

The temporary equilibrium method: Hicks against Hicks

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Abstract

Hicks is renowned for having introduced the temporary equilibrium framework in his book *Value and Capital*. Subsequently, however, he partially recanted this framework by rejecting the market clearing idea while still keeping the week device. The aim of this paper is to assess whether this change was right. My answer will be broadly negative. To make my point, I will ponder on the meaning and implications of the week device, assess the validity of Hicks' claim that slow adjustment can cause market rationing, examine his claim that the possibility of market clearing depends on the prevailing market form and, finally, assess his twofold affiliations towards Marshall and Walras.

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1 Introduction

John R. Hicks, ‘an economist of outstanding breadth and erudition’ (Bliss 1987: 641), has been a key figure of the economic profession in the twentieth century. He redirected the course of economic theory on at least two occasions. The first was his ‘Mr. Keynes and the “Classics”’ article ([1937] 1967) wherein he realised the feat of reducing the central theoretical message of Keynes’s *General Theory* to a short set of simultaneous equations and a single graph that became the cornerstone of macroeconomics for decades. Hicks’ second claim to fame is his book *Value and Capital* (1939; second edition 1946), which spearheaded the revival of Walrasian theory, and where, among other things, he introduced the temporary equilibrium framework.

However, Hicks was hardly the kind of intellectual who throughout his life would stick to the insights he developed in his youth. On the contrary, he revelled in distancing himself from his early contributions. To begin with, he did not approve of the ‘theory for its own sake’ in which the admirers of *Value and Capital* engaged.

In the second half of 1946, I made my first visit to the United States. I there met gain some old friends, such as Schumpeter and Viner; but I also made my first contacts with the younger generation, who were soon to become famous. At Cambridge (Mass.) I met Samuelson; in New York I met Arrow; and at Chicago Milton Friedman and Don Patinkin. I did not know them but they knew me; for I was the author of *Value and Capital*, which (as has since become obvious) was deeply influencing their work. They regarded it as the beginning of *their* ‘neo-classical synthesis’— not more than the beginning for they and their contemporaries, with far more skill in mathematics than mine, were sharpening the analysis I had merely roughed out. Their achievements have been great, but they are not in my line. I have felt little sympathy with the theory for theory’s sake, which has been characteristic of one strand in American economics; nor with the idealisation of the free market, which has been characteristic of another, and I have little faith in the econometrics, on which they have so largely relied to make their contact with reality ([1979] 1983b: 361).¹

More specifically, Hicks dissociated himself from his two main contributions. As far as the IS-LM model is concerned, he wrote in 1976 in his typical subdued style, ‘All the same, I must say that the diagram is now much less popular with me than I think it still is with many other people’ ([1976] 1982: 289-290).² As for the temporary equilibrium framework, his self-criticism focused on the market clearing characteristic of temporary equilibrium. He indicted

¹ The same dismissing views were conveyed by Hicks when receiving the Nobel Prize in 1972 for his work on general equilibrium and welfare economics. ‘[This work] was done a long time ago, and it was with mixed feelings that I found myself honored for that work, which I felt myself to have outgrown’ (1977: V).

² See also his paper, *IS-LM an Explanation* (Hicks [1980-1] 1982).

it on two grounds – first, its discarding of the slow adjustment phenomenon, and second, its lack of real-world relevance for modern economies. Subsequently, Hicks turned his attention to neo-Austrian theory, a move which gained him few followers. As noted by Bliss, ‘Hicks who had taught a generation how to do general equilibrium economics, was no longer talking a language that most economic theorists found congenial’ (1987: 645).³

My aim in this paper is to assess the validity of Hicks’ second self-criticism pertaining to temporary equilibrium.⁴ In a nutshell, the claim that will be put forward is that Hicks should not have recanted his earlier position.⁵ In Section 2, I expound his conception of equilibrium and time, in particular his temporary equilibrium framework. I also recall the rationale for his dissatisfaction with it. My critical analysis is presented in Section 3. It starts with an analysis of the week device introduced by Hicks. This was a clever trade technology device, yet Hicks left it ill-defined and proved unable to draw out the implications of its adoption. To be blunt, he sabotaged his own invention! In a second step, I contend that, for all its outward appeal, his claim that slow adjustment can cause market rationing (e.g. involuntary unemployment) does not stand up scrutiny. Next, I critically examine Hicks’ interpretation of Marshall’s conception of equilibrium, from which he drew his own ideas as to the formation of temporary equilibrium. Finally, I claim that things would have been simpler had Hicks been a fully-fledged Walrasian instead of wanting to bring Walras’s and Marshall’s views together.

2. Hicks on equilibrium and time

2.1 The temporary equilibrium framework

Hicks’ aim in *Value and Capital* was to dynamise Walras’s static analysis. He thereby took up a line of research initiated by Lindahl and Hayek, who had stressed the need for general equilibrium theory to be ‘in time’ and to integrate agents’ attitudes to the future.⁶ To this end, a pivotal role needed to be given to expectations, which in turn led him to propose a new equilibrium concept, intertemporal equilibrium. Its realisation, it was soon perceived, required agents to have perfect foresight. As this assumption was deemed too heroic, the welcome next step was to amend it by assuming that agents were making forecasting errors. The concept of temporary equilibrium with its imperfect foresight underpinning ensued.

³ Hence my doubt as to Hamouda’s characterisation of Hicks as ‘the economists’ economist’ in the title of one of his books (Hamouda 1993).

⁴ The present paper elaborates on views presented earlier in De Vroey (1999a) and De Vroey (2001).

⁵ For the opposite viewpoint, see Petri (1991).

⁶ Lindahl’s seminal paper was published in Swedish in 1929. It was translated into English under the title ‘The Place of Capital in the Theory of Price’ and published as part three of Lindahl’s book *Studies in the Theory of Money and Capital* (1939). Hayek’s paper is ‘Intertemporal Price Equilibrium and Movements in the Value of Money’, published in German in 1928 and reprinted in Hayek (1984).

