BANK CREDIT AND INVESTMENT BY THE YUGOSLAV FIRM

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1. INTRODUCTION

Yugoslavia has, since 1952, provided economists with a unique laboratory for examining decentralised socialism. The Yugoslavs have developed an economic system which combines social ownership of the means of production with decentralisation of decision making. This lies somewhere between the extremes of the administratively planned socialist countries and the decentralised capitalist countries. In recent years increasing discussion (and action) in both Eastern and Western Europe has centred on the desirability of moving from such extremes to a position closer to that of the Yugoslavs.

In Western Europe notions of industrial democracy have gained increasing currency primarily for the psychological and sociological benefits which it is claimed would be forthcoming. The economic consequences of such changes are not clear but the experience of the Yugoslav system provides some evidence. Economic theory however has lagged somewhat behind the more general discussion. It was not until 1958 that the first major steps were taken in analysing the resource allocation problem of the labour-managed firm. [Ward (1958)]. Ward's model has been re-examined and developed by a number of researchers [Domar (1966), Vanek (1970), Meade (1972), Meade (1974), Atkinson (1973), Maurice & Ferguson (1972), Dubravcic (1970)] without any major dissent from his conclusion that the collective would react in a seemingly perverse way to price signals (both of inputs and output).

Another line of theoretical development has been that which highlights the content of property rights under decentralised socialism [Pejovich (1969), Furubotn & Pejovich (1974), Furubotn (1976)]. This has shown that an attenuation of the property rights of individuals alters the incentives available to them and thus their reactions to economic indicators. The significance of such changes in property rights for economic and industrial policy in non-socialist countries contemplating an extension of industrial democracy and social ownership is obvious.

Furubotn and Pejovich have analysed a model of long-run enterprise behaviour where property rights are of the type applied in Yugoslavia. They have demonstrated [Furubotn and Pejovich (1970a), Furubotn & Pejovich (1970b), Furubotn (1971), Furubotn and Pejovich (1972)] that the incentives for investment are diminished in such a system. These earlier versions of what may be styled the Furubotn-Pejovich hypothesis were derived from a model in which there were no sources of credit available outwith the enterprise. The consequences of relaxing this assumption have been subsequently analysed [Furubotn (1974), Pejovich (1973), Furubotn & Pejovich (1973), Stephen & Smith (1975)] with somewhat conflicting views as to the impact of credit on the Yugoslav firm.

The importance of this discussion for economic policy in Yugoslavia and the debate on economic systems elsewhere is highlighted by Professor Pejovich thus:

> » ... the current liquidity crisis, unemployment and inflation [in Yugoslavia] could be attributed to the very structure of the Yugoslav economy after 1965, that is, to the pattern of behaviour it generates ... The analysis lends some support ... to the position of those Yugoslavs who are wary about the fast expansion of the market mechanism ... |The| problem is that the proponents of economic reforms have failed to incorporate the behavioural effects of property relations and some other key institutions in Yugoslavia into the standard economic theory of production and exchange« [Pejovich (1973) pp. 310, 311].

It is the contention of the present writer, and the burden of the analysis below, that Professors Pejovich and Furubotn have overestimated the impact of bank credit on the investment decision and consequently misplaced the blame for the economic problems which undoubtedly afflict Yugoslavia.

The present paper proceeds by developing a model of the investment decision in the labour-managed firm with Yugoslav-style property rights. Within the context of this model the impact of bank credit is then examined and the results contrasted with those of Furubotn and Pejovich. Subsequently the model is developed to incorporate an analysis of various means by which credit may be rationed and to examine the impact of arbitrary depreciation rules.

2. THE MODEL

The essential features of the Yugoslav system may be incorporated in a model with a limited number of assumptions;[1]

(i) enterprises are organised on a democratic basis and operate to maximise the utility of the workers employed therein;

(ii) workers whilst having complete autonomy in the organisation and operation of the enterprise are restricted in their rights over its assets; specifically, they cannot consume the enterprise assets: they may sell them to others but must use such proceeds to buy other assets of equal cost; this constraint is enforced by making the depreciation of assets compulsory; thus any increment to the assets of the enterprise must be maintained in perpetuity; initially it is assumed that depreciation is true, economic, depreciation.

(iii) in each period workers are free, subject to (ii), to allocate the surplus on the enterprise's operations (π) between the wage bill (W) and the Business Fund of the enterprise (I), which it will be assumed here to be used only for investment in productive assets within the enterprise;

(iv) for simplicity it is assumed here that the distribution of wages within the enterprise is egalitarian and that the workers have identical (homogeneous) preference functions;

(v) workers may invest outwith the firm only in bank deposits offering a fixed rate of interest (i_1);

(vi) the labour force, L, may be freely varied in accordance with the interests of the enterprise (or at least its initial majority).

Workers may be seen to be optimising their consumption with an identical planning horizon. This consumption pattern will be a function of wages received within the planning horizon together with any yield from savings. At the begining of the planning period workers have to resolve the allocation of the surplus between wages, and therefore current consumption, and investment, i.e.

$$\pi_t = W_t + I_t$$

Thus workers may sacrifice current consumption in order to increase future consumption but there is an alternative means of increasing future consumption — personal saving. If they are to be persuaded to invest in the enterprise the return from such investment must be greater than that obtained from bank saving, i_1.

