THE MACROECONOMIC THEORY AND POLICY OF AN OPEN WORKER-MANAGED ECONOMY*

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I. Introduction

In terms of its contribution to the solution of important real problems, the so-called macroeconomic theory is among the most significant branches of economic analysis. It is so important because, in a market economy, it allows policy makers to trace and identify the impact of various policies and/or spontaneous behavioral changes on the so-called macroeconomic variables, such as the level of national product, prices, the balance of payments, the rate of interest, investment, and others.

As the historical evolution of the discipline in the context of capitalist market economies indicates, the subject of macroeconomics is by no means a simple one. Throughout the nineteenth century and through the Great Depression and the so-called »Keynesian revolution« it has been dealt with by western economists (perhaps in the scientific tradition of the nineteenth century) in a partial equilibrium manner, that is, as a series of exercises establishing causal links within pairs or other subsets of variables, but never considering simultaneously the aggregative structure of the economy. Only after the Second World War, in the post-Keynesian and Patinkin tradition, were complete general equilibrium *macroeconomic* models explored. To this day some theoretical questions in this field remain unanswered and, especially in the area of monetary economics, constitute the principal preoccupation of western experts. A good deal of econometric work in capitalist countries is designed to substantiate these simultaneous theories through empirical observation.

Our macroeconomic understanding of the labor-managed market economy of the Yugoslav type is quite inadequate, at least as far as the present writer is able to judge. First of all, this economic system is fundamentally different from the western market economies, and thus any direct transposition and application of western macroeconomic analysis to the case of Yugoslavia would be quite incorrect. Second, and more practically, the expe-

*) The editors consider that some of the crucial assumptions and conclusions of Professor Vanek's paper are at variance with what actually occurs in the Yugoslav economy. However, they refuse to practice censorship and believe that the paper may initiate a fruitful scholarly discussion of problems that are very important and little known.

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rience of a self-management economy in Yugoslavia has been only two decades, a period considerably shorter than that offered to the observers of capitalist systems.

To my best knowledge (conditioned and limited by my difficulty in reading the Yugoslav languages) two attempts have been made at a *simultaneous* theoretical analysis of the labor-managed economy, one by Benjamin Ward[1]) and the other by myself.[2]) Ward's analysis suffers from three major defects which make it quite inoperative. First, and probably least of all, he uses too simple a theory of the money market, that is, the quantity theory of money. Second, he takes too seriously his earlier result of a backward-bending supply curve of real national product in the short run. Third, and by far most important, the equilibrium on which he bases his analysis of change (and by implication of policy) is an unstable one, so that his results are just the opposite of what they truly should be.[3])

For the purposes of the present analysis my own earlier work also is not fully adequate, and this in fact is the main inspiration for writing this article. First, in my book I was interested in producing a careful and detailed exposition of the macroeconomic structure without paying much attention to its practical applicability. Second, I have produced an analysis as general as possible with respect to the signs and values of key parameters, without considering possible simplifications arising from a closer knowledge of behavior of self-managed bodies. Third, being primarily interested in the logical structure of the theory, I have not included the foreign-trade sector of the economy, an omission which would be most unwarranted if one wants to deal with a country like Yugoslavia.

Given these considerations, our plan of work in this paper will be as follows. First in the next section I will reproduce briefly the formal simultaneous model as developed in my *General Theory of Labor-Managed Market Economies*. The only new thing here will be the introduction of the foreign-trade sector, that is, of the foreign exchange market.

In Section 3, I will derive from the complete formal model a somewhat simpler one which, almost without loss of generality, lends itself to simple diagrammatic use. In Section 4 I put to work the simplified model of Section 3 and derive a set of comparative-static results bearing on problems of short-run economic policy and of autonomous disturbances. Finally, in Section 5 I draw the conclusions of the study.

The appendix is devoted to a mathematical presentation of the reduced (simplified) model[4]), and the study of its comparative-static and dynamic properties.

2. The complete formal theory

The fundamental notion on which our formal theory of determination of macroeconomic variables is based is that all these variables are mutually

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[1]) B. Ward, *The Socialist Economy*.

[2]) J. Vanek, *The General Theory of Labor-Managed Market Economies*, Part II.

[3]) For the interested reader, all this is carefully explained in Section 17.5 of my *General Theory*.

[4]) Note that the mathematics of the general model is given in my earlier study.

dependent, influencing each other and simultaneously finding an equilibrium value — if an equilibrium exists. More specifically, this interdependence is the result of the fact that the various macroeconomic variables are determined through the operation of various markets, the supply and demand sides of these markets themselves being influenced by all the variables. Thus, for example, the price level will be determined in the market for (real) goods and services through the interaction of supply and demand of such goods and services, each in turn depending not only on price, but also on the level of national product, the exchange rate, the rate of interest, etc.

There are altogether five markets in our simultaneous macroeconomic theory: markets for goods (and services), money, bonds (i. e. financial capital), foreign exchange, and a *quasi*-market for labor. We use here the term *quasi* labor market because in a self-management economy (i. e. of associations of free producers) we cannot have a market for labor in the traditional sense of the word.

