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

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

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## **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.

JEL code: B41; D11; D81

Key words: 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).*

*There is no clear evidence from experience that the investment policy which is socially advantageous coincides with that which is most profitable (Keynes, 1936, p. 157).*

*The only good investment is in something that doesn't exist (9<sup>th</sup> Berlin Biennale for contemporary art)*

## 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 in fact 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 the axioms of 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.<sup>1</sup>

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 Walras at the end of the 19<sup>th</sup> 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, too, in a scenario in which consumers are considered as entrepreneurs (Bianchi, 1998), buying goods and services in order to engage in time-consuming activities

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

(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 importance of endowing microeconomics with Keynesian foundations will be discussed with reference to Keynes's prophetic essays about us, the grandchildren of his contemporaries (Keynes, 1963 [1930]). In fact, the Keynes-inspired consumption approach proposed in this paper 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 prophecy of an ideal stationary state. Section 3 outlines the analytical and methodological framework, firmly grounded on time as the main economic variable, with which I propose to interpret the present behaviour of Keynes's grandchildren (KGC). The essence of Keynes's investment theory is summarized in section 4, which also shows its possible extension to microeconomics. Section 5 concludes.

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

The marginalist approach to 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 assumption that fully informed and rational individuals choose among the available and affordable bundles of goods and services the (only) one that maximizes their *utility* came to be considered the only admissible metaphor of actual individual behaviour, in the absence of which no theory could pretend to be scientific. Since then, mathematizing economics has become the main item on our profession's agenda, especially when the axiomatic approach challenged the relevance of the notion of utility.<sup>2</sup>

However, insofar as economic models are designed to be relevant, they should reflect the realities. They should portray the essence of actual individual behaviour as well as the core mechanisms governing the complexity of economic systems, with the ultimate aim of identifying the remedies and policies to increase individuals' wellbeing. On the other hand, economic systems

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<sup>2</sup> See e.g. (Samuelson, 1938).

and customs both differ from each other in the same period of time and evolve through time; with the consequence that the metaphors should not be considered universal and may also be superseded. Therefore, it is possible that the assumption of full individual rationality and perfect information underlying the neoclassical metaphor of consumers' behaviour based on constrained utility maximization reflects a world that possibly existed, or still exists somewhere, 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. Here, thanks to some sort of tâtonnement, with or without an auctioneer, equilibrium prices emerge as the result of the opposite forces of demand and supply and consumers' satisfaction of recurrent needs and wants, e.g. for food and shelter, will be achieved at the minimum cost. On the other hand, although it is possible that the neoclassical story 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 understand and explore our own preference orderings amongst the many leisure activities to spend economic resources on:

... we have been expressly evolved by nature—with all our impulses and deepest instincts—for the purpose of solving the economic problem. If the economic problem is solved, mankind will be deprived of its traditional purpose ... Thus for the first time since his creation man will be faced with his real, his permanent problem—how to use his freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won for him, to live wisely and agreeably and well (Keynes, 1963 [1930], pp. 366-367).

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. While the persistence of the former explains why economic theory is, and must be, concerned with the crucial question of inequality and income distribution, it is the persistence of the latter that calls for some novel economic interpretation.

Of course, Keynes was well aware of the existence, already mentioned by Marshall (1920, p. 86-87), of insatiable wants.<sup>3</sup> However, in his 1930 essay, Keynes raised the crucial question of his

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<sup>3</sup> "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).

grandchildren possibly facing new choice problems while missing what we might call the productive capacity needed to enjoy “freedom from pressing economic cares”:

But it will be those peoples, who can keep alive, and cultivate into a fuller perfection, the art of life itself and do not sell themselves for the means of life, who will be able to enjoy the abundance when it comes. Yet there is no country and no people, I think, who can look forward to the age of leisure and of abundance without a dread. For we have been trained too long to strive and not to enjoy. It is a fearful problem for the ordinary person, with no special talents, to occupy himself, especially if he no longer has roots in the soil or in custom or in the beloved conventions of a traditional society (Keynes, 1963 [1930], p. 368).

