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Adjustment to price and quantity signals in a socialist economy

János Kornai

I.

INTRODUCTION (1)

In this study I try to answer the question: what is the impact of prices and of quantity signals on production in a socialist economy?

The approach is basically *not* prescriptive-normative, but descriptive-positive. The question to be dealt with is, what *is* there in the socialist economy and not what *should be* there. Only at the end of the study are a few short references made to certain prospects for change which, in the author's view, are desirable.

There are considerable differences between the various economic mechanisms of the Eastern European socialist countries. Besides, the mechanisms of individual countries undergo important changes over time. This study takes no account of differences between countries and between historical periods. It concentrates on what is common and constant, from the point of view of the subject investigated, in the economic systems of the Eastern European socialist countries. In other words, it treats a 'stylized' theoretical model of an Eastern European economy, functioning with the traditional economic mechanism, prior to any reforms.

Two books serve as background for this study. One is the author's work: *Economics of Shortage* (Kornai, 1980). The other is a collection of studies edited by the author and Béla Martos, which contains works by the author and by several other mathematical economists: its title is *Non-Price Control* (Kornai-Martos, 1981). The present study is a short summary of some ideas; the two books contain more-detailed explanations. Here we shall develop the train of thought only in verbal form; related mathematical models are to be found in the two books.

II.

HARD AND SOFT BUDGET CONSTRAINTS

One of the axiomatic starting-points of standard microeconomic theory is that the decision-maker can make only a decision that will not exceed his own budget constraint (see Figure 1). This axiom is considered self-evident not only in orthodox Walrasian microeconomics, but also in the new school that has branched from it; disequilibrium theory. Some members of this school prefer the name 'non-Walrasian economics'. The names of Clower, Leijonhufvud, Barro, Grossman, Benassy and Malinvaud mark this current. We shall be referring to the school by the words 'disequilibrium theory'. For

quantity bought
of product A

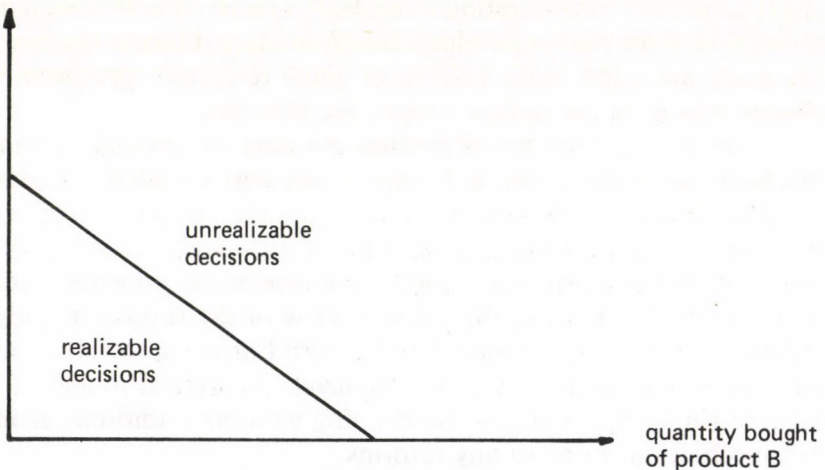


Figure 1. Hard budget constraint.

illustration let me quote the words of Clower (1965), the 'founding father' of disequilibrium theory: «... no transactor consciously plans to purchase units of any commodity without at the same time planning to finance the purchase either from profit receipts or from the sale of units of some other commodity...» The existence of the budget constraint (2) «may indeed be regarded as a fundamental convention of economic science, akin in all relevant respects to such

basic ideas of physical science as the second law of thermodynamics... unless we presuppose something of the sort, we have absolutely nothing upon which to build an account of individual decision processes.»

Is the existence of the budget constraint really self-evident? Is it really such a *general* and *absolute* law as are the basic laws of thermodynamics? And is it true that, if we rejected this axiom, we would have absolutely nothing upon which to build description and explanation of the behaviour of economic decision makers? In order to be able to answer these questions, we must try to take a fresh view of the meaning of the budget constraint.

In the usual way, we shall start from the household decision. The budget constraint is not just an *ex post* accounting formula for the household. It is an *ex ante behavioural constraint*. The consumer is compelled to take into account that he can pay only for such expenditure as he can finance, for nobody will pay the bill instead of him. This awareness will constrain his buying intentions.

Both traditional Walrasian microeconomics and the disequilibrium theories unhesitatingly extend the budget constraint axiom to the firm. Now this is doubtful, even in regard to the large corporations of modern capitalisms, but we shall revert to that later. Let us first turn our attention to the publically-owned firm of the socialist economy. This also accounts for its receipts and expenditures in money; it pays tax and takes out credit; it pays back its debts with interest, and so on. This may give the impression that the budget constraint works. All the more so since in the socialist countries the so-called 'principle of independent accounts' is an officially declared principle, according to which the firms has to cover its expenditures from its proceeds. In my view, however — I use the first person singular for I differ on this question from several of my colleagues — this is something of an illusion. In fact, the budget constraint is expandable, or 'soft', as is shown in Figure 2.

