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Working Paper

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Texto para discussão, No. 118

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Suggested Citation: Amadeo, Edward (1986) : Changes in output in Keyne's treatise on money, Texto para discussão, No. 118, Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio), Departamento de Economia, Rio de Janeiro

This Version is available at:
https://hdl.handle.net/10419/186365

DEPARTAMENTO DE ECONOMIA

PUC/RJ

JANEIRO 1986

TEXTO PARA DISCUSSÃO

Nº 118

CHANGES IN OUTPUT IN KEYNE'S TREATISE ON MONEY*

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* Forthcoming in Revista Brasileira de Economia.

** I would like to thank Murray Milgate, Lance Taylor, Stephen Marglin, Amitava Dutt and Susan Vitka for their helpful comments. As usual, they are not responsible for my errors and misinterpretations. The author is assistant professor at the Pontifical Catholic University, Rio de Janeiro (PUC/RJ).

1. *Introduction*

Volume XIII of Keynes's Collected Writings, published in 1973, contains a most important document for the study of the transition from the Treatise on Money (TREATISE) to the General Theory of Employment, Interest, and Money (GENERAL THEORY): a note from five surviving participants of the Cambridge 'Circus' [1] describing their relationship with Keynes, the nature of their criticism of the TREATISE, and their role in the development of the ideas leading to the GENERAL THEORY. The main criticism of the 'Circus' was directed towards the assumption of a given level of

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1. The Cambridge 'Circus' was a seminar group composed of young economists created in 1931 to discuss Keynes's TREATISE. The survivors of the group who, according to Moggridge (1976, p. 89), aggreed on the note printed in the *Collected Writings* are R. Kahn (who had a prominent role in reporting to Keynes the subject of the discussions), J. Meade, P. Sraffa, Joan and Austin Robinson.

aggregate output underlying the TREATISE's fundamental equations. The note attacks the assumption of given output as rendering the TREATISE somewhat irrelevant in light of the severe unemployment facing Britain in the 1920's and especially after 1929. The note also suggests that the 'Circus', by pointing out to Keynes the consequences of his assumption, played a fundamental part in the transition towards the GENERAL THEORY.

The survivors' view was to become the conventional view. Moggridge, the editor of Keynes's Collected Writings, was responsible for tranforming the Circus survivors' view into the, so to speak, official view. Moggridge's arguments may be summarized as follows. First, the specification of the fundamental equations is based on the assumption of given output [4], thus the book's conclusions are "not quite relevant to the conditions of 1930-31" (Moggridge, 1976, p. 89). Second, this assumption makes the equations inconsistent with the "verbal discussions concerning movements in output" (p. 89) contained in the TREATISE itself. Third, Keynes came to realize the shortcomings of the assumption after the book was published through the comments of Hayek and Robertson and, most importantly, the criticism of the 'Circus' (p. 88). Finally, the movement from the the TREATISE to the GENERAL THEORY began after these

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4. As Moggridge notices, "Kahn realized clearly that the TREATISE equations were a limiting case -- that of complete inelasticity of output in response to demand changes -- which was not really relevant to the conditions of 1930-1, when British unemployment averaged between 2 and 3 million" (Moggridge, 1976, p. 89).

criticisms with Keynes trying to "recast his analysis in terms of changes in output" (p. 90).

The purpose of this paper is to argue that Keynes was, in fact, quite aware of the assumption of given output in the formulation of the fundamental equations and clearly considered changes in output (and unemployment) to be a relevant problem and that given the method of analysis used in the book, the specification of the equations is perfectly consistent with and, indeed, adequate for, the study of changes in output. This implies that the study of changes in output per se does not differentiate the TREATISE from the GENERAL THEORY; the method of analysis on which the study is based is the real differentia [5].