Consistently with his focus on ‘the ability to enjoy the abundance’, Keynes pointed out that, like firms’ capital, the enjoyment-productive capacity should be considered a stock of accumulated flows of investments that his grandchildren need to engage in if they wish to benefit from the opportunities offered by the abundance of means of enjoyment:

Meanwhile there will be no harm in making mild preparations for our destiny, in encouraging, and experimenting in, the arts of life as well as the activities of purpose. But, chiefly, do not let us overestimate the importance of the economic problem, or sacrifice to its supposed necessities other matters of greater and more permanent significance (Keynes, 1963 [1930], p. 373).

It is worth recalling that Keynes’s vision of his grandchildren reflects a major concern of the Cambridge economists at that time, as emerges clearly in Hawtrey’s *The Economic Problem* (Hawtrey, 1926), which might have influenced Keynes when he was writing his 1930 essay.<sup>4</sup> Moreover, the emphasis on the need to acquire ‘the arts of life’ 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. ... In the mean time, those who do not accept the present very early stage of human improvement as its ultimate type, may be excused for being comparatively indifferent to the kind of economical progress which excites the congratulations of ordinary politicians; the mere increase of production and accumulation (Mill, 1909 [1848], pp. 748-749).

And, 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:

It is scarcely necessary to remark that a stationary condition of capital and population implies no stationary state of human improvement. There would be as

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<sup>4</sup> 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).

much scope as ever for all kinds of mental culture, and moral and social progress; 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. Even the industrial arts might be as earnestly and as successfully cultivated, with this sole difference, that instead of serving no purpose but the increase of wealth, industrial improvements would produce their legitimate effect, that of abridging labour (Mill, 1909 [1848], p. 751).

Moreover, also Mill addresses the delicate issue of the difficulty to acquire the ‘entrepreneurial’ attitude necessary to enjoy his ideal stationary state:

It is the common error of Socialists to overlook the natural indolence of Mankind; their tendency to be passive, to be the slaves of habit, to persist indefinitely in a course once chosen. Let them once attain any state of existence which they consider tolerable, and the danger to be apprehended is that they will thenceforth stagnate; will not exert themselves to improve, and by letting their faculties rust, will lose even the energy required to preserve them from deterioration (Mill, 1909 [1848], p. 793).

The next section is devoted to showing that a consumption theory consistent with J.S. Mill’s and Keynes’s concern with individuals struggling with their own preferences about alternative consumption experiences is in sight, the seeds of this alternative consumption theory having been disclosed by Georgescu Roegen (1983) with his re-reading of Herman Heinrich Gossen.

### **A time-based choice theory**

In fact, 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* to the English translation of his book – rescued from a minor role as a forerunner of the marginalist theory of value. In fact, 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 Walras.

According to Gossen, the goal of consumption experiences, which are the object of individual choices, is to make the flow of our lifetime as pleasant as possible, taking into account the fact that our preference ordering over alternative activities inevitably changes through time. What we find pleasant today depends also on what we did, or did not do, yesterday; on the other hand, other types of activities, possibly unpleasant, might be undertaken today with the sole purpose of having a positive influence on our ability to enjoy pleasant time tomorrow. 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. ... In other words: Enjoyment must be so arranged that the total life pleasure should become a maximum” (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 to identify 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).<sup>5</sup>

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. Gossen’s emphasis on time flows is to be seen, first of all, in his choice to start his explanation of the laws with reference to intellectual enjoyments:

Who does not remember the pleasure he has derived from the discovery, real or fancied, of a new truth! Subsequently, some pleasure is derived from dwelling on the subject for a while; but this diminishes more and more until in the end any further contemplation of the topic results in boredom (ibid, p. 7).

That Gossen was elaborating a general theory suitable to describe KGC’s behaviour emerges clearly from the following passage setting out his conception of our discipline, much in line with Mill’s and Keynes’s prophecies:

[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

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<sup>5</sup> For discussion and a graphical representation of Gossen’s laws, see Nisticò (2005).