Let us assume that the proceeds of the firm, after payment of the obligatory taxes, do not cover its production costs. Even if there is a sizable and lasting loss, it will not bring financial catastrophe to the firm. The state will bail it out. Various means are available. The use of even one of them may be enough to overcome the difficulties, though it often happens that several are combined.

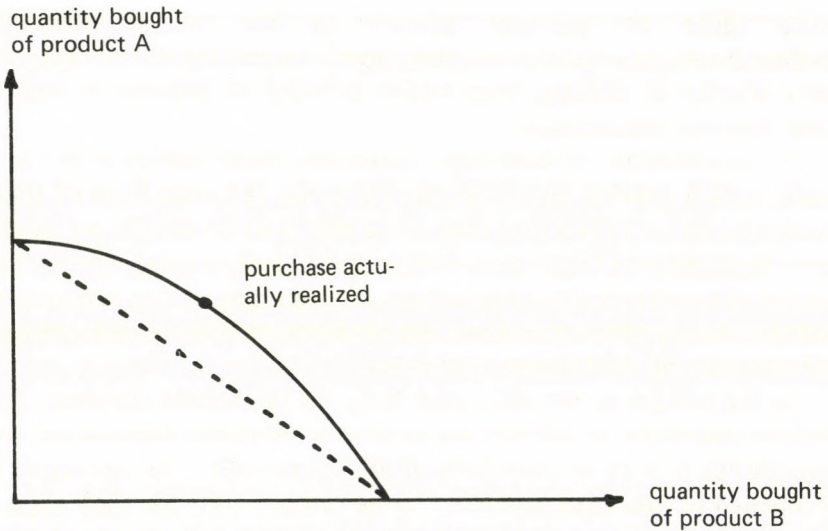


Figure 2. Soft budget constraint.

1. If the product of the firm has a centrally-prescribed price, the firm will be allowed to adjust *the selling price to cover actual production costs*. This is sometimes done directly by an unmasked rise in the price of the product, which goes on being manufactured. In other cases indirect, disguised forms are applied; manufacture of the old product ceases and it is replaced by another product, perhaps slightly different, but sold at a higher price.

2. The firm is given a *state subsidy*. This may be *ad hoc*, or regular and continuous. It may serve to cover the loss on a certain product suffered by all the firms manufacturing it. Or it may compensate for the total loss suffered by a single firm. Often a particular investment programme gets central support, either while it is under way, or subsequently as a compensation for losses.

3. The firm is granted *tax exemption*. Tax regulations 'tailor-made' for a firm or industry are introduced, or due payment is allowed to be postponed.

To illustrate the use of 2. and 3. we give Hungarian figures. The substitutes granted to firms under various headings in 1979 amounted to 37 per cent of the sums taken from state-owned firms also

under various headings. That is, extremely large-scale *redistribution* took place among state-owned firms.

4. The firm is granted *soft credit*. The bank often gives credit not to the financially strongest firm, which is regularly profitable, but to a financially unsound firm which cannot guarantee even repayment. Where there are financial difficulties, a rescheduling of repayment may follow; due instalments may be postponed. It can also happen that the buying firm forces the selling firm to grant it credit by arbitrarily postponing payment.

Means 1. shifts the loss of the firm on to the buyer; means 2. and 3. on to the state; and means 4. on to the banking system and the selling firm.

The effectiveness of the budget constraint, or its power to bind the decision-maker, belongs to the set of phenomena that we call *expectations*. *The more the firm can count on being bailed out if it has suffered losses, the softer the budget constraint will become. The hard budget constraint is in fact an ex ante behavioural constraint. As opposed to this, the soft budget constraint does not act as an ex ante behavioural constraint. It does not effectively constrain the set of decision alternatives facing the decision-maker, but its role is reduced to an ex post book-keeping/accounting formula.*

It follows from the preceding that it may not be only the two extreme cases, an 'absolute' soft or an 'absolute' hard constraint, that exist. There may be a whole range of hardness and softness between these two extremes. Standard microeconomics which assumes — according to this terminology — the existence of the absolutely hard budget constraint, is concerned not with a general but a *special* theory. The position on this scale of each segment of any economic system is empirically observable and, with the aid of adequate indicators, measurable. The softness or hardness of the budget constraint is manifest mainly in two groups of phenomena.

One group concerns the *survival* of the firm. Does permanent loss lead to bankruptcy, that is, to the demise of the firm? Or will the firm survive, with the help of the state? In case of a hard budget constraint, profit or loss becomes indeed a question of life and death.

The other group of phenomena concerns the *growth* of the firm. What correlation is there, on the hand, between the short- and long-term profitability of the firm and, on the other hand, between its development and expansion? Is the allocation of investment funds connected to profitability? Or is it independent of it?

