. Since  $\Pi' > \Pi^*$  the return in entering the Second Economy is greater at  $K'$  than at  $K^*$ , since  $\Pi'\alpha > \Pi\alpha$ , and hence the net return is greater as well since the wage in the First Economy is lower. Thus the "tighter" the Kantorovich proportions the greater is the incentive to enter the Second Economy.

A new transformation curve, defined by  $k'$ , can now be drawn as  $K'V'$  in Figure 3, analogously to  $K^*V^*$  defined by  $k^*$  of the previous section.  $K'V'$  will lie within  $K^*V^*$  for its entire length. A new P-equilibrium will be located somewhere on  $K'V'$ , where it is tangential to a convex indifference curve. We shall now prove that the output of both goods must be lower in the economy as a

whole in the P-equilibrium defined by  $k'$  as compared with that defined by  $k^*$ .

Consider the point R, where output of Good A on  $K'V'$  is equal to the P-equilibrium output level of the same good on  $K^*V^*$ . Since output of Good A is the same at both points the labor input and hence the marginal productivity and the real wage in terms of Good A must also be the same. The lower relative supply of Good B, however, means that  $\Pi$  is higher at point R than at  $p^*$ , by the properties of the indifference map. Thus point R cannot be consistent with P-equilibrium on  $K'V'$  since there is an incentive for further participation in the Second Economy. The P-equilibrium point relative to  $k'$  must therefore be at  $P'$  to the right of R on  $K'V'$ , thus resulting in both outputs being lower in the economy as a whole, with the First Economy equilibrium at S on  $OK'$ . The First Economy transformation curve  $T'T'$  corresponding to the P-equilibrium relative to  $k'$  lies strictly within  $T^*T^*$ , the one corresponding to  $k^*$ . More labor participates in the Second Economy under  $k'$  than under  $k^*$ . The effect of "tightening" the Kantorovich proportions is thus counter-productive for the planners, since actual output of Good A varies inversely with the planned output of Good A and not directly, as a result of the operation of the Second Economy. Tightening the plan only creates the incentives for an even larger Second Economy than initially.

Application of the same reasoning in reverse indicates that there is a "softer" Kantorovich plan  $\bar{k}$ , with  $\bar{k} < k^*$ , that maximizes the actual output of Good A, and under which the Second Economy is driven out of existence. Under this plan  $\bar{k}$  we still have  $\bar{\Pi} > \bar{p}$  but

the differential is just enough to off-set the relative technological inefficiency of potential Second Economy output. In other words

$$\frac{\partial Q_A^1}{\partial L_A^1} [\bar{p}, \bar{L}] = \Pi\alpha \quad (24)$$

at  $\bar{K}$  on TT so that it does not pay a single unit of labor to participate in the Second Economy. Plans that are even "softer" than  $\bar{k}$  are of course feasible but would represent unnecessary concessions to private preferences from the viewpoint of the planners. There would still be no Second Economy but the First Economy would have an output-mix that was too favorable to Good B. "Tighter" plans than  $\bar{k}$  would be self-defeating in terms of the actual output of Good A, for the reasons explained above. Thus the "threat" of a potential Second Economy forces the planners to be "softer" than they would ideally like to be in making concessions to the preferences of the public.

Thus far, however, we have ignored the very real and powerful instrument at the disposal of the authorities, namely surveillance, investigation and prosecution by the police and associated agencies. Is it not possible for them to be able to enforce any plan, no matter how "tight", simply by being sufficiently ruthless in control and suppression of "economic crimes"? As is well known the Soviet Union has the death penalty for crimes of this nature that are deemed sufficiently serious, and is not reluctant to use it.