The property rights structure outlined under assumption (ii) above, means that a worker may obtain a return from investment in

the enterprise only so long as he remains a member. Thus any return obtained beyond the planning horizon is lost and the effective return to workers will be lower than it would be if they were able to sell their future claim to such an infinite income stream. This may be contrasted with the position of a shareholder who may capitalise such an income stream by selling his claim to it.

Operationally it may be seen that unlike a capitalist the worker must regard depreciations as a cost[2] since he cannot capitalise it by selling his claim to its future productivity. Thus an investment opportunity in a firm yielding a return r_1 under capitalist property rights will yield less than r_1 to the worker under Yugoslav property rights. A return of i_1 from personal saving will be preferred to a productive investment yielding i_1 to the enterprise since each worker receives a return less than i_1. It should be noted that, given the obligtion to depreciate assets, they may be regarded as giving rise to a perpetual income stream to the firm, which, however, generates an income stream to the individual worker over a more limited period.

Pejovich (1973), p. 299, states that, when bank saving yields i_1, "given the future obligation to maintain the value of the fixed assets indefinitely" investment in the enterprise will require a yield of

$$r_1 = \frac{i_1(1+i_1)^n}{(1+i_1)^n - 1} \qquad (1)$$

where n is the period over which the return is received. It may be helpfou to clarify the meaning of the term r_1. It is the constant cash flow arising from the marginal investment *during the worker-manager's n-year planning period*. Since with compulsory depreciation we may regard this (in principle) as a perpetuity, from the point of view of the enterprise, r_1 is the rate of return to the enterprise (with an infinite planning horizon). The return r_1 is the minimum rate of return which must be received by the enterprise before workers will sacrifice current wages to invest in the enterprise.

Consider an investment of one dinar which yields, net of depreciation, an annual cash flow of r dinars. The application of the true, economic, depreciation to the maintainance of the asset can be thought of as continuing the cash flow at the level of r dinars indefinitely. At any point in time the asset still has its original value. The cash flow under these circumstances is thus a perpetuity yielding an internal rate of return of r (i.e. r/1).

However, a worker-manager with a finite planning horizon is motivated only by the increased income which he receives until the end of the planning horizon i.e. an investment of one dinar (i.e. foregoing a possible increase in his current income of one dinar) only yields to the worker n cash flows of r dinars. Consequently, given that his

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2) It should be noted that this accords with current Yugoslav practice. See Bendekovic & Teodorovic (1975), p. 39.

opportunity cost (given by the rate paid on bank deposits) is i_1 any such investment within the enterprise must yield to the worker an internal rate of return i_1 i.e.

$$\sum_{t=1}^{n} \frac{r}{(1+i_1)^t} = 1$$

$$\therefore r \sum_{t=1}^{n} \frac{1}{(1+i_1)^t} = 1$$

The term within the summation sign is but the present value of an annuity of one dinar over n years at a discount rate of i_1.

$$\therefore \sum_{t=1}^{n} \frac{1}{(1+i_1)^t} = \frac{(1+i_1)^n - 1}{i_1 (1+i_1)^n}$$

$$\therefore r = \frac{i_1(1+i_1)^n}{(1+i_1)^n - 1}$$

If this minimum acceptable return is designated r_1 equation (1) above results.

The impact of this differential between investment in "owned assets" (private saving) and "non-owned assets" (collective investment in the enterprise) may be demonstrated with the aid of figure 1. The curve S_1S_1 shows the amount of saving which workers would be willing to undertake at various levels of return. The curve II shows the marginal rate of return for various levels of investment by the enterprise. It is the Marginal Efficiency of Investment of the enterprise: for given levels of investment (shown on the horizontal axis) the vertical axis measures the cash flow, net of economic depreciation, generated each year during the planning horizon for each dinar of the investment. As argued above this would be the rate of return on the investment under private property rights. The rate of return to the worker manager under Yugoslav property rights is given by I'I'. For an n period planning horizon I'I' is obtained by solving equation (1) for i_1 given numerical values of r_1 where the values of r_1 correspond to II and i_1 the values given by I'I'.

In the absence of external credits for investment the equilibrium level of investment is OA, given by the intersection of S_1S_1 and I'I'. The equilibrium level of investment for the same firm under private property rights would be OQ, given by the intersection of S_1S_1 and II. Consequently a change to Yugoslav style property rights leads to a reduced level of investment in the typical enterprise.