By applying these two measures, the statement can be made that *in the Eastern European socialist countries the budget constraint of the firm is rather soft*. This is not simply a fiscal or monetary issue; it is not the consequence of too much indulgence on the part of the minister of finance or of the governor of the state central bank. It has a much deeper cause; *the paternalistic relationship between state and firm*. The state considers the firm as its 'own child'. It cannot and does not want to leave the firm in trouble, even if it got into trouble through its own fault. And the state holds intervention to be even more justified if difficulties for the firm have been caused by external conditions beyond its control, as where the terms of foreign trade have become unfavourable. And who could determine exactly the limits between 'external' conditions and the firm's own 'internal' shortcomings, its failure to adjust quickly and flexibly enough to changed conditions? The attitude of the firm is ambivalent; it kicks against patronage while it also wants the state's help. It is reassuring for the firm to know that the state will almost automatically compensate it for any loss.

While the preceding analysis holds in general for any socialist economy, it must be emphasized that the degree of hardness or softness is not uniform.

— There are differences between countries. As a consequence of the decentralisation reforms, the budget constraint may be somewhat harder in Hungary than in most other socialist countries. The position of Yugoslavia is also different from that of the other socialist countries.

— There are differences between sectors. In sectors enjoying priority in central plans, the constraint is softer. In sectors permanently neglected, it is harder.

— There are differences according to the form of ownership. In state-owned firms the constraint is softer, while in co-operatives it is somewhat harder.

— There are differences according to the size of the firm. The budget constraint is relatively softer for big, and particularly for giant firms, while it is harder for smaller firms. It must be added that in socialist countries there is a high degree of industrial concentration.

Although my subject is the socialist economy, I wish at this point to make a few remarks on the capitalist economy as well.

— The budget constraint of state-owned firms is rather soft. More than once, nationalisation has served the precise aim of ensuring survival for loss-making companies. Or it did so for companies which were not losers at the beginning, but became so, and now cover their deficit from the state budget. Numerous interesting examples of this are to be found in the works of Scandinavian authors. The study by Eliasson-Ysander (1981) on Swedish industry has a title that in itself throws strong light on the problems: 'Picking winners or bailing out losers?'

— With investments financed by the state or a community — whether they are manufacturing-, transport-, cultural-, health- or military projects — the budget constraint is regularly exceeded. The Concorde aircraft story is the classical example. It is worth quoting also the title of an article published in a West German weekly (Spiegel, 1981): «Wen kümmert das, wenn es teurer wird — Bei öffentlichen Projekten verkalkulieren sich die Bauplaner mit erstaunlicher Regelmässigkeit.» (Who cares if it grows more expensive — with public projects the planners miscalculate with surprising regularity.)

— In a number of countries the state will bail out privately-owned corporations if they are struggling with financial difficulties. It will grant a direct state subsidy or a state guarantee to encourage private banks to grant credit. It will bring in protectionist measures to defend firms in difficulties, and so on.

— And, finally, the most important thing: inflationary expectations themselves undermine the effectiveness of the budget constraint. The decision-maker in the firm is deeply affected in his behaviour by the knowledge that, if costs rise — either because of a wrong decision, or because of unfavourable external conditions — selling prices can always be adjusted within the inflationary process.

In the capitalist economy, as in the socialist, these phenomena are not due to the economic policy decisions of a government of central bank, even though these may have a role in determining their extent. Roots lie much deeper here too; they are related to the transformation of the social structure and of the role of the state. To analyze this sphere of problems from the point of view of history, sociology and political science would go beyond the scope of the present study.

The phenomena themselves are well-known; they are repeatedly discussed by politicians, and in newspapers, and they are scientifically investigated by numerous economists from Galbraith to Milton Friedman. It seems, however, that *theoretical microeconomics* has not drawn the due conclusions but pretends, stubbornly, that the budget constraint axiom remains valid (3). A deep gap exists between everyday experience on the one side and the axiomatic cornerstone on the other. It is therefore high to revise the theory from this point of view.

One more remark. I would not like to blur the difference which exists between the capitalist and the socialist economy. In a large part of the capitalist economy in a number of countries, the budget constraint both for firms and for non-profit institutions, is still *rather hard*. In the socialist economy — exceptions notwithstanding — the *rather soft* budget constraint is common. This, however, does not change the fact that the *problem* itself is a general one: economics cannot rest content with the *a priori* assumption of the existence of a (hard) budget constraint, but will have always to qualify that assumption. It will have to take the actual degree of hardness or softness of the constraint as the basis for theoretical analysis, in reflecting reality as well as possible.

III.

PRICE RESPONSIVENESS

All that is taught in traditional microeconomics about demand and supply functions is based upon the hard budget-constraint axiom. Without this axiom as a premise, the conventional premisses

regarding the nature of demand and supply functions cannot be maintained either.

The budget constraint of the household is hard in the socialist economy also. It will not be discussed in the remaining part of this paper; only the behavior of the producer firm will be analysed. Consequently, even if this is not specified in every case, the words 'demand' and 'supply' always refer to the demand and supply of firms.

