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Introduction

In this book we examine Yugoslav industrial organisation and allocative efficiency from the perspective of self-management theory. A large literature has grown up in recent years to analyse how firms will behave when the labour force plays the role of entrepreneur. However, few of the resulting hypotheses have been tested empirically. On the other hand, Yugoslavia has based its entire economic system on enterprise self-management, but there have been few empirical studies based on the relevant theory. This study is intended to fill this gap in the literature, analysing the Yugoslav economy with reference to the distinctive propositions of self-management theory.

The book has two parts, devoted respectively to deducing and testing hypotheses about the Yugoslav economy. In the first part, an abstract theoretical literature and a mass of institutional material is steered in the direction of empirical application. The relevant aspects of self-management theory are outlined in Chapter 2, and the Yugoslav economy is introduced in Chapter 3. Both chapters draw heavily on the existing literature, but the presentation in each is self-contained. Various issues in Yugoslav industrial organisation and resource allocation are explored in the second part of the book. Chapter 4 is concerned with changing market structure and Chapter 5 with income differentials and the pattern of industrial development. The general consistency between the empirical findings and our predictions is confirmed by estimating a formal model of income determination on Yugoslav data, with the results being reported in Chapter 6. Overall, our findings broadly confirm that self-management was affecting Yugoslav resource allocation in the predicted way between 1965 and 1974. Even so, we point out in Chapter 7 that
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our results can only be one element in an overall assessment of the system since the beneficial aspects of self-management have not been considered in the study.

Economic theory has shown that a competitive economy can sustain a Pareto efficient equilibrium under capitalism or self-management (Vanek, 1970; Drèze, 1976). Thus, self-management could only affect resource allocation in a competitive system by changing the shape of technology or of preference sets. In fact, it has been suggested that differences in internal organisation and incentives under self-management could alter production possibilities (see Vanek, 1970), and this view has motivated some empirical studies (see Balassa and Bertrand, 1970; Cable and Fitzroy, 1980). However, both the models and the empirical work are largely ad hoc at this stage, and the topic may anyway be of secondary interest in a relatively less developed economy such as Yugoslavia. On the other hand, much of the social and political work favouring the adoption of self-management (e.g. Vanek, 1971; Hunnius, Garson and Case, 1973; Zwerdling, 1979) has assumed that the satisfaction derived from a given allocation varies according to the allocative mechanism. Thus, state dependent utility functions are invoked to show that individuals would be happier under self-management for non-economic reasons. This approach also yields few empirically testable propositions about Yugoslavia at this stage. Therefore, we move outside the framework of competitive equilibrium in this study to consider whether the disequilibrium allocation will display any peculiar characteristics under self-management. In fact, the theory shows that labour market forces are weak in a self-managed system, which affects the course of adjustment to competitive equilibrium. Our empirical work comprises a search for these particular allocative inefficiencies on Yugoslav data.

To be more specific, self-management theory distinguishes cooperatives by their maximand; average earnings per worker. Such firms are assumed to pay out pure profits, the surplus of revenue over costs, to their worker-members as current income. In contrast to capitalist firms, which are normally modelled as choosing desired employment on the basis of market wages, self-managed firms are therefore seen as determining their own incomes as well as membership. In principle, the movement of workers between alternative uses ensures common wages for particular skill groups in other competitive systems. However, these labour market forces are
Inoperable under self-management because each firm has already chosen its own optimal labour demand point according to the enterprise specific demand and cost conditions, and is insensitive to further labour market pressures. It is the entry and exit of firms changing relative prices in product markets, or ‘general equilibrium effects’, which ultimately drive the system to an efficient allocation. Producers enter markets where earnings include an element of pure profit and depart from those where they include pure losses until an equilibrium price vector emerges which sustains equal incomes in different uses. In the interim, resource allocation will be distinguished by inter-firm income differentials and inefficiency in the choice of production techniques. More generally, allocative inefficiencies from whatever source, including for example product market imperfections, will always be reflected in a misallocation of labour under self-management. These issues are addressed more formally in Chapter 2, with the exposition being primarily geometric, and mathematical reasoning being largely confined to the appendix to the chapter.

The Yugoslav economy and the operation of the various allocative systems are described in Chapter 3. Our intention is to summarise the historical and institutional material relevant for our study, as well as to specify estimation periods. The complexity of the Yugoslav economy cautions against an excessively strict interpretation of our equilibrium propositions from the theory, and the information provided in this chapter is used throughout the second part of the book to help explain our empirical findings. We also divide post-war Yugoslav economic history into a number of periods, each representing the duration of a particular formalised allocative mechanism. Market self-management, to which our models apply, is argued to have only been operational between 1965 and 1974. Thus, much of the empirical work is devoted to analysing resource allocation in this period, and testing whether various Yugoslav indicators altered in the predicted manner around 1965.

