

U drugom delu članka ispituje se efekat uvođenja zajma u model radi finansiranja investicionih projekata. Pokazuje se da se uticaj zajma prilično razlikuje od uticaja koji je pretpostavljen u radu Furubotna i njegovog saradnika Pejovića. Ovo proističe iz njihove pretpostavke da se samofinansiranje javlja samo kada se željeni nivo investicija ne može u celosti isfinansirati iz zajma. Pokazuje se da ovaj redosled nije optimalan.

U trećem delu članka ispituje se primenljivost Furubotnovog modela kada se u obzir uzme »amortizacioni multiplikator« koji je uveo Horvat. To se čini istraživanjem amortizacione šeme zasnovane na nominalnoj vrednosti sredstava. Pokazuje se da takva šema stvara investicione fondove koji mogu biti dovoljno da sasvim otklone efekte sistema svojinskih prava koji predstavljaju osnovu Furubotnovog i Pejovićeveog modela.

SELF-MANAGEMENT, EFFICIENCY AND NEOCLASSICAL ECONOMICS

Branko HORVAT*

Many years ago, sometime after the First World War, Ludwig von Mises produced a »scientific proof« that a centrally-planned economy could not work, that it was economically impossible. Thus, the Soviet economy, against which the tract was oriented, would first, lag behind and it would finally break down. This proof, together with a certain number of other articles hostile to planning was republished in 1935 in a book edited by von Mises's compatriot, F. A. von Hayek.¹⁾ The book entered the classrooms and became required reading for unfortunate students. At the same time, the Soviet economy was growing at a rate higher than any other economy in the world. It was only after the Russians launched the Sputniks that von Mises's proof was quietly left to oblivion.

In a book just published, Henry Lepage²⁾ rediscovers von Mises. Lepage does not search for any proof against central planning, however. He quotes von Mises extensively as an inspiration for another exercise which is less ambitious but more up-to-date. It needs to be shown that self-management, though possible, is less efficient than capitalism. Consequently, self-management is nothing but an illusion and it is capitalism which is bound to triumph. The proof of Lepage has three ingredients. The first consists in a neoclassical analysis intended to prove that the allocation of resources is less efficient than in capitalism. Next, theoretical conclusions are supported by what is referred to as the Yugoslav experience. Finally, the author invokes Professor Milton Friedman and his son, and engages in a sort of computopia to forecast the brilliant prospects of capitalism. This, last, exercise in futuristic speculation has some interesting points, but is of no concern to me here. The oft-used phrase »l'expérience yougoslave montre« is rather unfortunate because the author has a poor command of facts, confuses political and economic causes and processes, and is mainly ignorant of professional literature — such as econometric and organizational studies — and par-

*) Professor of Economics, University of Zagreb, The French version of this article is published in *Revue Economique*, 1979.

¹⁾ F. A. von Hayek, ed. *Collectivist Economic Planning*, Routledge, London, 1935.

²⁾ H. Lepage, *Autogestion et capitalisme*, Masson, Paris, 1978.

ticularly of Yugoslav empirical and theoretical research. Thus, the case for comparative superiority of the two systems boils down to what neoclassical economics can teach us. And that might prove to be of some educational value.

The neoclassical proof of the inferior efficiency of a labour-managed economy reached France with delay. It was originally developed in the United States, where it now plays the role of von Mises's defunct proof. It has an interesting history.

Somewhat more than twenty years ago a young and progressive American economist, Benjamin Ward, came to Yugoslavia to write his doctoral dissertation on workers' management. Being well educated in neoclassical economics, he immediately asked himself the question of what ought to be the objective function of a labour-managed firm. In a capitalist firm that was profit maximization. Such a goal was clearly inapplicable. Ward decided that workers ought to maximize their wages, i. e., income per capita. He was not sure that Yugoslav workers really behaved that way and so he carefully christened his model *Illyrian Firm*. He published his main results in an article in 1958¹⁾. Lepage is also making use of that text.