That Keynes considered changes in the level of output and unemployment a relevant problem is clear from his contributions to debates on policy issues in the 1920's. He opposed the return of Britain to the gold standard at prewar parity on the grounds that it would require a reduction in money wages which could only be achieved through "deliberate intensification of unemployment" (Keynes, 1931, p. 252). His 1929 pamphlet "Can Lloyd Geoge Do It?" is yet another

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5. The claim that the study of changes in output does not differentiate the two books does not imply that it played the same role or had the same weight in the TREATISE and GENERAL THEORY. The central purpose of the GENERAL THEORY is to study the determinants of the levels of aggregate output and employment ; the TREATISE's objective is to explore an alternative to the quantity theory of money as an explanation for the determinants of the price level in the short period; and to apply this alternative -- the fundamental equations -- to discuss "credit cycles". As we will argue presently, changes in output are consistently and adequately studied in Keynes's discussion of the "credit cycle" in the TREATISE.

example of a discussion of changes in the levels of output and employment. In what follows, however, we shall concentrate on the consistency and adequacy issues rather than the relevance one.

Recently the notion that Keynes was unaware of the given output assumption has been challenged. Milgate (1983) has pointed out that Pigou, in a letter to Keynes in 1929, enquires if what he "argue[s] impl[ies] that changes in Bank rate cannot affect E [real income] or O [output]?" (JMK, XXIX, p. 5). Likewise, Hawtrey, in his comments on the proofs of the TREATISE, argues that "Mr. Keynes's formula only takes account of the reduction in prices in relation to costs, and does not recognize the possibility of a reduction of output being caused directly by a contraction of demand without an intervening fall of price" (JMK, XIII, p. 152). Keynes read and made comments to Pigou's letter; he was also aware of Hawtrey's comments althogh he only answered them after the publication of the TREATISE.

Keynes was aware of the assumption before the book was published and there is obviously no contention to Moggridge's first argument that the assumption permeated the specification of the equations. However, changes in output were the subject matter of a few chapters of the TREATISE. Kahn, himself an eminent participant of the 'Circus', admits that it was an error to conclude that changes in output were not discussed in the book. He writes: "I do not see how we could have attributed to Keynes the assumption of inelastic supply, and I am completely mystified by the questions: a) why we did not see this by ourselves; b) why it did not come out in the course of the discussions between Keynes and me" (Kahn, 1984, p. 108). As we shall notice presently it did "come out in the course of the

discussions" between Keynes and Joan Robinson, and Keynes did not quite accept the criticism.

The fact of the matter is that Book III of the TREATISE -- in which the fundamental equations are formulated -- is based on the assumption that the level of output is given; Book IV, however, provides a discussion of credit cycles and has an explicit analysis of changes in output in which the equations play a central role. The present study will focus on these two books. To facilitate their discussion, the article is organized as follows. After presenting some conceptual elements in section 2, we shall present a simple model for deriving the fundamental equations in section 3. This is followed by a discussion of how they can be used to study changes in output in section 4. Finally, section 5 provides a brief exposition of the steps needed to go from the TREATISE's model to that of the GENERAL THEORY.

2. *Concepts and Definitions*

This section is meant to serve as a reference for the categories used in the text. Since language tends to convey and often support a particular interpretation of any subject matter, this short glossary is an indespensible preliminary to our discussion of the central arguments.

2.1 *'Supply' and 'Expenditure' Dimensions in Keynes's Economics*

Two broad groups of concepts can be identified in Keynes's theory in the TREATISE and after; we shall refer to them as the 'expenditure' and 'supply' dimensions. Most studies of the development of the theories of aggregate output and prices in the 1920's and 30's --

including the study of the transition from the TREATISE to the GENERAL THEORY -- concentrate on the expenditure dimension, that is, on the aggregate monetary apects of the theories, definitions and determinants of income, saving and investment and the notion of monetary equilibrium [6]. Wicksell (1907, 1935) was the earliest champion of this dimension, laying down the framework for the study of 'macroeconomics' as we refer to it today. He studied a 'pure credit economy' in which the banking system acted as a creator of means of exchange on demand; that is, one in which demand for credit could always be accomodated. This allowed current expenditure to be independent of current income or, more especifically, investment (I) to be independent of saving (S). Monetary equilibrium -- or expenditure equilibrium as we shall call it -- is characterized in the Wicksellian system by the equality of investment and saving. Wicksell's 'cumulative process' is the result of a disturbance in the circular flow of income and expenditure or a discrepancy between investment and saving.

