THE DISAPPOINTMENT OF EXPECTATIONS: THE YEARS OF HIGH THEORY VERSUS THE YEARS OF RATIONAL EXPECTATIONS[1]

by

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> "O God! That it were possible
> To undo things done, to call back yesterday;
> That time might turn up his swift sandy glass,
> To untell the days, and to redeem these hours"
> (Hicks, 1939, Part III, front page)

1. Introduction

The notion of "errors in time" and the idea that these errors are the fundamental cause of fluctuations was developed in the "years of high theory" (Shackle, 1967) by the Italian economist Marco Fanno (1931 [1993], 1933 [2007]; Caldari and Meacci, 2007). The same idea reappears, with a renewed emphasis on the disappointment of expectations rather than on the equivalent expression of "errors in time", in a more cited article published by Hicks in the same year of Fanno's second article. Fanno's and Hicks' common idea was aimed to reach the same result, i.e. the explanation of macroeconomic disequilibrium, and marked a common stepping stone towards a revival of, and a new method for, the theory of fluctuations. This theory, which had been practiced and developed for a long time under the title either of "theory of crises" or of "theory of the business cycle", returned to centre stage in the second half of the 20th century when the main interest of economists and policy-makers rather shifted towards inflation and unemployment. The theme of expectations was taken up again in this revival from the standpoint of their formation rather than of their disappointment. It was not by chance, therefore, that this revival reached a climax in connection with the development of the Rational Expectations Hypothesis (REH), a device that was to conceal the link between the disappointment of expectations and the theory of fluctuations.

This paper is an attempt to reconstruct the role assigned or denied to the disappointment of expectations in the two revivals of the theory of fluctuations that took place in the 20th century. The

paper is divided in two sections. The first section is titled "The years of high theory" and is devoted to an examination of how the leaders of those years (Keynes, Hayek, Hicks) dealt with the disappointment of expectations in their theory of fluctuations. The second section is titled "The years of rational expectations" and is devoted to an examination of how the main authors of the second half of the 20th century have or have not dealt with the disappointment of expectations either in the context of a theory of fluctuations or out of such a context. After a brief account of the three prevailing hypothesis on expectations formation (the main theme of those years), i.e. the extrapolative, adaptive and rational expectations hypotheses, this section is devoted to showing that the disappointment of expectations is a common and implicit factor behind the reconstruction of the Phillips curve, of the aggregate supply curve and of the theory of economic policy that took place in these years. Finally, a third section is devoted to an assessment of the two blocks of thought on expectations investigated in the previous sections and leads to the conclusion that the scope and limits of the theory of fluctuations developed in the years of rational expectations are narrower than the scope and limits of the theory developed by the economists of previous generation.

2. The years of high theory

The most convenient way to go into the role played by the disappointment of expectations in the theory of fluctuations is to start from Schumpeter's notions of Statics, Dynamics and the Stationary State (1954, pp.963-71). In line with Hicks's definition based on dated and non-dated variables (1939, p.115), Schumpeter defines Statics and Dynamics as two different methods of analysis such that all economic variables either "refer to the same point of time" or are influenced by "past and (expected) future values, lags, sequences, rates of change, cumulative magnitudes, expectations". In this sense, the stationary state is just "an economic process that merely reproduces itself" and, more precisely, a methodological fiction such that "when we try to visualize how such a process might look and which of the phenomena of reality might be present in it, we *ipso facto* discover which of them are lacking" (*ibid.*, p.964). If one looks into this fiction from the standpoint of expectations, one finds that what is lacking in it are not expectations as such. What is lacking is, rather, their disappointment. This is the key for sharing Schumpeter's idea that Dynamics is not coextensive with the theory of economic growth and, indeed, for understanding why *period* analysis and *sequence* analysis are two separate methods of Dynamics[2]. On the other hand, since period

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[2] It is widely known that this twofold approach was developed in the 1930's by the Swedish economists as an offshoot of their distinction between *ex ante* and *ex post*. This was done in order to work out in the newly born macroeconomics the intertemporal consequences of any discrepancy between *ex ante* and *ex post* magnitudes (mostly saving and investment) or, which comes to the same, of the (ex post) disappointments of the expectations formed (ex ante) at the beginning of a given period. Both this distinction and that approach underlie Lundberg's study (1955) of the link between the disequilibrium resulting from the disappointment that occurs at the end of a particular period and the

analysis is an essential step to sequence analysis, it follows that, unless Dynamics is confined to the methodological fiction of the Stationary State, the disappointment of expectations or, which comes to the same thing, the discrepancy between the *ex ante* and *ex post* magnitudes of any period is the central problem of Dynamics. In the following subsections we shall examine how this problem was addressed, sometimes explicitly and sometimes implicitly, in the years of high theory and how it was solved, sometimes correctly and sometimes not, by the leading economists of those years.

2.1. Keynes

The role of expectations in Keynes' theory was first recognized by Hicks in his early review of the *General Theory* (1936). In this review expectations are regarded as the "missing element" of equilibrium analysis while Keynes' "method of expectations" is regarded as a device by which this analysis can be used to deal with disequilibrium "in the real world" (p.240). Furthermore, by connecting Keynes' method of expectations to the method of the Swedish economists based as it was on the distinctions between *ex ante* and *ex post* and between period analysis and sequence analysis, Hicks' review introduced the idea that this analysis would make no sense if expectations were fulfilled all the time, i.e. if no disappointment would ever occur. The link between the method of expectations detected by Hicks and the method of Swedish economists was never admitted by Keynes[3]. Yet the need for such a link is implicit in the early chapters of the *General Theory*. These chapters are concerned with the concepts of *aggregate* income, saving and investment as *flows* that take place in a given *period*. Keynes' arguments, however, are formulated in these chapters in such a manner that it is unclear whether his reasoning is based on the acceptance or rejection of the *ex ante/ex post* distinction, and therefore on the revision of expectations, along the lines required by period and sequence analysis.

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disequilibria resulting, across a number of different periods, from the disappointment of the expectations that rule at the inception of a roundabout method of production involving the employment of fixed capital for a large number of periods. Hence Lundberg's call for determining the length of the "unit-period" and for studying the impact of the discrepancies between the ex ante and ex post magnitudes of any period on the disequilibria of future periods (*ibid*., chapters II-III). On sequence analysis as the most suitable approach for studying the relationships between the equilibrium of decision-making units and the disequilibrium of the whole economy in the light of the formation and disappointment of expectations, the transmission of knowledge and "malinvestment", see Lachmann (1978, chapters III-IV). It should finally be added that the recent stream of literature on informational cascades, herd behaviour, bubbles and crashes may be regarded both as an introduction and as an extension of the stream of literature on the formation and disappointment of expectations here discussed in a macroeconomic context.

[3] Of course, Keynes was not unaware of the method of the Swedish economists, especially after their publications were made available in English. In his replies to Ohlin's criticisms, however, Keynes first admitted that he should "certainly give further thoughts to the advantages" of the Swedish method and that he had given it up "owing to my failure to establish any definite unit of time" for carrying it out (CW, vol. XIV, p.184) while, on the other hand, he promised a future article "dealing with the relation of the 'ex ante' and 'ex post' analysis *in its entirety* to the analysis in my *General Theory*" (1937a, p.663, italics added; see also 1937b, p.241, footnote 2). Other fragmentary views of the *ex ante/ex post* analysis can be found in Keynes' CW, XIV, pp.179-201.

