Economic Theory and Economic History: Perspectives on Hicksian Themes

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Introduction

Hicks's contribution to economic scholarship covers a range of perspectives that is seldom found in the lifework of an individual researcher. As a matter of fact, Hicks paid attention to economic decision making but, at the same time, withdrew from the abstract (axiomatic) approach to pure theory and emphasized the importance of accurate description as a field in which innovative conceptualization could emerge. In particular, he stressed the relationship between economic theory and economic history as of fundamental methodological significance, both in identifying the intrinsic limits of economic theorizing and in assessing the relationship between free choice and determinism, that is between economic rationality and irreversible processes.

More generally, Hicks belongs to the small group of distinguished economic writers in which the attention for human deliberation and action is not leading to a pure theory of choice, but is instead connected to a theoretical appraisal of human institutions and other relatively persistent structures.

The aim of this essay is to consider the different features of Hicks's work that may be related to his attempt of constructing a theory of economic behaviour in real time. In particular, we shall examine in which way Hicks's attention for time-related phenomena (stocks and flows, fixprice and flexprice, decisions and sequential causality) reflects a general concern for

human action as a historical process, that is as a set of stage-related decisions and transformations of the 'material' world. Hicks's contribution to economic theory, if considered in its full complexity, appears to be one of the most ambitious attempts carried out to date of building a bridge between theoretical and descriptive accounts of economic behaviour.

In this way, the whole of Hicks's contribution could be considered as providing the building blocks of a theory of economic history, in which a selective utilization of economic models allows for the analytical reconstruction of historically relevant practices under institutionally specific set-ups[1].

This essay is organized as follows. Section 2 considers Hicks's distinction between stocks and flows and its relationship to the conventional (that is, task-specific) character of methods of dynamic analysis. Section 3 analyzes the relationship between price setting and the nature of business income as a special case of Hicks's own historically oriented selection of economic models. Finally, section 4 examines Hicks's method of sequential causality and considers the linkage between money and the time structure of production as the most critical feature of the Hicksian theory of historical processes.

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[1] In this connection, it is worth recalling Hicks's view of economic theories as 'blinkers', that is as focusing devices useful in interpreting particular features of reality while leaving the rest unexplained. Hicks's conceptual framework identifies analytical tools for the interpretation of economic experience but never assimilates the whole experience with the domain of a particular theory. In this perspective, economic theories may be considered as rational reconstructions of pre-analytical descriptions, and their utilization reflects the particular purposes of the analysis that is carried out. (See Hicks, 1976a, 1986; see also Scazzieri, 1989, for an elaboration of the view of economic theory as rational reconstruction of pre-theoretical descriptions and beliefs.)

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Flows, Stocks and Economic Dynamics

One important feature of Hicks's approach to dynamic analysis is his distinction between two different ways of considering a process of economic change[2]. A clue to such a distinction is given by the work of economic historians:

> '[o]ne of the standard ways of writing economic history (particularly practised by political historians in their economic chapters) is to survey the *state* of the economy under consideration, as it was in various historical periods, comparing one state with another.
> This is the method of comparative statics. It is when the economic historian tries to throw his work into the form of a narrative that he becomes, in the theoretical sense, dynamic.
> Any examination of the work of economic historians will show that a difficult threshold has to be crossed at that point. It is in fact exceedingly difficult to cast economic history into a narrative form without becoming *more* abstract than one has to be on the survey method — greater realism in the matter of time sequence

[2] Hicks points out that '[i]f we look for a definition which shall define scope not method and which shall embrace the whole of the field which practice treats as dynamic, the kind of definition to which we must come is fairly obvious. I shall take it to be the theoretical analysis of the *process of economic change*. So defined, the subject includes the study of change in particular markets as well as in the whole economy; and no commitments is made in advance about the method by which the subject is to be examined' (Hicks, 1956; see Hicks, 1984, p. 201).

> has to be purchased by a higher level of abstraction in most other respects' (Hicks, 1956; see Hicks, 1984, pp. 201-2).

The methodological issue of the realism of time sequences also comes up in the field of economic theory:

> '[t]he historian is baffled by the problem of narrating in a single sequence events that occur successively and those that occur contemporaneously — and even in [economic] theory the analysis of a number of contemporary interacting processes soon proves to be beyond our powers. It is no accident that dynamic theory tends so largely to run in terms of simple aggregative models' (Hicks 1956; see Hicks 1984, p. 202).

The above framework highlights the possibility of dealing with processes of change in two different but complementary ways. For 'economic dynamics is not only concerned with what happens; it is also concerned with what is planned, or intended, or expected to happen. We do not merely have to deal with one time-scale; time reduplicates itself as in a mirror, or in a series of mirrors. Parallel to the real events, which have one course in time, are constantly changing series of planned or expected events, with similar but distinct courses' (Hicks, 1956; see Hicks, 1984, p. 203).

