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INCENTIVE SYSTEMS AND OPERATIONAL PRICE SYSTEMS
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Depending on their relation to prices, we can distinguish two groups of incentive systems:

a) Incentives which concern the physical product and which are therefore independent of prices. E.g. piece wage systems belong to this first group.

b) Incentives which concern the value product and which are therefore partially dependent on prices. Bonuses for fulfilling the gross or net production plan and profit-bonuses belong to this second group. Our analysis will be confined to the second group of incentives.

1. Gross production incentives and prices.

Until very recently, the most widely used incentive for managers of enterprises in socialist countries was a bonus for fulfilling the gross production plan in value terms. An appraisal in value terms requires that output be aggregated according to specified rules. In practice, aggregates are calculated in monetary terms, and prices are, as a rule, equal to the average total cost of the branch of industry plus a given percentage of profit.

The experience of socialist countries has shown beyond any doubt that bonuses for fulfilling (and overfulfilling) the gross production plan had decidedly negative effects on socialist production, the more so because of existing pricing practices. The current method of pricing (average total cost of branch of industry plus five per cent profit) tends to approximate the value relations between different products. Product A which requires twice as many resources as product B, is also twice as expensive. By pricing in this manner, the Central Planning Board attempts to limit the demand for product A in production and consumption and tries to encourage the demand for product B. It is easy to see, however, that so long as gross production bonuses are paid and

current pricing practices are adhered to, managers will not follow the intentions of the Central Planning Board because it is to their advantage to substitute product A for product B. We may label this a case of "Gresham's Law à rebours". Therefore, a bonus system for fulfilling the gross production plan and a system of average cost-plus pricing are contradictory. When they are used together, they disorganize socialist production. In order to remedy this contradiction, either the price system has to be adjusted to the incentive system which is being used, or the incentive system must be made compatible with average cost-plus pricing.

If for the sake of the argument we disregard practical difficulties and the prevailing way of thinking in regard to price ratios, we may consider changes in the price system as theoretically feasible. We want to stress at the outset, however, that in the end we shall not propose to "improve" the gross production bonus system by adjusting the system of pricing in an appropriate manner. We merely want to point out those changes in the price system which must be made if gross production bonuses are to be used effectively as an incentive device for plan fulfilment.

First, let us determine the prices which would induce buyers to meet the objectives of the Central Planning Board (buyer prices).[1] We have demonstrated that so long as gross production incentives exist, there will be a tendency to prefer expensive inputs. If we want to prevent enterprises from overfulfilling the plan for, say 100% woolen cloth at the expense of 40% woolen cloth, it would be advisable to equalize the prices of 100% woolen yarn and of 40% woolen yarn. The smaller the price difference between various grades of yarn, the less the danger that enterprises will violate their assortment plan. The conclusion that in order to prevent enterprises from taking the easy way out input prices must be similar or identical applies especially to raw materials, since their value is transferred into the product during one production cycle (process). But it also applies to machinery and equipment. The higher the depreciation rates and the share of depreciation allowances in total cost, the more pressing is the need for price equalization.

Second, let us look at the prices which would lead sellers to meet the objectives of the Central Planning Board (seller prices). In order to render gross production incentives effective, only the prices of inputs

have to be equalized. Different types of output (e.g., regular watches and waterproof plus shock resistant watches, dacron suits and woolen suits, etc.) usually require different production processes and different production expenditures. If enterprises are to be induced to fulfil their production plans under these conditions, prices for different kinds of output have to take these facts into account. If we were to apply the policy of equal prices to seller prices, we would put a premium on assortments with a small share of value added because they can be produced more easily, the bonus for plan fulfilment being the same. However, if we were to differentiate seller prices proportionately to average total cost, input prices being the same, we would put a similarly undesirable premium on assortments with a large share of value added because they would yield larger gross production bonuses. Price differentiation according to value added would make this premium even larger. To avoid both of these consequences, we have to find a price ratio that would repress concentrating on assortments which are easy to produce as well as on assortments which yield larger gross production bonuses. We may expect that such a seller price ratio would range between a ratio of equal prices and a ratio of prices which is proportionate to the ratio of average total cost.

For purposes of numerical illustration, we may use our example of regular wristwatches and waterproof plus shock resistant wristwatches. The temptation to utilize expensive inputs has been eliminated by equalizing input prices, and it is assumed that the material input is the same in quantitative terms. Thus production costs differ only because of difference in valued added:

Cost	Regular watch	Waterproof shock resistant watch
Average transferred value	10	10
Average value added	10	20
Average total cost	20	30

If we were to price according to value added, our price ratio would have to be 1 : 2. If we were to price according to average total cost, our price ratio would have to be 2 : 3. In order to avoid favoring either the production of regular watches or the production of waterproof, shock resistant watches, our price ratio would have to fall between 2 : 3 and 3 : 3 (i.e., 1 : 1). As an example, we may assume the ratio of 2.5 : 3, with seller prices of 30 for regular watches and of 36 for waterproof and shock resistant watches. However, this is only one of many possible examples which fall within this range, and the question remains: which

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ratio of seller prices, precisely, induces fulfilment of the assortment plans for regular watches and waterproof, shock resistant watches?

We are afraid that there is no general, theoretical answer to this question. A solution has to be found by means of trial and error. We may expect, however, that such a solution depends in large measure on the ratio of value added.