Let us first consider the problem of the short-term demand function. Figure 3 is drawn as a development of Figure 1. It is assumed

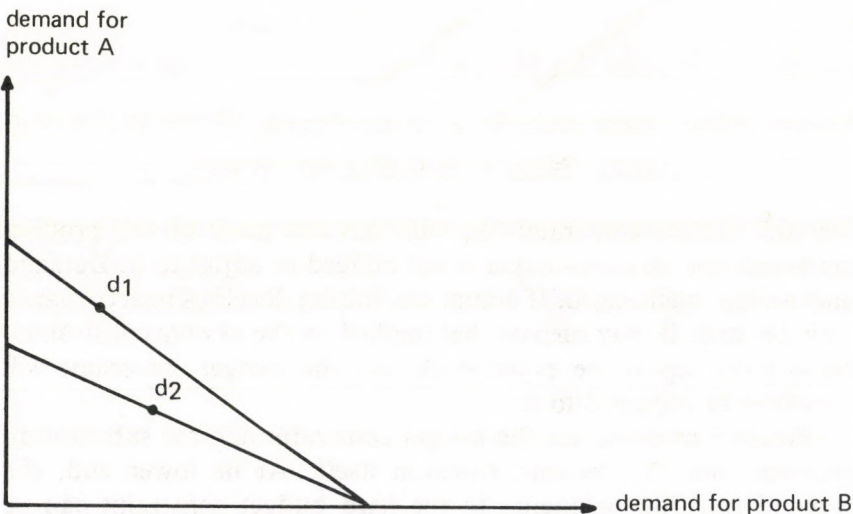


Figure 3. Demand in case of hard budget constraint.

that product A has, *ceteris paribus*, become more expensive. As a consequence, the set delimited by the budget constraint has been narrowed down. The earlier demand vector d_1 *must* be replaced by another demand vector. The new demand vector d_2 is situated on the new budget line (or perhaps below it) and implies a smaller demand for A. To reach the logical conclusion of a smaller demand for product A, it need not be assumed that the decision-maker will exhibit optimising behaviour, but only that his budget constraint is hard.

Figure 4 is a development of Figure 2, and presents the case of

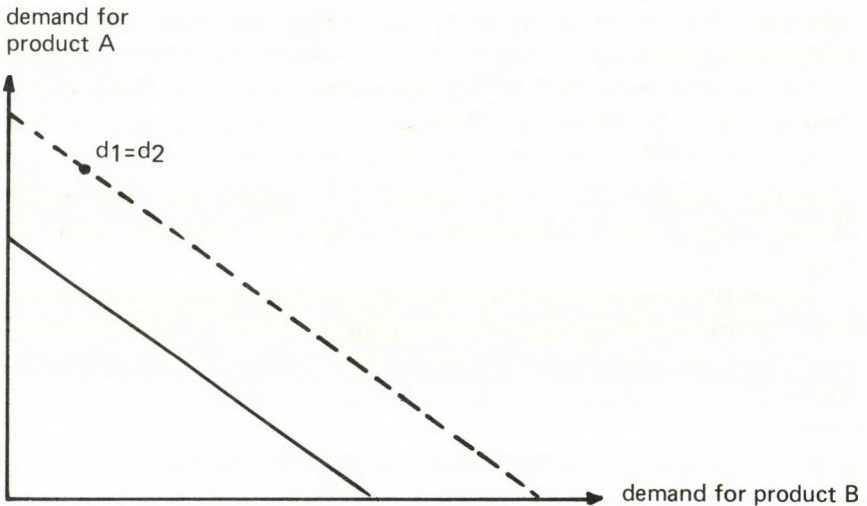


Figure 4. Demand in case of soft budget constraint.

the soft budget constraint. In vain has the price of the product increased: the decision-maker is not obliged to adjust to it. Demand may remain unchanged. If actual purchasing develops in accordance with demand, it may surpass that implied by the *ex ante* constraints, being based upon the expectation that the budget constraint will somehow be adjusted to it.

Figure 5 presents not the budget constraint and the substitution problem, but the demand function itself. At its lower end, the demand function belonging to the hard budget constraint can be seen — downward sloping in the usual way. At the upper end demand is unresponsive to price and therefore represented by a straight line. Between these two extremes an intermediate case is shown.

Demand that does not respond to price is not indeterminate. In the socialist economy the demand of the firms for inputs is determined jointly by various kinds of explanatory variable. The relative price of inputs, however, even if it does figure among the explanatory variables, exerts only a weak impact.