The two approaches mentioned above may be related to the methods of economic history in the following way. The purposive behaviour of individuals reflects itself in the existence of distinct and interacting sequences of plan formation and realization. On the other hand, the unfolding of real events through historical time makes it possible to introduce a sharp distinction between expected events and actual changes, and to assign a major role to the kind of structural heritage that each time period receives from the past.

In this connection, Hicks emphasizes the importance of accounting methods as means for determining what is fixed and what is allowed to change at any given time when a dynamic process is considered. As a matter of fact, the identification of a *particular* accounting period makes it possible

to spell out which descriptive convention is adopted in considering a process of change. For example, if the agricultural year is adopted as the accounting period (as the Physiocrats and the Classical Economists did), agricultural products are described in terms of flows of finished goods reaching completion at the end of each period. On the other hand, if we assume that the production periods of manufactured goods are different from the (conventional) agricultural period, it would follow that manufactured goods would be described either as *flows* of goods-in-process or as *stocks* of commodity reserves, depending on whether their production period is longer or shorter than the agricultural 'year'.

If we stretch our view beyond the agricultural period, *stocks* of agricultural products may be identified (these would be, for example, quantities of corn completed at the end of period t and not used for consumption or production in the course of period $t + 1$). Similarly, it is possible to identify stocks of the manufactured goods whose production takes more than the agricultural year, if we consider a number of accounting periods whose total length exceeds that of the corresponding manufacturing period. On the other hand, in the case of manufactured goods whose production takes less than the agricultural year, the consideration of more than a single accounting period (of the agricultural type) involves the piling up of greater 'stocks', which may be depleted or not, depending on what is happening on the demand side.

In other words, once a particular accounting period is adopted, the distribution of stocks and flows among productive sectors is also determined within the single accounting period. The consideration of time intervals longer than the accounting period may turn flows into stocks, as with 'long' manufactured goods. However, the stretching of time cannot turn stocks into flows (see the case of 'short' manufactured goods considered above). There is thus an asymmetry that has to do with the irreversibility of time: the

stocks of 'short' manufactured goods are the outcome of a process that 'is past, over and done with; it is there and cannot be changed' (Hicks, 1976b; see Hicks, 1984, pp. 263-64). The stretching of our time horizon cannot turn existing stocks into flows; it will simply increase the time interval in which stocks may pile up[3]. Hicks's emphasis upon the duality between real events and expected events (see above) provides a first introduction to his own 'theory' of economic history. In particular, it calls attention upon the critical role of descriptive frameworks in identifying different patterns of interaction between sequences of plans and sequences of real states. In this connection, Hicks has stressed the importance of business accounting as a conceptual framework especially suited to the investigation of time sequences in which rationality and plan formation may realistically be expected to play only a limited role. As Hicks puts it: 'it is felt (and it is really quite proper to feel) that *explanations* which run so largely in terms of subjective factors (*quantified* subjective factors) are unsatisfactory, because they are so largely incapable of verification. A framework which lays less stress upon such variables keeps us closer to the facts' (Hicks, 1956; see Hicks, 1984, pp. 207-7).

If the analysis of processes of change draws upon the conceptual frameworks common in business accounting 'the emphasis upon *ex ante* budgeting' will have to be dropped (Hicks, 1956; see Hicks, 1984, p. 207). For '[b]usinesses have too little control over their future operations to be able to present formal forward accounts; though they of course make estimates and plans for their own purposes, those estimates are always affected by a high degree of uncertainty' (Hicks, 1956; see Hicks, 1984, p. 207).

To sum up, stocks and flows may be assigned a critical role in identifying linkages between different accounting periods. In particular, the

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[3] Of course, any given stock of a 'short' manufactured good is itself the result of a cumulated flow. We may go back from stock to flow by reducing the length of our accounting period.

relationship between equilibrium of stocks and equilibrium of flows makes events *within* the current period (flows) to influence the maintenance of stock equilibrium: 'if stock equilibrium is to be maintained over the period, the end-stock equilibrium must be consistent with what was envisaged at the beginning; if, during the period, there had been a revision of expectations about the further future, the passage from one to the other could not be reduced to the flows that had occurred between them' (Hicks, 1982; see Hicks, 1984b, p. 215). This implies that stock equilibrium between two subsequent dates, when expectations are being revised, cannot be maintained unless stocks are also varied. In other words, conditions of flow equilibrium should be satisfied if stock equilibrium is to be maintained, but flow equilibrium is not a *sufficient* condition for stock equilibrium. Flow equilibrium may be associated with stock *disequilibrium* (cumulation or decumulation of stocks) if there is any mismatch between real and expected events within the current period.

In this connection, the asymmetry is worth noting between flows and stocks. Equilibrium of flows is possible under conditions of stock disequilibrium, even if stock equilibrium necessarily implies the equilibrium of flows within the current period. It seems that the position of stocks points to a deeper level of economic reality, that is to a level at which current *decisions* do not adequately reflect the state of linkages between subsequent accounting periods. Stocks, particularly in the case of manufacturing firms, represent the objective counterpart of past decisions, which current decisions can only partially modify. As a result, the dynamics of stocks, rather than that of flows, provides a priviledged standpoint to the consideration of historical linkages between periods.