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).

The main problem facing KGC is to answer the question ‘what shall I do’ rather than ‘what shall I buy’ (Steedman, 2001). The circumstance that what we do and what we buy are strictly related to each other has been emphasized 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.<sup>6</sup> 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 behaviour on the island (Nisticò, 2017). KGC devote their time to exploring new enjoyment opportunities and, contrary to Becker’s (1965) approach, the opportunity cost of their time is not equivalent to the (foregone) earnings they could have by selling their labour services for that span of time but simply the pleasant time they could enjoy during the best activity available, be it reading a novel or visiting a museum, playing tennis with a friend or watching television. Similarly, whatever the activity they devote to ‘earning money’, if unpleasant, KGC will think of it in terms of the pleasant time foregone. 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 months, their demand pattern changes significantly, in line with Gossen’s path-dependent perception of ‘pleasures and pains’; and such a change in demand takes place regardless of any variation in the exchange value of their endowments and of the relative prices of goods and services. Moreover, KGC have the opportunity to devote a considerable amount of time to expanding their enjoyment productive capacity.

If we look for a convincing economic theory to describe and interpret KGC’s behaviour, we will have to think in terms of time as their ultimate economic resource. As I have sought to show elsewhere (Nisticò, 2015), we can do so by means of the subjective theory of value, as outlined by Smith. In fact, by going back to Smith’s notion of ‘labour commanded’ (Smith, 1976 [1776], 34) economic accounting of individual activities can be performed in terms of time units. Smith distinguished between the real and the nominal price of commodities 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). It is in this context that a subjective theory of value based on ‘labour’ survives in *The Wealth of Nations* together with the cost-of-production theory of relative prices:

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<sup>6</sup> 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).

“What every thing is really worth to the man who has acquired it, and who wants to dispose of it or exchange it for something else, is the toil and trouble which it can save to himself, and which it can impose to other people. What is bought with money or with goods is purchased by labour, as much as what we acquire by the toil of our own body” (ibid.).

In line with Smith’s measure of value in terms labour commanded, Becker’s idea to compute the cost of consumption time in terms of foregone earnings can be fruitfully ‘reversed’ by computing the cost of consumption goods in terms of the foregone unpleasant time needed to earn the income necessary to pay for them. 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 a ratio of the pleasant over the unpleasant time units spent on it, according to the following equation:

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

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. washing dishes and enjoying dinner at home) and  $e_L$  represents the unpleasant share of working time;
- the  $g_{ij}$ s denote the services of all  $n$  market goods used up during activity  $j$ ,  $m_i$  their market price,  $w$  the individual’s wage (income) rate.

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 buy one unit of  $g_i$ , the whole denominator of (1) is the flow of unpleasant time necessary to perform activity  $j$ .

One of the main problems to be addressed in a time-based approach to consumer behaviour is the role of what comes ‘before’ and ‘after’ consumption decision. Therefore, accurate periodization is needed in the analysis. Although some of KGC’s activities are certainly recurrent, a significant part of their activities 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 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 ( $\partial r_j / \partial T_j$ ) on all activities performed within a given time period (Nisticò, 2014). 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 enjoyment does not necessarily emerge within the current week. Upon comparison of expected and actual satisfaction outcomes, they might formulate a Gossen-type plan also 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 is hardly likely to converge towards any 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. In fact, 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 'forced' to accept most of it, through a combination of their past choices and social constraints? There are no easy answers to the above questions. In any case, investment theory, and in particular Keynes's approach to it, is a necessary ingredient in microeconomics to be able to understand KGC's choices.

### **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. Income and consumption growth can offset the fall acting as a

sort of counteracting force, which is a convincing explanation of Easterlin paradox. In fact, in a time-based consumption theory that removes the given-preferences assumption various reasons 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 (Nisticò, 2015). These can be summarised as follows:

- given the sign of the first derivative in expression (1), when KGC perform the same activity by using higher quality inputs, spending more on market goods 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);
- the positive effect on  $\frac{\partial U}{\partial T_j}$  (1) generated by spending the extra income made available by economic growth on market goods without engaging in a risky re-structuring of the activities plan generates a *certain* positive effect on KGC’s overall rate of return.