It turned out that the Illyrian Firm behaved in a rather strange way. Whatever the capitalist firm does, the Illyrian one does the other way round. Since it is known that the capitalist firm is efficient, the Illyrian Firm must evidently be inefficient. For some years the article remained unnoticed. However, as socialist movements and trade unions began to press towards workers' management, it became necessary to show that this was an inferior system. The article was rediscovered, the term »Illyrian« discarded and replaced by »workers' managed« and a ready-made proof was obtained for the inferior allocational efficiency of the labour-managed economy. The proof was then included into the standard courses on comparative economic systems. After some time, the argument reappeared in the book by Lepage. Let me quote the main propositions from there:

»*Ceteris paribus*, the behaviour of the self-managed enterprise will be more Malthusian than that of a capitalist firm.«

»Its manager will fix the objectives of production and employment, as well as of investment, inferior compared with a capitalist firm placed in the same circumstances.«

»The incentive to invest is less strong in a self-managed enterprise than in a capitalist enterprise. The preference to consume immediately is stronger.«

»The Corollary of the Malthusian behaviour of the self-managed enterprise consists in having lower rate of growth in a self-governing society compared with a capitalist society.«

»This Malthusianism leads to a series of human and financial waste which makes for poorer use of society's resources compared with a capitalist firm.«²⁾

In order to »prove« these propositions — and some other equally-radical ones — I shall use a slightly more modern technique than that

¹⁾ B. Ward, »The Firm in Illyria«, *American Economic Review*, 1958.

²⁾ Lepage, op. cit., pp. 47, 71.

of Lepage and replace the graphs and numerical examples by algebra. This will considerably shorten the exposition. Since it is open to doubt whether contemporary capitalist firms (maximize profits³⁾) in order to be precise I shall talk of the »neoclassical firm«. For the same reason, I retain Ward's original terminology and refer to the alternative as the »Illyrian Firm«.

Consider a firm with a simple production function with two variable inputs, labour (x_1) and other resources (x_2)

$$q = f(x_1, x_2) \quad (1)$$

There is also a fixed cost k . Thus profit appears to be

$$\pi = pq - (wx_1 + p_2x_2 + k) \quad (2)$$

where p is the price of output, w the wage rate and p_2 the price of the other variable input. If profit is to be maximized, the first order conditions are the familiar marginal equations

$$\begin{aligned} \frac{\partial \pi}{\partial x_1} &= 0 \rightarrow pq_1 = w \\ \frac{\partial \pi}{\partial x_2} &= 0 \rightarrow pq_2 = p_2 \end{aligned} \quad (3)$$

The second order conditions are satisfied if diminishing returns are assumed, which I shall do throughout.

The analysis of the conditions (3) shows that (a) an increase in product prices increases output and employment; (b) an increase in factor prices decreases output and employment; (c) a change in fixed cost produces no effects since k does not appear in the conditions, and (d) labour is treated as any other resource, there is complete symmetry.

Let us now change the status of the firm and replace neoclassical management by an Illyrian workers' council. Since wages do not exist, we cannot establish profit. Advised by Lepage, the council will calculate income per member of the working collective

$$y = \frac{pq - (p_2x_2 + k)}{x_1} \quad (2a)$$

in order to maximize it. The first order conditions are now

$$\frac{\partial y}{\partial x_1} = 0 \rightarrow pq_1 = \frac{pq - (p_2x_2 + k)}{x_1} = y$$

³⁾ See Y. Simon, H. Tezenas du Montcel, *Economie des ressources humaines dans l'entreprise*, Masson, Paris, 1978.

$$\frac{\partial y}{\partial x_2} = 0 \rightarrow pq_2 = p_2 \quad (3a)$$

It is evident that the second order conditions are also satisfied.