Keynes's work is best known for its expenditure dimension aspects. But there is also an important supply dimension in his contribution. It addresses the decisions to produce and employ taken by the "producer or manufacturer"; the time horizon associated with these decisions being the "employment" or "production periods" (JMK, XXIX, p. 75). It corresponds to daily decisions based on 'employment period expectations', daily standing "for the shortest interval after

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6. See, for example, A. Hansen (1951), Patinkin (1976, 1983), Hicks (1967) and B. Hansen (1981).

which the firm is free to revise its decisions as to how much employment to offer" (JMK, VII, p. 47, n. 1). Equilibrium at this dimension is characterized by correct employment period expectations, that is, the equality between expected and actually realized results. Unlike the great majority of studies of Keynes's economics, we shall concentrate on the supply rather than expenditure dimension aspects of his work.

2.2 *Methods of Analysis*

Although economists often are not conscious of the particular method underlying their work, trying to make the method explicit and understand it may prove to illuminate the subsequent analysis. Some studies of Keynes's contributions enphasize the role of method, notablty Hicks (1936, 1965) and Garegnani (1976, 1978-9) [7].

The taxonomy of methods presented here is defined by two attributes: first, the relevant time-unit and, second, the analytical object of study. As for the first attribute, we shall define two time-units: the 'finite' and 'equilibrium' periods. The finite period is a general concept that can refer to any calendar or chronometric period; the choice of the particular time horizon depends on one's analytical purposes. Because it refers to an arbitrary cut in historical time, the finite period can correspond to either an equilibrium or a

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7. References to the work of Garegnani and Hicks and a comparison with the taxonomy proposed here can be found in the appendix to this paper.

disequilibrium position. However, given its arbitrariness, it will more often than not be associated with a disequilibrium position and, indeed, it seems safe to identify finite periods with disequilibrium positions.

In contrast, if we want to find a 'period' necessarily associated with equilibrium, this can only be done by use of a purely logical period -- chronological ones will not do. Since this period is supposed to be associated with equilibrium by construction, let us label it the 'equilibrium period'. The actual length of time it takes for equilibrium to be achieved is not important here. Rather, attention is focused on the position of rest associated with a set of exogenously determined variables (data) and the parameters specifying the (expectational, behavioural, and technological) functional relations of the system.

The second attribute of the taxonomy concerns the analytical objects of study, namely, the end-of-period position and the adjustment path. Independently of the period (finite or equilibrium), 'statics' is used to designate the study of the end-of-period configuration of a system and 'dynamics' the study of the adjustment path across a number of arbitrarily defined finite periods given any change in the data [8].

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8. We do not endorse the conventional view according to which there is a connection between dynamics and growth theory, on the one hand, and statics and employment theory, on the other hand. The comparison of both steady and stationary states is an exercise in 'statics' according to the taxonomy. The study of adjustment processes and stability conditions in both growth and employment theories is a study of 'dynamics'. What differentiates the two theories in our view is not the method underlying them but the extent to which the productive structure is assumed to adjust to changes in demand: in employment theory, capacity utilization adjusts whereas in growth theory, capacity itself accomodates.

We shall now combine the two attributes and propose the following taxonomy of methods:

Finite	Equilibrium	
T	G	Statics
-	D	Dynamics

The choice of the letters 'T', 'G' and 'D' here is not arbitrary. As we shall see, they refer to, respectively, the TREATISE, the GENERAL THEORY, and the drafts of the GENERAL THEORY.

The static equilibrium' or 'G' method corresponds to the conventional comparative statics method: it refers to the study of end-of-(equilibrium) period configurations associated with different sets of data. If we couple the equilibrium period with the study of the path of variables over time, this is an exercise in 'equilibrium dynamics', the 'D' method; the emphasis on the notion of equilibrium underlying the adjustment process and, hence, on stability conditions are the major feature of this method. The 'finite static' or 'T' method is appropriate for the study of immediate effects of a change in data; as we would expect, it will often picture the system in disequilibrium. A sequence of finite periods driven by changing

expectations characterizes the method [9]. It will be appreciated that both the 'sequence of Ts' and 'D' methods study a system over a series of finite periods; the difference between them depends on the role played by the notion of equilibrium and stability conditions (enphasized in the latter) and expectations (enphasized in the former).