Let credit for the purchase of fixed assets be available from the banking system at a *market clearing rate* of i_2. If this is a market clearing rate then any borrower is able to borrow as much as he wishes at that rate. It may be assumed that only collectives of worker-managers may undertake such borrowing. Before the impact of credit may be analysed two further factors must be taken into account: the manner in which property rights are applied to assets purchased with credit; and the length of the loan.
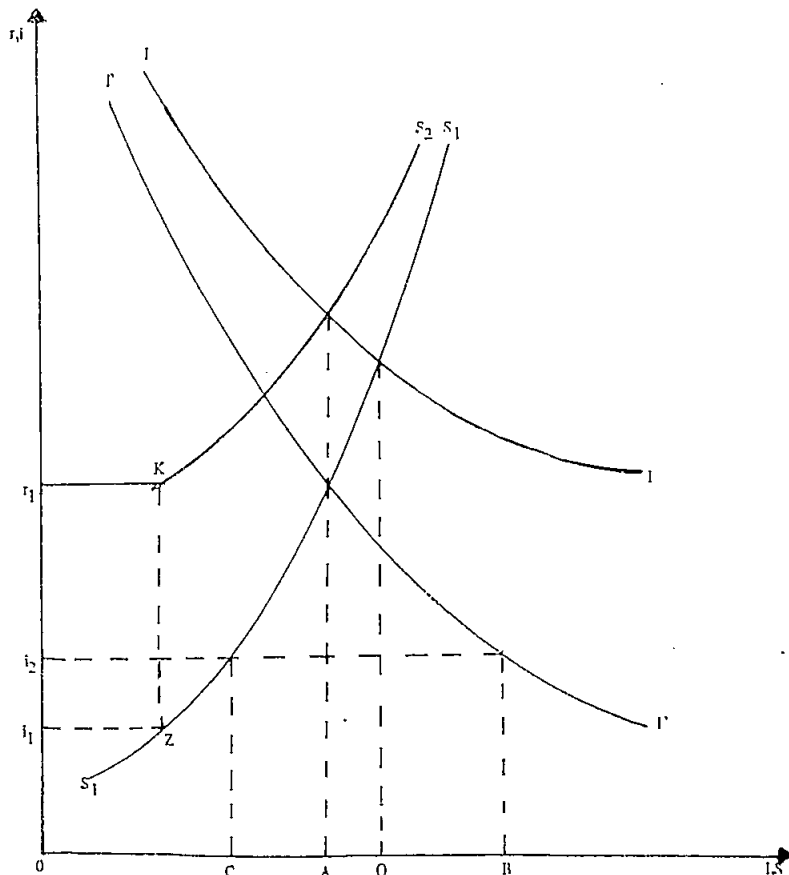

Figure 1

Whilst Yugoslav property rights require »the firm to maintain the book value of its assets if they (are) diminished by (physical) depreciation or other means...« |Pejovich (1973) p. 288| loans may be repaid from depreciation funds. This does not wholly remove the re-

quirement on the collective to maintain the increased value of its assets since this will be required after the loan has been fully amortised. Nevertheless it does mean that during the period of the loan the collective does not require to repay the loan *and* maintain the value of the asset.

However not maintaining the value of the asset is not without implications. If depreciation is not applied to the asset its productive capacity will fall thus reducing the cash flow each year. The cash flow will be reduced by more than the depreciation payment (by definition). Thus where depreciation is true, economic, depreciation worker-managers would be made worse off by repaying the loan from depreciation. Where loan period is the same as the planning horizon I'I' is the appropriate schedule for evaluating both self-financed investment and credit financed investment. When these periods differ the same schedule can no longer be used to evaluate both self-finance and credit finance. Three cases of credit finance will be examined in turn:

(i) $j = n$

(ii) $j > n$

(iii) $j < n$

where j is the loan period in years and n the planning horizon in years.

(i) $j = n$

When the loan period and the planning period are identical and depreciation is economic depreciation then I'I' in figure 1 is the appropriate MEI schedule for evaluation both loans and self-finance. If i_2 is the market clearing rate of interest on credit then the optimal level of investment is OB. This is made up of OC self-finance and CB credit. The collective is unwilling to borrow more than CB because the cost of credit beyond that amount is greater than the opportunity cost of self-finance. The opportunity cost of self finance being given by i_1ZS_1. Only when investment goes beyond C will credit be accepted at i_2.

The availability of credit at i_2 increases both investment and the current wage fund since it reduces self finance by the amount CA. In the case shown in figure 1 the level of investment increases above what it would be under self-finance with private property rights. It should be noted that whilst i_2 is the market clearing rate of interest under Yugoslav property rights it would not be so under private property rights. The high profitability of investment, as shown by II, would lead to a greater demand for funds and thus a higher rate of interest. Whether the availability of credit leads to higher or lower levels of investment in this particular firm when Yugoslav property rights are compared to private property rights is largely determined by the demand for credit elsewhere in the economy. It is reasonable to assume that where the market for credit is perfectly competitive (in both cases), that the level of investment will be lower under

Yugoslav property rights. It should also be clear that if the market clearing rate on credit were high such that it was above the intersection of I'I' and S_1S_1 no credit would be taken up and the collective would internally finance all investment.

In the cases where $j \neq n$ the method used above to take account of property rights (i.e. the transformation from II to I'I') is not very helpful. Instead the savings schedule will be transformed. The earlier transformation was attractive in that it conducted the analysis in terms of actual rates of interest (i_1 an i_2) and the rate of return perceived by worker managers. The transformation of S_1S_1 has the advantage of allowing a single MEI schedule (II) to be used to evaluate both self-finance and credit finance but uses a transformed value of interest rates. The transformation involves adjusting the schedule S_1S_1 such that it has a kink at i_1. This kink arises because only investment in fixed assets can yield a return greater than i_1. However the property rights structure as outlined above means that the return from investment required to yield the same return as bank deposits is

$$r_1 = \frac{i_1(1+i_1)^n}{(1+i_1)^n-1}$$

The transformed savings function for self-finance investment is shown as $r_1 K S_2$ in figure 1. It should be noted that this curve intersects II vertically above the intersection of S_1S_1 with I'I'.

In the case of bank loans where the rate of interest is i_2 and the repayment period is j then the rate of return required to make the loan acceptable is

$$g = \frac{i_2(1+i_2)^j}{(1+i_2)^j-1} \tag{2}$$

Where $i_2 \geqslant i_1$, then if $j \leqslant n$

$$g \geqslant r_1$$

(ii) $j < n$

Where the repayment period is less than the planning horizon and the rate of interest to be paid on credit is not less than i_1 then g is greater than r_1, say g_1 in figure 2. In the case illustrated in figure 2 the collective would udertake investment of OX, of which OY was self-financed and YX borrowed at a rate i_2 over j years with an effective burden of g_1. Clearly where $j < n$ the level of borrowing will be less than where $j = n$.