To summarize, we found certain rules for price setting within the framework of gross production incentives. Buyer prices, as a rule, are to be equalized. Thus we eliminate the incentive to use expensive means of production as an easy method of fulfilling the gross production plan. Equalized buyer prices, however, do not solve the assortment problem. For its satisfactory resolution, seller prices have to be set so that they cover (industrial) average total cost plus "society's share" (accruing to the state in the form of turnover tax, e.g.) and so that seller price ratios range between unit value and the value of the ratio of average total cost, to be found by means of trial and error.

Within the framework of gross production incentives, these methods of pricing can be used effectively by the Central Planning Board as instruments of economic policy in affecting methods as well as directions of production, since they enable the Central Planning Board to strengthen administrative orders with material incentives. So far as methods of production are concerned, the Central Planning Board can induce any branch of industry to used desired inputs by _increasing_ the prices of these inputs. In the case of machinery and equipment, demand, in addition, depends on depreciation rates and on rates of interest for fixed capital. By raising these rates, the Central Planning Board can stimulate demand for machinery and equipment further. So far as directions of production are concerned, the Central Planning Board can induce enterprises to exert special efforts in producing certain products or kinds of products by fixing the ratio of seller prices appropriately in their favor. Generally speaking, equal buyer prices are "neutral" in the sense that they induce indifference between inputs, and certain seller price ratios, to be found by trial and error, are "neutral" in the sense that they induce indifference between outputs. In the case of "neutral price ratios", the Central Planning Board has to rely on administrative orders only. Any deviation from these "neutral price ratios", however, provides already an incentive

in a particular direction, and price differentiation can thus be used by the Central Planning Board as a tool of economic policy.

So far, we have been trying to show that, in theory, a method of pricing can be devised which will enable the Central Planning Board to eliminate contradictions between prices and incentives with respect to plan fulfilment. Our contention has been that we can discover prices which "neutralize" or "balance" the negative influence of gross production bonuses on the fulfilment of assortment plans for inputs as well as for outputs. Next, we shall state several serious objections to the implementation of such a system of prices and gross production incentives:

First, the required price structure violates so-called "common sense". The prices of goods which "everywhere and always" were and are expensive (e.g., 100% woolen yarn) would have to be equal to the prices of relatively cheap goods (e.g., 40% woolen yarn). The prices of goods bought and sold within the state sector would have to be fixed at ratios which would deviate far from those which we are accustomed to view as proper, etc. The habit of thinking that price ratios have to, or ought to; correspond to the "value" ratios cannot be overcome easily. Moreover, adherence to this habit is not astonishing in view of the several thousand years of experience which formed it (Friedrich Engels in Das Kapital, Volume 3, Appendix I). Indeed, one may even wonder whether this habit can be overcome at all. For this reason, it may be better to look for an incentive system which would be compatible with the more "traditional" price system.

Second, within the framework of gross production incentives, we cannot induce the effective use of resources, even if prices are manipulated as discussed previously, because the system as such does not provide incentives for "economizing" in the sense of minimizing the use of "alive" labor and of "embodied labor". This deficiency is attributable to the fact that the enterprises are held to maximize gross production. By fixing prices appropriately as described previously, we may be able to eliminate many of the negative allocative effects of the gross production incentive system, but we do not create incentives for improving the technical production coefficients. Within the framework of gross production incentives, we cannot expect "initiative from below" on the part of enterprises and/or branches of industry with respect to economizing the use of means of

production. When prices are given economizing has to be induced from
above, for instance in the form of plan targets for cost reductions,
input norms, etc.[2]

Third, within the framework of gross production incentives, we
cannot avoid using two different price systems within the socialist
sector, viz. a buyer price system and a seller price system. This
requirement, however, holds true for other incentive systems as well,
as we shall show in Sections 2 and 3.

Fourth, and last but by no means least, the practical difficulties
of devising and operating a price system which is compatible with gross
production incentives are evidently enormous. In view of our other ob-
jections to such a price system, it does not seem worth the effort
necessary to implement it.

As we noted in the beginning, the aim of our analysis was not to
defend the system of gross production incentives, but to derive re-
quirements for an effective price system corresponding to it. As a
"by-product" of this discussion, the relativity of the "law of supply and
demand" became conspicuously apparent. Such obvious relationships as
that between price and demand (the higher the price, the smaller the de-
mand) holds true, in fact, only under the condition of specific institution-
al arrangements. Changes in the system of stimulating producers (e.g.,
a change to gross production incentives) affect the above relation between
price and demand (e.g., in the case of gross production incentives, an
increase in the price of an input will increase the demand for that input).
However obvious the fact as such may be, it is worthwhile to emphasize
that a given relation depends upon a given institutional setting, because
of the tremendous power of habit which is connected with that relation.
This power of habit is probably the only factor which explains why the
Central Planning Board made use and continues to make some use of gross
production incentives in combination with more or less "normal" price
ratios and why it practiced a price policy which assumed more or less
"traditional" price-demand relations.

2. Profit Incentives and Prices.

At the present time only a very few economists would defend an in-
centive system based on gross production. Rather, the profit sharing
system for workers, and bonuses based on profit for management are advocated.

The incentive system based on profit consists also of two parts:
1) bonuses based on profit achieved (or planned) and 2) a system of
prices for means of production and final goods to determine the
profitability of individual enterprises and branches of production.

Can there be contradictions between profit incentives and the
existing price system? Very likely yes. Only one (or few) price
systems can stimulate enterprises to behave in accordance with planned
tasks both regarding "what" and "how" to produce, and , as will be
shown below, the existing system of operational prices does not meet
the necessary requirements.