The distinction between stocks and flows ultimately reflects our choice of the accounting period (see above). As a result, commodities whose production period is short tend to be associated with the formation of stocks,

whereas commodities with a long production period would generally be described by flows if the accounting period is sufficiently long. The structure of the stock-flow network characterizing any given economic system within a certain accounting period depends upon the length of the accounting period and the duration of production processes. In this way, an important linkage is introduced between the time-structure of production and dynamic principles such as stock cumulation or decumulation. However, structural specification, in the form of the selection of a convenient unit period, emerges as a critical step in identifying, in each particular situation, the most important historical linkages between periods[4].

[4] It is worth noting that the above argument applies not only to the case of the stock-flow distinction, but also to the distinction between *flows* and *funds*. The latter duality reflects objective characteristics of goods from the point of view of their utilization in production or consumption (in general, a factory or a house are funds, whereas oil or raw materials are flows *from this particular point of view*). The stock-flow distinction, on the other hand, refers to the formation of 'reserves' of goods and is not directly linked to their pattern of utilization in consumption or production. The length of the accounting period is related to the distinction between funds and flows in the sense that most funds could be seen as goods with a 'reproduction cycle' longer than the unit period. In general a switch to a shorter accounting period tends to increase the number of funds, which comes to include a considerable number of reproducible goods (for example, machinery and human capital). On the other hand, the lengthening of the accounting period reduces the number of funds to that of non producible goods (for example, land). A recent treatment of the flow-fund distinction mainly from the point of view of production theory may be found in Georgescu-Roegen (1969, 1971, 1986, 1990). The general issue of structural specification, in connection with the analysis of economic dynamics, is considered in Baranzini and Scazzieri (1990), Landesmann and Scazzieri (1990), Scazzieri (1990).

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Fixprice, Flexprice and the Nature of Business Income

The formation of business income and its relationship to accounting practice is considered by Hicks as an important field of investigation in order to highlight the relationship between economic theory and economic history.

As a matter of fact, '[t]he purpose of income calculations in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves' (Hicks, 1939; see Hicks, 1984, p. 49). In the case of business income, its calculation provides a linkage between the stocks existing at the beginning and at the end of each accounting period[5]. In this way the valuation of business income provides an important connection between the past and the future, for variations of stock (capital accumulation or decumulation) will reflect in which way business income (or *profit*) is used in order to modify the structure of claims and liabilities existing at

[5] Here the stock would include 'the evaluation of the existing stock of real capital, and the network of claims and obligations that are built upon it' (Hicks, 1956; see Hicks, 1984, p. 207).

any given time[6].

For example a situation of initial and final stock equilibrium would be one in which business income (over and above capital maintenance) is entirely consumed[7]. On the other hand, capital accumulation and decumulation would be associated with initial stock disequilibria (existing stock being less than desired stock in the former case, and more than desired stock in the latter case). Of course, the previous notion of income implies that *negative* income may be defined as what must be taken out from the existing stock in order to cope with a loss. A consequence is that, in this case, capital decumulation will always take place, independently of the relationship between existing and desired stock. There is thus an asymmetry with respect to the positive income case, in which income may be either consumed or transformed into a capital increase.

The stock-flow framework makes it possible to consider changes of current variables (such as gains or losses) within a time-structure perspective. This is achieved by linking the definition of a gain or loss with the change in the structure of claims and liabilities that identifies the capital stock of a business firm at any given time. In this way, the level of current variables (gains and losses related to the definition of positive or negative business income) will not be identified unless it is possible to describe two different balance sheets separated by a finite time interval (the accounting period).

The above framework allows for the analysis of a variety of cases, which may be related with different 'carry-over mechanisms', that is with different arrangements by which 'events of a first period [...] determine the

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[6] The relationship between business income and the structure of current and capital accounts is also considered in Hicks (1983). A more general assessment of the relationship between business accounting and economic theory may be found in Hicks (1986, p. 99).

[7] This would of course be the microeconomic counterpart of the classical stationary state.

events of its successors' (Hicks, 1956; see Hicks, 1984, p. 204). In this way, the theory of the single period (that concentrates its attention upon 'what happens in that period and what is planned [...] to happen in it' (Hicks, 1956; see Hicks, 1984, p. 204), may be linked with 'continuation theory', whose aim is to consider the relationship between successive periods in terms of sequential causality[8].

In this connection, Hicks distinguishes between the 'carry-over' mechanisms that may be associated with fixprice and flexprice models respectively. In the former case, prices are considered to be relatively sticky (they cannot vary within the single period), and 'a failure to fulfil plans [...] results in an unwanted accumulation or decumulation of stocks (or perhaps in the appearance of "negative stocks" in the sense of unfulfilled orders)' (Hicks, 1956; see Hicks, 1984, p. 205). As a result, 'the determination of prices is held over to be a first step in continuation theory. Prices are determined, in each successive period, largely as a consequence of the discrepancies between supplies and demands which have appeared in the period before' (Hicks, 1956; see Hicks, 1984, p. 205).