(iii) $j > n$

When the loan repayment period extends beyond the planning horizon it is possible that g will be less than r_1. When $g < r_1$, say g_2 in figure 2, the collective will cease self-finance totally and borrow OZ.

Note however that they would be willing to lend OR to the bank. Clearly this will be so if the rate paid for credit is the same as that paid on bank deposits i. e.

$$\frac{i_1(1+i_1)^n}{(1+i_1)^n-1} > \frac{i_1(1+i_1)^j}{(1+i_1)^j-1}$$

where $n < j$

However transactions costs are likely to make the credit rate above the deposit rate. Consequenttly $n < j$ is not a sufficient condition to yield

$$g < r_1$$

Typically, the greater $(j-n)$ and the smaller (i_2-i_1), the more likely $r_1 > g$, e.g. when $i_2 = .08$ and $i_1 = .04$ and $n = 5$ years and $j > n$, then $r_1 > g$. Thus for a low gap between lending and borrowing rates and a short planning horizon, a moderate loan period could produce $r_1 > g$. Since Yugoslav interest rates have been generally low with the rate paid by banks on time deposits ranging from 6—7% and the rate demanded on credits ranging from 8—10% the crucial factors are the lengths of the planning horizon and the bank loan period.

At a deposit rate of 0.06 and a bank lending rate of 0.10 the loan periods required to produce $r_1 > g$ for various planning horizons are:

n	j
4	5
6	7
7	9
8	11
9	12
10	14

Evidence, privately supplied, suggests a loan repayment of five years implying that planning horizons must be very short for this result to apply. The length of typical planning horizons in Yugoslavia is an empirical question which remains to be answered. Moreover, when the loan period is used to ration lending, then there is an obvious tendency towards a situation where $g > r_1$ and the results of section 2 (i) applying.

It seems reasonable to conclude that there is only a small chance that $g < r_1$ and therefore the existence of credit, in this model, is unlikely to lead to a total cessation of self-financed investment.

3. COMPARISON WITH FURUBOTN & PEJOVICH

The insights gained from the model developed above would seem to be at variance with the pessimistic conclusion of Professor Pejovich quoted earlier (p. 222 above). The present model has isolated the property rights structure of Yugoslavia from the other aspects which distinguish that economy from a perfect market economy. It may therefore be these other imperfections which generate " ... liquidity crises, unemployment and inflation ..." Before trying to isolate these factors it will be useful to summarise the analysis which leads to Pejovich's conclusions. This is contained in Pejovich (1973) and, in some more detail, in Furubotn (1974). These models are almost identical and may be regarded as one.

The assumptions underlying the model are broadly equivalent to those outlined above. The model is set up diagramatically along the lines of figure 2. However no explicit distinction is made between the planning horizon and loan repayment periods. Furubotn (1974) reaches a radically different conclusion from the model outlined above when he considers the case where the interest paid on bank deposits exceeds r_1 e.g. g_1. He argues that given a rate of interest above r_1 the level of investment will be OT. This is obtained by the collective borrowing OX and self-financing XT. The borrowing is seen to shift the origin from which the savings function is drawn to X. This shifts r_1 KS_2 to the right as shown by UVS'_2. Furubotn clearly states (p. 269) that bank credit will be used before employing any of its own savings " ... because only by such a strategy can the collective attain the greatest level of capital accumulation and maximize welfare." [Furubotn (1974) p. 269]. Whilst such a process may attain the greatest level of capital accummulation *it does not maximise welfare.* This can be seen by comparing the Marshallian surplus with that obtained by the financing sequence outlined in the section 2. Furubotn's sequence involves a sacrifice of r_1 KPg_1 in order to obtain UVNM. There are no circumstances, under the assumptions made here and by Furubotn (1974), in which the latter of these amounts can exceed the former. It should be noted that r_1 $K = UV$. Furubotn's method seriously over-estimates the attractiveness of credit to the collective. The present analysis is however likely to imply a lower level of investment than suggested by Furubotn.

The most striking difference between the two models arises where Furubotn and Pejovich examine rates of interest on credit which are less than r_1. They argue that such a situation is plausible and as has been demonstrated earlier will lead to the complete substitution of credit for self-finance. However these authors make no distinction between the nominal rate of interest on such loans and their effective burden. It has been argued earlier that so long as depreciation is true, economic, depreciation only very extreme cases would lead to an effective burden below r_1.

