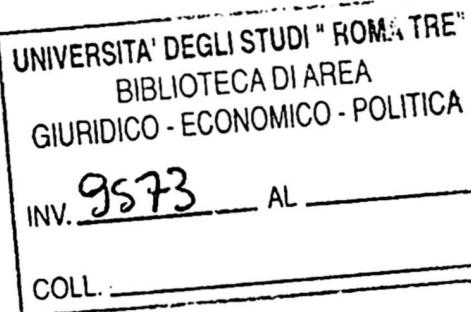


LE TEORIE ECONOMICHE DELLA PRODUZIONE

a cura di Stefano Zamagni



il Mulino



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Summaries

The Representation of Technology in Economic Analysis: Problems and Recent Developments

by Piero Tani

Recent literature on the problem of the different analytical representations of technology in economic theory of production, at a micro-micro level, is here reviewed. Duality results are considered, with special reference to the cost function, to applications to econometrics, and to efficiency measurements. The analytical representations of technology in the case of multiple outputs are also considered: the results obtained within the literature on contestable markets are sketched and briefly commented. An argument against the possibility of an efficient use of standard representations for a treatment of many technical aspects of production processes which may be important for economics, is presented, and thus derived the need for exploring new models. One model of great interest on this respect seems to be the flow-fund model by N. Georgescu-Roegen, new results and recent applications of which are discussed.

Ex-ante versus Ex-post Views in the Theory of Production

by Mario Amendola

The most important aspect of a theory of production is whether it is considered in an ex-post or in an ex-ante perspective.

In an ex-post perspective the process of production is identified with the utilization of the productive capacity corresponding to a given productive option, fully described by a set of technical coefficients and hence always essentially amenable to a synchronic representation.

In an ex-ante view it becomes the process through which a new production option is actually structured and further still options are envisaged: that is, a qualitative change originating within a true *process* which takes place sequentially. In this kind of process *inputs come before output in an essential way* so that no assumption as to how production is arranged can make a synchronic representation of it possible. Furthermore, the interpretation of the process as a qualitative change implies not only the appearance of an output in some

sense new, but that the inputs as well must undergo a modification while the process is taking place. Qualitative change is thus seen as a process of *creation of specific resources*.

When the essential character of the input-output relation in this kind of process is properly understood, it becomes clear that it cannot be financed by the proceeds of current production. *Additional financial resources* are required to start the process off and keep it going. Any investment in productive capacity implies a loss of liquidity, whether it is financed by the giving up of a financial asset or through a new liability. A theory of production in an ex-ante perspective, thus, cannot be but a *monetary theory of production*: that is, a theory focusing on the intertemporal complementarity relationship between financial and productive assets.

The Firm as Organization and the Production Function: An Impossible Marriage

by Massimo Egidi

Following the «bounded rationality» approach we can define the firm as an organization which performs the task of co-ordinating the limited capacities of different individuals who co-operate to organize a given goal. In this definition it seems that organization plays the same role as the market, as in the celebrated Coase paper «On the Nature of the Firm». And yet there is an important difference.

The market in fact co-ordinates the activities of different individuals and organizations within a given division of the labour in the society; but organizations, besides co-ordinating the activities of different individuals, are able to newly define their internal structure; the ability of projecting new forms of division of labour is the characteristic feature of entrepreneurial activity, and can be represented as a *problem solving* activity.

We show that the process of internal re-organization (inside the firm) may be represented as a dynamic process in the space of sub-problems, to be analysed by means of Artificial Intelligence tools. As a consequence, a dynamic efficiency of the firm can be defined, depending from the problem solving ability performed by the internal hierarchy.

Production and Welfare

by Richard Goodwin

The Pareto welfare optimum is in terms of given tastes and techniques. In view of the all pervasive power and influence of advertiz-

ing, one is forced to face the fact that the public's tastes are no longer given, but rather are subject to serious distortion in the interest of producers, thus subverting the welfare optimum.

Industry Analysis and technical Change

by Salvatore Baldone

The aim of this paper is to underline how a multi-sectoral scheme of the Von Neumann-Sraffa type can handle also «qualitative» details in the structure of production processes such as changes in elementary production phases and in their organization. These kinds of technical changes are analysed by considering the effects of some historically remarkable forms of structural change on the long-run profitability of the economic system. First of all some consequences of the division of labour and of mechanization on production organization and the lenght of the production processes are examined. These results are used, in the end of the paper, to describe and analyse the effects of some recent trends in technical change which are identified in automation and, in general, in the s.c. computer-integrated manufacturing technology.

These forms of technological change may involve some elements of joint production whose analytical details are examined in the appendix to the paper.