At a purely formal level the internal activities of the KGB can be introduced into our model via a coefficient  $(1-\lambda)$ , where  $\lambda$  is the probability of being apprehended and sentenced for participation in the Second Economy. For any Kantorovich plan  $k$  we can find a  $\lambda$  such that

$$\frac{\partial Q_A^1}{\partial L_A^1} [p(k), \bar{L}] = (1-\lambda) \Pi(k) \alpha + \lambda \beta$$

where  $\beta$  is the negative real income attached to the penalty and  $\lambda$ , the probability of being caught, is just high enough to make it unprofitable for anyone to enter the Second Economy. It is apparent from our earlier arguments that  $\lambda$  will have to be an increasing function of  $\underline{k}$ . The higher is  $\underline{k}$  the greater the incentive to participate in the Second Economy, so that the probability of apprehension has to be higher if the incentive is to be neutralized, assuming that the penalty is fixed.

Thus we may envisage a locus such as FF in Figure 4, with increasing  $\underline{k}$  accompanied by falling  $(1-\lambda)$ . For any plan  $\underline{k}$  there is a corresponding  $(1-\lambda)$  that will just offset the inducement to participate in the Second Economy.

We now postulate an objective function for the authorities that is

$$W = W [k, (1-\lambda)] \quad (26)$$

with

$$\frac{\partial W}{\partial k} > 0, \quad \frac{\partial W}{\partial (1-\lambda)} > 0$$

$W$  is obviously increasing in  $\underline{k}$ , for the reasons that we have discussed earlier regarding the Party's obsession with growth and defense, but why should it be increasing in  $(1-\lambda)$ ?

Here we would argue, on the basis of current opinion among Western Sovietologists, that increasingly since the death of Stalin reliance on terror and the secret police is not desired for its own

sake but is resorted to as a "necessary evil". This may surprise those who think of the USSR as a "police state" but it seems to us that there must be a reluctance to unleash the repressive apparatus, even if only for the simple reason that no one would be safe. Technocrats, intellectuals, managers and even party bigwigs all have an increasing stake, for professional as well as personal reasons, in a less dangerous and tense environment.

We thus combine the locus with convex indifference curves between  $\underline{k}$  and  $(1-\lambda)$  to generate an "optimal" policy  $[k^*, (1-\lambda)^*]$  at the tangency point.

The Second Economy thus owes its existence to a discrepancy between the "tightness" of a plan as measured by  $\underline{k}$ , and the "toughness" of control, as measured by  $\lambda$ . The Party has to steer its tortuous way between the Scylla of "Goulash Communism" and the Charybdis of the "Gulag". Abba Lerner was joking when he wrote exactly fifty years ago, a propos of the debate on the price mechanism and central planning with reference to the Soviet Union, that "the department to deal with 'Mises' was not the 'Gosplan' but the OGPU". Despite its reputation for efficiency the OGPU's modern successor does not seem to be having much success in putting handcuffs on the invisible hand.

Stanislaw Wellisz

Ronald Findlay

## FOOTNOTES

1. Both the terms "second economy" and "parallel market" were coined by K.S. Karol in 1971, according to Grossman. Further detailed information and commentary is contained in Katsenelinboigen (1977) and Simes (1975).
2. Nove (1979, p. 103) says "Whatever may or may not be the planners' view of a desirable product mix of consumers' goods, they do undoubtedly assert the priority of the future as against the present".
3. It is not necessary to think of  $L^1$  and  $L^2$  as two distinct groups operating full-time in each of the two branches. All workers could be simultaneously engaged in both, with the ratio of  $L^2$  to  $\bar{L}$  representing the average fraction of "working on own account" by officially employed workers. This imparts an obvious downward bias to measurement of productivity based on official statistics, a point that Grossman takes up in more detail.