As I explain in greater detail in my earlier study (*The General Theory*, Part II), the equilibrium condition in the goods market can be stated in functional form

$$\bar{Y} = Y(Y, p, r, i) \qquad (1)$$

where we use a bar on top to express supply and a variable without a bar to express demand, and where Y, p, r, and i stand respectively for real output, the general price level, the rate of exchange and the rate of interest. The right hand side of the equation is a behavioral function, indicating that the demand for domestic goods depends on real national income (because the higher such income, the more goods will be demanded); on the price level (because if prices vary, international competition will change, *ceteris paribus)*; on the rate of exchange (because that rate will determine the balance of payments, which in turn contributes to the demand for domestic goods); and on the rate of interest (because it influences the investment and consumption demand of domestic firms and households).

The equilibrium in the market for money, M, can similarly be written as

$$M_0 = M(Y, p, i) \qquad (2)$$

where the subscript »o« is used to indicate that the supply of money is a parameter, determined through the country's monetary policy.[5]) The behavioral demand for money simply states the obvious fact that demand will vary with the general price level and level of real income: the argument is perhaps less obvious but it becomes clear if we realize that depending on the level of the interest rate people will be willing to hold more or less money balances (rather than bonds or others assets).

[5]) It could also be postulated that M_0 is a variable determined by the state of the balance of payments through inflows or outflows of international reserves. But because in the real world we seldom find this to be the case, we can disregard this possibility.

To describe the market for financial capital, we assume that all domestic debt is held in the form of bonds of indefinite maturity, B, and the equilibrium in the market is determined by the equality of supply and demand, i.e.

$$\bar{B}\ (i,\ p,\ \bar{Y},\ r) = B\ (i,\ p,\ Y,\ r) \tag{3}$$

Note that here the supply side is also a behavioral function. The reader will find it easy to find for himself the rationale of the various arguments of the two functions.

The market for foreign exchange we consider for simplicity as depending on visible and invisible trade only (and not on an autonomous capital account). For the moment, we take the rate of exchange as a variable price determined in that market. Using m_{12} and m_{21} to stand for physical exports and imports respectively, we obtain an equilibrim condition, stated in terms of domestic currency and assuming foreign prices to be constant at unity.

$$pm_{12}\ (p,\ r) = rm_{21}\ (p,\ r,\ \bar{Y},\ i) \tag{4}$$

where the left hand side represents the supply of foreign exchange and the right hand side the demand for that exchange. It is again easy to comprehend the arguments of the export and import functions.

Finally, we have the *quasi* labor market condition postulating that in the short run, with capital stock, K_o, and the number of firms essentially given, an equilibrium employment L will be reached when the marginal productivity of labor $\partial\ Y\ (L)/\partial\ L$ is equal to the income earned by each worker, i.e.

$$\partial Y/\partial L = (p\bar{Y} - p_K K_o)/L \tag{5}$$

where p_k is a constant price of use of capital. Note that relation (5) is one in variables Y, L and p.

Last of all, we introduce the short-run production function linking labor input to output, for a given capital stock K_o, i.e.

$$x = x(\ K_o,\ L) \tag{6}$$

We thus have six equations in our five variables, $\bar{Y}$, L, r, p, and i. All that we can say thus far is that these equations may be consistent with a simultaneous equilibrium set of values of our five variables. Much more has been said about this type of general equilibrium system in my earlier book, and we will examine in greater detail a realistic reduced form of the system in the rest of this article.

3. The operational model

With six equations and five unknowns, obviously, our model appears overdetermined, and moreover is too complex to be operational. Fortunately, it is possible to clarify and simplify it and reduce it to manageable dimensions

by performing a set of steps, based in part on the mathematical properties of the model, in part on the observation of some real values of parameters.

The first step is based on the application of what is referred to as Walras's law. This law, not difficult to comprehend, tells us that in a complete system of general equilibrium including all relevant equations, if for some set of values of the variables (five in our case) all equations but one are in equilibrium (i.e. are fulfilled), then the remaining one must *ipso facto* be also in equilibrium. Consequently, any one of our equations (restrictions) can be taken as redundant, and thus we obtain a system in five independent equations and five variables, consistent with a general equilibrium solution. For our purposes, following the majority of writers, we will drop the bond or financial capital market equation, number (3).

In the next simplifying step we make the realistic observation that foreign exchange rates in general, including that of Yugoslavia, are fixed. Consequently, we can consider r as a constant, r_o, (hereafter for simplicity referred to as r), and transform relation (4) into an identity defining the balance of payments on current account

$$B_{din} \equiv p_1 m_{12} - r p_2 m_{21} \tag{7}$$

We are thus left with only four independent equations in only four unknowns. The next step is a very simple one. We merely introduce the production function, equation (6), into the remaining equations (1), (2), and (5), and thus are left with three independent equations in three unknowns, L, p, and i. The additional advantage of this operation is that by eliminating our one defining equation (defining the production process) we are left with three equations which are all market-equilibrium equations.