Take, for instance, chapters 3 and 5. After basing his "aggregate supply function" on the proceeds *expected* by entrepreneurs from a given level of employment and after distinguishing between "short-term" and "long-term" expectations, Keynes points out that "the *actually realised* results" of the production and sale of aggregate output will only be relevant to employment in so far as they cause a modification of "subsequent expectations" and also that "a *change* in expectations" will produce its full effect on employment only "over a considerable period" (p.47, Keynes' italics). Furthermore, the repercussions resulting from the process of revision of short-term expectations are examined in chapter 5 in a manner that conforms not only to the method of sequence analysis but also to a view of time-consuming production that conforms to the Austrian tradition[4].

Now take chapters 6 and 7. Here Keynes' method of analysis changes to the extent that not only the logic of these initial chapters but also the consistency of the whole theory built upon them is eventually undermined. Chapter 7, for instance, is devoted to showing that saving and investment are necessarily and identically equal. Taking it in its *ex-post* dimensions, this argument is correct. But, as Shackle points out, does this argument also imply something about a coherence of intentions? If not, what is the mechanism by which a possible disagreement between *ex ante* (aggregate) saving and *ex ante* (aggregate) investment is corrected into an *ex post* equality? This is, after all, what one would expect from a *general* theory. For what such a theory should also show is "how the interpretation of given conduct, by those who decide upon and perform it, alters as these acts pass from design to actuality in circumstances not successfully foreseen, and how the acts themselves are perhaps revised in the course of performance" (1967, p.148)[5]:

The ambiguities of these initial chapters of the *General Theory* are overcome, however, in those crucial parts of this book which are focused, directly or indirectly, on the precariousness of

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[4] This is confirmed at the beginning of chapter 5 where Keynes argues that the importance of expectations in determining the volume of output "in the real world" is necessitated by the plain fact of time-consuming production (1936, p.46) as well as in the middle of the same chapter where he points out 1) that it is *current*, not past, expectations that are relevant in determining the volume of output; and 2) that the process of their revision differs depending on whether it comes to short-term expectations (in which case the revision is "gradual and continuous, carried out largely in the light of realised results") or to long-term expectations (in which case the revision is rather sudden and violent) (*ibid.*, pp.50-51). Concerning the differences between the *Treaty* and the *General Theory,* Keynes eventually admits that he did not in that book "distinguish clearly between expected and realised results" and that his method there was to regard current *realised* profit as determining the current *expectation* of profit (*ibid.*, p.77).

[5] Keynes' failure to argue in terms of discrepancies between *ex-ante* and *ex-post* magnitudes led Ohlin (1937, p.237) to regard him as an old-fashioned "equilibrium theorist". Ohlin's overall treatment of this issue, however, ends up in a mistake much deeper than Keynes' omission or ambiguities. This mistake consists in regarding *ex-ante* saving and *ex-ante* investment as two *schedules* showing how much people are willing to save and to invest at different hypothetical rates of interest. The mistake consists in smuggling the *static* method underlying the neoclassical (micro) analysis of demand and supply into the (new) *dynamic* method underlying the Swedish (macro) analysis of *ex ante* and *ex post* magnitudes. Hence Haberler's observation that, by identifying the *ex ante* magnitudes with the alternative plans embodied in those (instantaneous) schedules rather than with the aggregate plans existing at the beginning of a *period*, "it is difficult to see how Ohlin can speak of people being disappointed by events going contrary to their plans" (1946, pp.190-191).

long-term expectations and on the readjustments resulting from their revision. These parts begin with chapter 12 and continue well into the end of the book. They are based on the idea that this revision is responsible for the *shifts* of the curves for the marginal efficiency of capital, on the one hand, and for liquidity preference, on the other; and therefore for the shifts of aggregate investment, the "flighty bird" of macroeconomics[6].

However coherent Keynes' initial chapters on static notions and his final chapters on their dynamic implications and however founded Ohlin's criticisms of Keynes' overall shortcomings may be, a common void is shared by these two authors. This void, which was to be partly shared by Hicks and partly filled by Hayek, consists in the failure to distinguish between the disequilibria originated by the *current* and those originated by the *intertemporal* incompatibility or miscoordination of expectations. As we shall see below, period analysis is as necessary to the study of the former incompatibility as sequence analysis is to the study of the latter. The latter, we shall also see, is most necessary when it comes to fixed-capital economies, i.e. to economies whose levels of employment and output depend on investments made in a more or less distant *past* and designed to bear fruit into a more or less distant *future*.

2.2. Hayek

The role of expectations in determining the volume of output and of their disappointment in determining its fluctuations is not as predominant in Hayek's work as it is in Keynes'. On one occasion, however, Hayek rejected Myrdal's allegation that in his theory of the trade cycle "there is no room for the role played by expectations" (1939, p.155). Indeed, one should distinguish Hayek's early article on intertemporal equilibrium (1928), where the disappointment of expectations is *implicitly excluded,* from his subsequent works on fluctuations (1929, 1931, 1937, 1939, 1941),

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[6] The importance of these shifts is best conveyed by Shackle's invitation to think of the former curve as "a tree-branch in a gale, sweeping up and down with the gusts of politics and of the emerging consequences of past action", and of the latter curve as "a thread floating in a gusty wind, continually liable to change its form not only because of 'the news', but even because of a change in the total quantity of money itself" (1967, p.151 and p.217). The impact of (a disappointment of) long-term expectations on (shifts of) the curves for the marginal efficiency of capital and liquidity-preference corresponds to Keynes' insight that both durable equipment in the former case and money in the latter can be equally considered to be a link by which the economic future is connected to the present (1936, p.146 and p.293). The treatment of this link is a proof that the analysis of (static) equilibrium under given expectations and the analysis of (dynamic) disequilibrium following a revision of these expectations consistently coexist as "two branches" (the static and the dynamic) of Keynes' theory that lend to it "an exceptional power to combine reasoning and realism" (Shackle, 1967, p.222). An echo of these "two branches" can be found in Kregel's interpretation of the *General Theory* (1976, p.209) as a system based on three models centred respectively on the notions of "static equilibrium" (both short-term and long-term expectations are never disappointed), "stationary equilibrium" (short-term expectations are, while long-term expectations are not, disappointed) and "shifting equilibrium" (both short-term and long-term expectations are disappointed and curves shift). However, Kregel's idea that Keynes' central emphasis is neither on expectations as such nor on their disappointment seems to contradict Keynes' assertion that the aggregate supply and demand functions (as distinct from the *effective* demand resulting from their intersection) are based on the expectations of entrepreneurs (1936, chapter 3; see also CW, XIV, p.179).