Chapter 4 is about the Yugoslav industrial structure, and provides something of a link between the two parts of the book, offering further descriptive material as well as some preliminary evidence on the relevance of the theory. We establish that Yugoslav product markets were severely non-competitive, which leads us to stress market structure in the remainder of the study. We also specify the changing industrial structure from 1956 to 1974, and examine what
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determines enterprise entry and exit. Self-management theory attaches considerable significance to these findings since they determine the extent and effectiveness of general equilibrium pressures in the system. Finally, we investigate whether one can observe the predicted associations between changing firm numbers, industrial concentration and average earnings. One would like to use our information to investigate the relationship between self-management and industrial structure as well, but Chapter 3 indicates that one could not adequately abstract from the effects of underdevelopment and planning.

Chapter 5 describes our empirical work on the allocative consequences of self-management in Yugoslavia. We examine various facets of labour market misallocation including income differentials, the choice of technique, wage and employment patterns and the changing structure of industrial growth. Our general method is to examine the Yugoslavian allocation of labour from as many angles as possible to strengthen any conclusions drawn. The findings are broadly consistent with predictions, with the most striking results concerning income differentials in the self-management era and the choice of more capital-intensive techniques after 1965. However, it is important to note that consistency with predictions cannot be interpreted as ‘proof’ of the theory. There could be other explanations of the findings, some of which are discussed in Chapters 2 and 3. The descriptive statistics of Chapter 5 only indicate the scale of allocative problems which one might attribute to self-management if the relevance of the theory had already been accepted.

The desire to establish something firmer than this leads us to test the explanatory power of the models in Chapter 6. On the basis of the discussion in Chapter 2, earnings equations are derived as the reduced form of the cooperative optimisation problem. The formulation nests various hypotheses from the theory and is estimated on cross-section data for each year of the self-management era as well as over the whole period. Numerous estimation procedures establish a robust and significant relationship between average earnings, demand side factors such as relative market power, supply side factors such as technical efficiency and scale, and input costs. The chapter shows that self-management models provide a very good explanation of Yugoslav income dispersion after 1965, and one which is significantly better than those offered elsewhere in the literature (e.g. Vanek and Jovicic, 1975).
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We conclude this chapter by considering some of the more important limitations of our study. In the first place, we use a very narrow interpretation of self-management theory, restricting ourselves to the particular branch of the subject in the tradition of Ward (1958), Vanek (1970) and Meade (1972). This assumes cooperatives to be income maximising in a certain environment, and limits the analysis to issues of static allocative efficiency. In fact, numerous more sophisticated models and alternative frameworks are beginning to appear in the literature, referring to questions of welfare maximisation, dynamics and uncertainty (see Bonin, 1980; Sapir 1980b; Ireland and Law, 1982). However, these have not yet yielded significant numbers of testable propositions about the operation of the system as a whole. Therefore we must base our work on the simpler textbook models for which the implications are at least fully specified, in the hope that our findings will encourage further theoretical work. Moreover, given the paucity of empirical results on the effects of self-management, one may wish to commence research with the simplest available propositions.

A second limitation is that we will only consider other interpretations of Yugoslav behaviour in so far as they have a bearing on the predicted effects of self-management. Thus, we never focus directly on such critical issues of Yugoslav economic history as the pattern of development and capital accumulation or the effects of regional disparities, except as factors specifying the environment in which self-managed firms operate. The advantage of this approach is that we can deduce very specific answers to the narrow questions at issue, but there is no doubt that breadth of coverage has been sacrificed for analytic precision. In consequence, our study cannot provide a balanced overall description of the post-war Yugoslav economy.

These methodological points can be clarified by considering how we deal with the most important alternative explanation of Yugoslav allocative inefficiencies: capital market imperfections. Yugoslavia has developed a special property rights system for capital, which excludes many of the more conventional elements of ownership. Moreover, the country’s capital markets are thin and severely imperfect, with interest rates regulated at well below the scarcity value of capital which causes rationing (see World Bank, 1975). These facts have motivated the development of two relatively distinct models associating general allocative problems with capital
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market imperfections. One approaches the issue from the perspective of property rights (e.g. Furubotn and Pejovich, 1970, 1972) and the other regards the problem as an institutional or a structural defect of the Yugoslav system (e.g. Vanek, 1973). Our analysis precludes any direct consideration of propositions from the former approach, and treats the latter as determining one element of the Yugoslav environment.

