DECENTRALIZATION AND FINANCIAL EQUILIBRIUM IN A CENTRALLY PLANNED ECONOMY (CPE)

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SUMMARY

This paper deals with the fundamental problem of socialist economies: how to ensure compatibility of financial equilibrium with efficient allocation of resources in a decentralized decision-making system. In order to ensure rational allocation of resources in a decentralized system, it is indispensable to apply marginal pricing of labour, materials and foreign currencies. In order to ensure financial equilibrium on the consumer market the financial system operates with average cost pricing rules, thus violating efficiency rules. Trying to solve this dilemma the constructors of economic reforms of the system give priority to financial equilibrium conditions by using average cost prices and exchange rates and correct them by subsidies differentiated for branches. This leads to bargaining processes and to the neglect of efficiency rules. The author proposes instead the use of a uniform subsidy of the central budget and presents variants of this systemic solution: in the form of a uniform subsidy to wage earners or in the form of a uniform subsidy to enterprises. The formalized analysis is included in the appendix.

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1. INTRODUCTION

There is a general consensus among eastern economists, that in order to ensure higher efficiency it is necessary to decentralize the system of management--at least in some spheres of economic decision-making. Decentralization cannot simply mean "partitioning" of central decisions by delegating decision-making from higher levels to lower decision-making levels. Decentralized decisions at the level of enterprises must be taken up in a general systemic framework ensuring overall optimization of the economy. Decentralization must be based on the concept of decomposition.[1] The indirect management system[2] must take the form of a financial system internally consistent with the system of central strategic planning. Such a system must--among others--fulfil the following conditions:

- the profit maximization criterion becomes the basic success indicator at the enterprise level;

[1] Kantorovich, L.V. 1960. Ekonomicheskij Raschet Nailuchschevo Ispol'-ovaniya Resursov (Akademia Nauk SSR, Moskva)

[2] W. Trzeciakowski. 1978. Indirect Management in a Centrally Planned Economy, North Holland. Amsterdam-New York-Oxford.

- the profit is measured in prices for producers, covering marginal costs of the least efficient producer (plus eventual scarcity rents)
- the foreign trade conversion rates (exchange rates) encourage all efficient exporters, hence these rates are marginal rates.

However, in all functioning socialist management systems--average--not marginal--prices and rates are applied, as well in the s.c. traditional management systems, as also in the s.c. "economic reforms".

In the *traditional system of central obligatory directives* it is assumed that inefficient--in terms of average prices--enterprises are subsidized. Equally it is assumed, that inefficient --in terms of average exchange rates--exporters are subsidized. This traditional decision-making system could be defended--at least in theory--as leading potentially to efficient solutions, assuming that:

- the central obligatory directives were optimal,
- the subsidies were fixed at the optimal level.

Needless to say, that none of the above assumptions holds in practice due to information constraints at the central level. In practice directives are the result of bargaining for lower plan targets, production subsidies--of bargaining for higher subsidies for producers, and export subsidies--of bargaining for higher subsidies for exporters.

Within the framework of *economic reforms* in their actual forms (as applied in Hungary and projected in Poland), the systemic solutions are equally questionable, not only on practical, but also on theoretical grounds, as:

- if detailed central directives are abolished, they cannot be treated anymore as instruments of overall optimization (as in the former, traditional system);
- if average cost pricing rules are applied, around half of the producers becomes unprofitable, hence is either eliminated or subsidized; in the first case the economy faces unemployment and unused productive capacities, in the

second case the central budget faces bargaining procedures of thousands of enterprises, asking for subsidies covering all their inefficiencies:

- if average foreign trade conversion coefficients are applied, about half of the exports becomes unprofitable; either this leads to harmful import restrictions, damaging the economy, or to export subsidies with all the disruptive consequences (enterprises instead of improving foreign resources or decreasing domestic costs are bargaining for maximum budgetary subsidies).

These weaknesses are a characteristic feature as well of the Hungarian, as of the Polish reform. The crux of the problem lies in the incompatibility of the traditional financial system, aimed at ensuring equilibrium of supply and demand on the consumers' market, and the systemic rules of rational allocation of resources.