## REFERENCES

- Becker, G.S. "Crime and Punishment: An Economic Approach",  
Journal of Political Economy, vol. 76, No. 2, March/April, 1968.
- Bhagwati, J.N. and B. Hansen "A Theoretical Analysis of Smuggling",  
Quarterly Journal of Economics, vol. 87, No. 1, February, 1973.
- Grossman, G. "The 'Second Economy' of the USSR", Problems of Communism,  
vol. 26, No. 5, September-October, 1977, reprinted in M. Bornstein (ed.)  
The Soviet Economy: Continuity and Change, Westview, 1981.
- Jones, R.W. "A Three-Factor Model in Theory, Trade and History" in  
J.N. Bhagwati et al (eds.) Trade, Balance of Payments and Growth,  
North-Holland, 1971.
- Kantorovich, L.V. The Best Use of Economic Resources, Harvard  
University Press, 1965.
- Katsenelinboigen, A. "Coloured Markets in the Soviet Union",  
Soviet Studies, vol. 29, No. 1, January, 1977.
- Kornai, J. Mathematical Planning of Structural Decisions,  
North-Holland, 1967.
- Kreuger, A.O. "The Political Economy of the Rent-Seeking Society",  
American Economic Review, vol. 64, No. 3, June, 1974.
- Lange, O. "On the Economic Theory of Socialism", Review of Economic  
Studies, vol. 4, Nos. 1 and 2, 1936-37.
- Lerner, A.P. "On the Economic Theory of Socialism, Review of  
Economic Studies, vol. 2, No. 1, 1934-35.
- Malinvaud, E. "Decentralized Procedures for Planning" in E. Malinvaud  
and M. Bacharach (eds.), Activity, Analysis in the Theory of Growth  
and Planning, Macmillan, 1967.

Nove, A. Political Economy and Soviet Socialism, Allen and Unwin, 1979.

Simes, D.K. "The Soviet Parallel Market", Survey, vol. 21, No. 3, Summer 1975.