Notwithstanding the above criticism Pejovich's pessimistic conclusion also relies on a futher difference in the models: the rate of interest on bank credit in his model is an administered price and not

a market clearing rate. Were this not so $g_2 < r_1$ would pose no problem since any collective faced by such a situation would be able to raise as much credit as it desired. If this were so, no inflation or liquidity crisis would be generated. The dire straights which Pejovich's model points to arise from factors other than the structure of property rights. Principally they arise because credit does not carry a scarcity reflecting price. The assumption that credit is available at the going rate of interest will now be relaxed and the results compared with those of Pejovich (1973) and Furubotn (1974).
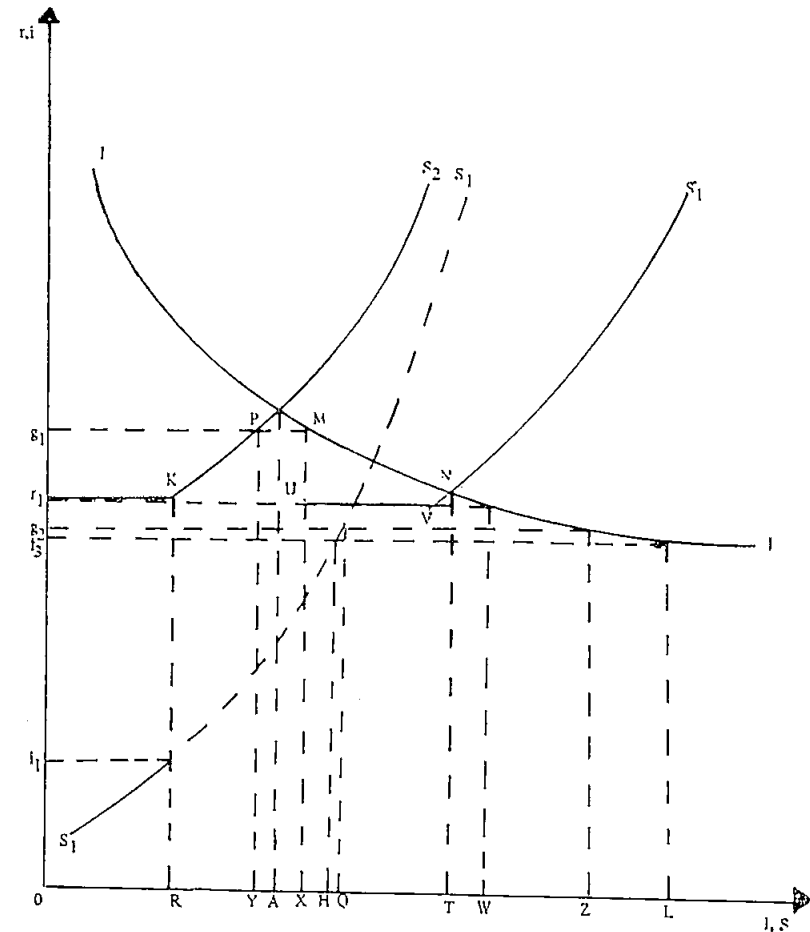

Figure 2

Assume that the effective rate of interest is g_2, in figure 2. The collective will wish to borrow OZ. If the rate of interest on credit is an administered price the banks may not have OZ available to lend. Suppose they lend in excess of OW. The collective will borrow what they can get at this rate and may finance the rest. In effect the workers would be willing to finance, themselves, anything up to OA and so long as the difference between OZ and the loan was no greater than OA the level of investment would be OZ.[3]

In contrast to this, Pejovich (1973), p. 305, asserts that "the firm's demand for investment funds will appear insatiable while at the same time its entire profit will be allocated to the Wage Fund". Such behaviour is clearly irrational since by it the collective loses substantial Marshallian surpluses which would accrue were they to finance part of the investment themselves. The error arises because Pejovich, like Furubotn, assumes a sequence in which self-finance is only used after credit is exhausted. If self-finance is applied first, then credit, it is clear that the collective will never allocate all of the surplus to the Wage Fund unless the desired level of investment can be wholly financed by credit.

4. CREDIT RATIONING

The constraint on enterprise borrowing from banks may be other than an absolute maximum amount of funds that can be obtained. The present writer's discussions with officials of a major Yugoslav investmet bank suggest at least nine criteria[4] which they use to ration loans (apart from the enterprise's ability to repay the funds). These are not all of a purely economic nature nor can all be analysed within the restrictive assumptions which underly the present model, but those which can are analysed below.

(a) *Project rates of return* are used to rank competitors for bank funds. If the rate of return used is the Internal Rate of Return then the resultant ranking may not truly reflect an appropriate economic ranking.[5] When the true rate of return (i. e. Return on Investment Capital[6]) is used there is the problem of whose rate of return to use. It should be clear from the above analysis that the rate of return to the enterprise and the rate of return to the workers who make up the collective differ. This is another reflection of the property rights structure. The rate of return to the enterprise[7] on an individual

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[3] It should be noted that in terms of figure 2 the process may be described as follows. The collective ascertains how much credit it would wish at g_2, thus determining the desired level of investment (e. g. OZ) from this is deducted the credit available taking the enterprise back along the horizontal axis to determine the residual to be self-financed. If the marginal return at that amount is greater than that given by r_1 KS, investment takes place, otherwise the level of investment is reduced until the residual amount is equal to OA.

[4] These were (i) the project's rate of return, (ii) the foreign exchange effect, (iii) funds provided by the enterprise, (iv) period of repayment of loan, (v) construction period of project, (vi) income per unit of investment cost, (vii) degree of bank participation, (viii) participation of foreign partners, (ix) priority to joint ventures.

[5] See Mao (1969).

[6] See Mao (1969).

[7] Which may be thought of as having an infinite planning horizon.

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project will be greater than that obtained by the workers. The difference between them is reflected in the distinction between II and I'I' in figure 1. Current Yugoslav practice[5] would seem to suggest that rates calculated with depreciation as a cost would be used. Thus the bank's evaluation of projects will accord with the workers' evaluation. However if Yugoslav practice changes and depreciation ceases to be treated as an economic cost[9] there is the likelihood of a conflict between the banks and the workers. Such a conflict will arise because of the ranking of projects implicit in II and I'I' may differ. It should be noted that the optimum portfolio of investment projects for the Yugoslav firm (under current property rights) may differ significantly from that for an identical capitalist firm faced with the same opportunities. Given the same cost of capital, as will be shown below, the ranking of mutually exclusive projects or the selection of projects subjects to a capital budget constraint may differ between the two systems. The Yugoslav firm will not only reject some projects selected by its capitalist twin but it may also select some projects rejected by its twin.