Within the framework of profit incentives, the operational price
structure and policy bear some resemblance to prices under "market
socialism", except for these fundamental differences:

1) In the theoretical model of "market socialism" prices constitute
an internally consistent system which, on the one hand, enables the CPB
to find the optimal allocation of resources, and on the other, in con-
junction with bonuses based on profit, stimulates enterprises to plan
fulfilment.

In existing socialist countries (DEC)[3/], the prices together with
profit incentives have to stimulate the enterprises to plan fulfilment.
However, as we had argued elsewhere,[4/] they cannot and are not used for
economic verification of technical coefficients, but can and have to
be used to enforce the universal application of methods of production
that the CPB deems appropriate.

Both in the theoretical "market socialism" model and in DEC, opera-
tional prices coupled with a given incentive system have an empirical
character. They have to be adjusted according to the supply-demand
situation and must not be based on any a priori rule of price determination
(e.g. average total costs of branch of industry plus 5% profit).

2) In theoretical "market socialism" there is only one price facing
both buyers and sellers. This is one of the basic requirements of this
model. The "one price" principle is essential for achieving the technical
efficiency of production. Different prices for a given good can and do
exist only in the sphere of consumption.

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In DEC, the situation is quite different. The "one price" principle is not one of its cornerstones. It seems to us that the principle of "double prices"--different for buyers and sellers--must be adhered to, if prices are to be used effectively as part of the incentive system.

Let us begin with the prices of means of production. The necessity of two different systems of operational prices, one for buyers and one for sellers, is the result of the external character of production methods in DEC.[5/] Because of the external character of methods of production there is little reason to expect that one price can properly stimulate both sellers and buyers to follow the methods of production prescribed for them in the national plan. These planned methods of production are not internally consistent in the national economy as a whole and are not fully coordinated with the price structure. The latter evolves historically; among its many parents were the efforts to use prices to stimulate increased production in bottleneck areas.

In such a situation one should not be astonished by rather general contradictions between the methods of production prescribed by the CPB and the methods of production implied (and stimulated) by relative prices. To resolve these contradictions one needs a "double-price" system which differentiates between producers and users, or a turnover tax calculated to achieve the same result.

The contradiction of the interests of sellers and buyers can apply to the general price level as well as to the individual prices of means of production.

In the sphere of consumers' goods there is also a need for different prices for sellers and buyers (the latter of which are now individual consumers). Two main reasons for this need can be noted here:

1) The CPB is, as a rule, active in the sphere of individual consumption. It has definite preferences regarding the desired structure of consumption because of social, welfare and other considerations. To effectuate this policy, within the framework of free consumers' choice, the level and the structure of consumer goods' prices play an important role. As long as the total volume of consumer goods does not call for an amount of resources in excess of that allocated to Division II, in a planned economy there are no serious reasons for the CPB --irrespective of the type of economic calculation actually applied--to be constrained

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in its consumer goods price policy by the level and structure of the costs of production of individual commodities. There are no persuasive reasons for "cost fetishism"--in any type of economic calculation--because the costs of production are more or less incidental, as incidental as the level and pace of technical progress in different branches of production, factor endowment in a given country, etc. [6]

2) If it is true that there are no valid reasons for "cost fetishism" under any method of economic calculation, it is especially true under DEC. As we argued elsewhere, in DEC prices are mainly means of aggregation, and their ratios as a rule do not reflect marginal rates of transformation. Costs based on these prices, then, obviously must also deviate from marginal rates of transformation. In such a situation it would be a serious mistake to allow the cost structure (via retail prices) to influence the structure of consumption. Elements which have to be considered to determine the level and structure of retail prices are discussed elsewhere. [7]

We have said above that within the framework of DEC two systems of operational prices are needed for the effective use of prices as a part of a profit-incentive system. Let us discuss them in more detail and also introduce the concept of "margin of tolerance" which, in many cases, may render different prices for buyers and sellers unnecessary.

The margin of tolerance can be defined as an area around the existing price within which price changes for buyers and/or sellers do not induce the enterprises to change the existing methods of production and product mix. As long as the margins of tolerance of buyers prices (P_b) and sellers prices (P_s) are tangent or overlapping, the need for a system of two distinct operational prices does not exist.

The magnitude of the "margin of tolerance" in different product groups and in the same product group, in different enterprises of buyers and sellers, may vary. The very existence and actual magnitude of the margin of tolerance is a result of several factors:

1) Differentiated pressure of administrative orders. In DEC one of the main reasons for the existence of the margin of tolerance is the system of administrative orders--quantitative ("what to produce") influencing P_s and qualitative ("how to produce")

influencing P_b. Under the system of administrative orders any deviation from planned tasks not resulting from _via major_, represents an illegal act. This undoubtedly inhibits deviations from the plan that may arise from the desire for material gains. The size of the margin of tolerance attributable to administrative orders depends on three elements: 1) the actual pressure of administrative orders, 2) the achieved level of social integration and 3) the absolute and relative magnitude of financial gains realizable by plan deviation (e.g. from assortment plan). Here we are concerned only with the first. As we know from experience, the actual pressure of administrative orders usually differs by branches of industry and by product groups. It is especially great in branches or products of so called "high priority". As a result, the margin of tolerance attributable to the use of administrative orders differs accordingly.

2) _Achieved level of social integration_ also has an influence on the magnitude of the margin of tolerance. Under _ceteris paribus_ assumptions, the magnitude of the margin of tolerance is proportional to the achieved level of social integration. A high level of social integration means that the producers identify the planned goals with those of their own and therefore do their best to achieve them even if the actual price structure makes certain deviations profitable.