A characteristic feature of the carry-over mechanism of fixprice models is that, since prices are held to be fixed within the single period, linkages among successive periods are in terms of stock accumulation or decumulation. Continuation theory aims at identifying sequential linkages in terms of the transmission of wanted or unwanted stocks.

A different approach is adopted in flexprice models, such as the one considered in *Value and Capital* (Hicks, 1939). Here, 'prices [are] flexible, so that there could be no unintentional carry-over of stocks; prices could vary within the *single-period*, but the movements of prices within the period

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[8] As Hicks puts in *Causality in Economics* (Hicks, 1979), sequential causality implies that cause precedes effect in a causally relevant way, that is in a way that is directly related with the *production* of the effect.

(from one part of the period to another) were neglected'. (Hicks, 1956; see Hicks, 1984, p. 205). In this case, on the other hand, prices are allowed to vary within the period, thereby ensuring demand and supply equilibrium in terms of quantity. It follows that continuation theory (the theory of systematic linkages between different accounting periods) would be based upon the comparison between real and expected prices: 'the windfall gaps between expectation and realisation were thrown over on to the price side' (Hicks, 1956; see Hicks, 1984, p. 205). Differently from what happens with the fixprice model, the 'structural heritage' that is passed over from one period to another reduces, in the flexprice case, to purely subjective elements, and the economist's attention may concentrate upon the relationship between interacting sequences of plan formation and realization without considering 'objective' linkages between subsequent accounting periods.

The alternative theories of continuation implicit in flexprice and fixprice theories respectively reflect two different historical situations, which we may tentatively associate with the technological and market structures of pure exchange and pure production models respectively (on this distinction, see Baranzini and Scazzieri, 1986 a and 1986 b).

Flexprice analysis implicitly assumes an idealised 'pure exchange' economy, in which only two types of commodities may be traded: '(1) perishable goods and personal services, which *could not* be carried over from one period to another; (2) speculatively traded commodities, stocks of which were held by merchants in order to make a profit on the difference between present and future prices' (Hicks, 1956; see Hicks, 1984, p. 206). In this type of situation, there is no unintentional carry-over of stocks, and continuation theory may focus upon purely subjective factors: 'it is insisted that the producer will only accumulate stocks if he thinks that the price he will be able to get, by selling them in some future period, will be better (in spite of the costs of holding) than what he could get by selling now; so in

this sense the accumulation of stocks is *voluntary*' (Hicks, 1956; see Hicks, 1984, p. 13).

A different type of continuation theory would be suitable in a situation in which pricing follows the fixprice procedure. In this case, 'demands and supplies do not have to be equal; there is then no equation of demand and supply to determine prices. In describing this model as a fixprice model, it is *not* assumed that prices are unchanging over time, from one single-period to its successor; only that they do not necessarily change whenever there is demand-supply disequilibrium' (Hicks, 1956; see Hicks, 1984, p. 213). Here, demand-and-supply disequilibria within the current period would be reflected in the formation of unvoluntary stocks of unsold commodities or unfulfilled orders. In other words, the continuation theory of a fixprice economy would be characterized by 'material' linkages between periods (real commodities or claims upon them) rather than by 'psychological' linkages expressing realized or unrealized expectations.

It may be interesting to see how the two different types of continuation theory are related with two distinct approaches to the formation of business income and its dynamic over time.

In a fixprice economy, a mismatch between actual and desired stock at the beginning of the accounting period would be reflected in a process of capital accumulation or decumulation during that period, that is (assuming positive business income) in a process by which part of business income is converted into capital stock or part of the existing stock is sold and converted into consumable income. Here, business income may be considered as the flow variable regulating the adjustment process between subsequent states (structures) of the capital stock. A different perspective must be adopted when considering a flexprice economy. In this case, there would be no significant carry-over from one period to another except for purposes of speculation. It follows that gains and losses could be considered as the

primary objective of business behaviour, quite independently of the 'structural' evaluation of the capital stock. In other words, business *income* becomes the critical explanatory variable, and it comes to be identified with reference to flow receipts and payments without considering the structure of the capital account. We may conclude that the flexprice assumption implies a concentration of attention upon the purposive behaviour of economic agents, quite independently of the structural rigidities emerging within the fixprice set-up.

In Hicks's view, flexprice continuation theory presupposes particular historical conditions, in which exchanges only consist of 'perishable goods and personal services' and 'speculatively traded commodities' (see above). On the other hand, fixprice theory considers an institutional set-up in which prices are set by manufacturers and retailers and are not allowed to vary too quickly as a consequence of demand-and-supply disequilibrium. In this type of set-up, 'a model in which quantities bear the brunt of disequilibrium fits most of the facts distinctly better' (Hicks, 1956; see Hicks, 1984, p. 206).