Consider two projects A & B. The cash flows associated with these projects are as shown in table 1 and are assumed to occur at the end of each year.

	Year										
	0	1	2	3	4	5	6	7	8	9	10
Project A	(1000)	500	500	500	500	500	500	500	500	500	500
Project B	(1500)	600	600	600	600	600	600	600	600	600	600

At a discount rate of 10% project A has an NPV of 2079.4 and project B has NPV of 2397.03. Provided 1500 were available B would be preferred to A. Under Yugoslav property rights however the capital stock of the enterprise must be maintained and therefore depreciation deducted from the cash flow to find the amount available for disbursement as wages and salaries and thus relevant to the workers making the decision in period 0. If depreciation is straight line, 100 p. a. must be deducted from A's and 150 p. a. from B's cash flows. The NPV's at 10% are now respectively A:1457.84 and B:1265.04. Thus A would be preferred to B.

Allowing for Yugoslav property rights will not only reduce the return on an investment but will also change the ranking of investments. If enterprises include depreciation as a cost and banks do not, the projects which banks wish to finance may differ from those

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[8] See Footnote 2 supra.

[9] Recent discussion with Yugoslav economists suggest that at least informally this is likely.

which firms wish to undertake.[10] In terms of figure 1 the physical projects requiring OA of investment when I'I' (i. e. taking full account of property rights) is used may be different from those physical projects requiring OA of investment when II is used.

(b) *Willingness of the enterprise to provide funds* may also be used to ration bank credit. Under Pejovich's analysis, if the rate of interest on credits is below r_1 in figure 2 (say i_3) and there is a requirement for the enterprise to contribute funds, it will never undertake more than OA investment, i. e. that which it would be prepared to finance fully itself. It would, however, wish to take as much bank finance as it could obtain at i_3.

The full incorporation of the property rights structure leads to a transformation of i_3 to an effective rate of g_1, say. In terms of figure 2 the firm will undertake OX investment but at rate g_1 will only want YX bank finance. As suggested earlier the firm will still wish to invest OX so long as the bank (at rate of interest i_3) is willing to lend at least AX.

Pejovich (1973), p. 306, alluded to pressure at that time in Yugoslavia for the reintroduction of a legal requirement for banks to require enterprise participation in the finance of their own investment projects. Early in 1976 such legislation was introduced. It requires firms to contribute 20% of all funds required for a project. The present analysis suggests that this is no great imposition. In terms of figure 2 this would not affect the overall investment of the firm unless OA < OX/5. This will only be the case if K S_2 (and S_1 S_1) is fairly far to the left, i. e. of a low propensity to save on the part of workers. Such a situation would affect the level of investment in the absence of credit or in the absence of the constraint. Basically it suggests A will be far to the left: it is not a function of property rights; it would apply under capitalist conditions. In the latter case the desired level of borrowing would be much greater and the constraint as binding. Pejovich's analysis, on the other hand, suggests that the 20% rate must reduce investment from the desired level (e. g. OL at i_3). The reduced level of investment will presumably be between OL and OH. However, the present analysis suggests that enterprises are unlikely to be prevented by the requirement of a proportion of self finance from undertaking projects which they would otherwise wish to undertake at a bank credit rate of i_3 (or any other rate below r_1).

(c) *The proportion of an investment's costs to be composed of bank lending* could also be used to ration funds. In this case the bank may give a high priority to projects in which the bank's contribution is relatively small. This will differ from (b) above in as far as the enterprise can obtain credit other than from the banks. Evidence from Yugoslavia suggests that it is common practice for contractors

[10] The ranking of a capitalist firm will be the same as that of the bank in this example.

working on the project or potential consumers of the project's output to provide such extended credit. However in terms of the model presented here, which excludes consideration of such other sources, the implications are the same as (b) above.

(d) *The period of repayment* of the loan may also be used to ration credit. The usual justification given for this is that it provides protection for the lender againts the riskiness of projects. However this is only valid so long as risk is thought, for a particular project, to be a function of time. Such a policy might also have the effect of encouraging small projects to be preferred over larger ones. In general as shown below, this method may reduce the demand for credit but it will not reduce the level of investment. This rationing mechanism may be seen as a special case of the loan period being less than the planning horizon which was examined above. It should be noted that this approach will not result in a reduced demand for credit unless repayment periods are less than planning horizons.