In connection with the preceding, we introduce the concept of *price responsiveness*. This is related to the category of price elasticity. In a certain sense, it is its generalisation. Price elasticity is a

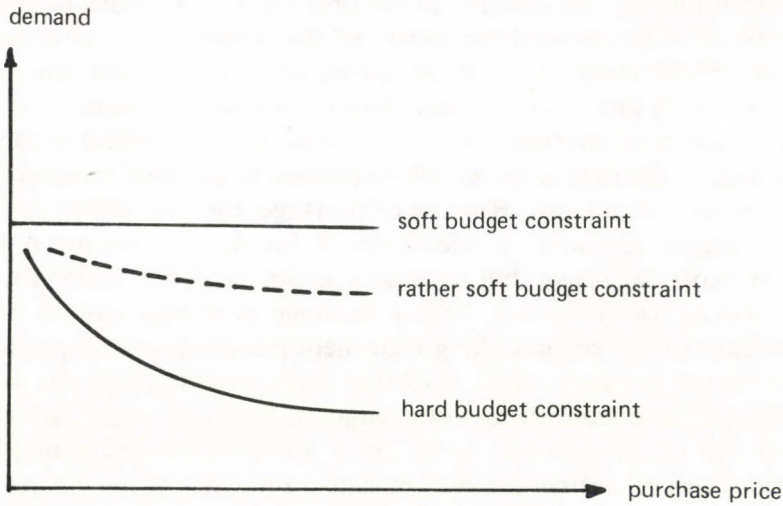


Figure 5. Demand functions.

partial indicator: it shows the way the demand of a group of buyers for a product, or for an aggregate of products, reacts to a change in the price of this product or aggregate of products. A distinction is made between the elasticity of the own-price reaction and the elasticity of the reaction to a change in the price of the substituting product. Price responsiveness is certainly lower in a given system I than in system II, if the absolute values of all the partial own-price- and cross-elasticities are smaller in I than they are in II. Let us take an example from public transport: a driver reacts with a different speed to the red light, the stop sign, or the horn of another car. If, however, he takes a strong tranquilliser, he will react more slowly and with less power to *each* of the signals: the tranquilliser dampens his responsiveness. The softening of the budget constraint acts as such a tranquilliser: it leads the economic manager hardly to be bothered by *any kind of* price signal. The degree of price responsiveness is an observable, measurable, operational category. Questions of measurement, however, cannot be discussed at this point.

In an Eastern European socialist economy *the softness of budget constraints, widely-spread chronic shortage, and the low price-responsiveness of the firm as buyer of inputs are cause and effect all at once: these phenomena are mutually reinforcing.* If the budget

constraint is soft, the demand of the firm faces no effective financial constraint. The demand for inputs of the whole sector of firms is prone to 'run away', both in the sphere of current production and, even more, in that of investment. This is the basic explanation of the phenomenon of shortage. And, if chronic excess demand becomes permanent, the firm as buyer will be pleased to get what it wants and will not care about cost. Because of shortage, the firm effects *forced substitutions* regularly. It substitutes B for A, not because A has grown more expensive, but because A is not available, which forces the firm to use B instead. Thus a shortage of B may arise as well; shortages spill over, and along with them price and cost responsiveness further weakens. And, if all that leads to rising costs for some firms, pressure from them will strengthen for some organisation to cover the resulting losses, or to apply some of the procedures set forth above to soften the budget constraint. The three groups of phenomena form a self-generating, vicious circle.

Price responsiveness is a comprehensive category. Different kinds of qualification are required for exact description. I list five. 1) Responsiveness is not equal for *demand* and for *supply*, that is to say, on the input and the output side. The socialist firm — although its price responsiveness is generally rather weak — reacts slightly more strongly on the output side than on the input side. This is because it is driven by several factors towards increasing output. In most Eastern European countries, output is measured by aggregate volume indicators. It is therefore worth looking carefully at the relative prices of the various alternative-products since, with an appropriate choice, the same resources may produce a larger aggregate production value. On a chronic 'sellers' market', the producer-seller can make his own choice, while the buyer is compelled to adjust his demand and purchases to supply.

2) Responsiveness is not the same with short-term and long-term decisions. In the short term it is a little stronger; in the long term it is barely observed. The firm intending to carry out an investment expects that, if actual implementation of the project has started, it will certainly be finished and, in the end, survival be guaranteed. If costs, including repayment of investment credits together with interest, are higher than had been expected, the price of the output to be produced by the new project will be adjusted accordingly. Or the

loss will be covered in another way, for example, by a permanent subsidy. In choosing techniques, different considerations may clash. On the one side will be the economic and technical managers' preference for modern technology. On the other side will be scarcities which are indicated by 'quantity signals' at present and which are expected in the future, such as a shortage of the foreign currency required for the import of the most-advanced technology. The impact of cost calculation is, however, very small indeed.

3) A further important viewpoint is the *dynamics*, or *time-intensity* of the reaction to the price signal. On the one hand, actual adjustment of input-output combinations may take a long time. Reaction ought to appear, but with some delay. On the other hand, the passing of time may damp the reaction. Following a price later, however, it becomes reassured; even if it has failed to adjust correctly, its losses will be somehow compensated.

4) One of the most important questions is whether a change in prices concerns *domestically manufactured and marketed products*, or *exported and imported goods*. The former is easier to neglect, while the latter has a more important effect, particularly on the foreign trading enterprise which is carrying out export and import business. The effect is, however, smaller for a firm using imported goods or one producing goods for export, because the impact is then damped by the compensating effects of the various subsidies, taxes, customs duties, bonuses, etc.