We shall suggest in section 5 that Keynes, en route from the TREATISE to the GENERAL THEORY, followed a T-->D-->G path of methods, 'T' standing for the TREATISE, 'G' for the GENERAL THEORY and 'D' for the drafts of the GENERAL THEORY [10].

3. *A model for the TREATISE*

Equilibrium in the TREATISE corresponds to Marshall's 'long periods', that is to say, to a position where capacity and capacity utilization as well as sectoral structure and technology adjust to demand. The definition of income in the book, according to which it is "identically the same thing [as] ... the earnings of the factors of production ... and the cost of production" (JMK, V, p. 111), provides clear evidence of the notion of equilibrium Keynes was

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9. There are some similarities between the 'temporary equilibrium' method developed by Hicks (1965) and the sequence of finite periods described here.

10. By 'drafts of the GENERAL THEORY' we mean not only the drafts themselves but also other documents (letters, lecture notes, etc.) to be found in volumes XIII, XIV and XXIX of Keynes's *Collected Writings*.

assuming [11]. Normal profits or the normal remuneration of entrepeneurs, "themselves amongst the factors of production" (loc. cit.), enter the definition of income; this is not the case for unexpected or "windfall profits or losses" [12] resulting from differences between sale proceeds and the costs of production.

Equilibrium, however, is only a point of reference; the objective of the TREATISE is to study the causes of deviations from equilibrium and, once the system deviates, the repercussion effects (JMK, V, p.120). We suggest that the appropriate finite time-unit for the study of disequilibrium positions in the book is the 'employment' or 'production' period as characterized in section 2. The following passage lends support to this view:

> "Insofar ... as production takes time ... and insofar as entrepeneurs are able at the beginning of a production period to forecast ... the demand for their product at the end of the production period, it is obviously the anticipated profit or loss on new business, rather than the actual profit or loss on business just concluded, which influences them in deciding the scale on which to produce and the offers which it is worth while to make to the factors of production" (JMK, V, p.143; emphasis added).

We consider the derivation of the fundamental equations from the perspective of the supply dimension, turning then to the expenditure

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11. In a 1934 draft of the GENERAL THEORY Keynes noticed that in the TREATISE he took as the "meaning of income not the expectations which led to the current employment of the capital equipment actually in use, but the expectations which would have led to the original erection as well as the current employment of the equipment actually in use" (JMK, XIII, p.425).

12. 'Profits' in the TREATISE are essentially *unexpected*; thus Keynes's recurrent reference to 'windfall profits'. He actually observes that "[i]t has been suggested ... that it might be better to employ the term *windfalls* for what I here call *profits*" (JMK, V, p. 113).

dimension. Unlike the GENERAL THEORY where profit maximization is assumed (and, therefore, the marginal cost is equated to the price), the TREATISE assumes that producers equate the average cost to the expected price or total cost to the expected sale proceeds [13]. The average cost of producing a given level of output, say $\underline{X}$, is given by the following equation:

$$i[E] = \sum_{i=1}^{n} r_i[N_i/\underline{X}] = \sum_{i=1}^{n} r_i/g_i$$

where r_i is the renuneration rate of factor i, i=1, ..., n; N_i is the volume of factor i used in production; $g_i = \underline{X}/N_i$ is the "efficiency coefficient" of factor i or its average product and i[E] is the 'income index', as we shall refer to it.