3) As already mentioned, the _absolute_ and _relative_ _magnitude of_ _financial gains_ realizable by plan deviation obviously constitutes an important parameter determining the magnitude of the margin of tolerance. The pay-offs of plan deviation depend on many variables; among others, on the relative share of bonuses in the total income of management personell. In the situation, not unknown in Poland a few years ago, when bonuses run as high as 50-60% of total income and were _de facto_ indispensible for maintaining a "normal" standard of living, the natural tendency on the part of management to obtain bonuses (almost "regardless of consequences") substantially _diminishes_ the actual margin of tolerance. Under other circumstances, with different incentive intensities, the margin of tolerance would be substantially greater.

4) _The existence of the "insensitivity margin"_. The magnitude of the margin of tolerance depends also on several factors which we can denominate as the "insensitivity margin". (a) First of all there is

the relative share of a given input in total costs. If the share of a given input in total costs is in the range of one or a few percent, the "sensitivity" of the enterprise (or the branch of industry) to its price change is, as a rule, small. If a certain input comprises, say 1% of total costs, even a 20% increase of its price will lead to only a 0.2% increase in total cost. It is very probable that a total cost increase of this magnitude will not cause any realignments in enterprise demand, and so the given price increase lies within the margin of tolerance. If, on the other hand, the very same input comprises 20% of total costs, the same price increase can initiate the process of substitution. We can conclude therefore, that the margin of tolerance for any commodity is differentiated according to individual enterprises, buyers or sellers. That is, the "effective margin of tolerance" is a magnitude of price change which does not cause deviation from plan tasks in any enterprise. It is determined by the smallest margin of tolerance, i.e. the margin of tolerance in the branch or enterprise with the narrowest "insensitivity margin". This obviously complicates the task of constructing a system of uniform prices for buyers and sellers, but, nevertheless, it enables the CPB to construct a system of "double-prices" (P_b and P_s) instead of individual accounting prices for every enterprise.

(b) The further element which accounts for the existence of the "insensitivity margin" and, via this margin influences the magnitude of the margin of tolerance, is routine. Because of routine, price changes within certain limits do not have any effect on the demand or supply schedules of enterprises. This "unwillingness to change" has its subjective aspect--any change means, as a rule, effort and trouble for enterprise management, and its objective aspect--usually every change costs money (the cost of changing technology, input norms, machine operations, etc). In short, routine is also one of the elements determining the existence and level of the margin of tolerance.

5) Lack of substitutes (partly because of rationing). Another factor which affects the existence and magnitude of the margin of tolerance is the substitutability of the mean of production. The more specialized the means of production, the less sensitive the enterprise to a change in its price and the greater the margin of tolerance around

it. However, the case of substituting input A varies with different enterprises. Input A may be easy to substitute in producing X, and very difficult in producing Z. Here again we meet the effective margin of tolerance described above.

Thus far we have been discussing substitutability _sensu stricto_, i.e. determined by technical causes, and have come to the conclusion that the smaller the substitutability the greater the margin of tolerance and _vice versa_ (of course under _ceteris paribus_ assumptions). Substitutability can also be limited (the margin of tolerance increased) administratively, by rationing. The rationing of means of production, which means that the enterprise cannot buy, say, bricks and lumber in other proportions than prescribed by plan, or cannot buy more of any of these inputs than the planned allotment, has the same effect as technical insubstitutability and diminishes the enterprises' sensitivity to price changes, i.e. increases the margin of tolerance.

The _possibility_ of substitution acts counter to the margin of tolerance, because it creates the objective basis for deviation from quantitative and qualitative planned tasks. The _motive_, however, for taking advantage of substitution possibilities is financial gain (in the form of profit bonuses) which can be achieved as the result of unauthorized changes in plan fulfilment. If the possibility of substitution is the result of technological and institutional (rationing) factors, the profitability of substitution, with the above given, depends on the price ratios. The margin of tolerance around the price of input A depends then, among others, on the profitability of its substitution by or for input B, i.e. on the price ratio of substitutes. It means that the margin of tolerance around a given price depends on the price system.

The price system, however, does not determine the magnitude of the margin of tolerance, but only its _distribution_ around a given price. Let us assume, for example, that the price ratio of lignit and coal is 1 : 2 and that with their prices fixed at 10 : 20 the margin of tolerance is identical for both prices, symetric and at the 10% level, that is, in this case the margin of tolerance = price $\pm$ 10%. The change in the price ratio to 9 : 22 will make the margin of tolerance asymetric for both prices, and moreover, the margin of tolerance will exist now only in the