Is there an explanation for the conceptual and institutional weaknesses of these reforms? Is there a positive solution to the problem? In my opinion there is a positive answer to both questions.

2. THE HISTORICAL EXPLANATION OF THE USE OF AVERAGE COST PRICING

What are the reasons why marginal prices and rates have been neglected, whereas average pricing rules have dominated and still dominate?

The function of allocation of resources has been always performed within the system of planning in all centrally planned economies. This allocation function has been performed autonomously with no direct connections with the financial system. This latter system (including the pricing system) was looked upon solely as an instrument of financial equilibrium. Prices were supposed not to interfere actively with the allocative decisions of planners. This was achieved by using special corrective levies and subsidies applied automatically by the central budget in order to neutralize losses or profits. Hence, the

financial system played the role of an "obedient servant" of the planning system. Pricing policies had nothing to do with the allocation of resources, as price formation was dictated exclusively by considerations of financial equilibrium. Therefore the financial system was constructed in accordance with average cost-plus rules and interested solely with the distribution of financial means. However, in addition to the historical explanation, there exists another, more important reason for the exclusive reliance on average cost-plus pricing rules: the use of marginal pricing within the existing financial system would conflict with financial equilibrium and induce inflationary tendencies.

3. RATIONAL ALLOCATION *versus* FINANCIAL EQUILIBRIUM IN EXISTING DECENTRALIZED DECISION-MAKING SYSTEMS

In a decentralized socialist economy, determining centrally and autonomously the rate of investment there is no systemic guarantee that marginal pricing and financial equilibrium are mutually consistent.

Wages are the main source of the purchasing power of the population and are the main component of domestic costs. The total wage bill, composed of wages in enterprises producing at low costs and in enterprises producing at high costs is close to the value of total production priced in average cost prices. Hence, the demand of the population, generated mainly by wages would cover supply, if production were priced in average cost prices, *not* marginal prices. On the other hand, the rules of rational allocation of resources in a decentralized system require that production be priced in marginal cost prices. However, in this latter case, the purchasing power of the population would be too small to cover supply. Producers' prices fixed at the marginal level contain accumulation margins that in total may be much bigger than the overall needs for investments and collective consumption. This is the real argument against the introduction of marginal pricing rules in socialist economies.

Why is this problem so acute in socialist economies and why it does not appear in that form in capitalist market economies? Contrary to market economies, there exist in centrally

planned economies a huge dispersion between average and marginal costs. This dispersion results from the lack of profit oriented investment criteria in socialist economies. The allocation of investment funds has been for decades determined by the central planner on the basis of various criteria not connected with profit maximization. This resulted in a very strong differentiation of efficiency indicators in various enterprises within similar branches, as well as in enterprises belonging to various branches. The most striking illustration of this phenomenon is the very high dispersion of foreign trade efficiency indicators for various export activities. This is evidently not the case in market economies. Hence, applying marginal cost pricing rules would result in socialist economies in huge accumulation margins, which, as a rule, would surpass by far the expenditures needed for investments and collective consumption. This type of a surplus does not appear in market economies, investments are financed from private enterprises' profits and collective consumption is covered by taxes.

Another reason for disrupting equilibrium on the consumers' market is the lack of continuity in the trend of the share of accumulation in national income. Abrupt changes in the rate of investments occurring in consecutive planning periods, and equally changes in the level of collective consumption are frequent. Hence, the socialist reformers have opted, and still opt, for average cost-plus pricing rules in order to keep financial equilibrium on the consumers' market at the expense of efficiency: the use of differentiated "equalization subsidies" in production and exports leads to bargaining procedures. As a result the attention of managers in enterprises is focused on privileges (getting higher subsidies), instead of on objective achievements (lowering costs and improving prices).

