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Keynes's investment theory as a micro-foundation for his grandchildren

Sergio Nisticò

Abstract

In contrast with the ‘missing micro-foundations’ argument against Keynes’s macroeconomics, the paper argues that it is the present state of microeconomics that needs more solid ‘Keynesian foundations’. It is in particular Keynes’s understanding of investors’ behaviour that can be fruitfully extended to consumption theory, in a context in which consumers are considered as entrepreneurs, buying goods and services to engage in time-consuming activities. The paper emphasizes that the outcome in terms of enjoyment is particularly uncertain for those innovative and path-breaking activities, which Keynes discussed in his 1930 prophetic essay about us, the grandchildren of his contemporaries. Moreover, the Keynes-inspired microeconomics suggested in the paper provides an explanation of why Keynes’s prophecy about his grandchildren possibly expanding leisure did not materialize yet. The paper finally points at the need for appropriate economic policies supporting consumers’ propensity to enforce innovative forms of time use.

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Keywords Keynesian microeconomics; consumption; time use; uncertainty; Keynes’s grandchildren

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Keynes's Investment Theory as a Micro-foundation for his Grandchildren

Except in a very few instances in modern societies (such as the customer who drinks in a lounge) no individual decides, say, how much bread to buy while eating bread (Georgescu-Roegen, 1983, p. lxxxi).

1. Introduction

The essence of Keynes's macroeconomic theory is the logical derivation of employment from the levels of the autonomous components of demand. With regard to these components, Keynes highlighted the importance of investment, the fluctuations of which depend on a crucial psychological variable, the state of confidence, embedded in the schedule of the marginal efficiency of capital. It is the uncertainty underlying the non-ergodic processes characterizing market economies that prevents investment from settling at its full employment level, thus implying the *End of Laissez Faire* and the need for active economic policies:

Many of the greatest economic evils of our time are the fruits of risk, uncertainty, and ignorance (Keynes, 1963 [1926], p. 317)

The monetarist and rational-expectations counterrevolutions of the 1970s centred their attack on the alleged absence, in Keynes's approach, of microfoundations firmly grounded on rational choice theory. The New Keynesian defensive strategy was to adopt those microfoundations while resorting to *ad hoc* rigidities and information asymmetries in order to avoid conceding to the counterrevolutionaries the laissez-faire policy implications.¹

In contrast with the essentially defensive New Keynesian strategy, a more active response to the 'micro-foundations argument' should focus on the present state of microeconomics, and in particular on the need for newer foundations than those laid down by its founding fathers, Jevons and

¹ For a critical survey of the New Keynesian approach, see Nisticò and D'Orlando (1998).

Walras at the end of the 19th century. In fact, the aim of this paper is to show that microeconomics can benefit from extending Keynes's explanation of investors' behaviour to consumer choice theory, in a scenario in which consumers are considered as entrepreneurs (Bianchi, 1998), buying goods and services in order to engage in time-consuming activities (Cairncross, 1958) the outcome of which in terms of enjoyment is more or less predictable at the moment of choice according as to whether they belong to a repetitive and routine plan or are innovative and path-breaking. The paper discusses the importance of endowing microeconomics with Keynesian foundations with reference to Keynes's prophetic essays about us, the grandchildren of his contemporaries (Keynes, 1963 [1930]) and proposes a Keynes-inspired approach to consumption choices that can explain why Keynes's prophecy about his grandchildren possibly reducing work and expanding leisure has not materialized (yet).

The paper is structured as follows. Section 2 recapitulates the economic implications of Keynes's prophecy and points out the analogy with J.S. Mill's ideal stationary state. Section 3 outlines the analytical and methodological framework, grounded on time as the main economic variable, suited to interpret the present behaviour of Keynes's grandchildren (KGC). The possible extension of Keynes's investment theory to microeconomics is presented in section 4. Section 5 concludes.