In the TREATISE, Keynes implicitly assumes that remuneration rates and efficiency coefficients are proportional to, respectively, the wage rate (w) and the average product of labor (a(N)) -- i.e., $r_i = d_i w$ and $g_i = k_i a$. Let $\Sigma(d_i/k_i) \equiv h$. Keynes also makes h=1

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13. Harrod notices this point as early as 1936 in *The Trade Cycle* in which he argues that "[t]here is no treatment of marginal position of entrepeneurs [in the TREATISE]; the treatment suggests that the entrepeneur is influenced not by his marginal position but by the excess of his total receips over costs" (p.66). Patinkin (1977, p.7) also notices the "... complete failure to make use of marginal analysis [in the TREATISE]".

[14] giving rise to a synthetic formulation of the income index:

1. $$i[E] = \frac{w}{a(\underline{X})}$$

As for the second side of the producer's decision, it is associated with his expectations about the demand for his products. Based on his experience and current information, the producer calculates his 'expected sale proceeds' which can be formally represented by E[pX], a function of the expected price (p) and volume of goods to be transacted (X). The expected proceed:output ratio (E/X) and the income index have the same dimension. They can both be put in a diagram having the price on the vertical axis and the level of output on the horizontal axis, as depicted in figure 1. Assume that the efficiency coefficient varies inversely with the level of output and that both the wage rate and the expected proceeds are given at the beginning of the employment period.

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14. The assumptions of proportionality and making h = 1 imply an implicit process of homogeneization of the factors of production. Indeed, Keynes does not refer to a(N) as the efficiency coeficient of labor but rather to a more abstract term, the coefficient of "human effort".

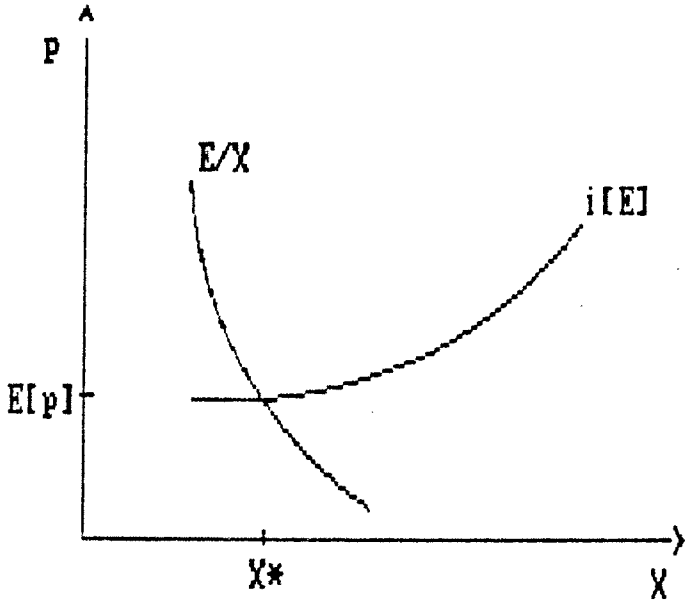

Figure 1

The intersection of the two curves determines [15] the level of output (X*) to be produced during the current employment period and the expected price level, E[p]. Notice that according to this construction the income index equals the expected price, that is,

$$2. \qquad i[E] = \frac{w}{a(N^*)} = E[p]$$

Assume that firms do not carry inventories from one period into another. If producers' expectations happen to be incorrect, the expected and actual (or 'market clearing') prices corresponding to X* will differ, i.e., $E[p] \neq p$. Windfall profits or losses (Q) would, therefore, be given by

$$3. \qquad Q = (p - E[p])X^*$$

Combining equation 3 with equation 2 yields a first version of the fundamental equations:

$$4. \qquad p = E[p] + \frac{Q}{X^*} \quad \text{or}$$

$$5. \qquad p = \frac{w}{a} + \frac{Q}{X^*}$$

According to equation 4 the actual price level can be decomposed into an expected and an unexpected (windfall) component

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15. The alternative assumption according to which the firm takes the expected price as given by its expectations about the demand curve at the industry level and equates it to the average cost does not affect the arguments of the following analysis.

respectively [16]. The other equation decomposes the price into the 'income index' (or average cost) and what we can refer to as the 'profit index' [17].