4. RATIONAL ALLOCATION *and* FINANCIAL EQUILIBRIUM IN DECENTRALIZED SYSTEMS

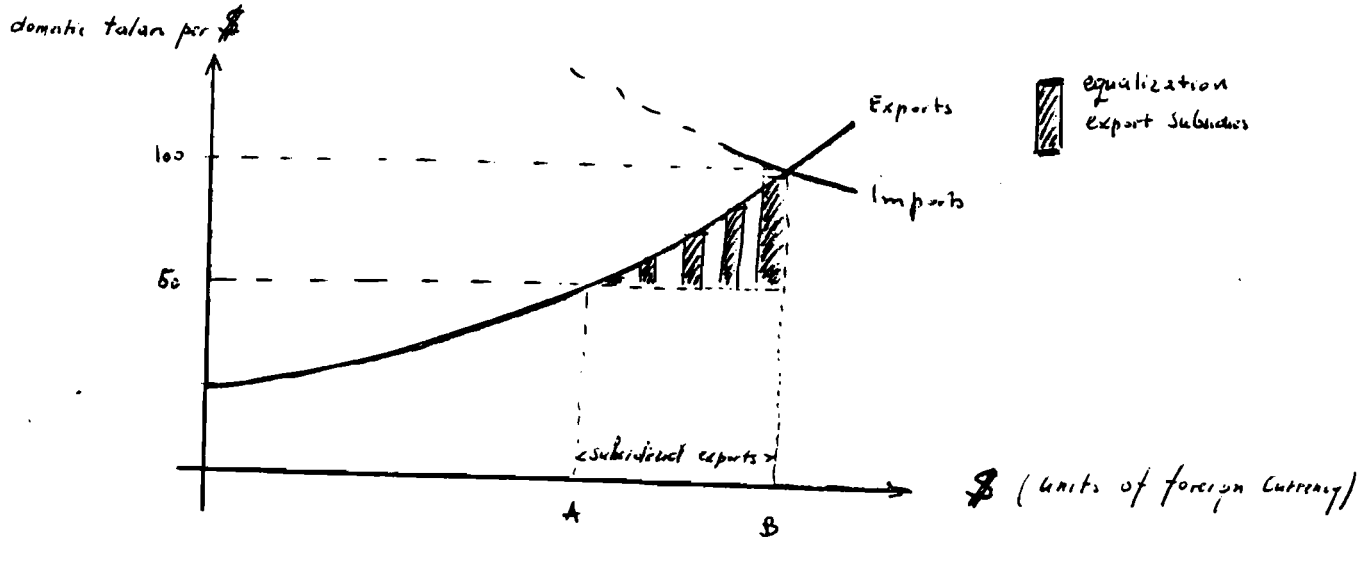
A. Marginal Pricing and Subsidy to Wages: The change over from a system of centralized directive planning into a system of indirect management based on marginal pricing requires the

introduction of a new instrument of central regulation of overall demand. A kind of "negative tax" for wages is what is needed. This new type of a subsidy is aimed at compensating this part of accumulation contained in marginal prices which exceeds the needs of a socialist society. This specific subsidy must be granted by the central budget. It cannot be born as an expenditure of enterprises, treated as an element of costs (otherwise a spiral of costs and prices would again destroy market equilibrium, inducing inflationary tendencies). In the course of time, when the discrepancy between marginal and average costs diminishes, it is possible that the subsidy may become negative, taking the form of a normal (positive) tax.

B. Average Cost Pricing and Subsidy to Enterprises: Experience proves that there exists a definite hostility towards marginal cost pricing and an attachment to average cost pricing. Besides, there is an intuitive fear, that marginal pricing would induce inflationary processes, which, once started, would then be difficult to stop.

Assuming that these convictions of the planners are given, still it would be possible to eliminate the existing incompatibility of efficiency considerations and equilibrium considerations by introducing a uniform subsidy to enterprises aimed at correcting the rates of substitution of resources from those based on average costs into those based on marginal costs.

Let us illustrate it with the example taken from reality. The export curve of an existing economy has the following shape:



Let the equilibrium marginal rates of exchange be 100 talars per dollar (unit of foreign currency). Let the average cost of earning $1 be 50 talars. In accordance with the rules of rational allocation of resources imported and exportable materials should be priced at 100 talars per dollar.