In the temporary equilibrium framework, the economy is viewed as composed of a succession of single periods. Hicks drove the point home in his later *Capital and Growth*:

In the discontinuous treatment we begin with the working of the model in a unit period (week, month or year); then we proceed to a sequence of such periods. ... In dynamics, the single periods as we shall call them will not be alike, or not exactly alike; but they will still have some common features, so that much of the analysis can be made repetitive. Much of the work can be done on a *representative* single period; this single period is always a first step. But it is never the only step in a dynamic theory; some means of linkage between successive single periods must also be provided.... thus what in the last chapter we called “equilibrium at one point in time” becomes the equilibrium of the single period; what we called “equilibrium over time” becomes equilibrium over a sequence of single periods (Hicks 1965: 30-1).

Hicks’ hunch was to ‘treat a process of change as consisting of a series of temporary equilibria’ (1946: 127). The single period, the time span associated with the formation of a single temporary equilibrium, needed to be short enough to validate the assumption that the data remain unchanged, so that it could be studied with the tools of static analysis. Changes were supposedly concentrated at the junction between the single periods. As to the precise length of the single period, Hicks opted for the week with trade assumedly taking place every Monday.

A convenient way of visualising this assumption of constant prices during the week is to suppose that there is only one day in the week (say Monday) when markets are open, so that it is only on Mondays that contracts can be made. Contracts can indeed be carried out during the week (goods can be delivered, and so on); but no new contracts can be made until Monday week. Monday's prices will therefore rule during the week, and they will govern the disposition of resources during the week (Hicks 1946: 122-3).

The term of temporary equilibrium, which Hicks borrowed from Marshall, was introduced to designate the equilibrium of spot markets on a given Monday. As to future markets, although they may fail to reach equilibrium, they nonetheless play an important role since agents’ expectations of them impinge on their supply and demand behavior. Demand equals supply for each good that is currently being produced or demanded. Moreover the aggregate demand to hold assets for purposes of consumption in future periods must equal the existing supply of assets. The interest rate is thought of as equating these last two magnitudes. The equilibrium

prices and interest rate last only for the single period under consideration – hence the qualifier ‘temporary’.⁷

To Hicks, temporary equilibrium was identical to Walras' static equilibrium, except that expectations about the future were explicitly introduced into the picture. The possibility of market rationing was discarded.

But we need also to try and bring ourselves to suppose that price-changes are negligible during market hours on the Mondays, when the market is open and dealers have to fix market prices by haggling and bargaining, trial and error. This implies that the market (indeed all markets) proceeds quickly and smoothly to a position of temporary equilibrium – in Marshall's sense. ... For the present, I must ask the reader to accept the assumption of an easy passage to temporary equilibrium as one kind of ‘perfection’ which we may assume in market conditions; just as we shall assume perfect contemporaneous knowledge (1946: 123).⁸

In spite of the permanent realisation of market clearing, Hicks' framework had room for disequilibrium. Leijonhufvud noted:

Market-clearing, however, was equilibrium in a “limited sense”; in the more fundamental sense of ‘equilibrium over time’, Hicks emphasised, the economic system was ‘usually out of equilibrium’ (1984: 31).

Disequilibrium, Hicks believed, should be related to the realisation of a distinct, higher, equilibrium concept, pertaining to the chain of successive temporary equilibria, ‘equilibrium over time’. In other words, disequilibrium existed whenever the realisation of the lower equilibrium concept (market clearing) co-existed with the non-attainment of the higher equilibrium concept.

[The condition for equilibrium over time is] that the prices realised on the second Monday are the same as those which were previously *expected* to rule at that date. ... The degree of disequilibrium marks the extent to which expectations are cheated, and plans go astray. No economic system ever does exhibit perfect equilibrium over time; nevertheless the ideal is approached more nearly at some time than at others (1946: 132-3).⁹

⁷ The term ‘temporary equilibrium’ is slightly misleading as it can indicate either the whole of the theoretical construct, as including the two distinct concepts of temporary equilibrium and intertemporal equilibrium, or only the first of them.

⁸ See also Hicks (1946: 131).

⁹ Hicks' model, which remained very rudimentary, was taken up by Patinkin (1965) and later revived in the 1970s by Jean-Michel Grandmont (1977).

Although the temporary equilibrium model is usually considered Walrasian, Hicks took his lead from Marshall as far as the formation of temporary equilibrium was concerned.¹⁰ What was needed, he felt, was to generalise Marshall's corn market model (1946: 121). According to the standard interpretation of this model, the matching of supply and demand resulted from agents' haggling and bargaining.¹¹ Marshall also claimed that false trading did not prevent the market from ending up in what he called a "true equilibrium" as long as the assumptions of additive utility and a constant marginal utility of money were made (the latter allowing for the elimination of income effects). The only difference between the false trading and no-false trading cases was that the monetary balances eventually held by the different agents were different. Hicks limited himself to transpose Marshall's reasoning into a general equilibrium context, while adding the new (but vague) condition that the adjustment towards temporary equilibrium needed to be quick. He also trod in Marshall's footsteps in considering that prices were fixed through trial and error ((1946: 120), thus admitting the possibility of false trading. In Marshall's reasoning, false trading did not impede the realisation of true equilibrium because he discarded income effects on the grounds that expenditures in every market represented only a small proportion of total expenditure. Whatever the validity of this argument in a partial equilibrium context, its extension to a general equilibrium perspective was dubious, as Hicks himself had admitted in his 1934 article on Walras.¹² Yet, oddly enough, in *Value and Capital* he discarded such qualms, justifying false trading on the grounds that income effects were negligible.¹³

A final point to be considered is what motivated Hicks to choose the week as his single period. Here also his reference was Marshall, whom he praised for having emphasised that adjustment was a time-taking process (1946: 122). Drawing from the *Principles*' celebrated fish example, he viewed Marshall's conception of time as resting on a 'tripartite division (Temporary Equilibrium on the first "Day", Short Period, and Long Period)' (1946: 122). This taxonomy followed from Marshall's *ceteris paribus* method. In the ultra-short period, the quantity produced is a part of the data 'having been determined by decisions that, when the market opens, are already in the past' (1965: 53). In the short period, the equipment, etc. is still a fixed quantity yet variable capital is no longer so. As a result, changes in the quantities

¹⁰ cf. Hicks (1977: IX).