2. Keynes's and J.S. Mill's prophecies and their 'yet to come' persuasions

The marginalist approach to explaining consumer behaviour - as it was shaped at the end of the 19th century by the few intellectuals aiming to bring our discipline within the realm of hard sciences - borrowed from statics the idea of the opposite forces of supply and demand, and from infinitesimal calculus the idea that market mechanisms tend to equate the marginal cost of all goods and services with the individuals' willingness to pay as reflected by marginal utility or *rareté* of those goods and services. By adopting this stance, both Jevons and Walras were able to pursue the twofold aim of identifying an alternative to the classical economists' theory of value, essentially based on cost of production, and of mathematizing Political Economy. The representation of fully informed and

rational individuals choosing among the available and affordable bundles of goods and services the (only) one that maximizes their *utility*² came to be considered the only admissible metaphor of actual individual behaviour, in the absence of which no theory could pretend to be scientific. Although it is possible that the neoclassical story, in which fully informed individuals meet in a precise place (the market) in a precise moment of time with the aim to maximize their objective function, was somehow a metaphor of some real economic interaction and not a collection of “merely mathematical forms to be evaluated only by aesthetics.” (Rubinstein, 1998, p. 191), it is certainly not able to provide insights into how we, i.e. KGC, seek to meet the challenge that Keynes foresaw in 1930, namely “how to use [our] freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won for [us], to live wisely and agreeably and well” considering also that we “evolved by nature—with all our impulses and deepest instincts—for the purpose of solving the economic problem” (Keynes, 1963 [1930], pp. 366-367).³

Taking a cross-sectional view of KGC around the world, it will be seen that, unfortunately, an enormous number of individuals have not yet been relieved of their ‘traditional purpose’, while those who are potentially free from ‘pressing economic cares’ still prefer struggling with them. The persistence of the former explains why economic theory is, and must be, concerned with the crucial question of inequality and income distribution; on the other hand, the persistence of the latter calls for

² The challenge to the relevance of the notion of utility coming from the axiomatic approach (see e.g. Samuelson, 1938) did not alter the nature of that metaphor.

³ Of course, Keynes was well aware of the existence, already mentioned by Marshall (1920, p. 86-87), of insatiable wants: “Now it is true that the needs of human beings may seem to be insatiable. But they fall into two classes—those needs which are absolute in the sense that we feel them whatever the situation of our fellow human beings may be, and those which are relative in the sense that we feel them only if their satisfaction lifts us above, makes us feel superior to, our fellows. Needs of the second class, those which satisfy the desire for superiority, may indeed be insatiable; for the higher the general level, the higher still are they. But this is not so true of the absolute needs—*a point may soon be reached, much sooner perhaps than we are all of us aware of, when these needs are satisfied in the sense that we prefer to devote our further energies to non-economic purposes*” (Keynes, 1963 [1930], p. 365, emphasis added).

some novel economic interpretation grounded on appropriate behavioural assumptions according to which consumers face a choice problem wherein the what-to-do question is at least as pregnant as the what-to-buy (Steedman, 2001).

The crucial issue of his grandchildren possibly facing new choice problems while missing what we might call the productive capacity needed to enjoy ‘freedom from pressing economic cares’ did not escape Keynes’s attention. In his 1930 essay, Keynes warned that “we have been trained too long to strive and not to enjoy” (ibid, p. 368) and, consistently with his focus on ‘the ability to enjoy the abundance’, he pointed out that, like firms’ capital, the enjoyment-productive capacity should be considered a stock of accumulated flows of investments that we need to engage on by “making mild preparations for our destiny, in encouraging, and experimenting in, the arts of life as well as the activities of purpose” (ibid., p. 373).

It is worth recalling that Keynes’s vision of his grandchildren needing to acquire ‘the arts of life’ not only reflects a major concern of the Cambridge economists at that time, as emerges clearly in Hawtrey’s *The Economic Problem* (Hawtrey, 1926), whose content might have influenced Keynes when he was writing his 1930 essay,⁴ but it also echoes John Stuart Mill’s prophecy of the stationary state as described in Chapter VI of Book IV of his *Principles of Political Economy*:

I confess I am not charmed with the ideal of life held out by those who think that the normal state of human beings is that of struggling to get on; that the trampling, crushing, elbowing, and treading on each other's heels, which form the existing type of social life, are the most desirable lot of human land, or anything but the disagreeable symptoms of one of the phases of industrial progress. ... (Mill, 1909 [1848], pp. 748).