However, the actual domestic pricing of raw materials and imported materials is based on the average exchange rate, hence, materials are priced domestically at 50 talars per dollar. In order to maintain the necessary value of exports the central planner applies equalization subsidies differentiated for branches. (Without the subsidies the unprofitable exports would disappear, leading to a decrease of exports from B to A.) This solution has the following weaknesses:

- it leads to bargaining for privileges: the central planner is not capable to control effectively the actual level of costs; the exporting enterprise can switch domestic overhead costs to export production, thus increasing the magnitude of the export subsidy covering costs;
- it focuses the attention of the manager of the enterprise on increasing the subsidy (which is relatively easy) instead of concentrating his efforts on decreasing costs or increasing prices received abroad--thus causing inefficiency;
- it destroys the rationality of economic calculus by differentiating the domestic pricing of inputs and outputs. This distorts the evaluation of profitability and may even lead to promoting the s.c. "negative exports", where the foreign earnings for the product do not cover the foreign currency value of inputs.[3]

[3]Let the normative use of input be 1 kg of rolled iron valued $0.80 and let the product be worth $1. Let the domestic producer use 2 kg of rolled iron for the same final product. In terms of foreign currency calculus the resulting loss is $0.60 (not considering processing costs) 2×0.80 dollars+processing costs > $1 In terms of domestic currency: inputs are priced 50talars/dollar, hence 2×0.80×50 = 80 talars. Outputs are priced 50 talars/dollar +50 talars/subsidy = 100 talars/$ Hence for bringing effective losses ($0.60) the producer gets a profit (neglecting processing costs).

Therefore, in order to correct the rates of substitution in accordance with marginal pricing (100:1) it is possible to grant a 50% wage subsidy to the enterprise. This will change the distorted ratio (50:1) into the correct ratio 50:1/2 = 100:1. In other words, an adequate share of the domestic cost (in the above example 50%) would be covered by the central budget, hence, the socialist enterprise would consider only the remaining costs in evaluating the profitability of a given activity.

The essence of this alternative proposal is to substitute a uniform, parametrically determined subsidy, acting in full conformity with the rules of economic calculus for non-parametric, differentiated equalization subsidies, incompatible with the requirements for efficiency.

5. POSTULATES

1. In order to ensure rational allocation of resources in a system of decentralized decision-making, it is indispensable to apply marginal pricing of labour, materials and foreign currencies. Prices operating within the financial system should express the marginal rates of substitution of these resources (by being equal to the relations of their marginal costs).
2. The financial system must ensure financial equilibrium on the consumers' market.
3. From postulates 1 and 2 results the necessity to introduce a new instrument of the financial system in the form of a uniform subsidy of the central budget.
4. If prices and rates of exchange are determined at the level of marginal costs it is necessary to subsidize demand. The most suitable form seems to be *a uniform subsidy to wage earners* proportional to wages, or a subsidy to all consumer goods.
5. If prices and rates of exchange are determined at the level of average costs it is possible to apply *a uniform subsidy to enterprises* in relation to labour costs. This subsidy reduces the level of enterprises' costs and brings it to the adequate rate of substitution, as determined by the marginal costs.
6. In any case the subsidy must be paid by the central budget, thus avoiding the danger of inducing an inflationary spiral of

increase of costs and prices.

7. The subsidy must be fixed uniformly as a central parameter in order to avoid bargaining. This does not exclude the use of additional differentiation of subsidies to wages, necessitated by social incomes policy considerations.

6. APPENDIX: MODEL ANALYSIS OF THE PROBLEM: EFFICIENCY AND FINANCIAL EQUILIBRIUM

1. Shadow Prices and Retail Prices

Let us denote:

l_k - shadow price of commodity k

M^r - marginal exchange rate (shadow price of currency of the foreign market r)

V_k^d - the retail price[4] of commodity or service k on the domestic market of consumer goods

P_k^K - planned volume of individual consumption of commodity k (the use of commodity k for investment and collective consumption is not included in P_k^K)

R - labour cost in the enterprise i

B - the difference between that part of the wage fund which does not correspond to the production and service activities (pensions, administrative wages, etc.) and that part of consumers' income which is not spent on individual consumption (savings, taxes, ect.)

The condition for overall equilibrium on the market of the consumer goods can be written as:

$$\sum_k V_k^d P_k^K = \sum_i R + B \qquad (1)$$

The retail prices V_k^d must insure not only overall equilibrium (1) but also the equality of the supply of and demand for each commodity or service on the market of consumer goods.

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[4] For the sake of simplicity, retail and wholesale prices of consumer goods are assumed to be equal.