We cannot analyze the first of the conditions (3a) directly. I shall therefore transform it in the following way

$$q - q_1x_1 = \frac{k}{p} + \frac{p_2x_2}{p} \quad (4)$$

It is easy to see that the following is true

$$\frac{\partial}{\partial x_1} (q - q_1x_1) = q_{11}x_1 > 0 \quad (5)$$

A similar analysis as earlier now produces the following results: (a) an increase in p reduces the right side of the equation (4); in order to preserve equilibrium, the left side must also be reduced which, according to (5), amounts to reducing employment x_1 and, consequently (by virtue of (1)), the output; (b) an increase in the factor price of other resources has the same effect as in the neoclassical firm; (c) an increase in the fixed cost (k) increases output and employment, and (d) factors are not treated symmetrically since wages do not occur in (3a) and the two conditions are differently structured.

The entire exercise is more clearly surveyed in a table:

Effects on Output and Employment

Type of change	Neoclassical firm	Illyrian firm	Self-managed firm
Increase in product price	+	—	+
Increase in wages	—	0	0
Increase in the price of mat. inputs	—	—	—
Increase in the fixed cost	0	+	0

The results are amusing — or horrifying — depending on one's mood and education. Illyrians do just about everything differently and — wrongly. When product prices in the market increase, they reduce output! The economy is thus hopelessly unstable. When the government wants to increase employment, it must levy a lump sum tax! The higher the tax, the higher are output and employment. And wage policy is of no use since Illyrians discard wages. It hardly needs to be added that none has ever detected anything similar in a real world economy — say in the Yugoslav economy. But in strict logic, this is no proof that it might, not happen sometime.

It remains to prove Malthusianism and underinvestment. Compare (3a) and (3). Since $y > w$, $q_1(\text{Illyrian}) > q_1(\text{neoclassical})$ which implies lower output and reduced employment. It also implies that for the same output (given the technology) the capital-labour ratio will be higher. The Illyrian Firm uses more capital than necessary. If there is unemployment, and the government administers subsidies in order to create new jobs, the Illyrian Firm will employ a lower number of workers. Thus, the efficiency of the economic policy is reduced.⁶⁾ Less employment and higher capital intensity implies, for a given time preference, a smaller rate of growth. The latter is further reduced by smaller saving due to the fact that social property makes impossible the instantaneous recuperation of capital at the market rate of interest.

All these effects are the results of an analysis «à court terme, c'est-à-dire a stock capital constant.»⁷⁾ Why should a short term analysis be made on the condition of capital stock constant? Why not constant employment? Is it because it is customary or because that is how the short term was defined by Marshall a century ago? Or because such an assumption generates pleasing consequences? In Marshall's time, a worker could be fired within a day; the disposal of capital would take more time and, generally, was not desired. Thus, it made sense to consider capital fixed. Assume, however, that the dismissal time for workers is the same as for managers, say six months. On the other hand, we know that in every firm there are bottlenecks whose elimination increases capacity rather quickly. Thus, capital is changeable upwards on a weekly if not on a daily basis. A need for reduced capacity may be met by abstaining from replacement, selling equipment on the market for second hand capital goods (which, in the neoclassical world, ought to be perfect), and by renting the premises. At any rate, since the analysis is conducted in terms of marginal changes, even small changes of capital would suffice. Consequently, it may be assumed that labour is fixed and capital variable. In that case, assuming self-financing, the rational goal might be maximizing the rate of profit. As Đinko Dubravčić showed,⁸⁾ that produces effects symmetric to those of Lepage. Except that now we have labour intensity, overinvestment, etc., i. e., everything wrong in the other direction. Suppose, next, that the firm is run by workers, whose number is constant because they do not dismiss their colleagues. Let the workers maximize their incomes. In this case, the consequences are completely neoclassical. Mathematically speaking, maximizing absolute magnitudes produces desirable results, maximizing ratios — undesirable ones. Thus, if you wish to prove that an economic system is bad, you have to show that its agents fell in love with the ratios.