where that disappointment is *implicitly included*. Before going into the latter aspect, it should be noted that there is some consistency in this oscillation. For, following Schumpeter's insight on the methodological fiction of the stationary state, Hayek's 1928 article may be regarded as an *a-contrario* introduction to what really matters, i.e. to the "phenomena which are lacking" in the fiction of intertemporal equilibrium[7]. The fluctuations of output are among these phenomena. And since expectations may be explicitly included in an intertemporal equilibrium model only if they are never revised or disappointed over an unlimited sequence of dates, it follows that their revision or disappointment is at the roots of intertemporal *dis*equilibrium, i.e. of fluctuations. This can be noticed if one starts from Machlup's idea (1976, p.23) that in the *Prices and Production* model (1931) "*monetary* factors *cause* the cycle but *real* phenomena *constitute* it" and from the realization that amongst the real phenomena of this model are changes in *relative* prices and in the *expectations* associated with them[8]. For what is set in motion by the credit expansion (money creation) contemplated in it is, initially, the (ill-founded) expectation that the expansion of the capital-goods sector can be sustained in the *real* economy and, eventually, when the error committed is perceived by entrepreneurs, the (unavoidable) perception that this expectation was ill-founded (disappointment), the result being that the structure of production, which had been "misdirected" in the ascending phase of the cycle, is then brought back to its initial conditions[9]. This self-reversing process is all the more effective the larger the number of profit-minded subjects (entrepreneurs) crowding the "Jevonian interval" (Garrison, 1989), i.e. the larger the number of individuals exposed to errors in time and the number of stages into which that "interval" is divided.

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[7] The dialectical coherence between Hayek's 1928 paper on intertemporal equilibrium and Hayek's subsequent works on fluctuations is proved by the opening assertions of that paper that "all economic activity is carried out through time" and that equilibrium analysis provides "no more than a partial explanation of what goes on in the economy as it actually exists" as well as by Hayek's later admission that "the situation seems here to be that, before we can explain why people commit mistakes, we must first explain why they should ever be right" (1937, p.33; see also 1941, p.17).

[8] This conforms to Hicks's assertion that in Hayek's 1931 model "price-expectations are not introduced explicitly, for in 1930 their day had not yet come" but also that there must have been "some implicit assumption" about them (1967, p.206). By arguing that this implicit assumption is that relative prices are constant and by adding that their flexibility is the mechanism by which the disequilibrium triggered by credit expansion is transmitted to the real economy through *lags*, Hicks implies that not only expectations but, indeed, their disappointment is at the roots of the fluctuations depicted in that model. The implicit role played by expectations in this transmission mechanism anticipates Hayek's later (and quasi-Keynesian) treatment of money as a "loose joint" between demand and supply (1941, Part IV, chapter XXVIII) and, more generally, the intersection between the market for *money* and the market for *saving*.

[9] The changes in the structure of production and in the composition of output resulting from "errors in time" coincide with Haberler's "vertical" and "horizontal" maladjustments (1946, chapters 3 and 4). By associating horizontal maladjustments with what he calls "error theories" (these errors being those relating to forecasts of final demand), however, Haberler fails to see that errors lie at the roots of both kinds of maladjustment, the only difference being that in the case of vertical maladjustments these errors have an impact on the whole economy whereas in the other case they are mostly responsible for the fluctuations only of particular firms or industries.

The role of the disappointment of expectations, both in relation to intertemporal equilibrium and in relation to the origins of fluctuations, is eventually brought to light by Hayek in his famous Copenhagen lecture (1933). One of the more important passages of this lecture concerns the distinction between "justified" and "sheer" errors[10]. While strengthening Fanno's idea that errors in time are at the roots of fluctuations, this passage clarifies that these are the errors committed by all entrepreneurs; but also, and more importantly, that the errors resulting from an event totally unexpected by the time previous expectations were formed must be distinguished from the errors resulting from the miscoordination of the expectations (plans) of individuals. This miscoordination corresponds to the *ex-ante/ex-post* discrepancies discussed above and is in turn the result of the incomplete knowledge by which individuals form those expectations (Hayek, 1937)[11]. What Hayek in his Copenhagen lecture calls "justified errors" are the errors that reflect a *current* miscoordination or incompatibility of expectations whereas the errors that he calls "sheer errors" are the errors that reflect an *intertemporal* miscoordination or incompatibility of expectations. When it comes to the "current" miscoordination (and therefore to justified errors), Hayek introduces the notion of *correct* (and, by implication, *incorrect*) expectations depending on whether expectations do (or, by implication, do not) incorporate all the information available in the period (1937, p.38)[12]. It should be noted that the importance of these distinctions becomes all the more evident the greater the amount of fixed capital used in aggregate production and the higher the number of "periods of observation" involved in the analysis of its fluctuations. In particular, the greater the amount of fixed capital existing in an economy (or, which is the same, the greater its degree of roundaboutedness) or the larger the number of periods of observation, the more subject is the economy to the consequences of "sheer errors". For, unlike "justified errors" which reflect some

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[10] "Every explanation of economic crises must include the assumption that entrepreneurs have committed errors. But the mere fact that entrepreneurs do make errors can hardly be regarded as a sufficient explanation of crises. Erroneous dispositions which lead to losses all round will appear probable only if we can show why entrepreneurs should all simultaneously make mistakes in the same direction. The explanation that this is just due to a kind of psychological infection or that for any other reason most entrepreneurs should commit the same avoidable errors of judgment does not carry much conviction. It seems, however, more likely that they may all be equally misled by following guides or symptoms which as a rule prove reliable. Or, speaking more concretely, it may be that the prices existing when they made their decisions and on which they had to base their views about the future have created expectations which must necessarily be disappointed. In this case we might have to distinguish between what we may call *justified* errors, caused by the price system, and *sheer* errors about the course of external events" (1933 [1939], p.141, italics added).

[11] Hayek's article on knowledge (1937) is an attempt to develop the themes of his Copenhagen lecture (1933 [1939]) in the direction of the *in-time* equilibrium that is reached or, more frequently, disrupted in a society made up of a large number of individuals acting on the basis of compatible or, more frequently, incompatible expectations.

[12] A more detailed discussion of "correct" and "incorrect" expectations can be found in Hutchison (1937). This author also distinguishes between "perfect", "correct" and "undisappointed" expectations in the sense that "perfect" expectations are necessarily "correct" and "undisappointed" (as well as "constant" in stationary and "changing" in dynamic conditions) whereas, if expectations are *not* perfect, "any combination of one of the alternatives form with each of the pairs, correct or incorrect, undisappointed or disappointed, constant or changing, is possible" (*ibid.*, p.646).

miscoordination between the intentions of the entrepreneurs and the consumers of the *current* period, whatever the amount of fixed capital inherited from past periods, "sheer errors" reflect the mismatch (which is the more harmful the longer, for a given amount of fixed capital, is the "investment period") (Hayek, 1941, Ch.) between the proportions in which the entrepreneurs of the *current* period plan their investments for the current *and* future periods (i.e. their demand for capital in different periods) and the proportions in which the consumers of *future* periods will divide their income between consumption and provision for further consumption (i.e. their supply of savings) in each of those future periods[13].