Furubotn and Pejovich (1970) point out that Yugoslav property rights in capital are severely restricted. Cooperative members can use the capital stock as they wish, but they cannot sell it, nor recover from it any investments they have made during their association with the company. Moreover, the book values of the assets must be maintained by appropriate depreciation. It is argued that these arrangements will lead Yugoslav firms to invest less than their capitalist counterparts or even than cooperatives which rented all their capital stock, and to rely relatively more on external than internally generated funds. The argument hinges on the members’ inability to recoup their principal which raises the implicit cost of funding investment internally. However, although this approach does generate empirically testable propositions, our focus on issues of static resource allocation precludes them from consideration in this study. It is not clear how restrictive this omission is, since the property rights analysis has been questioned both theoretically and empirically (see Stephen, 1978, 1979, 1980; Tyson, 1977a). Indeed, the model is not really concerned with the effects of self-management at all, but rather the consequences of a particular legal constraint on private Yugoslav choices. The organisation and performance of cooperative enclaves such as Israeli Kibbutz’s or the Mondragon group (see Barkai, 1977; Thomas and Logan, 1982) argues against any straightforward link between property rights and self-management itself. In consequence, it may not be too misleading to treat the property rights system as an exogenous element of the Yugoslav environment.

A second school of thought, best represented by the later works of Vanek (1975, 1977), stresses the widespread consequences of Yugoslav capital market imperfections. Some analysts go so far as to suggest that most Yugoslav allocative problems can be attributed to capital shortages, inefficient rationing procedures and low or negative real interest rates. A considerable empirical literature has emerged to measure the scale of capital misallocation (see World
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Bank, 1975; Miovic, 1975) and relate it to other allocative problems such as income differentials (see Vanek and Jovicic, 1975). Our approach is to treat these imperfections as characteristic of Yugoslav institutional structure. The aim is then to isolate significant phenomena in the Yugoslav economy which can be attributed to self-management, even when all other sources of allocative inefficiency have been taken into account. Unfortunately, there are still sometimes identification problems because allocative inefficiencies in different factor markets tend to be closely associated. However, it is hoped that our robust and detailed picture of inter-related labour and product market inefficiencies provides a sufficient case for the influence of self-management forces on the Yugoslav allocation of resources.
PART I

ECONOMIC THEORY
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The theory of a self-managed economy

2.1 Assumptions and Definitions

In this chapter, we briefly survey the relevant literature on resource allocation under market self-management. Particular stress is placed on the configurations of variables for which Yugoslav data are readily available, and on the functional forms appropriate for model estimation. We develop the analysis from first principles so the treatment of the material is self-contained and no prior knowledge of the literature is required. However, our interest is restricted to income maximising models along the lines of Ward (1958), Vanek (1970) and Meade (1972), and readers who wish to approach the subject from other perspectives are referred to Jones and Svejnar (1982) and Ireland and Law (1982).

There are five sections in the chapter, with the remainder of this one devoted to outlining our definitions, assumptions and notation. The following section is micro-economic, analysing cooperative decision-making under perfect competition. It shows how shifting control from private entrepreneurs to the labour force influences factor demand and the choice of equilibrium production technique and output. Decisions at the micro-economic level are brought together in the third section for a description of system-wide resource allocation under competitive self-management. We also compare the modes of adjustment to efficient general equilibria under self-management and capitalism, highlighting the relative weakness of labour market forces in the former system. The effects of monopoly power under self-management are the subject of the fourth section, which explains the link between product and labour market misallocation. Our empirically testable hypotheses are summarised in the final section.
Economic theory

From a theoretical perspective, a self-managed firm can be defined as a production unit in which the labour force as a whole takes all the economic decisions through some democratic process.1 This group, which will henceforth be referred to as the collective, assumes the entrepreneurial role, and in return for bearing this organisational function and risk, receives the surplus of revenue over cost which is distributed among the group according to some pre-arranged mechanism. We will generally assume that the labour force is homogeneous and has agreed to distribute the surplus, or pure profit, equally amongst the membership.2 The collective is also assumed to have borrowed the entire capital stock, for which it is paying a market-determined interest rate. Thus, the case of worker-owned firms which typifies Western experiments with cooperatives is not considered.3 In the self-managed system, labour hires capital rather than capital hiring labour or an entrepreneur hiring both factors. For the economic analyst, the main differences between such firms and their capitalist counterparts arise from the assumed objective of the organisation – to maximise average earnings per head rather than profits, or any of the other possible objectives discussed in the literature (e.g. Scherer, 1980). This maximand was first proposed in Ward’s seminal paper (1958), and was strongly justified as a first approximation by Vanek (1971), who pointed out that the membership would always prefer outcomes with higher incomes to those with lower ones. The case for income maximisation is straightforward. In their simple models, industrial economists always assume that entrepreneurial groups maximise the residual per member. But since the surplus is assumed to be invariant with respect to the membership of the group in capitalist firms, the objective can be reduced to simple profits. However, under self-management the labour force undertakes the entrepreneurial role, and the quantity produced varies with the size of the entrepreneurial group, so this simplification is no longer possible. The identification of the entrepreneurial role with that of a productive factor requires that the objective remains the surplus per entrepreneur, or average earnings per head.

However, the assumption of income maximisation severely restricts the questions which can be considered. We can certainly construct enterprise and general equilibrium models comparable with the textbook descriptions of competitive capitalism, but many proponents of self-management would argue that this misses the