We turn now to the expenditure interpretation of the fundamental equation. Here Keynes follows Wicksell quite closely. A developed banking system, creating credit on demand, makes investment independent of current saving. Or, put in a broader sense, it makes expenditure (Y), composed by investment (I) and consumption (C), independent of current income. It is assumed that saving (S) and consumption exhaust the value of income, as defined in the TREATISE. Profits, as given by the difference between expenditure (or aggregate sale proceeds) and income (or costs), are also equal to the difference between investment and saving:

6. $$Q = I - S$$

which, together with equation 5, gives rise to a second version of the fundamental equation:

7. $$p = \frac{w}{a} + \frac{I - S}{X*}$$

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16. The reader will recognize the Shacklelian flavor of this interpretation: "Keynes's ... fundamental equation implicitly compares two states of the ... price-level. This equation takes an *ex-post* view of what we shall call a proper-named unit of time ... and shows both what the price level would have been in that interval had entrepeneurs' expectations, prevailing at its beginning, proved correct, and what in fact the price-level was. This realized price-level is thus also exhibited as the sum of two terms, the expected level and the unexpected divergence therefrom" (Shackle, 1967, p. 163).

17. The income and profit indexes are closely associated with the TREATISE's concepts of "income inflation" and "profit inflation", respectively (JMK, V, p. 140).

In equilibrium, expenditure and income, in the expenditure dimension, and expected and actual prices, in the supply dimension, match. Windfall profits are zero. Or, as Keynes puts it in the TREATISE:

> "[T]he long-period or equilibrium norm of the purchasing power of money is given by the money rate of efficiency earnings [w/a]; whilst the actual purchasing power oscillates below and above this equilibrium level according as ... investment is running ahead of, or falling behind, saving" (JMK, V, p. 137; emphasis added).

In this section we have analysed the immediate effect of an expenditure disturbance ($I \neq S$) on the supply side or productive sphere of the economy leading to unforeseen results as represented by a discrepancy between expected and actual prices ($p \neq E[p]$). This analysis was conducted, so to speak, 'inside' the employment period, for a given level of output. We now go 'beyond' the employment period to consider changes in output.

4. *Changes in Output in the TREATISE*

Keynes did not accept the criticism coming from the 'Circus' that in the TREATISE the level of aggregate output was fixed. In a letter to Joan Robinson, he claimed the assesment was not quite accurate:

> "I think you are a little hard on me as regards the assumption of constant output. It is quite true that I have not followed out the consequences of changes in output in the earlier theoretical part [of the book]... . But ... I have long discussions of the effects of changes in output; it is only a particular point in the preliminary theoretical argument that I assume constant output" (JMK, XIII, p. 270).

The "preliminary theoretical argument" undoubtedly refers to book III of the TREATISE in which the fundamental equations are derived. Just as in the derivation developed in section 3 above, the study

takes place during or 'inside' the employment period. Producers choose the level of output at the beginning of the period based on their expected sale proceeds and information concerning the cost structure. Throughout the period they are faced with the actual demand. Although inventories may adjust (JMK, V, p.258), Keynes assumes that prices do the bulk of the 'market clearing' adjustment. The derivation of the equations is an exercise in 'finite statics' or, as Keynes puts it, the equations are "an instantaneous picture taken on the assumption of a given output". But, he continues, they represent an attempt "to show how ... forces could develop which [involve] a profit-disequilibrium, and thus require a change in the level of output... . [T]he dynamic development, as distinct from the instantaneous picture, was left incomplete and extremely confused" (JMK, VII, p. xxii; emphasis added).

The "dynamic development" is to be found in Book IV of the TREATISE ("The Dynamics of the Price Level") where Keynes sets as his task the explanation of the determinants of credit cycles. The idea is clearly to go 'beyond' the employment period given a situation of profit-disequilibrium; in terms of our construction, the aim is to study the effects of $Q = (p - E[p])X^*$ being different from zero. In describing the "three types" of credit cycles (JMK, V, p.252), Keynes clearly uses the employment period as the time interval demarking the analysis. A sequence of such periods provides the setting for the study of fluctuations of output, employment and prices.