¹¹ I, for one, disagree with this interpretation. cf. De Vroey (2003) where I claim that agents' omniscience is the real linchpin of the formation of market equilibrium in Marshall's model.

¹² 'Marshall's way out of this dilemma was to concentrate on a particular market, where he could show that if the marginal utility of one of the commodities exchanged could be treated as constant, then the final rate of interchange would be independent of the path followed to reach it. But this solution – which is, after all, only a very particular solution – is usually not available in the case of General Equilibrium' ([1934] 1983: 91).

¹³ In Hicks' terms, 'I think we may reasonably suppose that the transactions which take place at 'very false' prices are limited in volume. If any intelligence is shown in price-fixing, they will be (1946: 129). This stance prompted Clower's scathing commentary, that 'It is heartening to know that income effects can be ignored if they are sufficiently unimportant to be neglected' ([1965] 1984: 44).

supplied can enter the picture. Finally, in the long period, fixed capital is also taken out of *ceteris paribus* pond.

Such was the background against which, according to Hicks, the choice of the single period had to be made. Yet there was a dilemma. On the one hand, the single period should be as short as possible in order to authorise static analysis since the latter requires that the parameters of the market, its data and especially the supply of goods, remain fixed.¹⁴ On the other hand, drawing from the view that adjustment was a time-taking process, Hicks felt that the longer the time span attributed to the single period, the higher the likelihood that the adjustment process could be achieved before its end. Hicks' choice of the week was thus a middle-of-the-road solution, being longer than Marshall's ultra-short period (the day) yet shorter than his short period, usually associated with a time span of a month or more.

2. 2 Hicks' self-criticism

In *Capital and Growth* (1965) Hicks considered three criticisms that could be levelled against the temporary equilibrium framework. They related to uncertainty (i.e. the fact that expectations are not framed in a probabilistic way), to the assumption of perfect competition and to the permanent realisation of market-clearing (1965: 69, seq.). Hicks concentrated mainly on the third point. The problem with temporary equilibrium, he believed, followed from the choice of the week as the single period.

We (Lindahl and I) were following Marshall in treating prices as determined (in the short period, or single period) by "equilibrium of demand and supply". Our single period (or "week") was shorter than Marshall's "short period"; this made the equilibrium assumption still more dangerous. Marshall, it was argued above, may have been justified in the use that he made of it, in 1890; but to continue with it in the nineteen-thirties, and to make even stronger use of it, was very dangerous indeed. One of the reasons for this is that which came to be emphasised by Keynes: that there are markets, especially the labour market, in which prices are "sticky". The assumption of demand and supply equality, in every period, must for some markets be peculiarly unsatisfactory. (1965: 73-74).¹⁵

¹⁴ Hicks observed in this respect that even Marshall's choice of the day, which Hicks dubbed as the ultra-short period, might be questioned on the grounds that in some circumstances the day might be too long a time span for considering that the supply is fixed (1946: 122). Observing an excess demand for croissants on Monday morning, a baker could rush to his oven and prepare new ones to be ready for sale in the afternoon!

¹⁵ The same point is made a few pages later: 'The fundamental weakness of the Temporary Equilibrium method is the assumption, which it is obliged to make, that the market is in equilibrium – actual demand equals desired demand, actual supply equals desired supply – even in the very *short* period, which is what its single period must be taken to be. This assumption comes down from Marshall, but even in a very competitive economy, such very short-

This quotation interweaves two distinct arguments. The first is the “slow adjustment” claim – that, taken as the single period, the week is too short to allow supply and demand to match.¹⁶ The second is of an historical nature and concerns changes in market forms. While to Hicks these two arguments were related, I would rather consider them as evolving at different levels.

Slow adjustment

Hicks’ dissatisfaction did not lie with the week device itself but rather with the view that the matching of supply and demand could be reached within the time-span of a week.

The way in which I began in setting up that ‘dynamic’ problem I still felt to be right. The concentration on what happens in a particular period (my “week”).... Where I now feel that I went wrong was in my attempt to represent the markets of that week as being in equilibrium, even in ‘general equilibrium’ in the sense of my static theory (1977: VI).

Whether market clearing could be reached at the end of the time span that is chosen as the single period is a question that seems to have bothered Hicks all his life. According to him, it hinged on two factors. The first pertained to the duration of adjustment, which was assumed to be specific to the given real-world market under consideration. Such dissimilarities in the duration of adjustment resulted from either institutional factors – including moral or sociological ones – or technological ones, such as ‘time to build’. The second factor related to the choice made about the length of the single period. The shorter it was, the smaller the likelihood that the shock would be absorbed. Combining these two factors, Hicks’ claimed that rigidity and market-rationing were present whenever the market-specific adjustment time exceeded the length of the single period. In such a case, the forces leading to the equalisation of supply and demand lacked the time necessary for exerting their full effects within the period:

One is at liberty to make [the single period] any length one likes; but if one lengthens it or shortens it, one must take the consequences. If one makes it very long, say a decade, it may not be inappropriate, at least in some economies, to work in flex-price terms – with flow demands equalling flow supplies, over the period as a whole, and prices, on some sort of average over the period as a whole, being such as can assure this reality ([1956] 1982: 231-232).

run equilibration is hard to swallow; in relation to modern manufacturing industry, it is very hard to swallow indeed. It was inevitable that the time should come when it has to be dropped’ (1965: 76).