5. ACCOUNTING DEPRECIATION

If depreciation is calculated according to some arbitrary accounting convention it is highly probable that depreciation allowances will differ from the depreciation necessary to maintain the asset's produtivity. When depreciation allowances are calculated over the economic life of the asset the most extreme case will be when these are calculated on a straight-line basis but the productivity of the asset remains constant and then declines at an increasing rate. This is illustrated in figure 3, where the maximum productivity of the asset is given by Or.
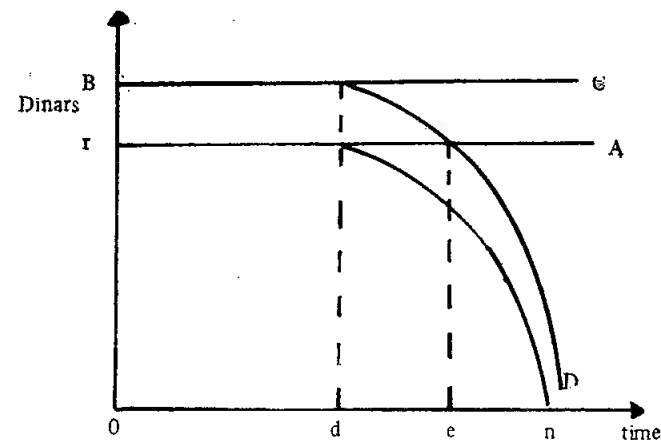

Figure 3

This is seen to be constant for a number of periods and then decline rapidly to zero by year n. True, economic, depreciation could maintain the productivity at r as shown by the line rA, whilst accounting depreciation is the distance rB, which equals $1/n$ times the nominal cost of the asset. The curve BD shows income over time when the asset is not maintained. It is clear that for the years up until d no depreciation is necessary. As a consequence repaying a loan from depreciation funds during that period would increase the income of the worker-managers. In the years from d to e this would still increase income but by less than the amount of the depreciations allowances, as shown by BD. Thereafter it would no longer pay to apply the depreciation allowances to repaying the loan. Repaying the loan from depreciation allowances will only be rational over part of the asset's life. Consequently use of the depreciation allowances cannot repay all of the loan.

The fact that repaying some of the loan from depreciation is rational does not necessarily invalidate the main analysis of this paper (i.e. that it is highly likely that the effective burden of a loan, g in figure 2, is greater than the minimum acceptable return under self finance i.e. r_1). For that, it has to be shown that repaying part of the loan from depreciation will reduce the required rate of return by more than $(g_2 - r_1)$.

The gain from repaying the loan from depreciation is

$$d_t - \delta_t$$

where $d_t = \dfrac{1}{n} K$, $K \equiv$ the initial cost of the asset and δ_t is the vertical distance between rA and rn in figure 3 for any year t i.e. the fall in the asset's productivity.

If the market rate of interest is i_1 (equal to the bank deposit rate) and the initial cost of the asset (or the amount of loan) is 1 then the minimum acceptable constant cash flow from the asset, r, is given by

$$1 = \sum_{t=1}^{j} \frac{r + d_t - \delta_t}{(1+i_1)^t} \quad \text{where } j = \text{the period of the loan.}$$

$$= r \sum_{t=1}^{j} \frac{1}{(1+i_1)^t} + \sum_{t=1}^{j} \frac{d_t - \delta_t}{(1+i_1)^t}$$

$$\text{let } \sum_{t=1}^{j} \frac{d_t - \delta_t}{(1+i_1)^t} = \varepsilon$$

$$\therefore 1 - \varepsilon = r \sum_{t=1}^{j} \frac{1}{(1+i_1)^t}$$

$$= r \left[\frac{(1+i_1)^j - 1}{i_1(1+i_1)^j} \right]$$

$$\therefore r = [1 - \varepsilon] \left[\frac{(1+i_1)^j - 1}{i_1(1+i_1)^j} \right]$$

Thus if ε is positive

$$r < \frac{i_1(1+i_1)^j}{(1+i_1)^j - 1} = r_2$$

if ε is negative

$$r > \frac{i_1(1+i_1)^j}{(1+i_1)^j - 1} = r_2$$

Clearly the smaller the value of j the larger will be ε. Note that the RHS of these inequalities are simply the required rate of return for a loan when capital is not paid from depreciation. Thus where ε is positive the required rate of return is reduced when depreciation is used to repay the loan. However the earlier analysis is only substantially affected when this required rate of return falls below r_1.[11]

It should be recalled that

$$r_1 = \frac{i_1(1+i_1)^n}{(1+i_1)^n - 1}$$

where n is the planning horizon of the worker managers. When the loan period is short and thus less than the planning horizon it is probable that ε will be positive but under these circumstances

$$r_2 - r_1 = \emptyset$$

$$\text{where } \emptyset > 0$$

In such a case the effect of repaying the loan from depreciation depends on the relative sizes of $\emptyset$ and ε. Consider an example where

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11) Clearly any reduction in r makes credit more attractive relative to self finance but where $r > r_1$ the consequences of this may be relatively small.

$$i_l = 0.06$$
$$n = 8$$
$$j = 4$$
$$K = 1 \text{ and the productivity of the asset}$$

does not decline until $j > 4$.

Under these circumstances

$$r_l = 0.16$$
$$g = (1-\epsilon)\, g_3 \quad , \quad \text{where } g_3 = \frac{i_l(1+i_l)^j}{(1+i_l)^j - 1}$$
$$g = .17$$

and therefore repayment of the loan from depreciation does not reduce the required rate below r_l.

It is more realistic to assume that the rate of interest on the loan will be greater than i_l, say $i_3 = 0.1$. In this case

$$r_l = 0.16$$
$$g = 0.19$$

Thus under these more· realistic conditions g is about 20% higher than r_1 although less than g_3. Furthermore when the productivity of the asset declines more rapidly than in the case considered here g will increase. Obviously the difference between the repayment period and the planning horizon is a crucial variable. The larger j is the smaller ϵ is likely to be for a given size of n. A general solution here is not possible but what can be concluded is that with arbitrary depreciation rates it is more likely that $g < r_1$. However· as has been argued earlier the consequences of $g < r_1$ are not as extreme as suggested by Furubotn and Pejovich.