The final reduction, which will lead us to a system of only two endogeneous variables, is somewhat more complex, and deserves more attention. To state the essence of the step even before explaining it, we claim that in a pure *short-run* macroeconomic representation of the labor-managed economy, the levels of employment and output can largely be taken as constants L_o and X_o, fundamentally determined by long-range processes of growth and not subjects to short-run forces. But we should now go to work and explain this contention.

First let us reemphasize the notion of a *pure* representation. By this I mean the absence from the model of institutional or custom-based rigidities, especially those of prices and wages. If such rigidities exist, my statement above as well as our last simplifying reduction become invalid. But of course, the model can then be adjusted to account for them.

In the pure representation, with perfect competition and no rigidly prescribed wages, prices should vary freely up and down with changing aggregate demand. The reaction of self-managed firms and industries, contrary to Professor Ward's contention[6], should by and large be nil in the short run. The first and most obvious reason for this is that over short periods, with increasing prices, it would be absurd for the working collective to fire some of its members in order to increase the remaining workers' incomes, very

[6] B. Ward, »The Firm of Illyria: Market Syndicalism«, *American Economic Review*, 1958, XLVIII, 4 : 566—589.

likely by an insignificant amount, over the increase already gained from higher prices. But even without such an expression of solidarity, the supply of goods will be highly inelastic or zero-elastic for reasons of technology. In Figure 1, the value-of-national-product function (given in our relation (6)) as considered by Ward is illustrated by the broken contour. But a much more realistic short-run relationship, with installed plant and equipment, will be either contour *a* or *b*, reflecting situations of divisible and indivisible processes respectively.

With an equilibrium solution — *i.e.* maximum income per worker — at point *e*, in the cases *a* and *b* a change in prices will only produce an upward shift of either of the two solid contours, the equilibrium clearly remaining at the corner-point *e*, with unchanged employment and output.

It may be of significance to note that the »social« or »solidary« behavior of the collective not reducing its size in the face of changing prices is not at all contradictory to the assumption of maximizing income per worker. But, unlike Professor Ward, we must remember that the income of all is to be maximized, not only that of those remaining in the enterprise after a »Wardian« price adjustment.

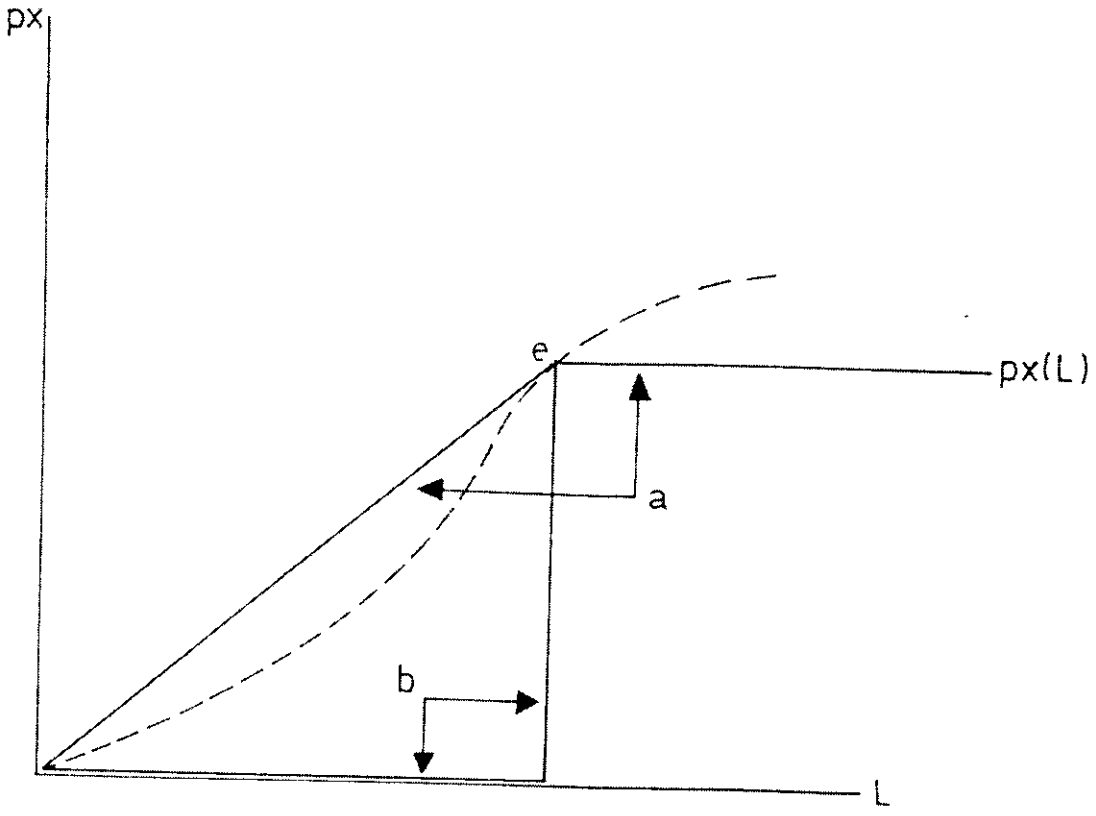

Figure 1

I believe, then, that we have ample justification for our claim of a zero or virtually zero-elastic supply function of national product. We can thus put $\bar{Y} = \bar{Y}_o$ and $L = L_o$, and disregard equation (5).