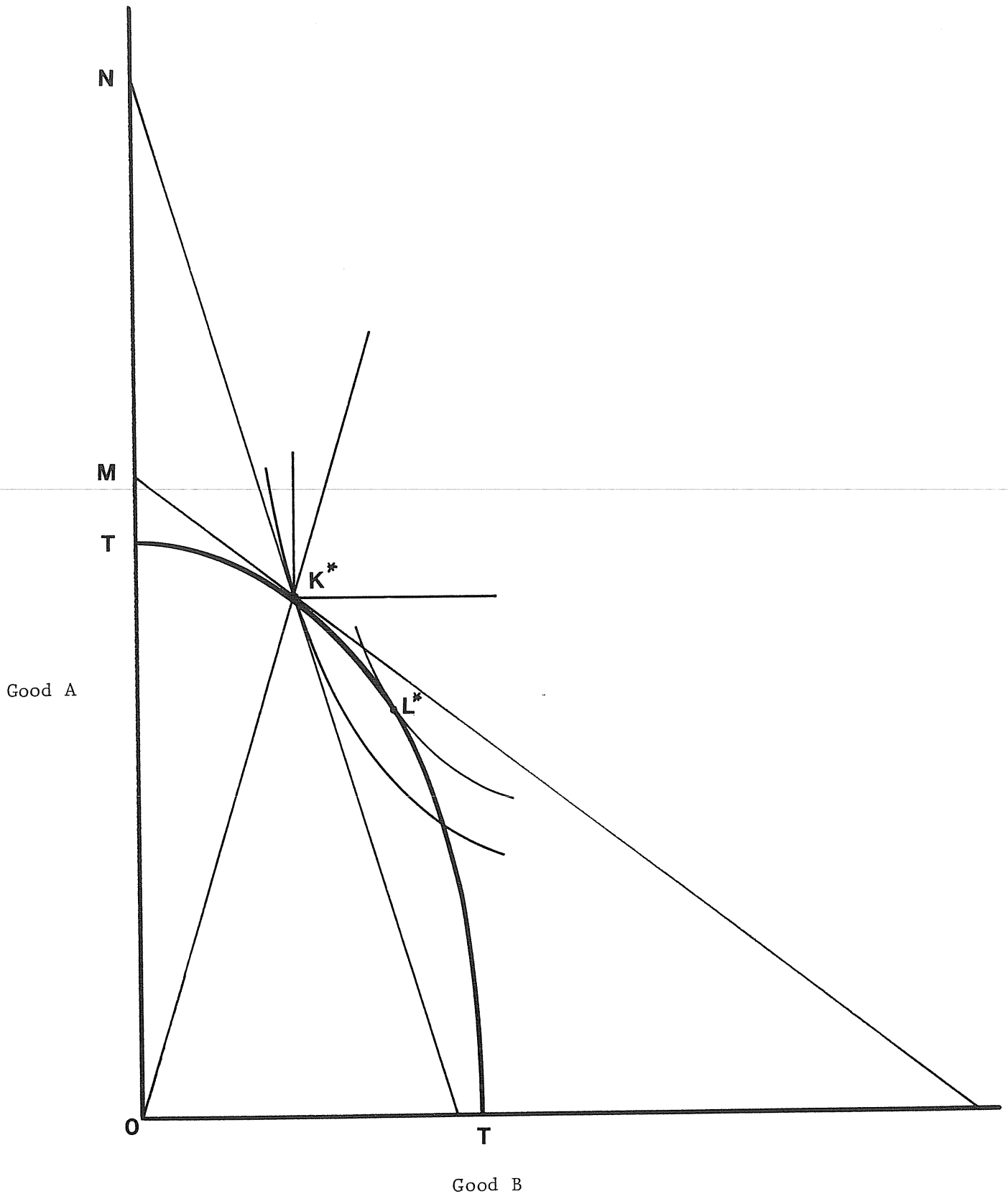


FIGURE 1