Manufactured commodities are often produced under conditions in which, contrary to what happened when '[t]he typical end-products of manufacturing industry [consisted] of objectively standardizable goods, which could be traded on competitive wholesaler markets' (Hicks, 1989, p.23), 'it is now the producer himself who has to take responsibility for the quality, and usefulness, of what he is selling; for he is selling, at least at the end of the chain, to a consumer who is not an expert' (Hicks, 1989, pp. 24-5). Under such circumstances, '[a]rbitrary changes [of price] "unsettle" the consumer. He may be taking time to decide to buy; so if, when he finally decides, he finds the price has risen against him, his confidence is lost, and the seller's reputation is damaged. And it can happen that there is a similar obstacle to price-reductions; they cast suspicion on the quality of the product, they suggest that something is wrong. Thus the diversified market had

a tendency to be what I have called a *fixprice* market, meaning not that prices do not change, but that there is a force which makes for stabilization, operated not by independent speculators, but by the producer himself' (Hicks, 1989, p. 25).

To sum up, the flexprice set-up suggests a type of continuation theory that is especially suitable to the modelling of historical cases in which commodities are perishable or speculatively traded. This implies that disequilibria are immediately reflected in price adjustments within the single period, and that there is no carry-over of disequilibrium *via* the formation of unvoluntary stocks. The linkage between each period and its successor is based upon the mechanism of expectations formation and realization, and the structure of the capital account of each business firm does not normally operate as a built-in stabilizer (as is the case with fixprice linkages). The above framework is found to be especially relevant in analyzing the historical experience of financial firms, or of merchant companies not directly involved in the production process. In both cases, and most clearly for a financial firm, 'nearly all of whose assets are marketable securities' (Hicks, 1982; see Hicks, 1984, p. 214), the business unit 'can change [her own] assets from one form to another, almost at a moment's notice' (Hicks, 1982; see Hicks, 1984, p. 214).

The capital account, due to price flexibility, may be taken to be always in equilibrium (actual stock being equal to desired stock virtually at any single point of time). In this way, the distinction between stock equilibrium and flow equilibrium recedes to the background, and flow equilibrium may be considered as a *continuum* along which the firm moves, without any significant time lag, from one stock equilibrium to another[9].

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[9] The notion of flow equilibrium as a succession of stock equilibria may be considered as an extension (to the extreme flexprice case) of Hicks's own definition of 'flow equilibrium', which seems to have been formulated having a fixprice set-up in mind. According to Hicks, '[i]f a unit is in stock equilibrium at the beginning of the period, and is still in

We may now move to the consideration of the fixprice set-up. The corresponding continuation theory is suitable to the modelling of historical cases in which commodities may normally be stored and the formation, or depletion, of stocks is not generally associated with speculative behaviour. In this case, price adjustment within the single period is impossible (see above), and disequilibria between demand and supply are normally carried over from one period to another by means of unvoluntary stocks (that may be positive or negative). The connection between subsequent periods is primarily due to the objective existence of unvoluntary stocks, and the structure of the capital account of a business firm operates as a built-in stabilizer with respect to the agents' behaviour within the current period.

Manufacturing firms may be considered as characteristic examples of a fixprice set-up. In particular, as Hicks points out, '[a]n industrial business [...] must have a large proportion of its assets in forms which make them not at all readily marketable; and even if they could be sold, they could not be replaced in new forms in a hurry' (Hicks, 1982; see Hicks, 1984, p. 214). As a result, a mismatch between demand and supply within the current period is likely to determine the emergence of stock disequilibrium at the end of the period. In this case, a change in the firm's environment is generally associated with a situation in which 'the goods (and claims) that are listed on [the firm's] balance-sheet are *not* the best out of a range of alternatives' (Hicks, 1982; see Hicks, 1984, p. 214). The formation of unvoluntary stocks of unsold commodities or unfulfilled orders would be the rule, so that inspection of a firm's capital account and of its evolution over time is an essential feature in the analysis of a business unit operating within a fixprice set-up. An industrial firm 'will always be, to some extent, in a

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stock equilibrium at the end, we shall want to say that it is in flow equilibrium during the period' (Hicks, 1965, p. 89). The extreme flexprice case suggests that a firm that is *continuously* under conditions of stock equilibrium will also meet the conditions of flow equilibrium during the relevant period of observation.

state of stock disequilibrium. Its endeavours, over time, to right that disequilibrium will be a major aspect of its policy. They will determine the time-path of the induced investment (or disinvestment) that it will undertake' (Hicks, 1982; see Hicks, 1984, p. 215). In other words, 'stock disequilibrium is the engine, or a part of the engine' by which the propagation over time of a given impulse takes place (Hicks, 1982; see Hicks, 1984, p. 214).

Alternative methods of price setting reflect the structure of markets, which is in turn related with the real composition and economic function of commodity stocks. In this way, the flexprice-fixprice distinction calls attention upon a fundamental theme in Hicks's theory of economic history, that is the relationship between freedom of choice and the 'complementarities over time' (Hicks, 1939) that restrict the space of feasible actions within any given time period[10].