We should note at this stage of our argument, and we will elaborate on this point later in Section 5, that the short-run equilibrium levels of in-

come and employment *need* not be at full employment of resources. Only a long-run process of adjustment, involving proper capital pricing and freedom of entry (i.e. forming of new enterprises) and a well-functioning capital market can produce such conditions.

We are now left with two endogenous variables i and p, the equilibrium conditions in the goods and money market (equations 1 and 2), the balance of payments (7), and three constants (in the short run) Y_0, L_0 and r. It may be useful to restate the two market-equilibrium relations in a new form

$$Y_0 \underset{e}{=} Y\ [i,\ p;\ \bar{Y}_0,\ r] \equiv m_{11}\ [i,\ p;\ \bar{Y}_0,\ r] + m_{12}\ [p,\ r] \tag{1'}$$

and

$$M_0 \underset{e}{=} M\ [i,\ p;\ \bar{Y}_0] \tag{2'}$$

where »e« is used to indicate an equilibrium condition, and m_{11} and m_{12} reflect domestic and foreign demand respectively for domestic products. Of course, both m's are composed of consumption and investment demand.

Both new relations are functions of two variables, i and p, and can be described graphically as contours (or collections of points) in the $i - p$ plane, fulfilling the respective equilibrium combinations. This is shown in the first quadrant (with respect to point O) in Figure 2. The locus corresponding to equilibrium in the real goods market is negatively sloped because, in order to keep demand for goods in equilibrium, i.e. equal to a constant supply, with declining interest rates (which *per se* increase demand) it is necessary to increase prices (which reduces demand through both the terms of trade effect and the so-called real balance effect). On the other hand, the money-equilibrium equation will be upward sloping, because to keep demand for money constant with increasing interest rates, one must absorb the thus created transaction balances through higher prices.

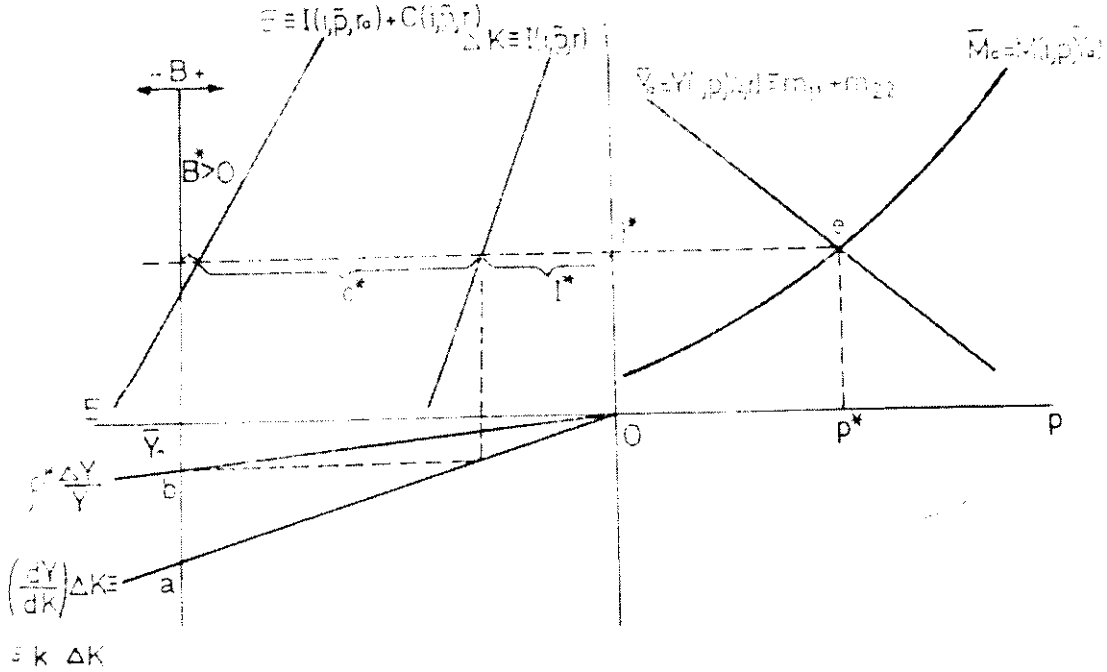

Figure 2

Of course, the general equilibrium solution is found when both markets are in equilibrium, that is, at point e, in Figure 2, corresponding to equilibrium values of the two variables, i^* and p^*.