¹⁶ Hicks was of course not the first author to try to explain market rationing in terms of slow adjustment. His most outstanding predecessor was Patinkin in *Money, Interest and Prices* (1965; first edition 1956).

The forces making for equilibrium in the labour market are for the most part rather slow in their action (1963: 137).

There is of course no question that ... there is always more flexibility in production when a long period is allowed for adjustment. If we take our stand at a particular historical date and look forward, the things that are to be produced in the following months have already been largely determined by past decisions; no change in demand can make much impression upon them. If we lengthen the “short period” to three months, there is more flexibility (1965: 50-1).

Market forms

Hicks’ second counter-argument runs as follows:

The trouble with the *Value and Capital* model is that it is not sufficiently realistic.... Both the manufacturer and the retailer are, for the most part, ‘price-makers’ rather than ‘price-takers’; they fix their prices and let the quantity they sell be determined by demand. The prevalence of this latter type of market means that a model in which quantities bear the brunt of disequilibrium fits most of the facts distinctly better. Where the *Value and Capital* analysis goes wrong is that it treats an exceptional type of market as if it were the normal case ([1956] 1982: 225).

A realistic theorist, Hicks firmly believed that theoretical models needed to reflect the real-world evolution. To him, the choice between the assumptions of flexibility or rigidity, instead of being a matter of principle, it depended on the characteristics of the markets (or “forms of markets”) under analysis. In his words, ‘since it is a changing world that we are studying, a theory which illuminates the right things now may illuminate the wrong things another time’ ([1976] 1983: 5).

At Marshall’s time (and earlier) most markets, he claimed, were functioning under the impulse of merchants:

A system of this kind – unorganised markets, with prices made by merchant intermediaries ... – had been the dominant market form throughout most of history (Hicks 1977: X).

However, a few exceptions to Marshall’s pattern were admitted, giving the Walrasian auctioneer hypothesis a limited relevance.

...Another type could arise. That is that which has been called the *organised market*, a type which has in fact long existed. Organised markets are like Walrasian markets, in that they work under rules; but the rules are rules of a club. ... The club, if it chooses, can employ a Walrasian functionary (1977: X).

In Hicks' eyes, Marshall's theory did a good job of accounting for unorganised markets, while Walrasian theory, based on the assumption of a market secretary, was valid for the minority market form. Moreover, he claimed that these two forms had in common that markets worked 'in a recognisably supply-demand manner... prices being determined in the old, universally, flexprice manner' (1977: XI XII). Therefore, it was natural that market clearing should be taken for granted. 'We are not to criticise the older economists for having thought in that way; in their time, it is probable, they were quite right to do so' (1977: XII).¹⁷

Yet since then, Hicks claimed, the merchant-dominated market form had given way to a system where the mercantile function had been taken over by producers themselves. The drive towards market clearing was absent from this new form. In order to reflect this evolution, economic theory needed to substitute the 'fixprice' for the 'flexprice' assumption.¹⁸

The dominance of flexprice methods in the work of the older economists was a reflection of the kind of industrial organisation which may well have been common in the nineteenth century, but is surely much less common today ([1956] 1982: 234).

[The earlier market form] has been largely replaced by what I have called *fixprice* markets, in which prices are set by the producers themselves (or by some authority); so that they are *not* determined by supply and demands (1977: XI).¹⁹

Here, the opposition between flexible and rigid market is no longer a matter of speed of adjustment but of market form. Fixprices models apply whenever the markets under consideration are such that a mismatch between supply and demand triggers no price change. In Hicks' words, 'In the fixprice model, prices do not necessarily change whenever there is demand-supply disequilibrium' (1982: 231, *seq.*).²⁰

¹⁷ This point was made recurrently by Hicks. See, e.g., Hicks ([1956] 1982: 234) and Hicks (1965: 55, 73-4).

¹⁸ He did not claim that the flexible prices assumption had become entirely irrelevant but rather that the proportion of flexprice markets compared to fixprice ones had tremendously decreased.

¹⁹ See also Hicks ([1976] 1982) and (1977: IX and *seq.*).

²⁰ Hicks admits that when prices are fixed in the above sense, the price that will prevail at the end of the unitary period can no longer be determined theoretically. In his terms: 'If we abandon the demand-supply equation, how are prices to be determined? The answer, which must be faced, is that the new method does not have any way of determining prices. There must be some way by which they are determined, but it is exogenous. The determination of prices is taken right outside the model. All that is said about prices is that they must cover costs; more strictly, that a thing will not be produced unless it is profitable to produce it. Subject to this condition prices can be what they like. ... If there is no more to be said about prices, it is natural to assume that they remain unchanged throughout the sequence that is being analysed. If prices are fixed exogenously, one will naturally begin by assuming them to be constant. The model becomes a fix-price model' (1965: 77).

3 A critical assessment

3.1 The week device

Hicks must be praised for having introduced the week concept, an ingenious device for integrating time into economic analysis. Unfortunately, despite having declared that the week ‘still needs to be clearly conceived and clearly defined’(1946: 122), he never pursued the matter in a satisfactory way.

The week, what exact time span?

As the quotations in Section 2.1 make clear, Hicks’ week should not be understood as coinciding with the period during which markets are open since trade is restricted to the first day of the week (‘There is only one day in the week (say Monday) when markets are open’ Hicks 1946: 122). Likewise, it would be incorrect to view it as comprising several trade rounds, since trade occurs only once in a given week, on the Monday. That is, the week and the trade round are in a one-to-one relation. The correct way of interpreting the week concept is then to view it as designating one trade round plus the interval separating it from the next trade round.