The alternative course of action for KGC is to undertake the necessary investment of their time and to set about more or less radical and recurrent revision of the weekly plan, which could lastingly deprive Gossen’s second law of its strength.<sup>7</sup> Suppose, for instance, that one of the KGC, Jane, is considering the opportunity to change the allocation of her time by devoting less time to ‘surfing the internet’, thus making 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 that Jane has an indirect source of information, to be ‘discounted’, about how pleasant is playing tennis, say from a friend, and a more reliable information about all monetary costs of the planned experience.

For Jane, the ‘marginal efficiency’ of investing  $T_{T1}$  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:

$$\frac{p_{T,1} \cdot \varphi_{T1,1} \cdot T_{T1} - \left( e_{T,1} \cdot \rho_{T1,1} \cdot T_{T1} + \sum_{i=1}^n g_{iT} \cdot \frac{m_i}{w} \cdot e_{L,1} \right)}{1 + r_{Te}} +$$

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<sup>7</sup> 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).

$$+ \frac{p_{T,2} \cdot \varphi_{T2,1} \cdot T_{T2} - (e_{T,2} \cdot \rho_{T2,1} \cdot T_{T2} + \sum_{i=1}^n g_i T \cdot \frac{m_i}{w} \cdot e_{L,2})}{(1+r_{Te})^2} = 0 \quad (2)$$

where:

- $p_{T,i}$  and  $e_{T,i}$  ( $i = 1,2$ ) denote, respectively, the shares of pleasant and unpleasant time expected to be experienced when playing tennis as unskilled in period 1 and as skilled in period 2;
- $\varphi_{Ti,1}$  and  $\rho_{Ti,1}$  ( $i = 1,2$ ) denote the factors by which Jane discounts, at the beginning of week 1, indirect evidence about the shares of pleasant and unpleasant time devoted to playing tennis;
- the sum expressions at the two numerators measure, *à la* Smith, the unpleasant 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).

Note that the two discount factors, expressing the importance of uncertainty and expectations, not only differ from each other in the same period of time since they could reflect some sort of loss aversion by which unpleasant time might be given a higher weight than pleasant time, but they also change through time 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 halfway.

The two discount factors, and their evolution through time, embed the role that uncertainty and expectations play within KGC's decision about whether or not to embark upon the available investment projects. Having assessed the marginal efficiency of alternative investments, if they were to behave as skilled entrepreneurs, KGC should engage in as many as investment activities with a rate of return resulting from (2) exceeding the rate of return obtainable through the best available alternative, i.e. adopting the 'conservative', goods-intensive strategy; this latter rate here playing the role that the monetary rate of interest plays in the well-known mechanism that Keynes describes in chapter 11 of the *General Theory*:

The reader should note that the marginal efficiency of capital is here defined in terms of the expectation of yield and of the current supply price of the capital-asset. ... Now it is obvious that the actual rate of current investment will be pushed to the point where there is no longer any class of capital-asset of which the marginal efficiency exceeds the current rate of interest. (Keynes, 1936, p. 136).<sup>8</sup>

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<sup>8</sup> It is worth recalling that our approach, measuring 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:

It should now be clear how our Hicks-Keynes approach can provide a vivid metaphor of KGC struggling with time use and 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 fact, a fundamental feature of Keynes’s approach to investment theory – as clarified in Chapter 12 of the *General Theory* – will have to be retained to understand how the daily life of KGC can to some extent be characterised by scanty investment decisions:

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. If we expect large changes but are very uncertain as to what precise form these changes will take, then our confidence will be weak. ...