The diagram permits us to identify other key magnitude of macroeconomic analysis. First of all, measured to the left of point O we have point Y_o reflecting the constant real national product of the economy in the short run. In the second quadrant thus defined, measured to the left of the i axis, we now have two well-known expenditure functions, the real investment function I and the real investment plus consumption function $I + C$, corresponding to i, and the price levels $\bar{p}$ (more exactly we might write this as $p\ [i]$ as defined by the $\bar{Y} = Y$ function of the first quadrant.) Both contours are downward sloping, basically indicating an increased real demand for both investment and consumption with declining interest rates. It must be recalled that both expenditure functions contain demand for both domestic and foreign goods. As shown in the diagram, corresponding to e, we can also read the equilibrium levels of consumption and investment, C^* and I^*.

Recalling that total national expenditure E equals $C + I$, and that the balance of payments on current account B is the difference between national expenditure and national product, we can immediately read the balance of payments as a horizontal distance between the $E = I + C$ contour and a vertical line (axis) originating at Y_o in Figure 2. In this way we also find the equilibrium solution B^*, a positive (surplus) balance of payments because for i^* and p^* national expenditure falls short of national product.

Finally, another useful piece of information — a first step in the direction of a dynamic analysis — is contained in the third quadrant with respect to O. The slope of the line Oa measured from the axis OY_o expresses the incremental capital-output ratio of the economy. Because I^* is the current increase in capital stock, the vertical coordinate of point b, constructed in the way shown in the diagram, indicates the corresponding increase in income in the next period, assuming that the new installed capacity is utilized in production. But because the distance OY_o is the current real national product, the slope of the line Ob shows the rate of growth of the economy.

Of course, next year the point Y_o would have to shift to the left by the amount given by point b, and all the functions would have to be adjusted throughout the model: but this would go beyond the scope of this article. Rather, we shall now turn to the problem of how alterations in the short-run macroeconomic structure affect the key macroeconomic solutions.

4. On short-run economic policy

We are now reaching a crucial point in our exposition. We can use the equilibrium structure developed in the foregoing sections to determine some important policy and other conclusions. We will do so here verbally, referring to our diagram, and in the Appendix mathematically.

In Figure 3 we have reproduced the diagram of Figure 2, but now considering various policy-induced, or autonomous changes. The first and most simple is the effect of a policy of monetary expansion, or, what is equivalent, an autonomous reduction in demand for money. Such a change

induces the equilibrium money-market locus $(\bar{M} = M)$ to shift to the right and down, and, as is shown in the first quadrant, this will displace the equilibrium point from e to e′. The result is that the rate of interest will decline and prices will increase. Accordingly, in the second quadrant, moving along the *E*-contour (which has not shifted because there was no disturbance in the expenditure structure), we reach point e′ at a worsened balance on current account, and a higher expenditure, primarily investment expenditure. The new investment level is also shown by e′. There is an unambiguous expansion in investment, and as shown by e′ and the construction in the third