The typical causality chain used to describe changes in output in Keynes's discussion of credit cycles begins with a change in the Bank rate which tends to make investment demand deviate from the current

level of saving ($I \neq S$). Producers, who are assumed to have been making their decisions over a period of relative normality, are taken by surprise by the expenditure shock. The effect in the supply dimension is measured by the difference between the expected and the actual prices, that is, $E[p] \neq p$, and as a result by the appearence of profits or losses. The latter will alter producers' expectations and plans and, therefore, their decisions concerning the future levels of output and employment. The following scheme synthetizes the causality chain characteristic of the TREATISE's model:

$$I \neq S \implies E[p] \neq p \implies Q \neq 0 \implies \Delta X$$

The method employed in the TREATISE is perfectly consistent with and adequate for the study of changes in output. Profit-disequilibium or the appearence of windfall profits or losses at the end of the period represents the bridge between two periods. As Keynes puts it when studying the expansionary effect on the consumption goods sector of an increase in investment demand,

> "[T]hose entrepeneurs who have liquid consumption goods emerging from the process of production are able to sell them for more than they have cost [p>E[p]=w/a], ... and so to reap a windfall profit [Q=(p-E[p])X*]... .[T]he almost inevitable result of profits on current output ... is to encourage manufacturers ... to strain their efforts to increase their output" (JMK, V, p.258).

By emphasizing the role of supply dimension aspects in the TREATISE we have tried to show that the fundamental equations are an adequate tool to study changes in output.

5. *Towards the GENERAL THEORY*

From what has been said so far, it seems unreasonable to argue that the difference between the TREATISE and the GENERAL THEORY hinges on the study of changes in output per se. It hinges on the method underlying the theory of output determination. In the TREATISE the theory is cast in a finite or disequilibrium period analysis; in the GENERAL THEORY, in an equilibrium static analysis. In what follows we shall discuss very briefly the steps Keynes took in going from a disequilibrium to an equilibrium theory of output. The steps are unavoidably related to the expenditure and supply dimensions.

On the expenditure side, the essential step is Keynes's enunciation of the 'psychological law' according to which consumption expenditure varies directly with income but to a lesser extent -- or that the propensity to consume is smaller than one. The law makes current income the central determinant of consumption and, at the same time, provides the system with an equilibrating adjustment process and stability condition for changes in output and prices [18].

As for the supply dimension, considerations about the role of employment period expectations along the adjustment process to changes in data are as important as the psychological law. The level of income based on which consumers make their expenditure decision is ultimately determined by producers' decision to produce and employ.

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18. Patinkin (1976, 1983) considers the enunciation of the 'psychological law' the central message of the GENERAL THEORY. As we shall notice, his analysis lacks a systematic discussion of the supply dimension aspects.

The latter, in turn, depends on expectations which, therefore, may affect the path of variables over time and the stability conditions. In the GENERAL THEORY Keynes "omits reference" to employment period expectations and implicitly assumes that they are continuously fulfilled on the grounds that "in practice the process of revision of [these expectations] is a gradual and continuous one, carried on largely on the lights of realized results" (JMK, V. p.50). In Keynes's 1937 lecture notes one reads that "the theory of effective demand is substantially the same if we assume that short-period expectations are always fulfilled" (JMK, XIV, p. 180).

To arrive at the GENERAL THEORY's static equilibrium theory of output, Keynes, departing from the disequilibrium theory of the TREATISE, had to discuss the stability of the adjustment path of output, employment and prices. Indeed, this is precisely what one finds in the drafts of the GENERAL THEORY: the detailed study of the roles played by the propensity to consume and producers' expectations and decisions to fix the levels of output and employment given a change in autonomous expenditure. The following examples are meant to legitimize the suggestion that both supply and expenditure elements played a role in Keynes's preparation of the GENERAL THEORY.

According to a 1931 letter to Kahn, windfall profits respond to changes in investment ("dQ/dI is positive"), output (O) responds to changes in profits ("dO has the same sign as Q") and, finally, saving responds to changes in output ("dS/dO [is] positive"). Therefore, argues Keynes, "if, starting from equilibrium, an increase in I makes Q positive, O increases and S increases but Q/O gradually diminishes" (JMK, XIII, p. 347). The last statement, a progressive reduction in

Q/O, as S increases -- remember that in the TREATISE Q = I - S -- is the implicit stability condition.