The Theory of Joint Production: Notes on a Debate

by Lionello Punzo

In this paper some of the most recent developments of the literature on joint production are reviewed. They originated from the «discovery» of certain difficulties in Sraffa. On an analytical level, one must acknowledge that this literature, by introducing the assumption of constant returns to scale into Sraffa, has produced a certain number of extensions of the nonsubstitution theorem, which, it is contended, belong to the General Equilibrium (or neoclassical) approach. From a conceptual viewpoint, on the other hand, the end result of this body of research is the marriage of Sraffa's and von Neumann's models to produce a spurious linear model with duality, ambiguously defined «Sraffian framework». This whole approach, which does not draw certain obvious implications for the analysis of production prices, seems to rest upon a deep misunderstanding of the nature of Sraffa's contribution and of the structure of his formalization. After rejecting the naif realism upon which the «Sraffian frame-

work» is founded, the paper outlines an alternative axiomatization of the production prices model which, while accounting for both single and joint production as special cases, avoids some of the alleged difficulties in Sraffa's analysis and, in particular, demonstrates its consistency with a nonlinear model of capitalistic evolution.

Prices and Quantities in Multisectoral Models of Disproportional Growth and Traverse

by Giancarlo Gozzi

Modern theories of production and growth are mainly concerned with the analysis of steady-state economies: the intrinsic limits of such an analytical framework are by now widely known.

This situation has recently, albeit only partially, changed as a result of two important contributions to the theory of disproportional growth: we refer to L. Pasinetti's model of structural change and to J. Hicks's analysis of traverse. After the introductory preliminaries of section 1, we draw attention, in section 2, on one of the aspects shared by the two models: the representation of the production process and technology. Both models picture the production process in terms of the analytical device of «vertically integrated» sectors even if for different purposes. Another common feature is the instantaneous adjustment of the relative prices of commodities to the new conditions under which the economy does operate. This is the starting point for discussing, in section 3, the possibility of describing the evolution of the prices of commodities by means of the theory of production prices; we criticize the over-simplified use of the Sraffian theory of (extensive) rent that has been made by some authors and argue in favour of the approach based on explicit consideration of «changing» average conditions of production of commodities.

Temporal Coordination and Productive Efficiency

by Paolo Piacentini

In this essay, an analytical framework for the description of some relevant features of modern production processes is outlined. The traditional representations in terms of production functions and activity analysis do not allow, a priori consideration of the importance of «real time» factors in production. The concept of «period of production», referred to elementary processes, as originally introduced in the works of N. Georgescu-Roegen, may be profitably utilized in order to analyze the influence of «time-efficiency» factors in the formation of

industrial costs. An analytical expression for the cost of production is thus developed within a simplified scheme of a «linear-flow production process», where final output results at the end of a sequence of operations performed on consecutive «phases» of production. Parameters such as «coordination» of productive capacity, and the «saturation» of the productivity potential, all involving «time-efficiency» considerations, are explicitly introduced.

In subsequent sections, the basic scheme is partially complicated in order to consider processes of choice on features such as the degree of «integration» and the «sequencing» of the production phases.

In conclusion, the potential utilization of the analytical framework for more empirically oriented researches on features of technical and organizational innovation in industry, such as integrated automation or «just in time» practices, are tentatively discussed.

Path-Dependency, Technological Description and Production Theory

by Marco Cantalupi

Standard production theory provides a characterization of the constraints faced by an economy at a given point of time. These constraints may interfere with the existence and the achievement of a particular set of equilibria. However, from a descriptive standpoint, the homogeneity of the points defining the set of production possibilities turns out to be a poor hypothesis. One would like to explain why the economy tends to encounter and/or discover particular subsets of techniques and what are the economic forces pushing towards particular branching points.

Although one could agree that the constraint argument should be modified in order to take into account the possibility of multiple pathways, a perspective that allows for a genuine role for history, a careful analysis of factors affecting sequential choices which are path-dependent is necessary.

The paper provides two examples of factors (i.e. *externalities* combined with the hypothesis of non-malleability of the capital stock and *organizational arrangements*) capable of determining the beginning of the process, the future branching sequence.

Production Process Theory: The Case of the Farm

by Alessandro Romagnoli

The aim of this paper is to formalize a model of the production process in the context of the farm «task-tool» organization, taking

into account the basic results of the «fund-flow» model of production. The traditional analysis of the farm shows that an elementary process is a time-arrangement of cultural operations performed according to agronomy recipes and to farmer objectives, reduction of the idleness of the fund elements used during the production period. From a theoretical point of view, any production process is the result of three analytical and operative co-ordinates: the «real time» (which provides the order and the length of the operations), the «method of production» (which distinguishes the «technical recipe» from the «production technique» and from the «production function») and the «plant» (which represents the number and the type of machinery and their allocation in any elementary process). All these co-ordinates are necessary to calculate the number of the elementary processes performed and the cost of any product.

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