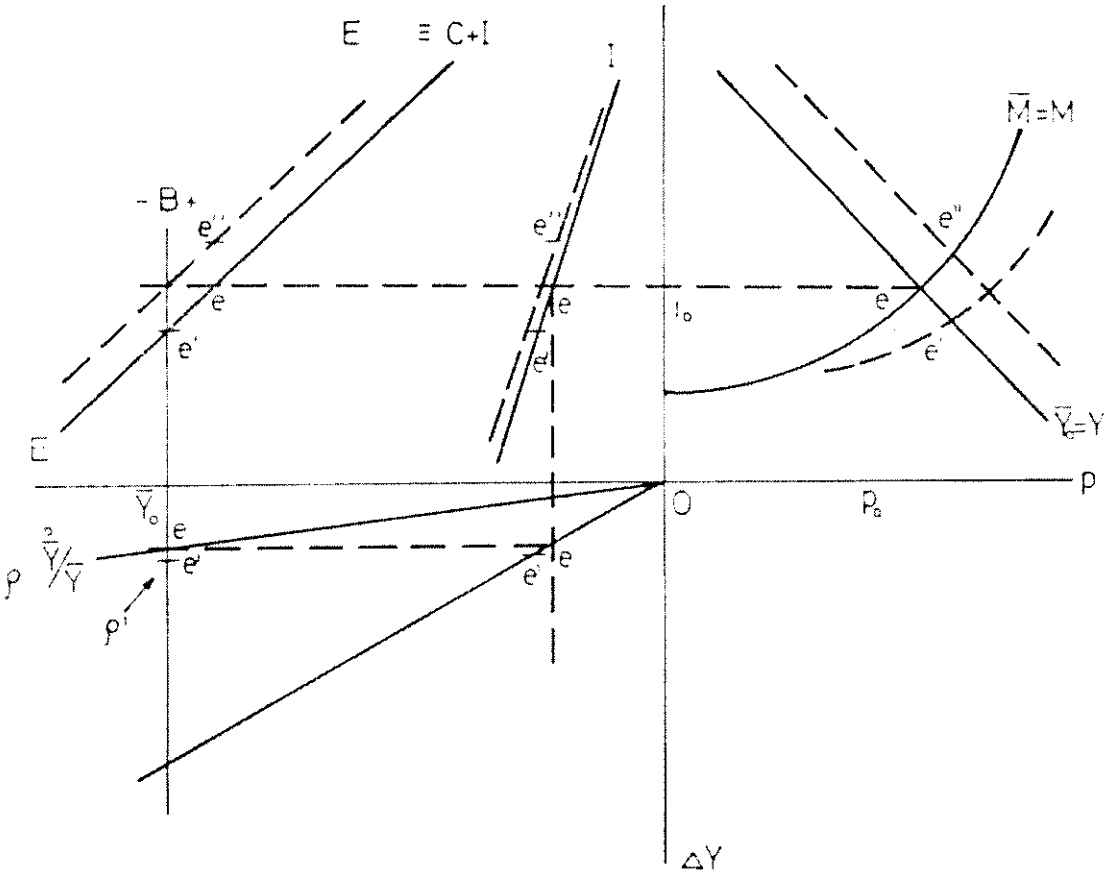

Figure 3

quadrant, this will unambiguously increase the rate of expansion, ρ, of the economy. Of course, in a realistic context, such an acceleration will occur with some timelag, through a faster shifting outward of the more-or-less vertical *short-run* supply function of a constant national product.

The second policy — also second in analytical complexity — is a government-induced expansion in expenditure through budgetary expansion. It is equivalent to an autonomous increase in spending by households or investors. In the first quadrant this will shift the $\bar{Y} = Y$ line to the right and produce a new equilibrium at e″ with both higher prices and interest rates. In the second quadrant both the *E* and *I* lines will move to the left, and a new equilibrium will be established at e″. The balance of payments now can improve

or worsen depending on the comparative importance of the shift on the one hand and of the movement along the E locus to a point of a higher interest rate. The more likely expectation perhaps is a balance of payments deterioration: this becomes a certainty if, together with budgetary expansion, the authorities keep (peg) the rate of interest at its initial line i_0 through monetary and credit expansion.[7])

The effect on investment and the national rate of growth is again ambiguous because of two offsetting effects of shift and slope. As shown by e'' on I, the volume of investment need not increase. However, if the expanded government spending is directed exclusively to investment, or if together with budgetary expansion the monetary authorities peg the rate of interest, investment and the rate of growth of the economy are bound to increase.

We turn now to a policy of devaluation and import tariff increase, which, when it comes to the balance of payments effects, may need some more extensive elaboration. But let us first turn to the effects of these (external) policies on the rate of interest and the domestic price level. Because both devaluation and higher import duty will put additional pressure on demand for goods Y (because through these policies domestic goods become cheaper to buy than foreign goods), we have in the first quadrant a shift of the $\bar{Y} = Y$ locus to point e'', similar to that produced by budgetary expansion. And consequently, prices as well as interest rates will go up, again with unchanged real product (and national income) in the short run. But what will happen to real expenditure and the balance of payments? One would normally expect that the balance of payments would improve from devaluation or a higher tariff barrier. But this need not be the case by any means, and this may bring into question a policy of devaluation by a country like Yugoslavia, especially if the dinar appears undervalued on just about any purchasing-power calculation.

The key argument here is that both devaluation and tariff policy will worsen the terms of trade for the domestic consumer or investor, and this will make him poorer in real terms. But poorer people usually increase the proportion of their income (whether more or less than 100%) spent. In other words, *ceteris paribus*, either of our two policies is bound to more the E-line in the second quadrant to the left. And thus the real balance will deteriorate on that account. It is only the movement along the E-line upward with higher interest rates that can offset this deterioration. The conclusion is that the total effect is ambiguous and probably small. The effects on investment and the rate of growth are also ambiguous because of two offsetting impacts on I. However, if a tariff policy is so designed as to prevent imports of non-essentials and favor investment goods, both the rate of growth and investment are bound to increase.

5. Overall conclusions of the theoretical analysis and some further considerations bearing on economic policy in Yugoslavia

We can first summarize our conclusions in the form of a table. In Table 1, we show the direction of effects of alternative policies as they

[7]) Note that we speak here of the balance of payments in real terms, and that an additional correction of the estimates would have to be performed to obtain results in terms of domestic or foreign currency.

emerged from our analysis of the labor-managed economy. In the rows we read the results for endogenous variables affected while the columns correspond to alternative policy instruments.

Table 1

Change in	Policy instrument: monetary and credit expansion	budgetary expansion	devaluation or tariff increase
Price	> 0	> 0	> 0
Interest rate	< 0	> 0	> 0
Real balance of payments on current account	< 0	$\gtrless 0$[a]	small $\gtrless 0$
Rate of growth and investment	> 0	$\gtrless 0$	$\gtrless 0$
Real product and national income in short run	> 0	≥ 0	> 0

a) A double inequality indicates a considerably more likely outcome.