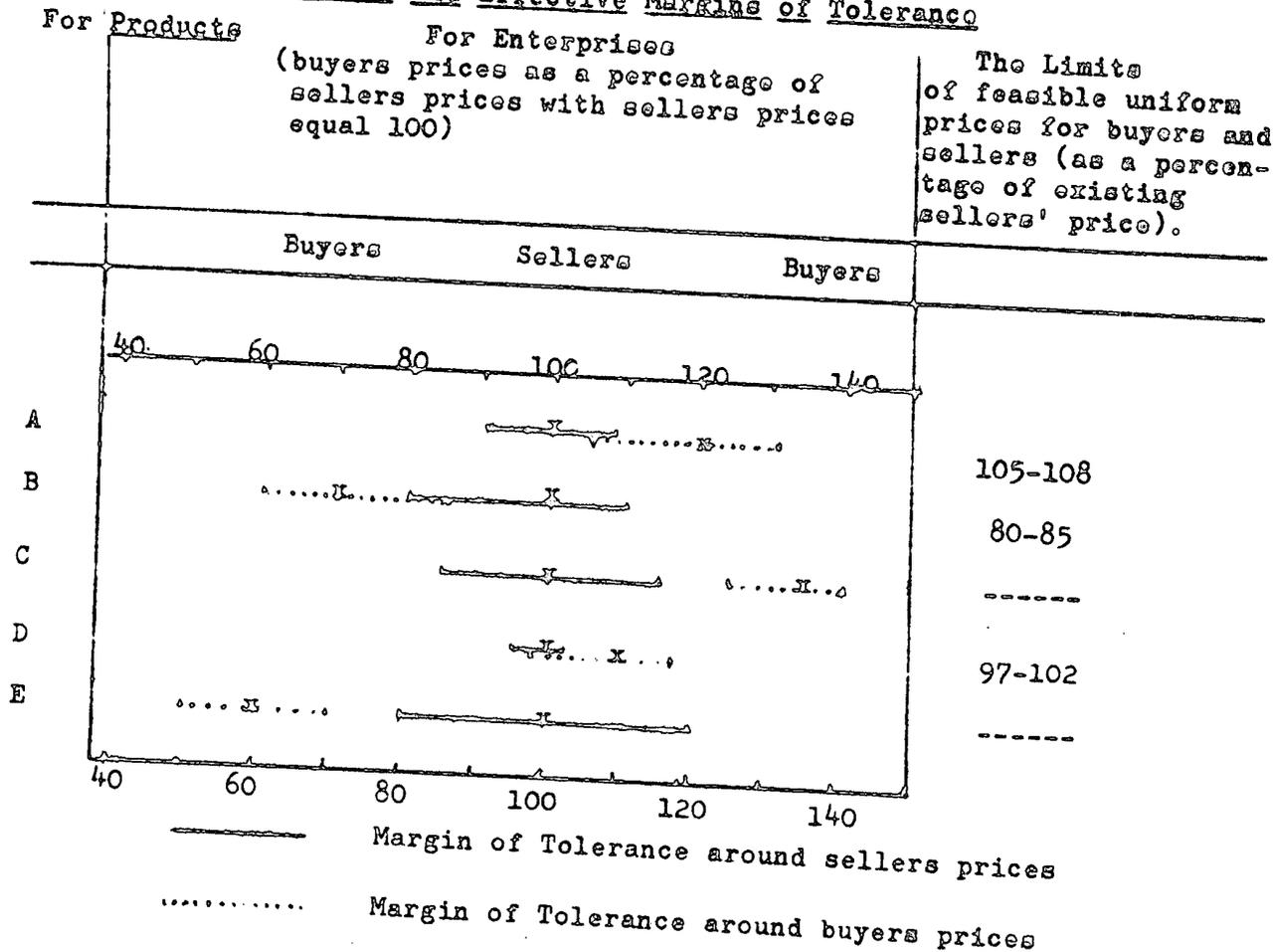case of a price increase for lignit (+20%) and for a price decrease for
coal (-20%). In constructing the system of operational prices we have
to take this into account.

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The existence of the margin of tolerance creates the objective
basis for fixing one price for both buyers and sellers, in spite of the
external character of methods of production, without the danger of
active, negative influence of prices on plan fulfilment. Such possibil-
ity of one price exists when the effective margins of tolerance around
P_b and P_s are overlapping or tangent. It is illustrated by the table
below:

Table 1

Prices and Effective Margins of Tolerance

For Products	For Enterprises (buyers prices as a percentage of sellers prices with sellers prices equal 100)			The Limits of feasible uniform prices for buyers and sellers (as a percentage of existing sellers' price).
	Buyers	Sellers	Buyers	
A				105-108
B				80-85
C				------
D				97-102
E				------

—————— Margin of Tolerance around sellers prices

·············· Margin of Tolerance around buyers prices

As demonstrated in Table 1, there can be one price for goods A, B
and D for both buyers and sellers because the effective margins of tol-
erance around the prices of these products are overlapping.

The effective margin of tolerance can be _extended_ or _contracted_ as a result of the CPB's economic policy. One reason why the CPB may be interested in extending the margin of tolerance is the desire to have _one_ price for both buyers and sellers in the greatest possible number of cases.

In changing the margin of tolerance the CPB can rely on: 1) the varying intensity of administrative orders, 2) differentiating the share of bonuses (based on profit) in absolute terms and in relation to basic salaries and 3) rationing policy. With (a) strong administrative orders and (b) limited bonuses it is possible, in a great number of cases, to fix _one_ _price_ both for buyers and sellers.

In the practice of socialist countries both of these conditions (a) and (b) are generally fulfilbd. In Poland, for example, the yearly profit bonus cannot exceed one month's wage or salary. This policy of limited bonuses is explained in terms of needs for market equilibrium for consumers' goods.

This policy of limited bonuses can be defended also by a different set of arguments along the lines mentioned above. The policy of limited bonuses is in accord with the character of our economy based on Direct Economic Calculation. It constitutes a valuable incentive for improving enterprise performance and yet not strong enough to endanger the discipline necessary for strict plan fulfilment.

At the same time we have to realize that increasing the margin of tolerance b the CFB has also its _negative_ _aspect_ because, in its ultimate effects, it means diminishing the force of incentives. Direct diminishing-- when we consciously limit the possible "absolute and relative magnitude of financial gains" which can be obtained by management; indirect--when we rely on administrative orders and rationing of the means of production. Diminishing the force of material incentives, at a given level of social integration, means the actual "deterioration" of average performance.