Let us now denote by β the relative level of the shadow prices as compared with the retail prices (the ratio of the individual consumption bundle priced in shadow prices to the same bundle priced in retail prices):

$$\beta = \frac{\sum_k l_k P_k^K}{\sum_k V_k^d P_k^K} \tag{2}$$

Using (1) β can be written in the form:

$$\beta = \frac{\sum_k l_k P_k^K}{\sum_i R + B} \tag{3}$$

β depends on B and the parameters of the problem of current optimization of the national economy. It does not depend on the preferences of consumers. There is no reason for β to be equal to unity in the planned economy.[5] The rate of accumulation is a decision variable and β depends on that rate.

V_k^d depends on the preferences of consumers. However, it does not mean that the structure of the individual consumption is determined according to the consumers' preferences. Assuming this additionally, i.e., assuming that the planned values of P_k^K maximize the consumers' utility function at given $\sum_i R$, investment and collective consumption, one can derive (for B independent of P_k^K) the principle of mutual proportionality of the shadow prices and the equilibrium retail prices.[6] In this principle, the coefficient of the proportionality equals β:

$$l_k = \beta V_k^d \tag{4}$$

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[5] In the perfect free market economy in the absence of any taxes or subsidies, except for income tax - $V_k^d = l_k$ and, therefore $\beta = 1$.

[6] Mycielski J., 1965. Ceny Kalkulacyjne, ceny detoliczne, Kursy dewizowe. Gospodarka Planowa No. 12/1965, Warsaw

2. The Principles of the Proposed Financial System

If the financial system has to be the basis for the current optimization of the national economy according to the concept of profit maximization, one must postulate the equivalence of the accounting profit and the financial objective function to be maximized in each enterprise. Hence, the financial objective function should be equal to the accounting profit multiplied by a certain positive constant a, minus a certain constant J.

Let p_k denote the difference between the output and input of commodity k in the enterprise. In other words p_k is the net output of commodity k in case $p_k > 0$, and the net input in case $p_k < 0$.

The basic financial objective function of the enterprise can be written:

$$a\left(\sum_k l_k p_k - R\right) - J \tag{5}$$

Let us now write (5) using prices V_k and exchange rates N^r of the financial system (in the sphere of production), assuming the mutual proportionality of these financial system prices to shadow prices:

$$V_k = b l_k \quad \text{for all commodities} \tag{6}$$

$$N^r = b M^r \quad \text{for all foreign markets} \tag{7}$$

The financial objective function (5) can now be written:

$$\frac{a}{b} \sum_k V_k p_k - aR - J \tag{8}$$

If the enterprise is exporting to or importing from the foreign market r the one of the p_k denotes the foreign receipts or expenditures, and the corresponding V_k should be understood as the exchange rate N^r.

Let Z^{FB} denote the gross financial profit of the enterprise, i.e., the difference between the value of outputs priced in V_k

and the value of inputs priced similarly, and the direct labour cost:

$$z^{FB} = \sum_k V_k p_k - \sum_k V S_k - R \tag{9}$$

where S_k = inputs.

Let us now introduce the following magnitudes:

$$S^D = \left(\frac{a}{b} - 1\right)\left(\sum_k V_k p_k - \sum_k V_k S_k\right) \tag{10}$$

$$S^R = (1-a)\,R \tag{11}$$

Now the basic financial objective function (8) can be written in the form of the net financial profit Z^{FN}:

$$Z^{FN} = Z^{FB} + S^D + S^R + J \tag{12}$$

Economic decisions concerning current management should be made at particular enterprises according to the principle of maximization of Z^{FN}. The central planning authority has to change the prices V_k and exchange rates N^r in such a way as to assume the fulfillment of the balances of all commodities and of foreign trade with all foreign markets. Of course, only a part of Z^{FN} should be left at the disposal of the enterprise; the remaining part of Z^{FN} should be transferred to the national budget in the form of an income tax.

The tax (or subsidy) S^D is proportional to value added.
The tax (or subsidy) S^R is proportional to labour cost.
Both taxes (or subsidies) are of a price-forming nature: they influence the equilibrium values of V_k and N^r.
The tax (or subsidy) J does not depend on the decision variables of current management; it may depend e.g., on investment decision variables.