The first thing that must be emphasized for a market economy based on self-management of the Yugoslav type is that the standard tools of short-run economic policy cannot be used in the same way and for the same purposes as they are in western market economies. Perhaps the most important is that real income and employment will not react rapidly to monetary, budgetary, or exchange policies. Only rates of growth will change, often with some timelag, as a result of properly designed policies or policy mixes.

The implication of this is that if there is unemployment or underemployment, stable and lasting long-run strategies must be adopted to cope with the problem, including abundant supply of long-run investment funds, not on abnormally easy terms (to guarantee proper factor proportions of projects), and possibly an active promotion of entry of new firms, to absorb the unemployed.

At the same time, the comparative short-run inertia of real product (the short-run vertical supply curve) has the great advantage of virtully eliminating the danger of short-run recessions of the type we have in western economies. Only rates of growth — through the mechanism shown in the foregoing sections — are likely to vary if investment rates fluctuate widely.

Monetary policy in a pure labor-management economy should primarily be used to cope with price and inflation problems. These problems can be

quite serious precisely owing to the very low supply elasticity of national product. In situations where downward price rigidities prevail, as seems to be the case in Yugoslavia, such policies may have to be assisted by price controls. Income controls should be avoided at all cost, as they tend to destroy some of the very essence and advantage of self-management.[3])

Another key conclusion of our analysis is that devaluations — and even increased tariff barriers — are unlikely to help the balance of payment significantly. In fact, the exchange rate should be readjusted from time to time according to some more or less precise purchasing-power-parity formula, and otherwise be viewed as a long-range variable, directly linked to the rate of growth and economic expansion.

Budgetary deficit spending is a useful tool for directing resources in the direction desired by the government, but is likely to be quite detrimental to the balance of payments and will be inflationary unless counteracted by monetary restriction.

For many reasons, some of which we may not yet be able to understand, there may be a marked asymmetry in real situations between price movements up and down, the latter being subject to considerable resistance. If such is the case, vigorous counterinflationary pressures may carry too high a cost in terms of rates of growth, and even employment and it will then be preferable to accept some »reasonable« rate of inflation as the price for rapid development of the country. It will only then be imperative to recognize this fully and consistently as a fact of economic life, and adjust various variables to that fact. In particular, all interest rates and other debt-service magnitudes must be reckoned in real (not nominal) terms, non-labor incomes — especially pensions and retirement funds — must be put on a price-related escalator, and a similar escalator must be devised for the foreign exchange rate.

Before concluding, let us try as far as we can to look at the reality of the Yugoslav economy in the light of our macroeconomic theory. Of course, such a confrontation of facts and theory must be taken, for the moment at least, as a crude first attempt leading to what we may call a set of plausible hypotheses rather than definitive results.

Perhaps the first thing to look at is our postulate of a low or zero short-run elasticity of supply. The behavior of Yugoslav prices and volumes of national (and also industrial) product do not contradict that hypothesis. There is no immediate short-run link between price variations and variations in volume (even though Professor Horvat has established a *negative* one for the period preceding 1967; see his *Business Cycles in Yugoslavia*, p. 232; but this may be more of a result of price controls than of purely economic forces). Rather it appears that prices vary in different ways with changing real output at different times, as a result of shifts in a vertical supply curve — conditioned by the level of investment determined in preceding periods (as our ρ in Figure 2) — and the current state of credit, monetary expansion and demand for goods and services.

It would appear that a very important factor of cyclical variations in the rate of expansion of the national economy is a self perpetuating shifting

[3]) The argument that without wage-controls and with price controls investment would be adversely affected is utterly out of place: such conditions must be produced as to do away with the direct interdependence of labor incomes and investment on the level of individual firms.

of the investment function — to the left and to the right in Figures 2 and 3 — which accelerates or decelerates the rate of expansion of productive capacity and of national product some 3 to 4 years later. Such accelerations, in turn, with relatively more steady expansion of personal incomes, regenerate an investment boom which leads to an accelerated expansion in the next cycle, etc.

The entire expansion — inflation patern is considerably complicated and blurred by price controls of variable intensity which, when relaxed after a period of considerable money-expansion (as around the year 1965) lead to delayed price expansions. A similar complicating effect can be imputed to currency devaluations. On the whole, in the intermediate and long-run, however, a crude quantity theory certainly does hold, the rates of growth of prices and real output roughly adding up to the rate of expansion of the stock of money.

Both the problem of rate of growth instability and less than full employment, as suggested by our analysis, must be dealt with through a conscious and well-informed long-range effort: the first primarily through proper and effective capital pricing and facilitation of entry of new firms (or diversification of existing ones) and the second through a stabilization of the long-range expansion of investment. In the latter context not the only method, but probably the most natural one, would be to let firms pay an approprite debt — service charge on *all* capital, and earmark such funds exclusively for accumulation. Besides the economic advantages of such an arrangement, one would also have the assurance that all »income of capital« goes for national enlarged reproduction, and not into anyone's pocket for consumption.

This method of funding the national investment effort would also make it possible to control prices (a highly desirable tool of control of monopolistic tendencies) without in any manner taking determination and distribution of labor incomes out of the hands of the work collectives.