[10] It has been argued in this connection that the analysis of the relationship between 'rationality' and 'time' is the most distinctive feature of Hicks's contribution to economic theory (see Meacci, 1983).

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Money, the Structure of Production and Sequential Causality

The previous sections of this essay have considered alternative types of continuation theory in connection with different assumptions about the price mechanism. In this concluding section, we shall argue that a comprehensive analysis of the relationship between 'free choice' and 'determinism' (that is, of the conceptual foundation of Hicks's 'theory' of economic history) cannot be undertaken unless production and money are explicitly considered. In the present analytical set-up, the production process may be considered as the unfolding of successive fabrication stages over real time, and money is essentially 'a standard for deferred payments' (Hicks, 1989, p. 42), that is, the means by which credit and debit relationships across different time periods may emerge.

As a matter of fact, the analytical features of continuation theory that may be considered when distinct mechanisms of price setting are examined (see above), re-emerge independently of price formation as soon as stocks and flows consist not only of finished final output but also of unfinished commodities (work-in-process) and finished commodities *not yet* used as means of production. In particular, the consideration of an economic system in which a multiplicity of productive units (firms, establishments) interact

with each other in terms of a complex division of labour requires the introduction of systematic linkages between different time periods. This is essentially due to the different length of the various partial processes, and to the need to establish a framework within which the mutual commitments to deliver means of production and to acquire finished goods may be enforced.

In this connection, the association between the time structure of the production processes and the emergence of monetary relationships emerges quite clearly. For any production process consisting of a multiplicity of stages would normally require the carry-over of stocks of work-in-process from one time period to another. On the other hand, the different lengths of different partial processes require some form of co-ordination between the accumulation or decumulation of stocks within the different productive units. A clue to this issue may be provided by the consideration of the debit and credit relationships that ensure the consistency of the production network over time. The reason is that the interdependence between short and long production processes requires a device (a convention) by means of which the processes of short duration 'lend' their output (or part of it) to the processes of long duration, making it possible for the latter to be undertaken at all. Such a device may consist in the formation of purchasing power with the sale of the final output of short-lasting processes, and its transfer to the long-lasting processes. The latter may thus be feasible even if no purchasing power gets formed when the work-in-process is carried over from one period to another. In other words, the start of long-lasting processes depends upon the formation of a 'store of value' by means of which the revenue from the sale of the output of 'short' processes is accumulated and carried over from one time period to another. In a symmetric way, the initial purchase of the raw materials needed in long-lasting processes, and the carry-over of work-in-process from one period to another, takes place through a 'deferred payment', which may or may not be associated with the actual transfer of

money but necessarily entails the formation of loans. (In the sense that the net output of short processes builds up a 'reserve' that supports the life of long processes throughout the time interval in which the final output from long processes is under gestation but not yet delivered.)

The co-existence of short and long processes within the production network of a modern economic system requires, in general, the formation of reserves, by means of which processes may be lengthened and payments deferred. Such reserves may be considered both from the real and the monetary points of view. In the former case, they consist of commodities delivered by short processes and permitting the long processes to be undertaken (an instance would be the wage fund considered by the classical economists). In the latter case, reserves consist of 'stored' purchasing power that may be borrowed or lent independently of the physical composition of the real reserves. (An early analysis of the relationship between real and monetary reserves in connection with the time structure of production may be found in Fanno, 1931 and 1932; see also Scazzieri, 1991).

A production economy based upon a complex division of labour would generally present a split between the short processes delivering goods for direct consumption and the long processes producing instrumental goods (tools, machines). The above argument suggests that there is, for this type of economic system, a specific 'structural' reason why it is likely to acquire features of a monetary economy. This is that money is essentially associated with deferred payments[11], so that a monetary economy has a built-in *ad hoc*

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[11] This feature of money is associated with the fact that 'the representative transaction, of sale or purchase, [is] in principle divisible into three parts. The first is the contract between the parties, consisting of a promise to deliver and a promise to pay [...]; the second and the third consist of actual delivery, one way and the other. In the case of the spot transaction, all are simultaneous; but they do not need to be simultaneous. If there is any difference in timing, promises precede deliveries; that is the only rule which applies throughout. Delivery of the article may come before it is paid for [...]; or it may come after, or partly after [...] What remains, in general, immediately after the making of the contract, are on the one hand a debt "in real terms" from the seller and on the other a debt in money