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The margin of tolerance is a feature of prices not unique to socialist economies. It also exists in capitalist economies, however, as far as we know, it is usually not taken into account in texts on price theory. The existence of the margin of tolerance in capitalist economies is not strange, because most of its causes are not specific characteristics of socialist economies and with few exceptions (administrativ

orders and rationing) are present in market economies as well. We are
also inclined to think--it is however only a guess which still needs
substantial research for its verification--that the margin of tolerance
is present especially in big enterprises. It seems to us that in big
enterprises the causes for the existence of the margin of tolerance
(specifically the "insensitivity margin") are especially strong. (In
a big enterprise the cost and time involved in adapting to price changes
are particularly great and hence the profitability of reacting to every
price change,,however small, is apt to be less than in smaller business
units.)

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     At this stage of our analysis we can formulate several conclusions:

     1) There are many "equilibrium" price systems for a given plan.

     2) Because of the margin of tolerance the CPB can in many cases
fix one price for both sellers and buyers, in spite of the external
character of the methods of production in Direct Economic Calculation.

     3) This uniform price for buyers and sellers usually also has a cer-
tain margin of tolerance to the extent that margins of tolerance were
previously overlapping. It is, however, much smaller than when we have
two different price systems, for buyers and for sellers.

     4) The existence of the margin of tolerance facilitates the stabili-
zation of operational prices without negative effects on plan fulfilment.
As long as changes in economic conditions (e.g. in planned tasks) call
for a change in prices within their margins of tolerance, keeping prices
unchanged does not cause by definition any reaction by enterprises and
does not weaken incentives to any substantial degree. Keeping prices
stable, therefore, has no adverse effects on plan fulfilment.

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     When we discussed the price system required for an incentive system
based on gross production, we felt a little bit like "Alice in Wonderland".
It was the economic world as we know it à rebours: products "everywhere
and always" expensive were priced the same as cheap goods, price increases
had the effect of increasing effective demand, etc. Within the framework
of profit incentives such an "extraordinary" price system is not necessary
for effective plan fulfilment. Because the goal of the enterprise is
now profit rather than gross production, it is possible to use prices
based on the notion of production costs, to have a more or less "traditional"

price structure. Scarce goods, which have to be economized, can again command the high price and <u>vice versa</u>. Of course, we are only saying here that now prices can be <u>related</u> to production costs, not that there is any one rigid formula by which they should be determined. If profit bonuses are to be used as an effective incentive for fulfilling planned tasks, the prices must have an <u>empirical</u> character, to be fixed and changed according to varying economic conditions and plan objectives.

This empirical approach to prices is in direct contradiction to the general and deeply rooted tendency of "price fetishism". The experience of capitalist economies accustomed us to think that prices must be based on value, price of production or costs. This is the root of the belief that prices have to be "proper", that is to say, they must have an objective basis in costs, however calculated. It would be in direct contradiction to t is belief to fix a high price for low cost goods or <u>vice versa</u>. The empirical approach is limited by fetishism.

We want to stress that in Direct Economic Calculation there is no <u>per se</u> optimal price system. The price system depends to a great extent on the incentive system used, on the goals posited for enterprises. To every incentive system there corresponds a specific price system such that changes in one necessitate compensating changes in the other. This is requisite if we want to avoid inherently contradictory stimuli of prices and incentives on plan fulfilment. The tasks of economists--as we see it--is not to look for price or incentive systems optimal <u>per se</u>, but to find the optimal set of their possible combinations: those combinations which best serve the task of plan fulfilment and will prevent prices or incentives to influence production in any directions contrary to plan.

3. <u>Net product incentives and prices</u>.

The incentive system based on gross production stimulated enterprises to use expensive instead of cheap methods of production and to produce material-intensive rather than labor-intensive goods.

The change from the incentive system based on gross production to one based on <u>net</u> production eliminates, to a great extent, the negative influence of "normal" prices (i.e. prices based on average cost of production + 5% profit) upon plan fulfilment. At the same time, however, it creates certain new problems dangerous for the effective functioning of the national economy.

By net product is meant the difference between gross production and the value of all material means of production, interest, rent and taxes. This definition of net product is used for the purpose of economic policy and differs from the definition of net product sensu stricto as used in Marxian economic theory. In the latter sense the net product is equal to v + s (variable capital plus surplus value) and, obviously, also includes interest, rent, taxes and similar forms of redistribution of value added.

Within the framework of the incentive system, based on net product as defined above, the enterprises will use means of production according to their price ratios fixed by the CPB. Because the values of inputs do not influence directly the net product, there is no reason for the enterprises to prefer expensive inputs in choosing production methods. There is also no reason for them to try to overfulfil the plan of gross production by eliminating the cheap goods from their assortment plan.

How will enterprises behave under the incentive system based on net product?

A. Methods of Production. With given prices the enterprises will try to minimize the "transferred value" (i.e. value of constant capital) and other items which are subtracted from gross production, because this, ex definitione, will maximize their net product. The CPB can stimulate the enterprises to economise any given input by a relative rise of its price or vice versa.

Whether the enterprises will economise the capital stock depends on the type of cost calculation used. Under the cost calculation which does not include interest charges and rent, there will be a tendency on the part of enterprises to have as big a capital stock as possible. The latter does not cost them anything and facilitates the maximization of net product. This, however, can be avoided by charging a proper interest rate and rent, and by a sound depreciation policy. Under this type of cost calculation it will be profitable for enterprises, trying to maximize net product, to use the capital stock and natural resources only to a certain level. The CPB can raise or lower this level by appriopriate changes in interest and rent charges.