We can now have a brief look at the foreign trade sector. Contrary to our expectation, statistically there was no deterioration in Yugoslavia's terms of trade; rather the terms improved somewhat following the devaluation from 7.50 to 12.50 in the mid 1960's. But a closer examination of facts puts this result in doubt somewhat. First, an extremely important service export sector — tourism — is not included in the index, and there, very likely, the terms of trade deteriorated. Second, the dinar index of imports increased by only 26 per cent between 1963 and 1970. This would imply that dollar prices of Yugoslav imports declined by some 35 per cent, and even more if the period were expanded through the end of 1971. There would be a similar, but somewhat milder decline in dollar export prices. While the latter is a real possibility following devaluation, the 35 per cent decline of a meaningfully constructed dollar price index of world experts to Yugoslavia is virtually an impossibility. And if the real decline was significantly less, then the terms of trade would have deteriorated.

Whether such a deterioration took place or not, the main conclusion of our paper is vindicated: At best, devaluation in Yugoslavia has a very short-run effect on the balance of payments; but all considered, such a policy is not one leading to any good or bad lasting effects on the balance of payments.

This conclusion has a further significant implication. If the balanced payments effect of devaluation is small or nil, then the Yugoslav policy makers should become much more keenly conscious of possible terms of trade effects. Deteriorations in or a permanent low level of terms of trade may have a serious immiserization effect on the Yugoslav worker. As someone accustomed to think in terms of dollar values, living in Yugoslavia I have a distinct feeling of a strong undervaluation of the dinar, and if there is any continuity between such internal and export prices, then the Yugoslavs are bartering their products and services too cheaply with the rest of the world. It may well be that the quest for »convertibility« — whatever that may be good for in a country which above all needs high employment and a high rate of growth — imposes too much of a burden on the working man of Yugoslavia.

MATHEMATICAL APENDIX

Differentiating relations 1, 2 and 7 with respect to the three policy parameters (instruments) we obtain in matrix form

$$\begin{bmatrix} A_1 & -m_{11}^i & 0 \\ -M_p & -M_i & 0 \\ A_3 & -m_{21}^i & -1 \end{bmatrix} \begin{bmatrix} dp \\ di \\ dB \end{bmatrix} = dr \begin{bmatrix} A_1 \\ 0 \\ A_3 \end{bmatrix}, dM \begin{bmatrix} 0 \\ -1 \\ 0 \end{bmatrix}, dG \begin{bmatrix} a \\ 0 \\ 1-a \end{bmatrix}$$

where the coefficients of determinant D must be negative for dynamic stability (according to the Routhean conditions) and where A_1 and A_3 respectively express the increase in demand for domestic goods (i.e. for Y) and the improvement or deterioration in the balance of payments resulting from a change in the terms of trade. The term A_1 normally can be expected to be positive, terms of trade being defined as r/p, and the term A_3 negative, Subscripts or superscripts of endogenous variables stand for partial differentiation. The nine key multipliers, obtained through Cramer's rule, and underlying Table 1, are

	dr	dM	dG
dp :	$\frac{1}{D} A_1 M_i$	$\frac{1}{D} m_{11}^i$	$\frac{1}{D} M_i a$
di :	$-\frac{1}{D} M_p A_1$	$\frac{1}{D} A_1$	$-\frac{1}{D} M_p a$
dB :	$\frac{1}{D}(A_1 D_{13} + A_3 D_{33})$	$\frac{1}{D} D_{23}$	$\frac{1}{D}(aD_{13} + (1-a)D_{33})$

where the terms D_{ij} stand for cofactors of the ij'th elements of the cooefficients matrix.

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MAKROEKONOMSKA TEORIJA I POLITIKA OTVORENE SAMOUPRAVNE PRIVREDE

Jaroslav VANEK

Rezime

U ovom članku sam razradio praktično primenljivu makroekonomsku teoriju samoupravnog privrednog sistema koja se može koristiti da bi se objasnila istodobna međuzavisnost makroekonomskih varijabli, kao i da bi se ustanovili efekti glavnih instrumenata makroekonomske politike.

Najvažniji rezultati ukazuju na to da se posmatrani sistem u biti razlikuje od sistema kapitalističke tržišne privrede, da se ni puna zaposlenost ni visoka stopa rasta ne mogu postići isključivo merama kratkoročne ekonomske politike, kao i da promene deviznog kursa možda imaju ograničene efekte na platni bilans i stepen ekonomske aktivnosti. U samoupravnom sistemu — ako ga posmatramo na osnovu date teorije — nestabilnost cena predstavlja mnogo ozbiljniji problem od nestabilnosti realnog nacionalnog produkta. Pod pretpostavkom da imamo sadašnji način iniciranja i podsticanja akumulacije kapitala, može se očekivati da će u Jugoslaviji u znatnoj meri fluktuirati samo realne stope rasta (a ne apsolutni nivoi). Međutim, takva nestabilnost nipošto ne predstavlja urođenu karakteristiku samoupravne privrede.