Unfortunately, Hicks failed to be consistent with this usage. Look for example at the following quotation:

I shall define the week as that period of time during which variations in prices can be neglected. For theoretical purposes, this means that prices will be supposed to change, not continuously, but at short intervals. The calendar length of the week is of course quite arbitrary (1946: 122).

The span of time when trade takes place, the Monday, also belongs to the week. As a result, the first sentence of the quotation is false (on Mondays, prices change from “false” to equilibrium levels). The above passage makes sense only if the week is understood as designating the interval between two Mondays rather than the Monday plus this interval. Thus, Hicks wavered between two definitions of the week, the first in which it included the Monday, and the second in which it designated the interval between two Mondays.

The exact nature of Hicks’ departure from Marshall

The only departure from Marshall that Hicks defended was his substituting the week category for Marshall's market-day. Yet, like Marshall, he supposed a one-day trading period. Where then lies the difference? Marshall's corn-market can be considered a daily market. Hence in his story, the interval between periods of exchanges is one night. The real difference, it turns out, is that Hicks replaced Marshall’s one-night interval with a six-days-and-nights interval, a

minor change since no contracts are stricken during these intervals. The eventual outcome is odd: whereas Hicks claimed that he departed from Marshall by abandoning his market-day category, in fact did nothing of the sort.

Real time or logical time?

Should the Monday be sub-divided into further time units (e.g. hours) enabling trade to be dated within the Monday time span or should such a sub-division be discarded? Hicks took the first option for granted. His view that the Monday equilibrium was arrived at by trial and error required further sub-divisions within the day. By taking this stance, he was merely treading in Marshall's footsteps. What, however, if both Marshall and Hicks were wrong?

In De Vroey (2000), I have argued that a consistent reconstruction of Marshallian theory requires the logical time solution. The same holds true for the week scenario: the duration of the formation of a trade round or Monday equilibrium is of anecdotal importance. Whether the Monday equilibrium is arrived at quickly or slowly is of no importance, since the implementation of decisions made on Mondays starts only on Tuesdays. On the other hand, were it accepted that the adjustment process could still be unfinished by Monday midnight, the week framework would collapse. Moreover, as soon as it is admitted that income effects cannot be discarded in an *a priori* way, the possibility of false trading emphasised by Marshall needs to be discarded as well. Therefore, applying Occam's razor, the period of opening of the markets is better reduced to a point of time. Market equilibrium should be considered as occurring in logical time, i.e. instantaneously.

While duration hardly matters for the week scenario, Hicks' opinion to the contrary notwithstanding, what really counts is the condition that exchanges be confined to well-delineated trade rounds. The trade round idea is central because it provides the time unit upon which the study of an economy 'in time' can be based. Viewed in this light, the temporary equilibrium framework combines two distinct time concepts, 'real time' and 'logical time'.²¹ The former refers to a sequence of weeks, each of which is dated. Equilibrium over time is that part of the theory which is 'in time'. In contrast, Mondays function in logical time.

At the risk of repetition, let me recapitulate the complete time picture of the temporary equilibrium framework. An economy is studied over a defined 'real' time period ('real' meaning that events are dated). This overall period is sub-divided into single periods, or weeks. The latter are again sub-divided into two successive sub-periods, Mondays when trade occurs and the other days from which trading is absent. Mondays are treated as points in time. That is, events within them are not dated.

²¹ cf. Donzelli, (1989: 27-28).

A final important point to note is that market clearing is a foregone conclusion as soon as the trade round hypothesis is adopted. In the Walrasian case this is due to the presence of the auctioneer, in the Marshallian context to the assumption that agents have perfect knowledge on market conditions (De Vroey 2003). As a result, Hicks' claim that market non-clearing is possible must be flawed as long as the week device is kept.

Rigidity

Hicks claims that 'Monday's prices will therefore rule during the week, and they will govern the provision of resources during the week' (1946: 123). No objection can be levelled against this statement except for the fact that, while it seems to be profound, a claim as to the existence of rigidity, it is actually trivial. True, prices do not change during the interval between two Mondays. Yet, this is not due to any rigidity but simply to the fact that markets are closed.²² Hicks' mistake is to have failed to distinguish between price rigidity as characterisation the interval between trade rounds and price rigidity as occurring within a trade round. The former is a compelling yet trivial feature. In contrast, the latter is a conundrum that needs to be explained.

This mistake has often been repeated. Take for example Hahn's statement, that 'One way [to have rigidity] is to suppose that prices decided on Monday cannot be altered until the following Monday' (1990: 541). To repeat, flexibility or rigidity must characterise what happens on a given Monday. Even when prices are perfectly flexible, they will not change from one Monday to the next since markets are closed during this interval. Hence Hahn's statement is flawed.

3.2 Lack of market clearing

Hicks' discontent with the temporary equilibrium framework was based on two lines of argumentation. The first was that the week was too short a time span to allow markets to clear; the second that, while market clearing was a correct characterisation of past real-world markets, this was no longer true for current ones.

Two objections must be levelled against the first argument. First, according to Hicks, the mere fact of extending the duration of the single period will decrease the proportion of markets experiencing market non-clearing, the reverse being true for its shortening. In order for a market, which was previously considered as cleared, to become rationed (or vice-versa), it would then suffice that the length of the single period were modified, without any change in

²² Here again Hicks departs from his initial definition by identifying the week with the interval between two Mondays rather than with the Monday plus this interval.

the objective features of the working of the market. That the occurrence of a phenomenon as significant as market rationing depends exclusively on the unit of measure adopted is inadmissible.