Using an incentive system based on net product, we can expect the initiative for economizing the material means of production to come from

within the enterprise. Whether this initiative will also include an
attempt to economize capital stock and natural resources will depend on
the type of cost calculation used.

This rosy picture of incentives based on net product also has its
negative side: the impact on _labor_ _force_ utilization--also influencing
the utilization of material means of production.

Within the framework of incentives based on net product the labor
force has a _zero_ or _even_ _negative_ _price_ from the point of view of its
influence on the level of net product.

Let us assume that the production plan of the enterprise is 10
units of X at 10 zlotys per unit in operational prices and planned costs
are:

material and others	80
wages and salaries (net product)	20
total	100

with 10% bonus for achieving the planned volume of net product.

If the enterprise achieves the production target, using a labor
input 10% higher than planned (e.g. due to overtime work) the level of
net product will not be influenced. Bonuses will therefore not be
diminished. In this situation, from the point of view of the enterprise,
the cost of labor is _zero_.

If the enterprise achieves the production target, using a labor
input 10% higher than planned (e.g. due to overtime work), but at the
same time cutting non-labor inputs by 5 units, it will overfulfil the net
product plan. In this case, the labor force has a _negative_ price from
the point of view of bonus maximization. The same will hold, only not so
strongly, if using more labor input than planned, results from additional
employment (and not overtime) since then the bonuses will have to be
shared by a greater number of employees. This will also be true, even
more strongly, under a system of _progressive_ bonuses based on net product.

The result of the above is that within the framework of incentives
based on net product there will be a tendency on the part of enterprises
to substitute labor for material means of production. There will also
be a lack of financial incentives to economise labor.

Two serious dangers are connected with this:

1) the danger of spending more for the national wage fund than planned, resulting in a disequilibrium in the consumers' goods market, leading to inflationary pressure;

2) the danger of deviation from planned methods of production disturbing the planned real balance equilibrium.

Can these dangers be prevented by appropriate price policy? Obviously not. In the situation where the price of the labor from the enterprise's point of view is zero or negative, there is no possible change in the price ratios of material means of production to labor which can remedy the two dangers mentioned above.

The remedy lies in administrative means. Price policy per se is ineffective. But used in conjuntion with administrative means it can again become an effective tool in stimulating producers to fulfil planned tasks. To achieve this, we have to eliminate the zero or negative price of the labor at the enterprise level. It can be done by strict control and rationing of the wage fund.

Under strict rationing of the wage fund, when the enterprise cannot increase its net product by increasing labor inputs, labor ceases to have a zero or negative price in enterprise calculation. When this is true, price policy for the material means of production is again an effective tool for stimulating producers to achieve the planned methods of production and product mix. The enterprises treat labor inputs as given (a function of the planned wage fund) and react to changes in price ratios the same as under profit incentives, i.e. they try to equalize the value marginal productivity of each factor with its price. The CPB can again use the prices of factors of production as a part of an incentive system.

We have to realise, however, that net product incentives create a certain conflict of interest between enterprises and the Central Planning Board. At the stage of plan building, when the wage fund is not yet fixed, labor from the enterprise calculation point of view has a zero or negative price. As a result, enterprises will try to get as high a wage fund as possible in order to create hidden reserves. These can be used to overfulfil the planned net product by cutting material costs. This pressure from the enterprises, due to the incentive system used, will, undoubtedly, be reflected in methods of production approved by the planners.

Then, at the stage of plan fulfilment, the actual performance will tend to deviate from planned tasks because enterprises will try to take advantage of existing reserves in approved methods of production. They will try to maximize the net product by substituting labor for material means of production within the limits of the approved wage fund. The consequences of this conflict of interests cannot be resolved satisfactorily within the framework of an incentive system based on net product.

B. What to produce. Let us now discuss the consequences of net product incentives on "what to produce".

The magnitude of net product for 100 zlotys of gross production differs in various branches of production (e.g. it is relatively great in mining and relatively small in the electric power industry) and-- what is especially important--it differs also for various products within a given branch of industry or enterprise. For example, the relative share of net product in gross production is greater in the case of hand painted porcelain than plain or regular porcelain. This fact creates certain problems for economic policy.

1) The different share of net product for 100 zlotys of gross production in various branches of industry makes it necessary to apply bonuses differentiated by branches or, in the case of equal bonuses, the use of a properly differentiated turnover tax. These are necessary if we want to avoid unjustified differences in the level of bonuses received by different branches of industry.

2) The different share of net product in various goods makes necessary the use of a turnover tax differentiated by products. Otherwise there will be a tendency to deviate from the planned product mix.

Summing up: the properly differentiated turnover tax makes possible the use of price policy as an effective tool for stimulating enterprises to produce in accordance with the tasks prescribed for them in the national plan.

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Incentives based on net product do not invalidate the argument put forward in the previous Section that in Direct Economic Calculation there is a need for a system of two operational prices--one for buyers and one for sellers--due to the external character of the methods of

production. Since our discussion of the margin of tolerance existing around every operational price also applies to the incentive system based on net product, we do not have to repeat our previous arguments here.

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We can formulate the main conclusions of our analysis in the following ways:

1) The operational price and incentive systems always have to be analysed together and not in isolation. The latter, however, is the prevailing practice. For every incentive system there is an appropriate price system, and changes in one will always have to be accompanied by compensating changes in the other. Otherwise, there will be a contradiction between prices and incentives used, a contradiction from the point of view of their influence on plan fulfilment.