The role of equilibrium *in time*, the difficulty of achieving it in an economy where knowledge is dispersed amongst different individuals and, by contrast, the role that the disappointment of expectations (whether correct or incorrect) plays in disrupting that equilibrium is a complex theme that receives in *The Pure Theory of Capital* (1941, especially Parts II and III)[14] a much greater attention than it did in *Prices and Production* (1931 [1935]). The complexity of this theme is here enhanced by Hayek's discussion of the case of an unforeseen event that hits a fixed-capital economy. This case is based about the assumption that "some persons suddenly decide to consume less" (1941, p.272); i.e. about the assumption of an unforeseen change in *saving*[15]. In this case, as Hayek argues, "it makes little difference whether we assume that the unforeseen event occurs quite unexpectedly or whether we assume that its imminence becomes known some time *after* the investment has been made" (1941, p.306, italics added). By splitting his argument in two parts depending on whether the unforeseen saving of the current period exceeds or falls short of what was expected when a multi-period investment was decided in a previous period, and by concluding that, in the case of an unexpected excess, the result is "a temporary accumulation of

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[13] The verbs and tenses used in the main text above do not coincide exactly with those adopted by Hayek himself for he makes it unclear whether the coordination is *current*, i.e. related to a given period, or *intertemporal*, i.e. related to a set of successive periods. The second perspective oddly emerges in one of the few passages where Hayek distinguishes between "money capital" and "money savings" and argues that, when (individual) saving and capital are expressed in money, a number of factors, the most important of which is hoarding, emerge not only in the current period but, with greater indeterminateness, in any future period. (1933 [1939, pp.144-5)].

[14] While Part II is focused on the expectations and plans of a single mind (the central planner) and, therefore, on the necessary compatibility of these expectations and plans, Part III is focused on the expectations and plans of a multitude of individuals (free-market economy) and, therefore, on the possible incompatibility of the independent plans of all these individuals.

[15] This case, which Hayek (1941, p.) admittedly draws from Bresciani Turroni and Strigl, is nothing but the case first examined by Fanno (1931, 1933). Both Hayek and Fanno look at the unforeseen change as hitting a time-consuming economy divided in at least two sectors (consumption goods and capital goods) and in such a manner that the sudden fall in consumption "cannot affect the relative quantities of the two kinds of goods available" *at the time* of the fall (Hayek, 1941, p.272). It is worth noting that the issue of the specificity or mobility of capital goods is raised by Hayek (*ibid*., Chapters XXIII and XXIV) in this connection in that the more irreversible the investment made and the lengthier the life of the investment the more will the economy suffer from the intertemporal miscoordination or disappointment of expectations.

stocks of consumer goods", Hayek implies an intertemporal (rather than current) incompatibility of plans (expectations) for, as he points out, this does reflect a lack of "correspondence between individual intentions" not within a single period (sometimes identified by Hayek as one month, 1941, p.23 and p.254) but over a certain set of successive periods. Hayek's argument, however, is not without ambiguities in that the notion of equilibrium is initially referred (in an implicit context of period analysis) to "a state of complete compatibility of *ex ante* plans" (1941, p.23) but is eventually re-utilized (in an implicit context of sequence analysis) to discuss the disruption that occurs once the (consumption) plans of one period turn out to contradict the (investment) plans of previous periods[16].

2.3. Hicks

Hicks's analysis of expectations, of their disappointment and of their impact on fluctuations is most evident in his initial (1933) and final (1939) contribution to the years of high theory. The joint influence of Keynes and Hayek is already visible in Hicks' initial assertions that "the condition for equilibrium is perfect foresight", that "disequilibrium is the disappointment of expectations" and that "a real economy is always in disequilibrium" (CEET, vol. II, p.32)[17]. Concerning Keynes, the *General Theory* led Hicks (1936) to distinguish Keynes' "method of expectations" from the object of Keynes' "special theory" of employment and to give, in his subsequent works, more weight and more re-adjustments to the former than to the latter. Concerning Hayek, we have already seen above that Hicks, in his remake of the "Hayek story", acknowledged the implicit role of expectations, and of their disappointment, in the origin and evolution of that "story". On the other hand, Keynes' and Hayek's joint influence on Hicks is also discernible behind his later insights on the epistemological

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[16] Here Hayek fails to clarify what should have thrown further light or coherence on other parts of his theory. In particular, it should be noted 1) that what Hayek's case of unforeseen saving is about is nothing but the intertemporal disappointment of expectations; 2) that this special kind of miscoordination is all the more likely and relevant the more "fixed" is the capital employed in production or, which comes to the same, the longer is the "Jevonian interval"; and finally 3) that "it makes little difference" (to use Hayek's expression above with regard to Parts II and III of his 1941 book) whether the economy affected by this special kind of miscoordination is a free-market or a centrally-planned economy in that both kinds of economy are subject to "sheer" errors. This failure seems to reflect a more general neglect for the difference between the two notions of time that intersect the Austrian theory, old and new; i.e. the notion of "time as a container" (which properly underlies Hayek's theory of fluctuations) and the notion of "time as an ingredient" (which underlies Böhm-Bawerk's theory of capital) (Meacci, 1994). The overlapping of the different contexts resulting from these notions conceals what Hicks (1956) ambiguously calls the "central dynamic issue" of modern theory, i.e. "how to superimpose the pattern of change, which is one time-pattern, upon the underlying pattern of capital-using production, which is another" (CEET, Vol. II, p.221).

[17] These assertions have been related by Hicks the Elder (1991, pp.371-2) to Hayek's 1928 notion of equilibrium and to the "criterion for non-distortion". This criterion can be regarded as a benchmark for identifying *a contrario* what we might call the "criterion for distortion" that is needed when it comes to the analysis of real-world economies. If one looks back to Hicks' 1933 article one finds that this criterion calls for the acknowledgment of the disappointment of expectations. Concerning the link between this disappointment and *money* as a store of value as well as the parallel link between Hicks and Keynes on these matters, see Hicks the Younger as well as Hicks the Elder (1933 and 1973). On the two Hicks and on their common interest for the role of (historical) time, see Leijonhufvud (1984).

difference between economics *of time*, economics *in time* and economics *out of time* as well as on Keynes's theory being a theory that "has one leg which is *in* time, but another which is not" (Hicks, 1976, p.269). By maintaining, as Shackle would, that the leg which is *in* time revolves around the concepts of marginal efficiency of capital and liquidity preference whereas the leg which is not rests on Keynes' theory of production and prices as "wrapped up in the multiplier", both Hicks the Younger (1936) and Hicks the Elder (1976) convey the idea that Hayek and Keynes are the pioneers of economics *in time* and that, since it is the "method of expectations" that supports the leg of Keynes's theory which is *in* time, we might regard the disappointment of expectations as the unrecognized "knee" of this leg.

Hicks' twofold interaction with Hayek and Keynes is most evident, however, in the initial chapters of Part III of *Value and Capital* (1939). Here it is argued 1) that the stationary state is an evasion from the "main crux" of Dynamics, namely from the divergence between prices *expected* (in the past) and prices *realized* (in the present) as well as between *current* prices and *expected* prices; 2) that one thing is "equilibrium over time" (in which no mistakes are ever committed and plans continue to be executed without revisions) while another thing is "temporary equilibrium" (which holds on the Monday of each 'week' and is disrupted by the conditions that may occur on the Monday of the following 'week'); 3) that disequilibrium is therefore the prevailing condition of an economy *in* time, the degree of this disequilibrium depending on the extent to which "expectations are cheated, and plans go astray"; and finally 4) that a "Futures Economy" can indeed remove "inconsistency disequilibrium", i.e. the disequilibrium resulting from the inconsistency of current plans (for in this case "people would be under contract to buy or sell certain goods on the second Monday") but cannot remove the disequilibrium resulting from *unexpected* changes (for in this case and on any following Monday the same people "might be unwilling or unable to buy or sell the amounts of goods contracted for") (*ibid.*, Chapter X).