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 precisely the excessive weight placed on the enjoyment opportunities offered by ‘experienced’ behaviour and 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:

[I]nvestment becomes reasonably ‘safe’ for the individual investor over short periods, and hence over a succession of short periods however many, if he can fairly rely on there being no breakdown in the convention and on his therefore having an opportunity to revise his judgment and change his investment, before there has been time for much to happen. (Keynes, 1936, p. 153).

Moreover, life is not long enough; — human nature desires quick results, there is a peculiar zest in making money quickly, and remoter gains are discounted by the average man at a very high rate (Keynes, 1936, p. 157).

Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally. (Keynes, 1936, p. 158).

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“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).

## Concluding remarks

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 future course of actions, since KGC's expectations and state of confidence may well change:

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. Whenever KGC actually engage in investment activities leading to new consumption habits, the induced change will modify the sequence of weekly temporary equilibria. In a 'learning by doing', 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 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. In fact, regardless of any possible discrepancy between expectations and outcomes, it is worth looking into the hypothetical case in which, small and random shocks apart, KGC are satisfied with their past choices and, given the budget constraint, start to reiterate the same plan over the weeks. It is here that the importance of Gossen's second law of pleasure comes into play. 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. 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 (2), 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 all 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.

In fact, although reiteration of the same weekly plan tends to lower the overall rate of return, 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 shoes or clothes, exploring the features of a new smartphone while commuting by train or bus, KGC can introduce some novelties that do not require complex revision of their weekly plan, the outcome of which would be highly uncertain. In fact, those forms of consumption can simply overlap with the existing time allocation, requiring no extra, specific, time to be devoted to them. In this sense, we can say that they increase the good-intensity of KGC’s activities plan. Among process-innovation strategies we should also include the recurrent decisions to spend on those goods that technical progress makes available to reduce the time KGC have to devote to purely defensive, instrumental activities (such as housekeeping) that, generally, do not produce any pleasant time in themselves, apart from the brief moment that their accomplishment brings with it. We have mentioned Scitovsky’s idea that, insofar as those innovations are not coupled with the presence of some *new* capacity to produce enjoyment, when technical progress makes more time rather than more income available to the individual, the time saved on those defensive activities, ‘naturally’ flows into the residual activities (such as watching TV) compatible with the *existing* enjoyment production capacity. Here the role of economic policy comes into play.

In fact, for the Mill-Keynes prophecy to be realised, KGC should engage more often in activities aimed to increase their enjoyment capacity, whose beneficial effects will emerge only in subsequent periods. We have also argued that investment activities can also be reiterated or truncated, and it is worth noting that it is precisely thanks to the temporary period framework *à la* Hicks that those many instances in which KGC either extend or cut their planned, roundabout activities can be accounted for. In fact, past enjoyment performances affect the ‘initial’ perception of the costs and benefits of KGC’s investment project under evaluation. Some of KGC, e.g. those who are inclined to invest in sporting activities requiring a lot of unpleasant training ‘before’ enjoyment, are not necessarily inclined to go on with investing in musical culture or in learning a foreign language, while others, already going in for one sport could easily be attracted by the possibility to go on with a new one. They discount the costs and benefits of a yet unexplored activity—as they may learn of them through word-of-mouth or other channels of information—according to their ‘past’ experiences. Their consumption history influences, above all, the state of confidence about the future outcomes of their present choices.

Faced with the alternative between a goods-intensive (process-innovation) and a time-intensive (activity-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, which we might call the ‘default’ option, analogous to interest rate in Keynes’s theory of investment.<sup>9</sup>

Let me conclude with the possible role of policy and welfare institutions for KGC. In fact, the question is whether and how economic policy could foster their exploratory behaviour and their propensity to invest in new sets of activities. In fact, 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 – à la Keynes and Mill – could be designed to allow KGC 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’. Production of the new goods and services required by KGC’s new activity plans will follow suit. However, this is the ground for new, challenging research.

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<sup>9</sup> For the importance of ‘bankruptcy as an institution’ increasing entrepreneurs’ propensity to risk, see Sylos Labini (2002, p. 359).

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