Moreover, as Keynes was later to do, Mill foresaw the potential benefits of a society where individuals spent most of their time enhancing their enjoyment-production capacity, where there

⁴ For a lively reconstruction of how the Cambridge of the late 1920s constituted fertile ground for the ideas to be found in Keynes’s writings, see Bariletti and Sanfilippo (2017).

would be “as much room for improving the Art of Living, and much more likelihood of its being improved, when minds ceased to be engrossed by the art of getting on (ibid., p. 751). On the other hand, also Mill addresses the delicate issue of the difficulty to acquire the ‘entrepreneurial’ attitude necessary to enjoy his ideal stationary state by pointing out “the natural indolence of Mankind; their tendency to be passive, to be the slaves of habit, to persist indefinitely in a course once chosen (ibid., p. 793).

The next section aims to show that a consumption theory consistent with J.S. Mill’s and Keynes’s vision of individuals struggling with reshaping their own preferences about alternative consumption experiences is in sight, the seeds of this consumption theory having been disclosed by Georgescu Roegen (1983) with his re-reading of Herman Heinrich Gossen’s *The Laws of Human Relations and the Rules of Human Action Derived Therefrom*.

3. A time-based choice theory

It is somewhat paradoxical that a microeconomic theory consistent with the role that Mill and Keynes envisaged for consumers’ investments was being elaborated precisely in Mill’s time by the German economist Hermann Heinrich Gossen, whom Georgescu-Roegen – with his brilliant *Introduction* (Georgescu-Roegen 1983) to the English translation of Gossen’s book – rescued from a minor role as a forerunner of the marginalist theory of value.

Gossen casts his theory of human behaviour within a temporal framework, more congenial to Mill’s and Keynes’s conception of consumers as entrepreneurs, rather than within the atemporal, utility-maximisation approach of Jevons or Warlas. According to Gossen, individuals choose among consumption experiences pursuing the goal of making the flow of their lifetime as pleasant as possible, considering the fact that what they find pleasant or unpleasant in the present depends also on what they did, or did not do, in the past; on the other hand, other types of activities, possibly unpleasant, might be undertaken in the present with the sole purpose of having a positive influence on one’s ability to enjoy pleasant time in the future. Gossen’s attention towards a clear ‘evolutionary’

and path-dependent conception of preferences over alternative consumption activities emerges from the very first pages of his book:

Now, on the one hand, the life of a human being covers a considerable time span, and there are large number of pleasures in life that man can obtain immediately; yet those pleasures have the consequence of imposing later, disproportionate deprivations. On the other hand, the most elevated, the purest pleasures become comprehensible, become real pleasures, only after man has educated himself for their appreciation (Gossen, 1983 [1854], p. 3, emphasis added).

Having specified the maximand - total pleasant lifetime - and the context - calendar time - of individual choices, Gossen goes on with identifying the fundamental behavioural assumptions upon which to build his theory. These are summed up in his two laws of pleasure:

The magnitude [intensity] of pleasure decreases continuously if we continue to satisfy one and the same enjoyment without interruption until satiety is ultimately reached.

A similar decrease of the magnitude [intensity] takes place if we repeat a previously experienced pleasure. Not only does the initial magnitude [intensity] of the pleasure become smaller, but also the duration of the pleasure shortens, so that satiety is reached sooner. Moreover, the sooner the repetition, the smaller the initial magnitude [intensity] and the shorter the duration (ibid. p. 6).⁵

Gossen's laws, in that they emphasise the negative effects of reiterating the same enjoyment through time, clearly clash with the now established static version of marginal utility as a decreasing function of the stock of the quantity available in a given moment of time, or of hypothetical, alternative quantities consumed in a timeless context. More than that, Gossen's approach to consumption theory is much in line with Mill's and Keynes's prophecies, as it clearly emerges from the following passage setting out his conception of our discipline:

⁵ For discussion and a graphical representation of Gossen's laws, see Nisticò (2005).

[Political Economy] sets for itself the task of developing the rules governing the provisioning of the human race with the so—called material goods and how the most advantageous results of this process can be achieved. It thus limits the applicability of its rules to the so—called material goods. There is absolutely no good reason for this limitation since man engaged in enjoyment is completely indifferent whether the pleasure is created through material or nonmaterial goods. This limitation was imposed solely by the circumstance that it seemed impossible to formulate rules applicable above and beyond the material goods. The present conventional name of this science is no longer appropriate if we set aside this limitation and extend the purpose of this science to its real dimension —to help man obtain the greatest sum of pleasure during his life. With this idea in mind, in the sequel I shall speak instead of the science of pleasure” (ibid, pp. 38-9).