Of the various assumptions quoted — and other variations are obviously possible as well — which are applicable to self-management? By now, this is no longer a matter of speculation, but a matter of observed

⁶⁾ Lepage, op. cit., pp. 65-69. But if there is lack of labour and surplus of capital, the effectiveness of economic policy would be enhanced.

⁷⁾ Op. cit., p. 69.

⁸⁾ D. Dubravčić, «Labour as Entrepreneurial Input», *Economica*, 1970, 297-310.

behaviour.⁹⁾ The answer is: none. The real world is somewhat different. At the beginning of the accounting period, the workers' council sets aspiration wages which are valid for that period. Wages being fixed, what remains to be done is to maximize the residual surplus

$$\pi = pq - [(w + \Delta w)x_1 + p_2x_2 + k] \quad (6)$$

The increment Δw can, of course, be either positive or negative. At the end of the period, aspiration wages are revised upwards or downwards, depending on the success of the firm. Thus, we must distinguish between two types of wages: accounting wages ($w + \Delta w$) and the actually paid wages ($w + \Delta w + \Delta w^*$). Only the former enter the objective function.

A look at (6) suffices to persuade us that the mathematical properties of the equation are the same as that of (2): a self-managed firm will behave like a neoclassical firm and will be equally efficient. The only — yet socially extremely important — distinction is to be found in the fact that labour is no longer a commodity, it is no longer sold to an employer, and so paid wages do not figure in our table. The objective function may be described as: maximum total income subject to the constraint that the accounting wages be $w + \Delta w$.

The natural question to ask is whether there will be any tendency for wages in various firms to converge to a market wage. The answer is positive and the reason is the same as the one for the equalization of profits in the capitalist market: competition and free entry.

The next question is whether it is rational to follow an objective function like (6). The answer is again positive. If we stay within the neoclassical framework, we may imagine a workers' council adopting a long-term plan which maximizes the incomes of the employed workers over a collectively chosen horizon. The plan is then broken into a score or so of short-term plans, one for each accounting period. The resulting wages represent aspiration wages for relevant periods.

As for investment, growth and the rate of interest, one would assume that after the appearance of Keynesian economics there is hardly any need to argue that the nineteenth century neoclassical notions are of no use, to say the least. In particular, it is not saving that determines investment, but investment that generates savings. As Kalecki would say, workers spend what they earn but capitalists earn what they spend. The rate of interest has little to do with the time preference. And in an industrialized economy, high marginal propensity to consume is conducive to growth.

What can one expect to happen in a self-managed economy? Social property and planning reduce risks and so increase investment opportunities. Both reduce interest rates and increase the rate of growth. A higher rate of growth induces a higher rate of technological progress, *ceteris paribus*.

Lepage, being neoclassical, reaches the opposite conclusion: »... technological progress and socialism are two incompatible notions (von

Mises resurrected!)... Since the logic of the self-managed firm (and of the self-managed economy) is to be less efficient, since, *ceteris paribus*, the logic is to invest less and to be less innovative, the transition to self-management cannot but slow (down) the social change...¹⁰⁾

How are we to resolve this contradiction between a neoclassical and a Keynesian prediction? By referring to the facts, obviously. »L'expérience yougoslave montre: (a) chronic overinvestment which forces the government to design various measures for the reduction of investment; (b) a higher rate of technological progress than in the other countries¹¹⁾ for which we have the data, (c) a higher rate of growth than in most other countries. Yet, the Yugoslav economy is by no means a model economy. Besides, being a pioneer in self-management, it was bound to make many mistakes which latecomers will be able to avoid. Thus, Yugoslav performance may be taken as the lower limit of efficiency reasonably expected in a self-managed economy.