device by means of which the coordination between short and long processes may be achieved. The possibility of monetary payments binds together production processes of different durations, so that the net output from short processes may be used to start and maintain long-lasting processes. This may be achieved by considering the net output of short processes as a 'store of wealth' having a monetary expression. In this way, the continuation of a long process through its successive fabrication stages will be made possible by monetary loans to the productive units in which such processes are carried out. It is these loans that provide long processes with the resources needed to maintain the work-in-process under operation for longer than the reproduction requirements of short processes would allow. The operation of a long process requires the availability both of direct consumption goods (wage goods) and of the goods in process themselves. (The latter category includes 'normal stocks of materials, of half-finished and of finished goods'; see Hicks, 1969, p. 151). Wage goods are generally produced (and reproduced) by short processes, so that in this case the linkage between short and long processes is based upon the utilization of the wage processes' *net output* in order to maintain long processes. (The 'simultaneous exchange' of finished products between short and long processes is not possible, due to the different lengths of production periods.) The case of goods in process is remarkably different. For goods in process are generated as internal products within the long processes, so that there is no need for them to be 'bought' when moving from one subperiod to the next. However, the work-in-process cannot be carried forward unless the corresponding maintenance costs (including fuel, labour, and so on) are actually met. The co-ordination between short and long processes appears to be quite different depending on which side we consider. From the point of view of *short processes*, co-ordination takes the form of a real loan of short processes' net output. From the point

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terms from the buyer' (Hicks, 1989, p. 42).

of view of *long processes*, the latter have to be able to borrow 'liquidity' (financial loan) in order to cope with contingent needs before their output is finished.

The distinction between short and long processes makes liquidity (and the corresponding monetary arrangements) a central feature of productive co-ordination and division of labour, quite independently of the particular financial needs that may be associated with the existence of fixed capital. In this connection, a critical point is whether capital is or not 'sunk' in some form of investment, 'from which it can only gradually, at the best, be released' (Hicks, 1969, p. 144). Capital may be 'sunk' both when it is embodied in some type of equipment and when it is 'locked' in the work-in-process of a long-lasting productive activity. In either case, 'it is the availability of liquid funds which is crucial' (Hicks, 1969, p. 144-5), and financial institutions perform an essential role in shifting real resources from one sector to another independently of the physical form that 'liquid resources' originally have.

The monetary form of loans to producers makes it possible to bind short and long processes together, by permitting the storing up of the value of short processes' net output and its utilization under a physical form (direct consumption goods *and* semi-finished goods) that may be different from the original one. However, real reserves (and real 'deficits') would be the necessary basis upon which monetary linkages between short and long processes may be introduced.

As a result, monetary institutions could provide a critical linkage between different sectors of a productive system. Money emerges here as performing an essentially macroeconomic function, in the sense that it appears to smooth the asymmetries and bottlenecks due to the different time structures of production processes. In this connection, real stocks and flows within the individual productive units bring about a complex picture in

which each production process of given length is associated with a distinct stock-flow relationship, and thus with a particular way of relating the past with the future. On the other hand, the technical relationships among different processes require a coordination device, which may operate at the level of decisions by making consistent across a number of different time periods situations that are clearly inconsistent if a shorter time horizon is considered. In this perspective, monetary arrangements may be helpful in order to overcome the 'temporal unevenness' of an interlinked productive system, and also to ensure that the structure of inherited assets existing at any point of time is not an obstacle to the transformation of the output mix and production techniques. As a matter of fact, the existence of a store of value in 'immaterial' form (money) permits intertemporal exchanges purely on the basis of the institutional arrangements regulating the credit-debit relationships. In this way, it emerges that there is an important linkage between money, markets and the organization of production, particularly after a detailed division of labour has been introduced. More specifically, the co-ordination of short and long processes is made easier by the existence of markets for future delivery, and money appears to be an essential institutional device in order to ensure the credibility of commitments taken in that connection. As a result, a new field of research takes shape in which the theory of economic history derives from blending the abstract reconstruction of co-ordination requirements with the analysis of the particular asymmetries and institutional corrections operating in any particular situation[12].

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[12] There is thus a unifying thread linking Hicks's analysis of real markets (Hicks, 1969) with his attention for the real capital structure (Hicks, 1965, 1973, 1977, 1985) and for the types of 'continuation theory' suitable in its investigation (see, in particular, Hicks's treatment of liquidity and sequential causality in Hicks, 1979). Specific features of Hicks's contribution to the theory of economic history are discussed in Bauer (1971) and Gerschenkron (1971).

References

AMENDOLA, M. and GAFFARD, J.-L. (1988), *The Innovative Choice*, Oxford and New York, Basil Blackwell.

BARANZINI, M. and SCAZZIERI, R. (1986a), 'Knowledge in Economics. A Framework', in M. Baranzini and R. Scazzieri (eds.), *Foundations of Economics. Structures of Inquiry and Economic Theory*, Oxford and New York, Basil Blackwell, pp. 1-87.

BARANZINI, M. and SCAZZIERI, R. (1986b), *Foundations of Economics. Structures of Inquiry and Economic Theory*, Oxford and New York, Basil Blackwell.

BARANZINI, M. and SCAZZIERI, R. (1990), 'Economic Structure: Analytical Perspectives', in M. Baranzini and R. Scazzieri (eds.), *The Economic Theory of Structure and Change*, Cambridge, Cambridge University Press, pp. 227-333.