These two kinds of disequilibrium, i.e. the one that can and the one that cannot be removed in a "Futures Economy", are the result, it should be noted, of respectively the "current" and the "intertemporal" miscoordination of expectations (plans) or, in Hayek's terms, of "justified" and "sheer" errors discussed above. This second kind of miscoordination and errors cannot be properly tackled, however, within the confines of period analysis and of its central notion of "temporary equilibrium", as Hicks did in the dynamic parts of *Value and Capital*. Indeed, in spite of Hicks' numerous afterthoughts, revisions and self-criticisms produced throughout his life and in spite of his late admission that it was the method of the Swedish economists that led him to detect the "method of expectations" in Keynes' *General Theory* (1973, p.8, note 4), he never went far enough to develop the dynamic parts of his 1939 book in the direction of tackling the "ultimate dynamic

problem" as defined by Hicks himself. This problem is posed by the disequilibria resulting in *future* 'weeks' from the disappointment of the expectations held on the Monday of any *initial* 'week'. It should be noted, however, that this problem deserves to be tackled with the tools of sequence analysis rather than, as Hicks did in *Value and Capital*, with those of period analysis. Yet, when he came to adjusting the dynamic method adopted in his 1939 book in order to incorporate the superior insights of the Swedish method, Hicks limited himself to arguing that the Swedes' (in particular Lindahl's) "single-period theory" was framed in terms of *fixed* prices with *ex ante* demands and supplies *not* necessarily equal (Hicks' "fixprice method") whereas his *Value and Capital* "single-period theory" was framed in terms of *flexible* prices with *ex ante* demands and supplies necessarily equal (Hicks' "flexprice method"). Hence Hicks' double conclusion 1) that the *ex ante-ex post* theories could be of two sorts: Q-type (or quantity-*disequilibrium*) and P-type (or price-*disequilibrium*) theories; and 2) that his *Value and Capital* P-type theory could be easily combined with a Q-type theory to produce a Q-*and*-P type theory; which, in Hicks's view, is what Keynes eventually did with his "hybrid" theory of employment, interest and money (1956, CEET, vol. II, p.224)[18].

3. The years of rational expectations

While the economists of the years of high theory came to the theme of expectations in view of the impact that their disappointment had upon macroeconomic equilibrium over time or upon disequilibrium and fluctuations, the economists of the second half of the 20th century re-focused their attention on the same theme with the initial aim of putting forward a specific hypothesis or formula for the mechanism by which (aggregate) expectations are formed. This hypothesis or formula was then used to develop new theories or models in contrast with, or in support of, the main arguments sometimes of the "economics of Keynes" and sometimes of "Keynesian economics", one difference between these two sets of arguments being that expectations play the role we have seen in the former and scarcely any role at all in the latter set[19]. The main hypotheses

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[18] Hicks' last-ditch defence of his *Value and Capital* dynamic method is not enough, however, to deflect from it the criticism that he himself eventually raised against Keynes' theory as an "inherently short-sighted" theory (Hicks, 1985, p.60). Short-sighted, it should be noted, in the sense that this theory, being confined to a concept of equilibrium "restricted to the determination of employment within the period that is under consideration, taking that period *by itself*" (1985, p.59-60), is a "single-period theory" rather than a "continuation theory" (1956, p.223); it is, in other words, a theory based on what happens in a *given* period rather than on what happens in *successive* periods once the expectations of this period are revised or disappointed. It is not by chance, therefore, that chapter 6 of *Methods of Dynamic Economics* (1985, pp.52-61) is titled by Hicks "The Methods of Keynes" (methods, that is, in the plural and in contrast with the method, in the singular, attributed to Keynes in Hicks's 1936 review of the *General Theory*). For a similar view of Keynes's "hybrid" theory, see above Shackle's criticism of Keynes's neglect of the *ex ante-ex post* distinction.

[19] For an overview of the snowballing literature on the economics of Keynes, Keynesian economics, Old and New Classical economics, Old and New monetarism, New and Post-Keynesian economics and many other divisions, conflicts and transformations of modern macroeconomics, see Snowdon and Vane (2004). See also Phelps (1990).

formulated in this connection have been the extrapolative expectations hypothesis (EEH), the adaptive expectations hypothesis (AEH) and the rational expectations hypothesis (REH). While the EEH is based on the idea that the expected value of a variable for a given period is determined by changes in the actual level of this variable in two or more previous periods[20], the AEH takes into account not only the actual values and changes observed in past periods but also any difference between the actual values observed in past periods and the values previously *expected* for these periods[21]. Contrary to the backward-looking bias of the EEH and AEH, the REH assumes that expectations are formed only on the basis of the information available *now* and of the prediction of relevant economic *theory*[22]. Amongst the implications of the REH is the idea that, if the theory is

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[20] The EEH was introduced by Metzler (1941) in the context of his model of inventory cycles which was aimed, it should be noted, to overcome Keynes's static analysis of the Multiplier by providing a *sequence* analysis of this mechanism in which Robertson's receipts-expenditure lag is combined with Metzler's own variants of the Lundberg's sales-output lag. The extrapolation parameter is called by Metzler "coefficient of expectations". Thus, if the variable is the price level P, the EEH formula is $P^*_t = P_{t-1} + \eta (P_{t-1} - P_{t-2})$ where P^*_t is the expected price level for period t; P_{t-1} is the actual price level observed in period t-1; P_{t-2} is the actual price level observed in period t-2 while η is the coefficient of expectations. When this coefficient is equal to zero, expectations are said to be "static" and current prices are expected to persist. When this coefficient is greater than zero (it may actually be lower), expected prices are proportional to the experienced increase in prices and expectations are said to be "extrapolative". Metzler's "coefficient of expectations" (η) is very close to Hicks's "elasticity of expectations" (*e*) (1939, Chapter XVI) in the sense that $\eta = e - 1$ with the implication that any variations of *e* ranging between zero and unity correspond to variations of η ranging between -1 and zero (Metzler, 1941, note 13).

[21] The AEH was introduced by Cagan (1956) and can be captured by the formula $P^*_t = P^*_{t-1} + \eta (P_{t-1} - P^*_{t-1})$, or $P^*_t - P^*_{t-1} = \eta (P_{t-1} - P^*_{t-1})$, where P^*_t is the price level that is expected in period t; P^*_{t-1} is the price level that was expected in period t-1, P_{t-1} is the actual price level observed in period t-1, η is the "coefficient of expectations". Expectations are revised in each period according to the errors committed in previous periods. While these errors are measured by the difference between P_{t-1} and P^*_{t-1} the coefficient η determines the speed or magnitude of the reaction to errors through the revision of expectations. One of the limits of the AEH and possibly one of the reason for the rise of the REH is that "it is not plausible to assume that a decision-maker, who is otherwise assumed to behave rationally, continues to form expectations in a way which is continuously contradicted by experience in a mechanical and easily perceived fashion" (Mills, 1961, pp.333-4).