My second objection is as follows. I have argued above that whenever the temporary equilibrium framework is correctly understood, trade must be viewed as taking place within well-delineated trade rounds, with equilibrium being arrived at instantaneously. This impinges at once on the Marshall-Hicks insight that the adjustment towards equilibrium is a time-taking process: slow adjustment can play no role in the formation of temporary equilibrium. True, it can affect the formation of equilibrium over time, and generate disequilibrium as a departure from the higher equilibrium concept, yet such a disequilibrium co-exists with market clearing. Hicks' mistaken belief that slow adjustment causes market rationing is due to his confusing disequilibrium as the non-attainment of equilibrium over time with disequilibrium as the non-attainment of temporary equilibrium.

To take an example, assume that a shock, requiring an adjustment in both wages and prices, happens in a given market at the beginning of the period of analysis. Define the latter as lasting six months and take the week as the single period. That is, the period of analysis covers about twenty four trade rounds. Suppose, moreover, that, due to institutional factors, a full year is needed for the wage adjustment to come to an end, while three months suffice for prices. As a result, the goods markets will have reached its new equilibrium position before the end of the period, but the labour market will not. Following Hicks, should the goods market be declared flexible and the labour market rigid? One is tempted to answer in the positive. Yet the problem with such a stance is that it rests on loosely defined concepts. In particular, Hicks' one-to-one relationship between flexibility and market clearing (or rigidity and market rationing) is wanting. Admittedly, the labour market is still in disequilibrium at the end of the six-months period in the sense that market values are different from normal values. However, a mismatch between *normal* supply and demand does not imply that the *market* supply of and demand for labour are unbalanced. In other words, Hicks confuses equilibrium and market clearing, which should be separated.

Turning now to Hicks' market form claim, a host of counter-arguments come to mind. First, his contrast between two historical market forms is too sharp to be plausible. Is it really obvious that the role of intermediaries has decreased over time, that prices were more flexible in the past than in modern times? Second, Hicks fails to justify the existence of a causal link between market forms and market outcomes. Why should market clearing be a normal outcome in a context, where prices are set by intermediaries, but an anomaly when they are set by producers?

However, my main objection is methodological. Hicks wants theoretical models to be based on a realistic account of the functioning of markets. If this stance is taken seriously, the week

device must be discarded at once, because having exchanges confined to trade rounds amounts to assuming that markets function in a centralised way. With a few exceptions, this is not the case for real-world markets. To be consistent, Hicks should have forgone the week device, which he did not.

Moreover, by putting forward his market form argument, Hicks is led into making a radical departure from standard neoclassical theory, be it Marshallian or Walrasian. In effect, it can be claimed that, from its inception, from Adam Smith onwards, economic theory has side-stepped the issue of the working of the market and to all intents and purposes postulated market clearing. Two possible reasons can be evoked. The first is tractability. The trade round assumption distorts reality, yet it makes things easier. As several examples illustrate, constructing a theory to explain the functioning of really decentralised markets is a daunting task. The second argument is benign neglect. This amounts to claiming that the issue of how exchanges take place concretely is of secondary importance. In order to come to grips with the hard core of the competitive process, it is the formation of the higher equilibrium concept that matters. In other words, competition is viewed as bearing on more basic adjustments than those governing individual trade rounds. This line of thinking is long-lived, going all the way back to Adam Smith. Smith was interested in the formation of natural prices and only dealt offhandedly with market prices. Likewise, it may be presumed that Marshall would have found it inadmissible to discard the possibility of disequilibrium as a departure from normal equilibrium, while having no qualms about assuming away departures from market equilibrium. With Walrasian theory this expediency character became even more apparent. The only vindication that the auctioneer assumption can receive is that it allows the issue of price formation to be side-stepped while still having a convenient story to tell about it. As the author of *Value and Capital*, Hicks could have made the same point, that disequilibrium over time and the convergence towards equilibrium over time matter more than disequilibrium as a departure from temporary equilibrium.

3.3 Hicks, Marshall and Walras

Hicks' interpretation of Marshall

Hicks' account of Marshall's conception of equilibrium and time as a tripartite taxonomy certainly has a rooting in Marshall's writings. Nonetheless, it fails to capture what I see as the hallmark of Marshall's conception – its being composed of two equilibrium-cum-time concepts, market equilibrium and normal equilibrium, the former pertaining to the market day or trade rounds, the latter to a sequence of days. These equilibrium concepts are part and parcel of each other and they must be studied jointly. On the one hand, the formation of normal equilibrium arises through a succession of market-day operations. On the other hand, any analysis that is confined to the formation of market equilibrium can never be the full

story, since its realization is no guarantee of the attainment of higher equilibrium.²³ As to the short/long-period distinction proper, it crops up in Marshall's analysis only in a second stage of the reasoning, its *raison d'être* being to separate two sub-types of normal equilibrium according to the nature and length of demand shocks.

Such a dual conception of equilibrium is present in Hicks' temporary equilibrium framework, yet, oddly enough, he fails to take account of its presence in Marshallian theory. The following passage from *Capital and Growth*, in which Hicks criticises Marshall's short period analysis is a clear illustration of his lack of awareness:

What was Marshall's justification for treating the short period model, not merely as being self-contained, but also as being in equilibrium? How far, that is, can we expect that the performance of an industry (for we had better keep to an industry) over a month (say) of time, will be reasonably well represented by its short-period equilibrium? ... Equality between demand and supply, in the sense of amount bought and amount sold, is an identity, which has nothing to do with the equilibrium assumption. Equality between amount sold and the amount which, in given circumstances, sellers will want to sell is a quite different matter. Sense can be made of it over a long period; but when it is applied to a short period, it looks a very dubious assumption indeed (1965: 53).

Hicks' mistake in this passage lies in his failure to separate normal equilibrium and market equilibrium. Had he been aware of the divide, he would have realised, first, that market clearing (or the lack thereof) is a market-day outcome, and second, that market clearing can co-exist with disequilibrium (a lack of full equilibrium).