2) In Direct Economic Calculation there is no price or incentive system per se optimal. We can find, however, an optimal combination: that combination which serves best plan fulfilment and which precludes price or incentive stimuli not in harmony with planned tasks.

3) The "price consequences" of any incentive system or of contemplated changes in it (i.e. changes in rules and/or intensity of incentives) always have to be carefully analysed to avoid their possible negative effect on plan fulfilment. And vice versa, any price changes have to be analysed from the point of view of their impact on the functioning of the given incentive system.

4) The choice of any given incentive system determines the system of operational prices which can be effectively used in conjunction with it and vice versa. Thus, as we have shown in Section 1, the effects of average cost-plus pricing operate in contradiction to the stimuli of gross product incentives. This mutual interdependence of the incentive and operational price systems limits the CPB's freedom of action in making both price and incentive policy.

FOOTNOTES

1/ The buyers are here, of course, the state enterprises and not the individual consumers. We are concerned in this paper with the so called "operational prices" only, which are used within the socialist sector for stimulating producers-sellers and buyers- to plan fulfilment. In the socialist economy there are also so called "programming prices" used for plant construction and so called "consumers' prices", which have to equalise supply and demand, and at the same time, to influence consumption patterns in the direction socially desirable (as seen by the Central Planning Board).

2/ In practice, gross production incentives are usually suplemented by incentives to economise inputs per unit of output, e.g. in the form of bonuses for diminishing unit cost. In this paper, however, we do not analise the "mixed" incentive systems with bonuses for many indices, as e.g. level of gross production, diminishing the unit costs, raising quality of products, introducing technical progress, etc.

3/ The method of economic calculation applied in existing socialist countries we call Direct Economic Calculation (DEC) because in this type of calculation one computes and co-ordinates directly the physical magnitudes. E.g. the supply of steel which is a function of existing capacities and other material and technical conditions, with demand for steel, which is also the result of certain technical calculation (inputs norms multiplied by volume of production) when desired final products are defined. Three basic elements are co-ordinated directly in this type of calculation: 1) existing material and human resources, 2) desired final products which represent preferences of the CPB and 3) technical coefficients of production. This type of calculation is known and described as material balances and/or input-output analysis.

In DEC we have prices, wages, etc. but they do not play an active, balancing role: in DEC the supply and demand of steel is not--ceteris paribus--a result of the price of steel; demand for labor is not the function of the wage level, and prices and wages do not fulfill the equilibrium conditions. In DEC there is--as a rule--a direct co-ordinator

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(balancing) of physical quantities without active use i.e. determining supply and demand, of value categories such as prices, wages, rate of interest.

This is obvious enough and generally recognized. Unfortunately the same cannot be said about conclusions generating from it as well as of developing the model of economic process where the magnitudes expressed in monetary terms are not used as the basis for economic choice but rather as the way of representing the inputs and outputs when the aims and methods of production are given.

4/ See A. Wakar, J.G. Zieliński, The Direct Economic Calculation, ("Ekonomista", Nr. 1, 1961), and J.G. Zieliński, Economic Calculation in a Socialist Economy, Panstwowe Wydawnictwo Naukowe, Warsaw 161, pp.225.

5/ One of the most fundamental feature of DEC is the external character of methods of production. Within the framework of DEC there is no mechanism f economic verification of technical coefficients (methods of production). The "fundamental assumption" of input-output analysis (and the same, of course, applies to material balances) is that required input per unit of output is technologically determined and can be consider as a structural constant. When we treat the technical input coefficients as independently given parameters, we assume that they are independent of factor prices and eliminate from this model of general equilibrium the substitution principle of marginal productivity theory. This can be considered its fundamental weakness (Leontief).

It means that the methods of production used in DEC are external to the system. They are not verified within the system, so that the best methods of producing a given output cannot be chosen, but are taken from outside the system and constitute unverified data. They are so called "traditional" methods of production, i.e. methods of production used in the past, or so called "advanced" methods of production, usually taken from the practice of more advanced countries and used as data for plan building by the country under consideration.

6/ Of course, the consumers' "sovereignty" is abolished here. But let us assume for the moment that differences in price ratios between, say, Poland and the U.S. as shown in the table below, are the result of real differences in marginal cost ratios. Would it not be risky to say that

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one or the other structure of consumption, resulting, _ceteris paribus_, from the given price structure, is better than the other? If there are no objective criteria to determine what strcuture of consumption is better than the other, the CPB has no reason to be much worried that because of random elements in the consumer price structure it is doing any harm. Moreover, in many cases it has definite opinions about the desired structure (and volume) of consumption, and price policy allows it to achieve them without limiting the freedom of consumers' choice.

	Retail price ratios (1961)	
	U.S.A.	Poland
ready-made suit -- one lb. of ham	50 : 1	60 : 1
can of sardines -- one telephone call	2 : 1	40 : 1
cup of coffee -- tram ticket	0.5 : 1	10 : 1
drip-dry shirt -- scientific book	1 : 1	18 : 1
"helanca" socks -- cinema ticket	1 : 1	4 : 1

7/ See A. Waker, J. Beksiak, The Consumers' Goods Prices ("Studies in the Theory of Socialist Economy" [A. Waker, ed.] Vol. II, Central School of Planning and Statistics, Warsaw, 1962), and J.G. Zieliński, _op. cit._ Chapters IV) The Place of the Consumer is A Planned Economy) and V (Remarks on Market and Planning). Both works are Polish.