Grounding consumption theory on Gossen’s approach allows going beyond the criticism addressed to the marginalist conception of demand by those schools of thought – e.g. the institutionalists, the post-Classicals and post-Keynesians – that, rejecting methodological individualism, emphasize the social dimension of consumption.⁶ In fact, even the economic decisions of the isolated man *par excellence*, Robinson Crusoe before his meeting with Friday, cannot be understood, theoretically, without a clue as to what motivates his daily activities on the island (Nisticò, 2017). This is why, if we seek to explain the economic decisions of KGC, we need a theoretical framework encompassing time spent in exploring new enjoyment opportunities in a context similar to Becker’s (1965) where time and market goods are the input of the individual activities. On the other hand, in order to address Mill’s and Keynes’s concerns, one needs to reverse Becker’s 1965 seminal idea to convert consumption time into foregone earnings and take the opposite viewpoint of converting earnings into foregone pleasant time. Such a conversion can be easily done by means of

⁶ For an interesting review of an early debate on social interdependencies in consumption in the pre-axiomatic, Marshallian era of neoclassicism, see Bianchi and Sanfilippo (2015).

the subjective labour theory of value, as implied by Smith’s notion of ‘labour commanded’ (Smith, 1976 [1776], 34). Starting from the Bentham-like assumption that individuals are ‘rich or poor’ according as to whether or not their wealth suffices for them to avoid the unpleasant time necessary to “enjoy the necessaries, conveniences, and amusements of human life” (*ibid.* p.34), Smith asserted that “what every thing is really worth to the man who has acquired it ... is the toil and trouble which it can save to himself, and which it can impose to other people” (*ibid.*).

It is precisely by resorting to Smith’s measure of value in terms labour commanded that one can revert Becker’s idea to compute the monetary cost of consumption time in terms of foregone earnings into the opposite one, i.e. to compute the cost of consumption goods in terms of the foregone unpleasant time needed to earn the income necessary to pay for them, thus allowing for an economic accounting of individual activities in terms of time units. The fruitfulness of this approach lies in the possibility to identify the efficiency of each form of time use (activity) in terms of a ‘rate of return’ (Nisticò 2014; 2015) computed as the following ratio of the pleasant time per unit of unpleasant time necessary to perform the pleasure-generating activity:

$$r_j = \frac{p_j \cdot T_j}{\sum_{i=1}^n g_{ij} \cdot \frac{m_i}{w} \cdot e_L + e_j \cdot T_j}, \text{ with } \frac{\partial p_j}{\partial g_{ij}} > 0$$

(1)

where:

- e_j and p_j denote, respectively, the unpleasant and pleasant shares of the total time T_j devoted to activity j (e.g. to washing dishes and to enjoying dinner at home) and e_L represents the unpleasant share of working time;
- the g_{ij} s ($i = 1, 2, \dots, n$) denote the services of the n market goods used up during activity j , m_i their market price, w the individual’s wage/income per unit of time.

Note that, since the ratio m_i/w represents the labour commanded, i.e. the amount of working time, supposedly unpleasant only for the fraction e_L , necessary to pay for one unit of g_i , the whole

denominator of (1) is the flow of unpleasant time directly and indirectly necessary to perform activity j .

One of the main problems to be addressed in a time-based approach to consumer behaviour is the accurate periodization of the analysis needed to consider the role of what comes ‘before’ and ‘after’ consumption decision, given that *no individual decides, say, how much bread to buy while eating bread*, as Georgescu-Roegen put it (see opening quotation of the paper). Some of KGC’s activities are certainly recurrent; others, however, are dedicated precisely to interrupting the repetitive rhythm of their daily life. Also, KGC could take the troublesome decision to truncate a recurrent activity started in the past. Consumers fail, much in the way entrepreneurs do. On the other hand, projects for new activities and new buying options of durable goods may take shape, to be treated, analytically, as investment taken under uncertainty. Therefore, a theorist accustomed to seeking optimum solutions might be disappointed on observing that KGC’s time allocation does not fulfil the optimality condition characterized by the equality of the marginal rates of return ($\partial r_j / \partial T_j ; j = 1, 2, \dots, Z$) on the Z activities performed within a given time period (Nisticò, 2014 and 2015). This is why Keynes’s investment theory, coupled with Hicks’ (1946) temporary equilibrium approach, can be appropriately extended to household decision-makers to cope with the ordinary viewpoint that KGC’s daily life flows through a time-frame conventionally divided into ‘units’ (say minutes) and ‘periods’ (say weeks), over which they distribute their activities.