BAUER, P. (1971), 'Economic History as Theory-Review', *Economica*, May, vol. 38, pp. 163-79.

FANNO, M. (1931), 'Cicli di produzione, cicli del credito e fluttuazioni industriali', *Giornale degli Economisti e Rivista di Statistica*, vol. LXXI May, pp. 329-70.

FANNO, M. (1932), 'Irrtümer in der Zeit als Ursachen wirtschaflichen Schwankungen', in *Zeitschrift für Nationalökonomie*, vol. IV, n. 1.

GEORGESCU-ROEGEN, N. (1969), 'Process in Farming versus Process in Manufacturing: a Problem of Balanced Development', in G.U. Papi and C. Nunn (eds.), *Economic Problems of Agriculture in Industrial Societies*, London,

MacMillan, pp. 497-528.

GEORGESCU-ROEGEN, N. (1971), *The Entropy Law and the Economic Process*, Cambridge (Ma.), Harvard University Press.

GEORGESCU-ROEGEN, N. (1986), 'Man and Production', in M. Baranzini and R. Scazzieri (eds.), *Foundations of Economics. Structures of Inquiry and Economic Theory*, Oxford and New York, Basil Blackwell, pp. 247-80.

GEORGESCU-ROEGEN, N. (1990), 'Production Process and Dynamic Economics', in M. Baranzini and R. Scazzieri (eds.), Cambridge University Press, pp. 198-226.

GERSCHENKRON, A. (1971), 'Mercator Gloriosus', *Economic History Review*, vol. 24, n. 4, November, pp. 653-66.

HICKS, J. (1939), *Value and Capital. An Inquiry into Some Fundamental Principles of Economic Theory*, Oxford, Clarendon Press.

HICKS, J. (1956), 'Methods of dynamic analysis', in *25 Economic Essays* (Festschrift for Erick Lindahl), Stockholm, Ekonomisk Tidschrift.

HICKS, J. (1965), *Capital and Growth*, Oxford, Clarendon Press.

HICKS, J. (1969), *A Theory of Economic History*, Oxford, Clarendon Press.

HICKS, J. (1973), *Capital and Time. A Neo-Austrian Theory*, Oxford, Clarendon Press.

HICKS, J. (1976a), ' "Revolutions in Economics" ', in S. Latsis (ed.), *Method and Appraisal in Economics*, Cambridge, Cambridge University Press, pp. 207-18.

HICKS, J. (1976b), 'Some Questions of Time in Economics', in A.M. Tang, F.M. Westfield and J.S. Worley (eds.), *Evolution, Welfare, and Time in Economics*, Lexington, Mass., Lexington Books, pp. 135-51.

HICKS, J. (1977), *Economic Perspectives. Further Essays on Money and Growth*, Oxford, Clarendon Press.

HICKS, J. (1979), *Causality in Economics*, Oxford, Basil Blackwell.

HICKS, J. (1982), 'The Credit Economy', in J. Hicks, *Money, Interest and Wages*, vol. II of *Collected Essays on Economic Theory*, Oxford, Basil Blackwell, pp. 266-75.

HICKS, J. (1983), 'The Concept of Business Income', in J. Hicks, *Classics and Moderns*, vol. III of *Collected Essays on Economic Theory*, Oxford, Basil Blackwell, pp. 189-203.

HICKS, J. (1984), *The Economics of John Hicks*, Selected and with an Introduction by Dieter Helm, Oxford and New York, Basil Blakwell.

HICKS, J. (1985), *Methods of Economic Dynamics*, Oxford, Clarendon Press.

HICKS, J. (1986), 'Is Economics a Science?', in M. Baranzini and R. Scazzieri (eds.), *Foundations of Economics. Structures of Inquiry and Economic Theory*, Oxford and New York, Basil Blackwell, pp. 91-101.

HICKS, J. (1989), *A Market Theory of Money*, Oxford, Clarendon Press.

LANDESMANN, M. and SCAZZIERI, R. (1990), 'Specification of Structure and Economic Dynamics', in M. Baranzini and R. Scazzieri (eds.), *The Economic Theory of Structure and Change*, Cambridge, Cambridge University Press, pp. 95-121.

MEACCI, F. (1986), 'John Hicks: A Review of Selected Works', *Atlantic Economic Journal*, vol. XIV, n. 1, pp. 127-30.

SCAZZIERI, R. (1989), 'Economic Theory as Rational Reconstruction', *Ricerche economiche*, vol. XLIII, January-June, pp. 40-56.

SCAZZIERI, R. (1990), 'Vertical Integration in Economic Theory', *Journal of Post-keynesian Economics*, vol. 13, n. 1, pp. 20-46.

SCAZZIERI, R. (1991), 'Flussi, fondi e dinamica economica: riflessioni sul contributo di Marco Fanno', in M. Manfredini Gasparetto (ed.), *Saggi in onore di Marco Fanno*, Padova, Cedam.