[22] The REH was introduced with the aim to deal with "short-period price variations in an isolated market with a fixed production lag of a commodity which cannot be stored" as well as with "sensible predictions about the way expectations would *change* when either the amount of available information or the structure of the system is *changed*" (Muth, 1961, p.315 and 317, italics added). The REH has been later turned into a variety of forms ranging from Muth's microeconomic context to its macroeconomic implications. If, for instance, the variable at issue is the rate of inflation, the REH most simplified formula is: $P'^e_t = P'_t + u_t$ where P'^e_t is the expected rate of inflation from t to t+1; P'_t is the actual rate of inflation from t to t+1; u_t is an error term. According to this hypothesis, errors are essentially random with a mean of zero (so that expected $u_t=0$) and are serially uncorrelated over time, i.e. they are unrelated to errors committed in the past. Systematic errors are possible under the AEH (for agents are here allowed to adjust their expectations by at least a fraction of the errors committed without taking care of any further information) but are impossible under the REH. What, therefore, is implied in the REH formula above is that the expected rate of inflation and the actual rate are eventually equal: $P'^e_t = P'_t$. For a more sophisticated account of the REH, of its variants and of the models built upon them, see Pesaran (1989), Hoover (1992) and others. The idea that the REH is incompatible with Hicks' "temporary equilibrium", which is based instead on the possibility of the disappointment of expectations from one 'week' to another, is acknowledged by Farmer (1999, p.89). For an overview of how the REH was developed as an attempt to overcome Fisher's explanation (based as it was on expectational errors) of the "Gibson Paradox" (which concerns the positive correlation between the nominal rate of interest and the rate of inflation), see van Zijp (1994).

right, expectations are necessarily fulfilled as well as the idea that, if theoreticians believe in the validity of their theory, they must also believe in the validity of the REH.

3.1. The expectations-augmented Phillips curve

The three hypotheses on expectations formation can be used to model the behaviour of prices, quantities or both in the context, respectively, of P-models, Q-models, P-and-Q-models according to Hicks' classification discussed above. A major difference, however, between these hypotheses is that while the EEH and the REH do not take into account the possibility of "errors in time", the third hypothesis, the AEH, does allow for this possibility and can accordingly been regarded as a "learning-from-errors" or "errors-correcting" hypothesis. The inclusion of errors into this hypothesis, however, calls for a conclusive model or theory to be focused on the impact that the resulting disappointment of expectations exert either on P or on Q or on both. It is ironic to note that this extension, which did not fail to materialize soon after that hypothesis was introduced, was aimed to cripple those very branches of "Keynesian economics" which, due to their lack of attention for the role of expectations, were far away from the spirit and letter of the "economics of Keynes". Nonetheless it was the "economics of Keynes", rather than "Keynesian economics", that was thought to be crippled by that extension. Yet it can be objected nowadays that the second kind of economics was to be enriched, rather than rejected, by such an extension.

The old Phillips curve is a case in point. When Phelps (1967) and Friedman (1968) launched their critique and, in hindsight, the reconstruction of this curve, they resorted, in spite of their different terminology, to the role played in its transformation by "errors in time" and the disappointment of expectations. The main difference between the new approach and the approach that carried the way in the 1930s relates to the *object* of these errors as well as to the *agents* who are most prone to them. While this object was in most contributions of the 1930s the *ex ante/ex post* discrepancies between *saving* and *investment* (entrepreneurs being the agents most exposed to these errors), in the modern revival of the theory of fluctuations the object becomes the expected/actual rate of *inflation* (workers rather than entrepreneurs being now the agents most prone to committing the errors). Moreover, while the force lying behind the errors committed by entrepreneurs may be thought to be, for instance, their "animal spirits" (via shifts of the propensity to invest facing a constant propensity to save) (Keynes, 1936, Ch.12), the force lying behind the errors committed by workers is more likely to be their "money illusion" (via the belief that a change in money wages involves an equivalent change in real wages). Thus Phelps' and Friedman's original contribution was to "augment" the old Phillips curve by arguing that there are as many possible curves as expected rates of inflation and that any actual curve relating to a given expected rate shifts once

workers realise that they have been "fooled", i.e. that their expectations have been disappointed or, which comes to the same thing, that the rate of inflation they *expected* when contracting their nominal wages turn out to fall short of the rate of inflation they *experience* at the end of the contracting period. The AEH is at the core of this argument in the sense that workers are assumed to adjust (i.e. to revise upwards or downwards) their inflation expectations at the beginning of a period by at least a fraction of the forecast errors committed in previous periods. The final result is known: the inflation-unemployment trade-off along the short-run Phillips curve is dissolved into a combination of rising inflation rates with a constant rate of unemployment at its "natural" level along a long-run vertical line. This implies that only when unemployment is at its natural level expectations are fulfilled; and, accordingly, that when unemployment falls short of, or exceeds, its natural level, the expectations running at the beginning of a period are disappointed and revised at the end of it. In such a framework, the disappointment of expectations reappears as the root cause of the impossibility of *keeping* not only the "market" rate of unemployment below (or above) its "natural" rate (when it comes to workers' expectations of inflation) but also the "money" rate of interest below (or above) its "natural" rate (in the case of people's expectations of inflation). It is understood that this impossibility becomes manifest only after the period has run its course (or only if it is too short for the disappointment to materialize) and only in the absence of *accelerating* inflation, i.e. of a situation in which people keep being "fooled" over an unlimited number of periods[23].

Not that the old Phillips curve be devoid of any meaning. Indeed, in the light of the difference between a static (stationary) and a dynamic context, one can still argue that the old Phillips curve might well fit the static context (a context, it should be noted, in which expectations are given and fulfilled) though it cannot fit at all the latter. The trouble is that the dynamic context – and the dynamic method introduced in the 1930s for dealing with it- is the context that *must* be adopted in economic analysis when it comes to the problems of the *real world* (unemployment being one of these problems) and, even more so, to the policy measures needed to solve these problems (a most important task initially assigned to the Phillips curve). Unfortunately, the disappointment of expectations is one of the problems that cannot be avoided in the real world. Even more unfortunately, this problem cannot be solved by relying on the static method.

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[23] Hence Friedman's distinction between a *rising* rate of inflation (which implies the disappointment of the expectations based on past inflation) and a *high* rate (which is assumed to be constant and can be easily anticipated) and his final conclusion that "a rising rate of inflation may reduce unemployment, a high rate will not" (1968, p.11). For a comprehensive discussion of the relation between *natural* and *actual* magnitudes in the light of optimal policy rules, see Woodford's neo-Wicksellian model in Woodford (2003). It can however be noted that the "explosive spiral" in which Woodford summarizes Friedman's Wicksellian view of the "cumulative process" triggered by a low interest-rate peg is the result of expectations that are continuously disappointed upwards rather than self-fulfilled from one round of inflation to another.