In fact, KGC allocate time units to the various activities well aware that their outcome in terms of pleasant time, but also some costs in terms of unpleasant time, do not necessarily emerge within the current week. Upon comparison of expected and actual satisfaction outcomes during the week, they formulate a new Gossen-type plan covering the weeks to follow. Hence, in a Hick’s-Keynes sequence of temporary equilibria extended to consumption choices, each new weekly plan is based on the information provided by past experiences, but also on the expectations of future enjoyment opportunities, in a dynamic sequence that has no potential to converge towards an optimal intertemporal equilibrium path:

Even when we have mastered the “working” of the temporary equilibrium system, we are even yet not in a position to ... examine the ulterior consequences of changes in the data. These are the ultimate things we want to know about, though we may have to face the disappointing conclusion that there is not much which can be said about them in general. Still, nothing can be done about these further problems until after we have investigated the working of the economy during a particular week (Hicks 1946: 246).

Within the suggested Hicks-Keynes metaphor of KGC’s behaviour, there is also room for Marshall. Some of KGC’s decisions are dictated by their ‘short-run’ expectations, i.e. they are taken assuming as given the capacity to produce enjoyment, as well as the existing social and institutional constraints, e.g. the impossibility to change their job, or place of residence, within a week’s time. On the other hand, KGC take other types of decisions that are prompted by their ‘long run’ expectations, with the precise aim of adjusting their enjoyment-production capacity and/or removing the obstacles preventing them from making major changes in their future weekly plans.

To what extent is there room for maximizing within a time-based decision-making process where what to buy depends on what to do? To what extent can KGC choose all the details of their weekly plan rather than being locked in most of it, through a combination of their past choices and social constraints? Providing answers to the above questions requires investment theory, and in particular Keynes’s approach to it, to be embedded in a microeconomic analysis of KGC’s choices. Note also that Samuelson’s revealed preferences approach to proving the existence of a well-behaved demand function (Samuelson, 1938) for KGC is of little help since, after repeating the same set of activities for a few weeks, their demand pattern changes significantly, in line with Gossen’s path-dependent perception of ‘pleasures and pains’ regardless of any variation in the exchange value of their endowments and of the relative prices of goods and services.

4. Do KGC invest enough in enjoyment-production capacity?

According to Gossen's second law, reiterating through time the same plan of activities implies a fall in the overall rate of return, computed by aggregating equation (1) over all Z activities. Income and consumption growth can offset the fall; however, they act merely as a sort of counteracting force, which is a convincing explanation of Easterlin (1974) paradox. Why, then, there is so little change in the structure of KGC's weekly plan? The answer can be provided by a time-based consumption theory that removes the given-preferences assumption and explain why KGC keep devoting a significant share of their weekly time to work – i.e. to earning the income necessary to increase the 'goods-intensity' of their activities plan – rather than to exploring the opportunities offered by new activities, possibly more rewarding in terms of enjoyment. The argument runs as follows:

- given the sign of the first derivative in expression (1), spending more on market goods, e.g. by using higher quality inputs, is an effective strategy to counteract Gossen's second law for each activity j ;
- there is a strong incentive for KGC to spend the amount of time that technical progress frees from merely instrumental activities (such as housekeeping) on purely time-killing activities that they "can take up at a moment's notice, linger over at will, or drift into unwittingly" (Scitovsky, 1992 [1976], p. 164);
- KGC could consider the, certain although transient, positive effect on (1) generated by spending the extra income made available by economic growth on market goods superior to that expected from engaging in a risky re-structuring of the activities plan.