More broadly, a basic ambiguity surrounds Hicks' use of the term 'short period'. In Marshall's fish example, the short period refers to a change in demand supposed to be of no permanent character yet to last long enough to make it worthwhile for firms to change their supply of fish by modifying their variable capital. Let me call this 'short period in the Marshallian sense'. Crucial for my purpose is that it covers several trade rounds, market clearing supposedly existing at each of them. Its duration can vary, say decreasing from three months to one, yet it will still comprise several market days. Turning to the temporary equilibrium approach, I have shown that variations in the length of the single period are of secondary importance since they pertain only to the interval between trade rounds. If the length of the interval comes close to the duration which is usually dubbed as a short period (say three months), the week concept (which no longer corresponds to a calendar week) could be viewed as a short-period category. Let me call this the 'short period in the week analysis context'. Although it lasts longer, it still comprises only one trade round.

²³ Whereas it is true that the higher equilibrium concept can be studied in isolation, in as far as attention is concentrated on existence only, the reverse is not true.

The same duration can be ascribed to the ‘short period in the Marshallian sense’ and the ‘short period in the week analysis context’, say three months. Nevertheless, these two concepts will retain their distinct contents, the short period covering a sequence of trade in the former case, and a single trade round in the latter. Unfortunately, Hicks is unaware of this difference. It is impossible to sort out whether he uses the short-period term in the Marshallian or in the week sense. Outwardly, he seems to be treading in Marshall’s footsteps, yet consistency with the week device requires his reasoning to be based on the weeks sense.

Bringing Marshall and Walras together

Hicks always defended eclecticism:

You will, I fear, feel in the end that I am too Open to be an Austrian; for I am an Open Marshallian, and Ricardian, and Keynesian, perhaps even Lausannian, as well. I put perhaps to the last, for I think I have shown why I now rate Walras and Pareto, who were my first loves, so much below Menger ([1979] 1983: 128).²⁴

He was definitely more of a synthesiser than a divider. Already in his 1934 article on Walras, he suggested that a deep affinity existed between Marshall’s and Walras’ theories.

The modern reader of Walras’ *Elements d’Economie Pure* is struck by its affinity, not with the work of Jevons or Menger, but with that of Marshall. For a quite considerable part of the way Walras and Marshall go together, and when they separate, it is a difference of interests, rather than of technique that divides them. While Walras was seeking for the general principles, which underlie the working of an exchange economy, Marshall forged an analytical instrument capable of easier application to particular problems of history or experience. Yet, since the followers of Walras cannot always afford to be pure philosophers, and Marshallians have their moments of reflections, the two systems have inevitably tended to grow back into one another as the years pass by ([1934] 1983a: 86).

Value and Capital was built on the insight that Marshall and Walras needed to be brought together, and several commentators have praised Hicks for his success in this respect.²⁵ I,

²⁴ As pointed out effectively by Leijonhufvud, Hicks’ originality may have its roots in the fact that his education as an economist was largely autodidact. ‘When it came to learning economics, he [Hicks] set about it as a task of creating a personal synthesis, making up his own mind through wide and eclectic reading about what were the best elements, how they might be improved and how they might fit together. The personal synthesis of economic theory that he was building had far more of Lausanne, Chicago, Vienna and Stockholm than of Cambridge in it’ (1994: 149). See also Hicks’ *LSE and the Robbins Circle* (1982). Where I depart from Leijonhufvud is in his belittling of Marshall’s influence on Hicks.

²⁵ For example, ‘It was John Hicks who linked up the Marshallian tradition with the Walrasian heritage and thus became the founder of modern general equilibrium theory’ (Niehans, 1994: 357).

however, must disagree with such a view since I take it that the Marshallian and the Walrasian approach are alternative rather than complementary research programmes (De Vroey 1999).

Hicks should have tried to solve the trade technology problem he was facing by resorting to Walras rather than to Marshall. Admittedly, at the time, the level of development of Walrasian theory was still low. In particular, although reference was already being made to the possibility of recontracting, the auctioneer figure had not yet been introduced into the picture. Had this been the case, and had Hicks been a fully-fledged Walrasian, he could have stated that market clearing was the direct result of assuming an outside price-setting market secretary. As a result, the issue of the formation of temporary equilibrium would be settled at once. In such a context, false trading could have only a virtual existence, and the price formation process should be conceived of as taking place in logical time, i.e. instantaneously. Hence any argument about slow adjustment would come out as off-target. Yet Hicks had little sympathy for this line of thought. When later confronted with the auctioneer hypothesis, his opinion was that it was valid only for a small proportion of markets. In no way was he ready to accept it on a general scale.

To conclude, when re-assessing his temporary equilibrium brainchild, two routes were open to Hicks, a radical and a pragmatic one. Either he could have argued that the Walrasian approach should be rejected at once because of its lack of relevance to a real-world decentralised system. Or he could have opted for a softer stance, proposing a limited rather than a global criticism of the Walrasian approach. Yet the criticism he eventually offered squared with neither of these approaches. As far as the first route was concerned, he did not go far enough, focusing merely on the speed of adjustment instead of attacking the whole construct. As to the second, his slow adjustment argument was unable to win the day because it wrongly assumed that a compelling feature of the Walrasian approach, market clearing, could easily be removed from it.

4. Concluding remarks

My aim in this article was to critically revisit Hicks self-criticism of his temporary equilibrium framework. I have argued that Hicks' argument is wanting on several scores. I have criticised him for failing to disentangle the implications of his week scenario. I have rejected his claim that slow adjustment causes market rationing, I have criticised him for wavering between two interpretations of the short period concept, and I have dismissed his market-form argument. More generally, my conclusion is that either the Walrasian research programme is worth adhering to, in which case Hicks' objections carry no weight because market clearing is a foregone conclusion or it should be rejected at once because of its unrealistic character. Hicks' criticism suffers from being subdued, and his middle-of-the-road position, consisting of accepting the week device yet foregoing market-clearing, proves ill-

conceived. His mistake is to have failed to perceive that Marshall and Walras were incompatible bedfellows. Things would have been simpler had he not tried to bring Marshall's and Walras' insights together. In that case, no rationale for any recantation would have been existing, except for a radical rejection of the Walrasian approach.