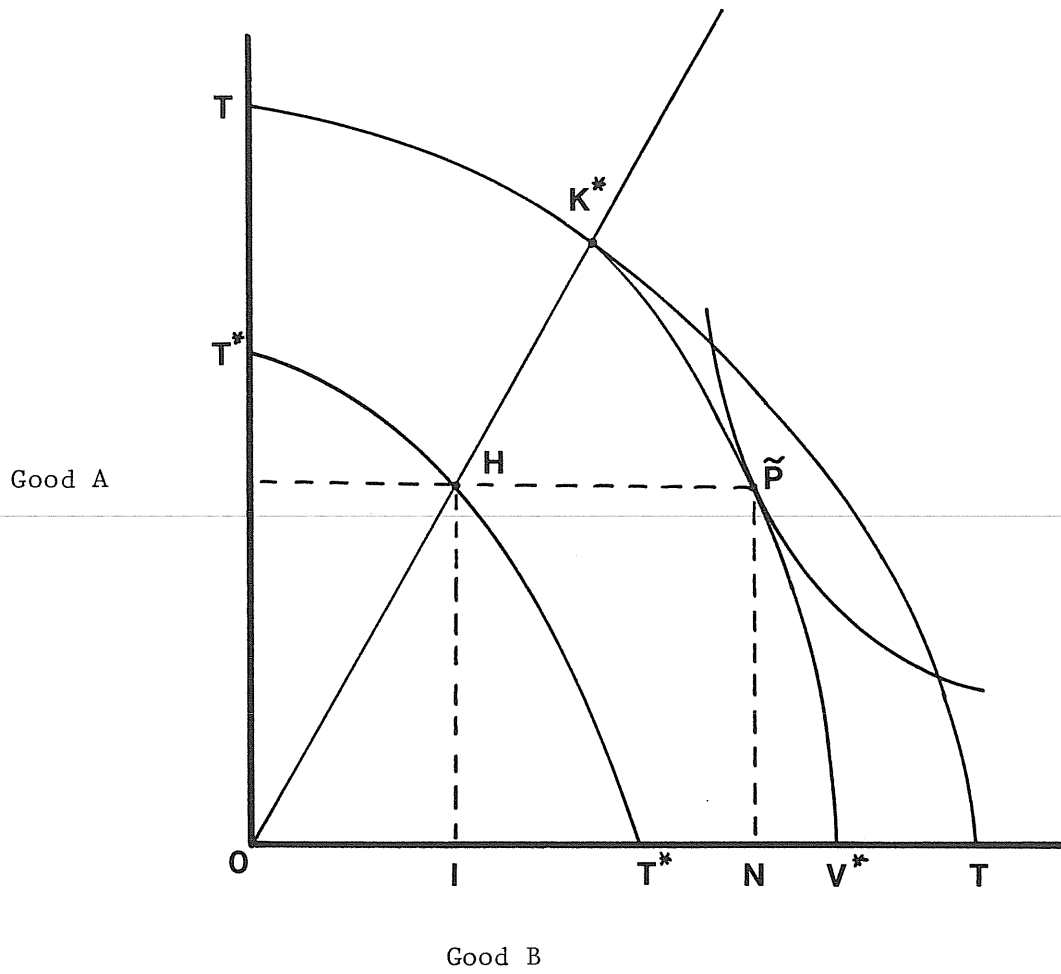


FIGURE 2

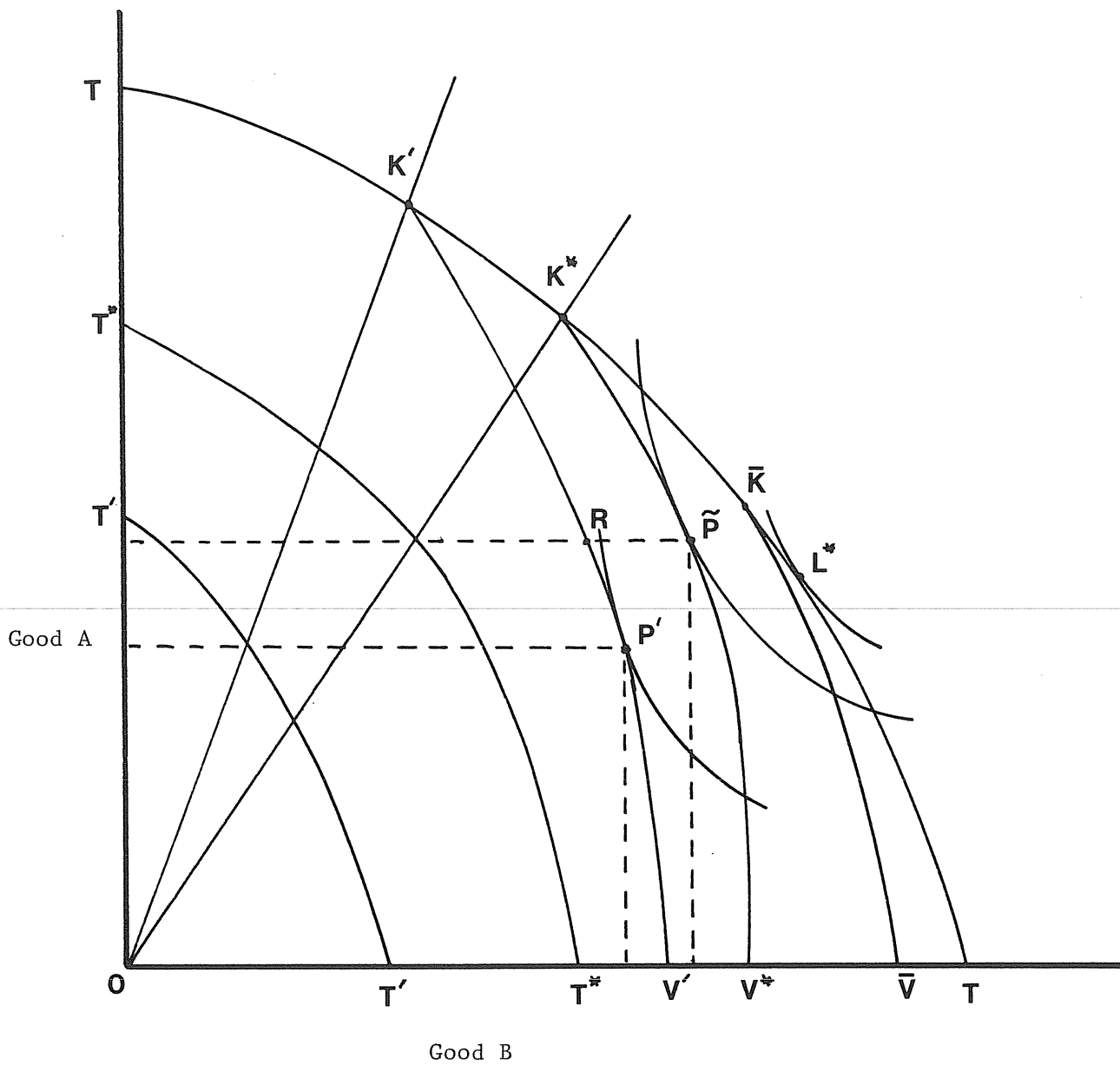