More specifically, the one-week rate of return (r^*) that KGC expect to earn when devoting the possibly available extra income to increase expenditure on market goods, while sticking to the old plan made of the Z activities chosen in the past week, is given by the following equation:

$$r^* = \frac{\sum_{j=1}^Z T_j \cdot \Delta p_j (g_{1,j}, g_{2,j}, \dots, g_{n,j}, w_1 - w_0)}{\sum_{j=1}^Z \sum_{i=1}^n g_{ij} \cdot m_i \cdot \left(\frac{1}{w_1} - \frac{1}{w_0} \right) \cdot e_L}$$

(2)

where:

- the expression at the numerator measures the extra pleasant time that KGC expect to enjoy when spending the proceeds from the increase of their income rate ($w_1 - w_0$) in new and/or more market goods ($g_{1,j}, g_{2,j}, \dots, g_{n,j}; j = 1, 2, \dots, Z$);
- the expression $(1/w_1 - 1/w_0)$ at the denominator measures the time saved to earn one unit of money when income per unit of time increases from w_0 to w_1 ;
- the whole denominator measures the overall unpleasant labour time that KGC could have saved, had they decided to keep expenditure on market goods unaltered.

According to Gossen's second law, we assume that the numerator of (2) will be zero as of the beginning of the next week.

The alternative course of action for KGC is to take the opportunity offered by technical progress to undertake a longer-term investment of some of their monetary and time resources. These could be devoted to set about more or less radical and recurrent revision of their weekly plan, which could lastingly deprive Gossen's second law of its strength.⁷ Suppose, for instance, that one of the KGC, say Jane, is considering the opportunity to modify the allocation of her weekly time by devoting less time to her (now better rewarded) job as freelance accountant to make room for the time needed to start practicing a new sport, say tennis, in the forthcoming week, her ultimate aim being to experience the pleasure of practicing tennis as a skilled player for some amount of time in the week to follow. Let us assume, for simplicity, that Jane's horizon includes two weeks only and that she got from one of her friends some information, to be weighted or 'discounted', about how pleasant is playing tennis as skilled and as unskilled player. On the other hand, the accurate information about all monetary costs of the planned experience is at Jane's disposal.

⁷ Gossen himself was perfectly aware of the existence of this strategy to counteract his law: "Exercise of the eye, ear taste and mind increases, in general, the enjoyment of the objects serving these senses" (Gossen, 1983 [1854], p.8).

The ‘marginal efficiency’ of Jane investing the required units of time in the tennis course with the aim to devote T_{T2} units of time as a skilled player in the week to follow is given by the value of r_{Te} that solves the following expression:

$$\begin{aligned}
& \frac{p_{T,1} \cdot \varphi_{T1,1} \cdot T_{T1} + \left(e_{T,1} \cdot \rho_{T1,1} \cdot T_{T1} + \sum_{i=1}^n g_{iT,1} \cdot \frac{m_i}{W} \cdot e_{L,1} \right)}{1 + r_{Te}} \\
& - \left(e_{T,1} \cdot \rho_{T1,1} \cdot T_{T1} + \sum_{i=1}^n g_{iT,1} \cdot \frac{m_i}{W} \cdot e_{L,1} \right) \\
& + \frac{p_{T,2} \cdot \varphi_{T2,1} \cdot T_{T2} + \left(e_{T,2} \cdot \rho_{T2,1} \cdot T_{T2} + \sum_{i=1}^n g_{iT,2} \cdot \frac{m_i}{W} \cdot e_{L,2} \right)}{(1 + r_{Te})^2} \\
& - \frac{\left(e_{T,2} \cdot \rho_{T2,1} \cdot T_{T2} + \sum_{i=1}^n g_{iT,2} \cdot \frac{m_i}{W} \cdot e_{L,2} \right)}{(1 + r_{Te})} = 0
\end{aligned} \tag{3}$$

where:

- $p_{T,\omega}$ and $e_{T,\omega}$ ($\omega = 1,2$) denote the expected shares of pleasant and unpleasant time, respectively, to be experienced when playing tennis as unskilled in week 1 and as skilled in week 2;
- $\varphi_{T\omega,1} > 0$ and $\rho_{T\omega,1} > 0$ denote the factors by which Jane discounts, at the beginning of week 1, indirect information about the shares of pleasant and unpleasant time devoted to playing tennis in the two weeks;
- the parenthetical expressions preceded by the minus sign represent the time investment, i.e. the overall unpleasant time, including both the moments of frustration as well as the labour time needed to pay for the market goods and services necessary to perform the tennis activity (e.g. renting the court, the racket and the balls), at the beginning of week 1 and of week 2.