3.2. The misperceptions-augmented aggregate supply curve

We have hinted above at the ambiguities incorporated in the initial chapters of the *General Theory*. Among these ambiguities is Keynes' "Aggregate Supply Function" by which the proceeds (net of user cost) expected by entrepreneurs from a given volume of output are related to the employment associated with this output (1936, chapter 3). These ambiguities may be responsible for the conflicting interpretations of that function that took place in the 1950s and 1960s as well as for the replacement of this function by the similar, but by no means, identical "aggregate supply curve" that followed suit. While Keynes' function was drawn in the Z,N plane (Z being the proceeds and N the employment level) with expectations explicitly, though not unambiguously, included in the proceeds, the new curve is universally drawn in the P,Q plane (P being the hypothetical price level and Q the actual aggregate output) as an "augmentation" of the horizontal aggregate supply curve (which was previously adopted to represent the possibility of increasing aggregate output at constant prices). A crucial difference between this "augmented" curve and Keynes' function or the horizontal aggregate supply curve is that the disappointment of expectations is unambiguously, though only implicitly, included in it.

The implicit non-ambiguity of this inclusion may be clarified by cross-examining the contributions produced on this matter by Phelps (1967, 1968, 1970), Friedman (1968) and Lucas (1972, 1973). These authors start from the context of imperfect information (Stigler, 1961) and of incomplete knowledge (Hayek, 1937) captured in their "island parable" (Phelps *et al*., 1970)[24] and proceed by explaining the impact of shocks, in most cases an unanticipated monetary expansion, on unemployment and output. Given this context and given the crucial distinction between the *initial* and *final* effects of the disturbance, these authors trace the former effects to the *misperceptions* by which individuals (whether households or firms), constrained as they are by the information available on their own island, react to the disturbance. If it comes to a monetary expansion, these misperceptions consist in misinterpreting the (unavoidable) rise of *absolute* prices induced by the expansion for the (impossible) rise of the *relative* price of *each* of the goods to be produced. The joint outcome of the wrong solution given by imperfectly informed individuals to this "signal extraction problem" is a decrease in the level of unemployment and an increase in the volume of

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[24] According to the "island" parable, goods are supposed to be produced on different islands by firms and workers whose knowledge is limited by the "interisland" obstruction to the flow of information. In such a context it may well happen that money wages and money prices do increase while real wages and relative prices actually decrease in each island with the result that employment and output mistakenly increase across all the islands.

aggregate output[25]. This increase can be depicted by a curve sloping upward in the P,Q plane. This curve is known as the "surprise" supply curve but should more properly be called the *misperceptions-augmented* aggregate supply curve. For it is true that both expressions are made equally ambiguous by the fact that, when surprises occur or misperceptions are revealed, the curve stops sloping upwards. But the clear distinction between the initial and the final effects of the disturbance on which this curve is built makes it possible to separate the *expectations* that form in individual minds at the *beginning* of the process (when no one knows whether they are doomed to fail) and the *disappointments* that are enforced upon these very minds by the time the process comes to an *end*. What makes it worthwhile to dub this curve the misperceptions-augmented aggregate supply curve in a way similar to the expectations-augmented Phillips curve is that along both curves people are subject to the "errors in time" they have committed at the beginning and have realized at the end of a period rather than to the *surprises* they experience at a point of time (a lottery ticket may provide a surprise without its purchase being ever considered a mistake). The essential difference between the two curves, once it is acknowledged that the impact of the disturbance is to force unemployment in one case or aggregate output in the other below or above their "natural" levels, is that the expectations ruling at the beginning of the process stem either from the *neglect*, in one case, or from the *misinterpretation*, in the other, of what is happening or is going to happen in the actual economy. The process set in motion in the two cases, beginning with a given set of expectations and ending after a certain time lag into a related set of disappointments, is nothing, therefore, but a process of *errors in time*: when errors are realized and disappointments take place, both curves, however different the planes in which they are drawn, shift upwards and tend equally towards a long-run (full-information) vertical shape consistent with the equilibrium (natural) levels of employment and output[26].

3.3. The policy ineffectiveness proposition

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[25] It is interesting to note that in his Nobel Lecture Lucas (1996) regards the solution of this problem as the key for coming to grips with Hume's "double standard" or conflicting ideas (on what was to be called the neutrality of money) in his two essays *Of Money* and *Of Interest*. For there are passages in these essays in which Hume argues for the neutrality of money as well as passages in which he argues for the opposite. The solution suggested by Lucas for this outward contradiction is that what Hume has in mind in the neutrality passages are the final or long-period effects of a monetary expansion whereas what he has in mind in the non-neutrality passages are the initial or short-period effects of the same expansion, captured as they are in what is called above the misperceptions-augmented aggregate supply curve.

[26] It may be of interest to note that, when Phelps came to present the neutrality of money as a feature to be observed "if and when firms and workers formed *correct* expectations" (of money wages and money prices) except that they "have no way of perceiving such neutrality *at the start*" (2007, p.546; first italics Phelps', second italics added), he made use of the same expression ("correct expectations") that we saw above to be used by Hayek while conveying the idea of expectations resulting from the *whole* set of existing information.

If one assumes that the expectations ruling at the beginning of a period are formed by agents on the basis of the whole information available at that moment (i.e. by agents who neither ignore nor misperceive what is happening), one is led to believe that the shocks discussed in the previous sections can have no impact on real magnitudes either along the expectations-augmented Phillips curve or along the misperceptions-augmented aggregate supply curve. Since, under this assumption, the possibility of "errors in time" disappears along with the difference between the initial and final effects of the disturbance, the two curves acquire immediately, i.e. as soon as the shock takes place, their full-information vertical shape. This special assumption is what is conveyed by the REH. This hypothesis, however, is made up of two components: one consists in assuming that expectations are formed on the basis of the whole information available at a particular moment; the other consists in adding to, and drawing from, this perception the resulting predictions of the theory. The former component may be said to convey the REH in what may be called its "weak" dimension, the latter in what may be called its "strong" dimension[27].

The usefulness of splitting the REH into these dimensions becomes clear when it comes to the so-called "policy ineffectiveness proposition" (Sargent and Wallace, 1976). According to this proposition, the mere announcement of a policy measure, say an expansionary monetary policy, is "digested" into the economy as assumed by the REH, i.e. in the sense that agents are able to anticipate all the consequences of the new measure at the very moment, or even before, the measure is enacted[28]. The resulting "super-neutrality of money" (a feature by which money is said to be neutral not only in the long run –i.e. in a run long enough for errors in time to be perceived and expectations to be revised- but also in the short run –i.e. in a run never too short to keep agents from perceiving what is going to happen) signifies that central banks can affect employment and output levels only at the cost of creating illusions and disappointments; which implies that these illusions

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[27] While the "weak" dimension is intended to overcome the AEH and the EEH and may indeed be consistent with the theory developed in the years of high theory, the "strong" dimension of the REH is a stepping stone of the "Dymanic Stochastic General Equilibrium Model" (DSGE), the extension of General Equilibrium Teory (GET) to modern macroeconomics. It is interesting to note that, while advocating a "post Walrasian macroeconomics" as a reaction to DSGE, Colander (2006) confines this reaction to the study of the *multiple*-equilibria resulting from the *current* asymmetric information and processing capabilities of individuals instead of extending it to the study of the *shifting* equilibria resulting from *intertemporal* changes in the information and processing capabilities of these individuals, whether heterogeneous or not. This restriction, it should be noted, implies a shift from studying the uncertainty of the *future* (which underlies, for instance, Hayek's analysis of "sheer" errors) to studying the uncertainty of the *present* (which is focused instead on Hayek's "justified" errors or "incorrect" expectations discussed above).