In a centrally planned economy retail prices V_k^d may differ from the prices V_k paid to the producers. The difference is a

tax operating in the sphere of individual consumption; for commodity k this tax equals:

$$S_k^K = \left(V_k^d - V_k\right) P_k^K \tag{13}$$

The sum of taxes S_k^K will be denoted by S^K

$$S^K = \sum_k S_k^K \tag{14}$$

Using (2), (6) and (13) one obtains

$$S^K = (1-\beta b)\sum_k V_k^d P_k^K = \left(\frac{1}{\beta b} - 1\right)\sum_k V_k P_k^K \tag{15}$$

If the principle (4) is accepted, one obtains from (6) the mutual proportionality of the system of retail prices and the system of prices in the sphere of production:

$$V_k = \beta b V_k^d \tag{16}$$

Moreover, formula (13) then gives:

$$S_k^K = (1-\beta b) V_k^d P_k^K = \left(\frac{1}{\beta b} - 1\right) V_k P_k^K \tag{17}$$

i.e., the uniform rate of taxation for all consumer goods.

Summing up:

The financial equilibrium consists:

- in the equilibrium in the sphere of individual consumption and is reached by maintaining the retail prices at a proper level (dependent on the required level of accumulation) and by using taxes S_k^K.
- in the equilibrium of particular enterprises in the sphere of production.

3. Variants of the Financial System

In the proposed financial system with arbitrarily determined values of the constants a and b, all three taxes S^D, S^R and S^K differ from zero. Moreover, it follows from (10), (11) and (15) that it is not possible, in general, to determine the values of a and b so as to assure the disappearance of all these taxes; this would be possible only if $\beta=1$ (then $a=b=1$).

It can be shown, however, that by an appropriate choice of values of a and b it is possible to make two of the three taxes S^D, S^R and S^K vanish. This can be done in three ways.

Variant 1.

If $a=b=1$ then $S^D=S^R=0$ and

$$S^K = (1-\beta)\sum_k V_k^d p_k^K = \left(\frac{1}{\beta} - 1\right)\sum_k V_k p_k^K \tag{18}$$

The system of prices V_k and exchange rate N^r is identical to the system of shadow prices and marginal exchange rates, and the gross financial profit and the net financial profit (for $J=0$) are identical to accounting profit. If principle (4) is accepted, the retail prices V_k^d and taxes S_k^K are:

$$V_k^d = \frac{1}{\beta} V_k \tag{19}$$

$$S_k^K = (1-\beta) V_k^d p_k^K = \left(\frac{1}{\beta} - 1\right) V_k p_k^K \tag{20}$$

for all consumer goods.

Variant 2.

If $a=1$ and $b=\frac{1}{\beta}$ then $S^D=S^K=0$ and

$$S^D = \left(\beta - 1\right)\left(\sum_k V_k p_k - \sum_k V_k s_k\right) \tag{21}$$

The prices V_k and exchange rates N^r equal the shadow prices and marginal exchange rates, respectively, divided by β: the

net financial profit (for J=0) equals the accounting profit. If principle (4) is accepted, the retail prices V_k^d equal the prices V_k (there is only one price system in the national economy) and the taxes S_k^K all vanish.

$$V_k^d = V_k \tag{22}$$

$$S_k^K = 0 \tag{23}$$

for all consumer goods.

Variant 3.

If $a=b=\frac{1}{\beta}$, then $S^D=S^K=0$ and

$$S^R = \left(1-\frac{1}{\beta}\right)R \tag{24}$$

The prices V_k, exchange rates N^r and net financial profit (for J=0) equal the shadow prices, marginal exchange rates and accounting profit, respectively divided by β. If principle (4) is accepted, the retail prices V_k^d equal the prices V_k (there is only one price system in the national economy) and the taxes S_k^K all vanish.

$$V_k^d = V_k \tag{25}$$

$$S_k^K = 0 \tag{26}$$

for all consumer goods.

When $\beta < 1$ then as follows from (18), (21) and (24) S^K in variant 1, S^D in variant 2 and S^R in variant 3 are taxes if, however, $\beta > 1$, then they are subsidies (with the opposite sign).