Note that the four discount factors, expressing the importance of uncertainty and expectations, not only differ across individuals in the same period of time (e.g. because of individual differences in loss aversion by which unpleasant time might be given a higher weight than pleasant time) but they also change through time for the same individual. This is clearly so both if the investment is not

undertaken (new information might become available) and if it is undertaken, since practicing tennis in week 1 will increase the evidence available at the beginning of week 2 (the actual shares of pleasantness and frustration experienced in week 1) relative to that available at the beginning of week 1 when formulating expectations for week 2. This is why the investment might well be undertaken and then truncated, or extended, at some point.

If they were to behave as skilled entrepreneurs, KGC should engage in a long-term investment activity if its rate of return resulting from (3) exceeds the rate of return resulting from (2), i.e. that expected from the ‘conservative’, goods-intensive strategy, which can be reiterated at the beginning of each week. This latter rate here plays the role that the monetary rate of interest plays in the well-known mechanism that Keynes describes in chapter 11 of the *General Theory* (Keynes, 1936, p. 136).⁸

The two strategies epitomized by expressions (2) and (3) have their own rationale. They represent the two fundamental motivations of *tranquillity* and *excitement*, as Mill (1871, p. 19) put it or of *comfort* and *pleasure* according to Scitovsky’s (1992 [1976], ch.4) jargon. Their coexistence constitutes a vivid metaphor of KGC struggling with time use and, at least presently, showing a weak propensity to invest in enjoyment productive capacity as a means to fill the gap between the actual and the ‘potential’ enjoyment made available by technical progress. In this respect, a fundamental feature of Keynes’s approach to investment theory – as clarified in Chapter 12 of the *General Theory* – will have to be considered, the question being whether KGC’s scanty investment decisions could depend on the low reliability of the information embedded in the weights appearing in expression (3):

⁸ Note that expressing all the relevant variables in time units solves the ‘measurement’ problem that Keynes highlighted also with the aim of marking the difference between his notion of marginal efficiency of capital and the marginal productivity of capital: “There is, to begin with, the ambiguity whether we are concerned with the increment of physical product per unit of time due to the employment of one more physical unit of capital, or with the increment of value due to the employment of one more value unit of capital. The former involves difficulties as to the definition of the physical unit of capital, which I believe to be both insoluble and unnecessary” (Keynes, 1936, p. 138).

It would be foolish, in forming our expectations, to attach great weight to matters which are very uncertain. It is reasonable, therefore, to be guided to a considerable degree by the facts about which we feel somewhat confident The state of long-term expectation, upon which our decisions are based, does not solely depend, therefore, on the most probable forecast we can make. It also depends on the confidence with which we make this forecast—on how highly we rate the likelihood of our best forecast turning out quite wrong. ... The outstanding fact is the extreme precariousness of the basis of knowledge on which our estimates of prospective yield have to be made (Keynes, 1936, pp. 148-49).

It is, therefore, the much stronger weight that KGC tend to place on the enjoyment opportunities offered by ‘experienced’ behaviour as well as by short-term investments, whose rate of return is certain enough — e.g. travelling to a (usual or new) place in the countryside during weekends or going out for dinner with friends in a (usual or new) restaurant — that can explain why KGC’s long-term investment may fall short of the level needed to enjoy the opportunities envisaged by Mill and Keynes, also considering that “life is not long enough; — human nature desires quick results ... remoter gains are discounted by the average man at a very high rate” and “[w]orldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally (Keynes, 1936, pp. 157-158).

5. Concluding remarks

It is time for demand theory to go back on Gossen’s track breaking free from the cage where it was set by the founders of the demand-and-supply explanation of relative prices. The developments of industrial economics show how poorly the pricing strategies of millions of firms around the world can be captured by the idea that a unique set of exchange ratios can be determined by solving a system of simultaneous equations expressing the balance of the opposite forces of the willingness to pay and to sell confronting each other in a precise marketplace and in a precise moment of time (even for all transactions to be concluded in all future periods and under all possible contingencies).