More specifically, on the basis of empirical studies by econometricians, industrial sociologists and others, one can quote a number of reasons why the capitalist firm and capitalist economy are generally substantially less efficient than a labour-managed one.¹²⁾

1. Since the worker is not working for himself but for someone else, for a master, he lacks proper motivation and his work effort is not optimal. A summary of the relevant empirical research is to be found in a book by Paul Blumberg.¹³⁾
2. Hired labour must be supervised. There is a need for many layers of supervision. That implies material and human costs.
3. The impetus for day-to-day innovations is weakened and persons outside the research departments contribute little to innovation.
4. Weak sanctions for poor management. »Managers make mistakes and shareholders are punished«.
5. High costs incurred by labour-capital conflicts resulting in strikes, lockouts, etc.
6. Alienation, unhappiness and mental disorders as documented in the semi-official report *Work in America*.¹⁴⁾
7. Collusive practices and undetected economic crimes due to the fact that decisions are made by a handful of individuals free from public inspection.
8. Deformation and destruction of the market by financial concentration, cartelization, oligopolistic practices and other kinds of market control.

⁹⁾ Op. cit., p. 349.

¹⁰⁾ The rate of technological progress is measured in the usual way as the residual in the Cobb-Douglas production function. See B. Balassa, T. Bertand, »Growth Performance,« and comments by myself, *American Economic Review*, May, 1970, pp. 314-25.

¹¹⁾ For an elaboration, see B. Horvat, »Why are Inefficiencies of Private Enterprises Tolerated«, *Economic Analysis and Workers' Management*, 1975, 339-45.

¹²⁾ P. H. Blumberg, *Industrial Democracy: The Sociology of Participation*, Constable, London, 1968.

¹³⁾ M. J. T., Cambridge, 1973.

⁹⁾ B. Horvat, »Prilog zasliwanju teorije jugoslovenskog poduzeća«. *Ekonomiska analiza*, 1967, 7-27.

9. Private ownership imposes definite constraints on social planning. Therefrom business cycles, unemployment and low long-run rate of development.

10. Most of the preceding defects require perpetual government intervention. The state bureaucracy expands with its deadening effects on efficiency and liberty.

In the preface to the book, Michel Drancourt writes: »Il faut que les moyens dont l'homme dispose, grâce notamment aux techniques qu'il met au point, soient largement utilisés pour une meilleure affectation des ressources. Seule cette dernière permet en effet de faire face à des besoins croissants... C'est parce que nous sommes ambitieux pour l'homme qu'entre l'autogestion et le capitalisme, nous choisissons — avec Henri Lepage — le capitalisme.« In view of what has been said above, is one really »ambitieux pour l'homme« when one opts for capitalism?

AN EXPLANATION OF EARNINGS' VARIATION IN THE
YUGOSLAV SELF-MANAGED ECONOMY

Saul ESTRIN*

INTRODUCTION

This paper proposes a way to test hypotheses about self-managed firms, and presents some preliminary results from estimating the model on Yugoslav data. It is intended to focus empirical attention towards those observable variables which economic theory predicts would behave differently in a self-managed environment, and assess the relevance of the analysis for Yugoslavia.

In the literature on labour managed enterprises (i.e. 2, 11, 12), attention has been concentrated on comparing their equilibria and responses with those of technically similar capitalist firms. The possibility of a perverse short-run supply response is the central conclusion, which points empirical work to the estimation of supply elasticities, despite obvious problems of identification and interpretation. However, any difference in equilibrium between the firm types must be reflected in a divergence between earnings and the market wage, and average earnings between firms will vary according to the profit level that would have been earned under capitalism. A particular market economy reaches the same general equilibrium under either system (2), but the resource misallocation during disequilibrium occurs in different markets. Specifically, shifts in demand are reflected in an inter-industry profit distribution under capitalism, but an average earnings dispersion under self-management. Since, in enterprise equilibrium, a co-operatives' chosen earnings equal the labour value marginal product, market disequilibrium is associated with a pareto inefficient labour market allocation. This is not true in capitalism since each firm equalises the value marginal product to the given market wage. Thus, any self-managed economy must be characterised by an average earnings dispersion outside full competitive equilibrium, and this could not occur under capi-

*) Department of Economics, The University, Southampton, U. K.