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BANKARSKI KREDIT I INVESTICIJE U JUGOSLOVENSKOM PREDUZECU

Frank H. STEPHEN

Rezime

Model koji autor konstruiše u odeljku 2 ovog članka ukazuje na to da će jugoslovenski sistem vlasništva, ceteris paribus, na nivou tipičnog preduzeća ·dovesti do nižeg nivoa investicija nego što je to slučaj u sistemu privatnog vlasništva. Uvođenje eksternog tržišnog kredita dovodi do poboljšanja ovog rezultata. Takav rezultat izgleda da je u saglasnosti sa Vanekovim (1973) gledištem po kome samoupravna preduzeća postižu optimalne rezultate samo u slučajevima potpunog eksternog finansiranja investicija.

Furubotn (1974) i Pejovich (1973) tvrde da kombinacija eksternog finansiranja i jugoslovenskog prava vlasništva predstavlja osnovni uzrok mnogih ozbiljnih problema sa kojima je suočena jugoslovenska privreda. Autor članka nastoji da dokaže da ovakvo zaključivanje nije valjano iz dva razloga. Prvi se sastoji u pogrešnoj analizi samog procesa realizacije željenog nivoa kredita, a drugi u tome što pomenuti autori ne razlučuju pitanje

niske cene kapitala u jugoslovenskoj privredi od prirode svojinskih prava nad kreditom. Ova dva međusobno povezana faktora dovode Furubotna i Pejovicha do vrlo pesimističkih zaključaka.

U odeljku 4 i 5 dve pretpostavke iz ranijeg modela su modifikovane da bi realističnije mogle da odraze uslove koji postoje u Jugoslaviji. Analiza racioniranja kredita pokazala je da će posledice racioniranja biti manje oštre nego što je to u slučaju s modelom koga su analizirali Furubotn i Pejovich. Ova razlika u rezultatima se u velikoj meri može pripisati njihovoj specifikaciji procesa kojim se određuje optimalni nivo kredita. Druga pretpostavka odnosi se na mogućnost otplate glavnice duga iz amortizacije. Zbog toga je finansiranje investicija iz neisplaćenih ličnih dohodaka manje privlačno za jugoslovenskog samoupravljača. Autor je zatim u analizu uključio i otplatu duga iz amortizacije. U svim slučajevima, pokazuje F. Stephen, posledice investicionih odluka u samoupravnom preduzeću nemaju tako ekstremni karakter kao što to tvrde Furubotn i Pejovich.

RAZDELITEV DOHOTKA V GOSPODARSKEM RAZVOJU

*Miroslav GLAS**

V sistematičnem raziskovanju problemov gospodarskega razvoja je v povojnem času pozornost od vprašanj kapitala in investicij prešla na vprašanje zaposlenosti in razdelitve dohodka. Medtem ko je analiza vloge investicij vodila do varčevanja in s tem tudi od funkcionalne razdelitve dohodka[1], zlasti v smislu kategorij mezd in profita, pa je v sedanjem času poudarek na medosebni (personalni) razdelitvi dohodka. Pri tem gre za dohodke, ki jih prejemajo posamezniki, bodisi kot neposredni členi gospodarskega procesa ali pa iz drugih izvorov, ter za neenakost, ki nastopa v razdelitvi teh dohodkov. Ta razdelitev pa se potem povezuje z rastjo gospodarstva kot rezultat te rasti, hkrati pa tudi kot ena od določljivk rasti same. Razdelitev dohodka se namreč v politiki dohodka pojavlja v ozadju uresničevanja določenega načela »pravičnosti« v delitvenih razmerjih, zlasti v oblikovanju delovnih dohodkov[2], nastopa kot faktor ohranjanja gospodarskega in širšega družbenega ravnovesja ter v poskusih stimuliranja gospodarske rasti, kjer se dohodek predpostavlja kot osnova motivacijskega mehanizma.

Ukvarjanje z razdelitvijo in zaposlenostjo je izraz nezadovoljstva z dosedanjimi razvojnimi rezultati, zlasti v nizu dežel v razvoju, izraz prehoda na vprašanja kvalitete razvoja. Zaupanje v avtomatizem gospodarske rasti, ki naj bi mimogrede rešila vprašanja razdelitve, ko bi se bistveno izboljšal nivo materialnega blagostanja, je povsem neupravičeno, saj je dejansko prišlo do stagniranja, ponekod pa celo do zniževanja realnega dohodka velikih skupin prebivalstva[3]. Razvojna politika se zato vrednoti s poudarkom na rezultatih zaposlovanja in razdelitve, ne pa le po svojih kvantitativnih rezultatih, ki ne morejo biti samemu po svojih kvantitativnih rezultatih, ki ne morejo biti samemu sebi cilj. Pomen razdelitve dohodka je seveda v tem, da v blagovno-denarnem gospodarstvu dohodek nastopa kot sredstvo za potrošnjo, s tem pa prejemniku zagotavlja določeno materialno blago-

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1) Zlasti velja to za neokeynesijansko tradicijo, npr. dela Kaldorja, Pasinettija in drugih.

2) Vsekakor lahko govorimo o »pravičnosti« v narekovajih, ker je slednja v literaturi omejena na razprave o delovnih dohodkih, brez poseganja v izvore drugih dohodkov.

3) Primerjaj Griffin (1977), Oshima (1977).