5) Finally, a most important qualification: *whose* responsiveness is involved? In the socialist economy a multi-level control system is functioning. The real actions of firms are the combined results of decisions taken at different levels of control — at the centre, at the different sub-centres and in the firm itself. It has been emphasized so far that the home-currency budget constraint of the firm is rather soft. Now it has to be added that there is in the economy a budget constraint that really is hard: it is the balance of payments in convertible currencies. This also can be stretched for a short while by taking foreign credits, but, in the end, the limits of indebtedness will be reached. For the present, the question can be left open; whether these constraints are set by creditors, or whether the borrower himself is afraid of over-indebtedness. The two phenomena are correlated. It is enough to state that the government and the central planning

apparatus feels that this budget constraint really is hard. They are therefore bound to adjust to changes in export and import prices. *Thus the 'centre' shows a considerable responsiveness towards world market prices.* The question is, to what extent can this central price responsiveness be 'decentralised', and delegated to economic managers at lower levels. If the budget constraints of the latter are soft, balance of payments difficulties are left to the centre to be solved; no automatic mechanism ensures that firms feel these problems directly.

It has been disputed for a long time, whether «does money matter»? In my opinion, the answer depends on the issues discussed above. Money is passive in the sphere of production, if the budget constraint of the firm is soft, if there is a chronic sellers' market and if firms are not price-responsive. (We disregard here the influence of money on household behaviour.) The harder the budget constraint of the firm, and the more price-responsive its behaviour, the more active will be the role of money. This simple relationship indicates, that the study of the «hardness» or «softness» of the budget constraint has important implications for monetary theory.

There are lively disputes among economists of socialist countries about the most appropriate exchange rates, and about the most appropriate rules for determining the home prices of exported and imported goods. I do not deny that these are very important issues, yet they are not the *key* questions. *No exchange rate and no pricing principle is able adequately to transmit world market price signals to the production sphere, if the price responsiveness of the firm is weak.* The key question is: should the state continue to play the role of a general insurance company? The insurance premium is paid by all subjects of the state, since worsening terms of trade exert a harmful effect on living standards and on economic growth. It is this 'premium' which the state uses to compensate firms which have suffered an 'accident' because of deteriorating world market conditions. This 'insurance company' function undoubtedly promotes economic stability: it guarantees survival not only for every firm, but for every single job as well. It mitigates the uncertainties of the future, and thus stimulates investment and finally growth. At the same time, it excludes a most important motivation towards adjustment to the changing world market situation: this is the feeling that failure to

adjust may involve grave consequences for the firm. The loss caused by deficient adjustment is suffered by the whole society — and here we have come back to the starting point of our train of thought: the high 'premium' which the population pays to the 'insurance company'.

Weak price responsiveness is a problem that has been 'in the air' in Eastern Europe for a long time: it is often discussed among economic managers and officials. It is, however, pushed into the background in Eastern European theoretical economics. There are dozens of books and hundred of articles containing numerous observations and thoughts about the way prices *are* determined and even more, in a prescriptive-normative spirit, about the way they *should* be determined. Various opinions and schools exist which are engaged in an interesting dispute. Yet the question *whether prices have an impact at all* in the sector of state-owned firms and, if so, how strong an impact, is hardly treated at all in the literature of Eastern European countries.

I doubt whether it is sufficiently well known how the capitalist firm reacts to prices. The question is not how it *would* act if every decision-maker behaved as is expected of him in textbooks; but how strong the *genuine price responsiveness of the capitalist firm is*.

IV.

QUANTITY SIGNALS

In the socialist economies a fundamental role is played by non-price or quantity signals.

One category of signal constitutes a part of the organised, formal, 'official' flow of information. *Commands* are sent 'downwards' from the centre to sub-centres or to medium-level control organs. From there they are sent to firms, mainly in the form of *output targets and input quotas*. These are given either in physical units, or as aggregate volume indicators. The latter are, in a sense, borderline cases, since the product of quantities and prices is used for aggregation. Yet it seems justifiable to list this among 'quantity' signals. Price is here simply an aggregation weight; *in this role it*

does not give information about the market situation, about the relation between supply and demand, or about relative scarcities of resources, goods and services.

Also within the framework of this organised, formal and 'official' flow of information, quantity signals are sent 'upwards'. They go from firms to sub-centres — that is, medium-degree organs — and from there to the centre. So do reports on the fulfilment of earlier commands, and of output and input plans: *suggestions* on the planned volume of future output; *claims* for various resources; and so on.

The role of 'official' quantity signals is well-known from the literature on the economic mechanism of socialist countries. It therefore need not be treated in detail here. Many think that the decision-making system of the planned economy is built exclusively upon this flow of information: 'command ↔ report and suggestion'. In fact, several other signals play a role as well. Some complement and support the pieces of information specified above. Others can come into conflict with these pieces of information and modify or correct their effects. Without aiming at completeness, we shall quote a few characteristic examples.