Conversely, our choice to adopt Hicks's sequence of 'non-converging' temporary equilibria is consistent with the aim of economic theory to be relevant and compliant with the 'openness' of KGC's course of actions taking place in calendar time:

The schedule of the marginal efficiency of capital is of fundamental importance because it is mainly through this factor (much more than through the rate of interest) that the expectation of the future influences the present. The mistake of regarding the marginal efficiency of capital primarily in terms of the current yield of capital equipment, which would be correct only in the static state where there is no changing future to influence the present, has had the result of breaking the theoretical link between to-day and to-morrow. ... The fact that the assumptions of the static state often underlie present-day economic theory, imports into it a large element of unreality (Keynes, 1936, p. 145).

The given-preferences assumption underlying traditional microeconomics is clearly inappropriate in this respect. In a path-dependent pursuit of a satisficing plan, what KGC liked doing and buying in the previous weeks is not necessarily what they will like to do and buy in the forthcoming weeks. Similarly, what they started to do and to buy in the present week will not necessarily be repeated the next week. The change is also induced by the logical impossibility of a stationary state of enjoyment implied by Gossen's second law of pleasure. The flow of calendar time lowers the overall rates of return; repetitive life can be pleasantly restful, to a certain extent, but it tends to generate boredom, which KGC may fight against by introducing 'changes', small though they might be, in their weekly plan.

In fact, the 'novelties' that KGC need in order to counteract the effect of Gossen's second law can be 'embodied' in the market goods, i.e. the inputs of their activities, thus generating a sort of 'process innovation' for a given set of repetitive weekly activities. By driving to work and back home with a new fancy car while wearing new clothes, exploring the features of a new smartphone while commuting by train, KGC can introduce some novelties that do not require complex revision of their

weekly plan, the outcome of which would be highly uncertain. As if a company producing typewriters in the early 80's introduced new, computer-based technologies on the input side while trying to earn profits by sticking to the production of old-fashion typewriters; and the main problem of KGC lies in the circumstance that, contrary to companies, their performance as choosers can hardly be measured and questioned.

Investment and innovation are at least as necessary for KGC as they are for a firm in a competitive and evolving business environment, or for Schumpeter-like entrepreneurs looking for new profit opportunities when the effect of competition has eroded the old ones. Given the importance of the discount factors in equation (3), KGC's possible revision of the weekly plan to create new enjoyment opportunities may be driven more by an urge to change than by a rational calculation. However, such an urge to change their weekly plan is not necessarily strong enough, as Mill thought, to exploit the potential benefits deriving from being free from 'pressing economic cares'; it tends to be weakened precisely by the availability of new market goods offered by the same technical progress that could pave the way to new enjoyment opportunities. The temporary-period framework *à la* Hicks can account for experiments on new enjoyment activities that, as we all know, can also be extended or truncated. Faced with the alternative between a goods-intensive (process-innovation) and a time-intensive (product-innovation) strategy, KGC can have no certainty as to whether the latter will prove successful. Only their *animal spirits* induce them, occasionally, to revise their weekly plan and to take the risk of failing rather than relying on the moderate, transient, but sure gain implicit in the goods-intensive strategy.

Let me conclude with the possible role of a non-paternalistic economic policy and of some sort of welfare institutions for KGC, the question being whether and how policy could foster their propensity to invest in new sets of activities as, for instance, the institution of bankruptcy did to foster

economic growth in the early nineteenth century.⁹ Apart from more or less arbitrary taxation on some types of market goods, there may perhaps exist nothing like a monetary policy able to reduce the rate of return on the default option and hence to induce KGC to embark on more investment projects to expand their enjoyment capacity. However, a new welfare state, including the extension of public, learning programs designed to foster creativity and exploratory behaviour of all age groups should be on the agenda of economists and policy makers. As a result, KGC's inclination to open out their choice set so as to include the possibility to introduce more novelty in 'what they do' besides that embedded in 'what they buy' would be strengthened. Production of the new goods and services required by KGC's new activity plans will follow suit; but this is the ground for new, challenging research.

⁹ For the importance of 'bankruptcy as an institution' increasing entrepreneurs' propensity to risk, see Sylos Labini (2002, p. 359).

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