In a 1931-32 draft of the GENERAL THEORY, the study begins with "the case where there has occured a decrease of disbursement leading to a decrease of profits" (JMK, XIII, p. 383). Keynes next studies the effects on the decision to produce of a reduction in profits and then, the effect on earnings and expenditure; the latter refers essentially to consumption expenditure. At this point, the reasons for expenditure to fall less than earnings -- such as the "pressure of increasing poverty" which makes people save less -- come into the picture as an explanation for the stabilization of the contrationary process. Keynes concludes by arguing that

> "once we have reached the point at which spending decreases less than earnings decrease with investment stable, the attainment of equilibrium presents no problem. For provided the spending always increases less than earnings increase and decrease less than earnings decrease, i.e. provided S and E have the same sign, and that investment does no change, any level of output is a position of stable equilibrium" (JMK, XIII, p. 387).

It becomes quite clear from Keynes writings that both supply and expenditure dimension elements were important to the study of the equilibrating path following a change in investment. And that the stability of this process was at center stage; hence our suggestion that, <u>en route</u> to the GENERAL THEORY from the TREATISE, Keynes made use of the 'dynamic equilibrium' method. In this sense he took both an historical and analytical step between the two books.

Appendix: *A Note on the Literature*

Garegnani (1976, 1978-9) and subsequently Milgate (1982) have suggested that Keynes in the GENERAL THEORY makes use of the traditional (classical and early neo-classical) method of 'long-period positions'. We endorse this view though a few remarks on terminology are needed. Garegnani's 'long-period' is, in our terms, the 'equilibrium period'. Garegnani and the classicals assume that forces operating in a capitalist economy tend to continuously drive the system towards a 'position of repose' (the long-period position) whenever it is shaken by a change in data: 'deviations' from this position characterize the adjustment process which in our terminology takes place over a number of 'finite periods'.

Keynes, too, identifies the long-period with what we call here the equilibrium period when he writes that it "relates to a position towards which forces spring up to influence the short-period positions whenever the latter have diverged from [the long-period]" (JMK, XXIX, p.54). The concepts of 'short' -- in our terms, 'finite' -- and 'long' -- in our terms, 'equilibrium' -- refer, respectively, to deviations from a position of rest and the position of rest itself.

Marshall (1890) employed the concepts of 'long' and 'short' periods in a different manner. In his work, they refer essentially to the extent to which the productive structure responds (or accomodates) to changes in demand. In the 'short-period' capacity utilization adjusts to demand whereas in the 'long-period' capacity itself (besides the skill of labor and sectoral structure) adjusts. The notion of 'short-period equilibrium' usually associated with the GENERAL THEORY's model actually corresponds to Marshall's usage of the

term. Accordingly, the term 'long-period equilibrium' characterizes the position of rest in growth theory.

The term 'long-period' when applied to the GENERAL THEORY requires the following clarifying note: it refers to the usage of the term which identifies it with a general position of rest; not with Marshall's usage. Given the ambiguity of the term, we would rather refer to equilibrium to convey the notion of the position of rest.

It should also be made clear that Keynes's "forces spring[ing] up to influence the short-period positions whenever the latter have diverged from the [long-period]" corresponds to a process which, according to our taxonomy, would be cast into the 'dynamic equilibrium' method. The method is supposed to describe the path of the system over a number of finite periods with emphasis given to the notion of equilibrium. An alternative approach to study the path of the system over time is the 'sequence of static finite priods' method. Here, expectations play a major role in driving the variables and the notion of equilibrium is not quite so emphasized. The method was developed by Hicks (1936, 1965) who calls it the 'temporary equilibrium' method, following the influence of Lindhal (1939) and Hayek (1929) [19].

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19. See Milgate (1979) for a detailed study of the origins of the notions of intertemporal and temporal equilibria.

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