In the capitalist economy it is quantity signals on *surplus or slack* that are important: where is unemployment, and what is its size; where are unsold inventories and of what; where are unutilised capacities? In our economy, however, *shortage signals* prove to be especially important. They trigger reaction at all levels of economic control: if it turns out that queuing up for some product takes longer than usual; if the backlog of unfilled orders or the rate of refused orders has grown above or sunk below the normal level; or if the stock of output accumulated by the producer-seller has decreased or increased at more than the usual rate. The classic problem of economics concerns the allocation of available resources. In our economy, a new problem appears, as a complement to the classical question: the allocation of non-availability, that is, the *allocation of shortage*. The effect of shortage signals is that the decision-maker takes resources away from where shortage is less than customary and transfers them to where shortage is particularly intensive. He thus provides for a certain degree of 'levelling out' of the shortage phenomena. Reallocation decisions, responding to shortage signals, are

made at every level of economic control: within a firm, in the management of an industrial branch, and in central planning (4).

One group of signals must be particularly underscored: it is the 'voice' — so called after Hirschman (1970). Decision-makers are influenced not only by silent numbers (whether these are prices, or non-price quantities) but by the words of living people as well.

On the decision-maker's table there is the quantity estimate and, perhaps, an efficiency and profitability calculation made with the aid of prices. There is also the telephone. A lot depends on who telephones the decision-maker and what pressure is put on him to choose one or another alternative. There are not only 'officially' submitted plans, but also persuasion and 'lobbying'.

The effect of another 'voice' — that of complaint and protest — must also be mentioned at this point. Buyers may be complaining about not being able to get some goods; or those on the waiting list for flats may find the wait too long. The factory director or the engineer may be discontented because of lack of materials, parts, or specialists. A detailed analysis of these phenomena would take us from the field of our own profession into that of political sociology and socio-psychology. There is, for example, the question: on what does the sound intensity of the 'transmitter' and the sensitivity of the 'receiver' depend? Can the one suffering trouble tell of his dissatisfaction and dare he do so? Is the decision-maker able to, and does he want to, hear the signals? If it operates, this signal system is apt, at least to some extent, to replace traditional economic information, such as prices and quantitative economic data. If it does not, economic management is left even more without signals and feedback.

In this way, we have already come to one of the grave problems of non-price signals: the difficulty of *comparison*. An invaluable advantage of calculations made with prices is simply comparability, and together with it, *objectivity*. Whoever made the calculation, \$ 1000 cost is \$ 1000 cost. If, however, a social loss or sacrifice is reported by the 'voice', the question arises, what weight should we give to the signal? It may be that the protesting voice exaggerates. Or the reverse: it may not point out the problem clearly enough, out of modesty or cowardice. The one using such information will inevitably judge it subjectively in deciding what to attribute to the words of one or another informant.

Another serious question is *the correlation of information and incentive*. With a hard budget constraint, it is in the obvious and direct interest of the decision-maker to take price signals into consideration as much as possible. If he fails to do so, he will come off a loser. Of course, the neglect of non-price information also has its consequences, but the relationship is not that simple, transparent or automatic.

A third kind of serious problem is closely related to this; the *ex ante* or *ex post* character of the signal. The *posterior* character of a price signal is justly referred to as its weak point. Price reacts to a given market situation, and perhaps — where there is some rigidity — with considerable delay. Only then do quantities, demand and supply become adjusted to price. One of the potential advances made possible by quantity planning is that it gauges the situation *anteriorly*, and deduces the action programme from this analysis. It must be admitted, however, that this potential advance is not fully used in actual planning, precisely because of the weakness of motivation. It happens quite often that the decision-maker reacts to a quantity signal only when it reports trouble that has already occurred, a grave loss, or even a catastrophe. One or another element of the economic system hits a *tolerance limit*, and the necessary measures are taken only afterwards. A number of Hungarian economists predicted in the 1960s that the reserve of labour would be exhausted in a few years. Their forecasts, however, had insufficient impact on the choice of techniques in investments started in those years, or on the rate of scrapping of the existing stock of machines. Hundreds and thousands of economic managers had to run head-on into the wall of the labour supply constraint to become aware that latent reserves had indeed been exhausted, that this shortage was chronic and that, therefore, a radical change must be made in the choice of techniques.

The economic science of socialist countries has immense tasks to accomplish in exploring the role of quantity signals, among them informal quantity signals. As in the earlier sections of this paper, I must add: I do not think that these problems concern only the socialist economy. First Keynes, and then the disequilibrium theories of the 1970s and 1980s, called attention to the importance of quantity signals. Even so, I feel that it is not quite clear what is, in fact, the

role of quantity signals in today's capitalist economy. To mention just one example: what was the 'pure' effect of price signals — that is, of the dramatic increase in the price of crude oil — on the development of energy consumption in capitalist countries? In addition, what was the effect of expectations of a possible future fall in oil supply and, what is closely related to it, of the fear of a possible oil embargo — of being at the mercy of the oil producers. Beyond this, a lot of open questions remain to be cleared both by empirical-statistical studies and by theoretical analysis.

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Finally, one more remark. In the introduction to this paper it was made clear that we were considering a general, 'stylized' model of the Eastern European socialist economies and were not talking about the specified features of the Hungarian economy. Further, it was emphasized that this paper aims to provide a descriptive analysis and not to elaborate a normative theory or to make practical suggestions. To conclude, however, I do wish to make one or two observations concerning the tasks facing the Hungarian economy.