FIGURE 3

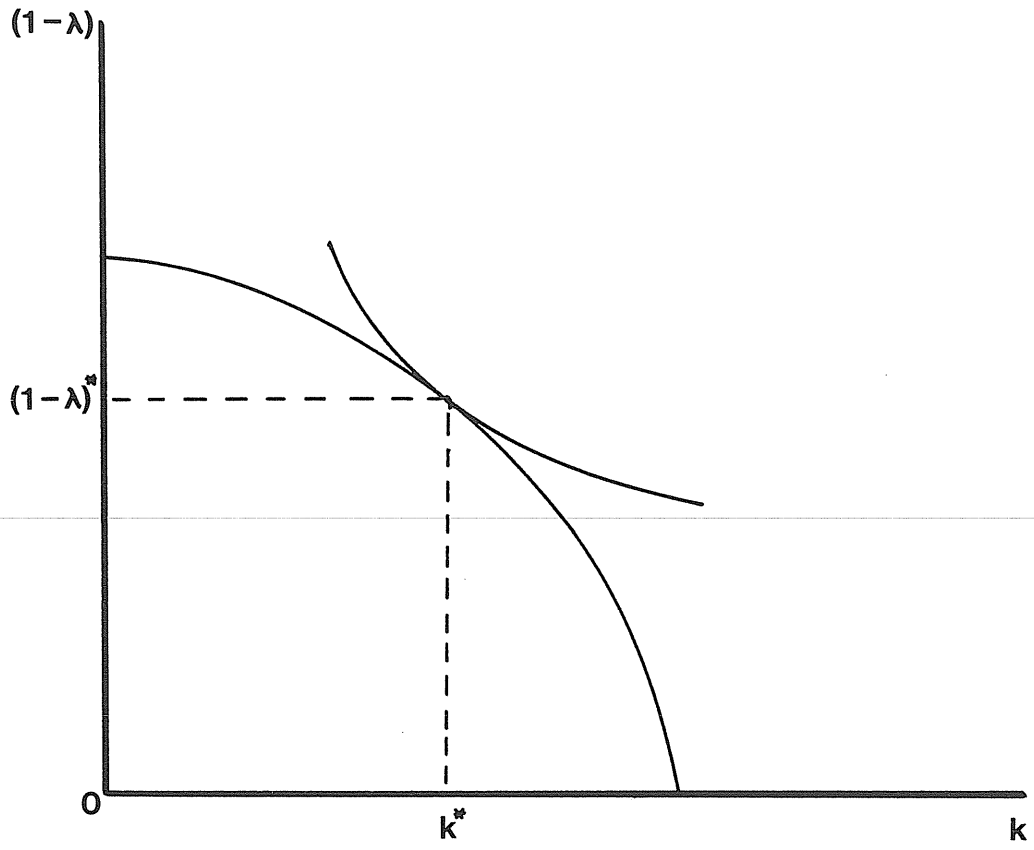


FIGURE 4