[28] Closely linked to the policy ineffectiveness proposition is 1) the so-called 'Lucas critique' (whereby the parameters of the macroeconometric models used for framing policies cannot incorporate also the changes in expectations originated by these policies); 2) the call for monetary rules (whereby central banks should refrain from "fooling" the people about what they are going to do or where the economy is going to go); 3) the issues of central bank credibility (whereby central banks cannot "fool" the people more than once) and of time inconsistency (whereby the "fooling" by central banks or governments consists first in announcing a certain rule and than in reaping the impact on real magnitudes of "cheating" with it).

and disappointments can actually be created only if people do *not* behave as required by the REH or, which comes to the same, only if the REH is dropped out of the analysis. It is here that the "weak" and "strong" REH come into the picture. For it is true that the REH, being forward-looking in both of its dimensions, is more suitable than the EEH and the AEH for evaluating the future impact of current policies (particularly of *new* policies); and that, in its strong dimension, it adds to the advantages resulting from exploiting all available information the further advantages coming from the agents' ability to draw from it the predictions of the theory. But the additional power thereby conferred upon agents boils down to nothing once the expected outcome of particular policies is separated from the future condition of the economy to be affected by these very policies. The snag is that between the *expected* outcome of a policy measure (whatever the model on the strength of which this outcome has been expected) and the *future* condition of the economy lies the flow of historical time. This is, as shown above, the "main crux" not only of Dynamics but also of Keynes', Hayek's and Hicks' theories taken together. The complications raised by this flow can be easily removed when it comes to modelling an *abstract* economy. But they cannot when it comes to evaluating the future impact of particular shocks or policies on the economies of the *real* world. For not only does that flow add ever new *complexities* to the complexities that normally afflict these economies or the theories designed to understand them. It also brings forth *novelties* that these theories, not to speak of the resulting economic policies, are unable to predict or to overcome.

4. Concluding remarks

A bird's eye view of how the disappointment of expectations has entered the theory of fluctuations from the years of high theory to the more recent years of rational expectations brings to mind Robertson's vision of the hunted hare, i.e. that "if you stand in the same place, or nearly the same place, it can be relied upon to come around to you in a circle". Indeed, if one compares the analysis developed in the latter with that developed in the former years, one may realize that the weight of the hare (the size of literature) has hugely increased while the circle covered (the scope of literature) has under some respects shrunk or changed its shape. The mismatch between the weight of the hare and the diameter of the circle seems to be at the roots of the demise of the REH and REH-based models after their spread in the 1980s and 1990s. Apart from the crises that have hit the world economy ever since and the global recession of 2008-2009[29] a number of analytical reasons can be provided to account for such a demise.

The most general reason seems to be the tendency (somehow shared by Shackle himself in his account of the years of high theory) to confuse the scope and limits of General Equilibrium

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[29] For an early example of the rising skepticism about the power of modern macroeconomic theory to comprehend the most recent crises and recessions, see Leijonhufvud (2009)

Theory (GET) with the scope and limits of the Economics of Uncertainty and Expectations (EUE) (Meacci, 2009); or, in Hicks' terms (Hicks, 1976), the inability to separate the economics *of time* (or of no time at all) from the economics *in time*; or, in Hayek terms (Hayek, 1933, 1937, 1941), the logic of equilibrium (which is *out* of time) and the logic of fluctuations (which are *in* time) and, accordingly and more particularly, the rationality of *choice* and the rationality of *expectations*; or, in still different terms (Shackle, 1969), the inability to grasp that decisions taken in historical time are "self-destructive" and that the learning process is at all times "eating its own heart". All these insights lie behind the argument set out above against the confusion between the *expected* or *deducted* outcome of a particular policy and the *future* conditions of the economy as such.

Another reason can be drawn from the tendency of the years of rational expectations to neglect Keynes's distinction between short-term and long-term expectations as well as Hayek's remarks on the difference between the behaviour of agents and the forecasts by model builders. As for Keynes, we have already seen that aggregate investment is more affected by the sudden revision of long-term expectations than by the slow and gradual changes of their short-term counterparts (which might indeed be modelled according to a "weak" REH, for it is sensible for producers to base their expectations on the "most recent realised results, except in so far as there are definite reasons for expecting a change") (1936, p.51). As for Hayek, his warning against confusing the information given to the "observing economist" with the information given to the "persons whose behavior we try to explain" (1937, p.6) reflects the more general distinction, discussed above, between "correct" and "incorrect" expectations (depending on whether they are or are not compatible in the current period) and, in case of "incorrect" expectations, the associated distinction between "endogenous" and "exogenous" disturbances or, as we saw above, between "justified" and "sheer" errors. The distinction between "correct" and "incorrect" expectations and the possibility of "justified" errors may be used in support of Phelp's critique of the REH in that people have not only to form expectations of other peoples' expectations but also to choose the "true" model among the plurality of models available for processing existing information (Frydman and Phelps, 1983, Aghion *et al.*, 2003, Phelps, 2003, 2007; Frydman and Goldberg, 2007).

A third reason for the changing shape of the hare-and-circle image may be the recent neglect for an aspect of modern economies which occupied centre stage in the years of high theory. This relates to the "Jevonian interval", i.e. the backward and forward links by which capitalistic economies can enjoy today the fruits of irreversible investments made in a distant or very distant while their entrepreneurs are carrying out new and equally irreversible investments the fruits of which will be enjoyed in a distant or very distant future. The widespread use of fixed-capital in historical time implies that the disappointment of expectations (especially of entrepreneurs) does

play a greater role in shaping the events –and should play a greater role in shaping the theory- of modern fluctuations than it used in the past. Yet, while the authors of the years of high theory highlighted, however differently, the devastating impact that the miscoordination of plans on saving and investment exert on the "Jevonian interval", the authors of the years of rational expectations have rather overlooked this impact and have focused instead on the oscillations of output and employment around their "natural" levels as if these levels were not subject in their turn to fluctuations and to both kinds of miscoordination.

A further reason for the changing emphasis of the literature may lie in the fact that, by collapsing the *future* into the *present*, the "strong" REH has pushed the theory in an essentially similar, though apparently opposite, direction relative to the one undertaken by the two hypotheses (the EEH and the AEH) which it was meant to replace and which rather consist in collapsing the *present* into the *past*. In any case, the weak dimension of the REH reminds us not only that that the whole information set given to agents today may be turned by the flow of historical time into a completely different set tomorrow; but also that this tomorrow may come much earlier than the "investment period" is completed or capital returns to its point of departure in the sphere of its circulation. The result of these "exogenous" disturbances is that rational expectations, including the expectations that rule in Hicks' "Futures Economy", are subject to "sheer" errors and therefore to disappointment as much as any other kind of expectation.

This brings us back to the beginning of the years of rational expectations and to the idea that this beginning is a lower step compared to the beginning of the years of high theory. The inferiority of this step is due to the habit of focusing on the mechanism of expectations formation as a topic more relevant than the consequences exerted by the disappointment of expectations, whatever the mechanism of their formation, on the capital structure of the economy and on the levels of employment and output associated with this structure.

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