In 1968, Hungary took the first step on the way to reform. The path was not not straight: phases of progress, regress and detours alternated. It is true that on a few important points thorough changes were made: firms were given more independence, first of all, in their short-term decisions. But they continued to be largely dependent, financially, on the centre and on sub-centres. Using the terminology introduced in this paper: the budget constraint of the firm has remained rather soft. Therefore, the responsiveness of firms to price signals, even though it has somewhat strengthened, is still too weak.

For the Hungarian economist it is comforting to hear that in a number of socialist countries it is our reform that is taken as an example. Yet there are quite a few Hungarian economists — myself among them — who are discontented with what we have done (5). Although a few important measures were introduced in 1979-1981 with a view to intensifying the effect of prices, what was done is still not enough. It is desirable that we should make more resolute and faster progress in the direction taken by the Hungarian economy in 1968.

RÉSUMÉ

Cette étude a pour but de répondre à la question: quel est l'impact des signaux de prix et de quantité sur la production dans une économie socialiste.

Le point de départ est le réexamen de la notion de «contrainte budgétaire». Elle a nature d'axiome dans la théorie microéconomique conventionnelle; elle est traitée comme la règle de comportement allant de soi pour tout décideur. En réalité, pour l'entreprise d'état socialiste, la contrainte budgétaire est «molle». Même s'il y a un déficit important depuis longtemps, l'Etat libérera l'entreprise de la contrainte par les moyens suivants: 1° la hausse du prix administré qui s'ajuste ainsi au niveau des coûts réels de production, 2° l'attribution d'une subvention par l'Etat, 3° l'entreprise bénéficie d'une exemption fiscale et (ou) 4° d'un crédit à terme «mou» pour financer le déficit.

Il en résulte que la survie de l'entreprise est assurée, sa croissance sera indépendante de la rentabilité.

Plus la contrainte budgétaire est molle, moins l'entreprise est sensible aux prix. Puisque l'entreprise est indifférente aux coûts, sa demande est presque insatiable. La mollesse de la contrainte budgétaire, la généralisation des pénuries chroniques, et la faible sensibilité aux prix des entreprises, sont des phénomènes qui se renforcent les uns les autres.

Finalement l'article discute le rôle des signaux autres que les prix, tels que les ordres du Centre et les rapports d'exécution des entreprises, les signaux constitués par les stocks, les pénuries, etc.

ABSTRACT

The study tries to answer the question: what is the impact of prices and of quantity signals on production in a socialist economy.

The point of departure is the reconsideration of the notion of the «budget constraint». This plays an axiomatic role in standard microeconomic theory and is regarded as a self-evident behavioral rule of every decision-maker. In fact, the budget constraint of the state-owned socialist firm is «soft». Even if there is a large and long-

lasting deficit, the state will bail out the firm, by the following means: /i/ the administrative price will be raised and adjusted to the actual production costs, /ii/ the firm is given state subsidy, /iii/ the firm is granted tax exemption and/or /iv/ the firm is granted soft credit. As a consequence, the survival of the firm is warranted, and the growth of the firm will become independent of profitability.

The softer the budget constraint, the less price responsive is the firm. Since the firm is not sensitive to costs, demand is almost insatiable. The softness of the budget constraint, the widely spread chronic shortages, and the low price responsiveness of the firm are mutually reinforcing phenomena.

Finally, the paper discusses the role of non-price signals, such as commands given by the centre and reports of the firm to the centre; stock-signals, shortage-signals, etc.

NOTES

- (1) The author wrote this study during his stay as guest professor at the Department of Economics of the University of Geneva. The research activities underlying the paper had been carried on under the auspices of the Institute of Economics of the Hungarian Academy of Sciences and of the International Research Institute of the University of Stockholm. He wishes to avail himself of this opportunity to express his thanks to all three institutions for their support. The paper has been presented at the conference on «Problems of Changes in Relative Prices», organized by the International Economic Association in Athens, in 1981.
- (2) Clower in fact writes here about Say's Principle. This implies as is clear from the quotation, the existence of a budget constraint.
- (3) This applies equally to the more orthodox Walrasian line of mathematical economics and to the works of disequilibrium theory. For a survey of disequilibrium theory see Benassy (1980).
- (4) The author, together with A. Simonovits, has constructed a model of an economic system of n sectors, in which the isolated, decentralised economic decision-makers are orientated exclusively by quantity signals, mainly by information concerned with the backlog of unfilled orders. With the strong simplifying assumptions of the mathematical model, it can be shown that an economy orientated by shortage signals is viable, able to grow, and capable of self-regulation. If, in some sectors of the system, shortage is 'too strong' or 'too weak' the system is able to drive itself back to the path that is characterized by 'normal shortage'. See Kornai-Martos (1981), chapter 12.
- (5) This wide-spread of opinion is made quite clear by the article of Nyers-Tardos (1980).

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