References

- Bridel, P. (1997), *Money and General Equilibrium Theory: From Walras to Pareto (1870-1923)*, Cheltenham: Edward Elgar.
- Bliss, C. (1987), 'Hicks, John Richard', in Eatwell, J., M. Milgate and P. Newman (eds.) *The New Palgrave. A Dictionary of Economics*. London: Macmillan, vol. 2, pp. 641-46.
- Clower, R. ([1965] 1984), 'The Keynesian Counterrevolution: A Theoretical Appraisal', in Walker, D. (ed.) *Money and Markets. Essays by Robert Clower*, Cambridge: Cambridge University Press, pp. 34-58.
- De Vroey, M. (2003), 'Perfect Information à la Walras versus Perfect Information à la Marshall', *Journal of Economic Methodology*, vol. 10, pp. 465-492.
- De Vroey, M. (2001), 'Price Rigidity and Market Clearing. A Conceptual Clarification.', *Cambridge Journal of Economics*, vol. 25, pp. 639-656.
- De Vroey, M. (2000) "Marshall on Equilibrium and Time. A Reconstruction", *The European Journal of the History of Economic Thought*, vol. 7, pp.20-44.
- De Vroey, M. (1999a), 'J.R. Hicks on Equilibrium and Disequilibrium: *Value and Capital* Revisited', *History of Economics Review*, Winter, pp. 31-44.
- De Vroey, M. (1999b), 'The Marshallian Market and the Walrasian Economy. Two Incompatible Bedfellows', *The Scottish Journal of Political Economy*, vol. 46, pp. 319-338.
- Donzelli, F. 1989. *The Concept of Equilibrium in Neoclassical Economic Theory: An Inquiry into the Evolution of General Competitive Analysis from Walras to the 'Neo-Walrasian Research Programme'*. Ph.D. Dissertation, University of Cambridge.
- Grandmont, J.-M. (1977), 'Temporary General Equilibrium Theory' *Econometrica*, vol. 45, pp. 535-572.
- Hahn, F. (1990), 'John Hicks the Theorist', *The Economic Journal*, vol. 100, pp. 539-49.
- Hamouda, O. (1993), *John R. Hicks: The Economist's Economist*, Oxford: Basil Blackwell.
- Hayek, F. ([1928] 1984),. 'Intertemporal Price Equilibrium and Movements in the Value of Money' in *Money, Capital and Fluctuations: Early Essays*, London: Routledge, pp. 71-117.
- Hicks, J. R. (1982), 'LSE and the Robbins Circle' in *Money, Interest and Wages : Collected Essays on Economic Theory*, vol. II, Oxford: Basil Blackwell, pp. 3-10.
- Hicks J. R. ([1980-1] 1982), 'IS-LM : An Explanation', in *Money, Interest and Wages : Collected Essays on Economic Theory*, vol. II, Oxford: Basil Blackwell, pp. 318-331.

- Hicks, J.R. ([1979] 1983a), 'Is Interest the Price of a Factor of Production?' in *Classics and Moderns: Collected Essays on Economic Theory*, vol. III, Oxford: Basil Blackwell, pp. 113-128.
- Hicks, J. R. ([1979] 1983b), 'The Formation of an Economist' in *Classics and Moderns: Collected Essays on Economic Theory*, vol. III, Oxford: Basil Blackwell, pp. 355-364.
- Hicks, J. R. (1977), *Economic Perspectives: Further Essays on Money and Growth*, Oxford: Clarendon Press.
- Hicks, J. R. ([1976] 1982), 'Time In Economics' in *Money, Interest and Wages: Collected Essays on Economic Theory*, vol. II, Oxford: Basil Blackwell, pp. 282-300.
- Hicks, J. R. ([1976] 1983), '“Revolutions” in Economics' in *Classics and Moderns: Collected Essays on Economic Theory*, vol. III, Oxford: Basil Blackwell, pp. 3-16.
- Hicks, J. R. (1965.), *Capital and Growth*, Oxford: Clarendon Press.
- Hicks J. R. (1963), *The Theory of Wages* (second edition), London: Macmillan.
- Hicks, J. R. ([1956] 1982), 'Methods of Dynamic Analysis' in *Money, Interest and Wages: Collected Essays on Economic Theory*, vol. II, Oxford: Basil Blackwell, pp. 217-235.
- Hicks, J. R. (1946), *Value and Capital* (second edition), Oxford: Clarendon Press.
- Hicks, J. R. ([1937] 1967), 'Mr Keynes and the “Classics”' in *Critical Essays in Monetary Theory*, Oxford: Clarendon Press, pp. 126-142.
- Hicks, J. R. ([1934] 1983), 'Léon Walras' in *Classics and Moderns: Collected Essays on Economic Theory*, vol. III, Oxford: Basil Blackwell, pp. 85-95.
- Leijonhufvud A (1994), 'Hicks, Keynes and Marshall' in Hageman, H. and Hamadou, O. (eds.), *The Legacy of Hicks: His Contributions to Economic Analysis*, London: Routledge, pp. 147-61.
- Leijonhufvud, A. (1984), 'Hicks on Time and Money', *Oxford Economic Papers*, Supplement, pp. 26-46.
- Lindahl, E. (1939), *Studies in the Theory of Money and Capital*., New-York: Augustus M. Kelley.
- Niehans, J. (1994), *A History of Economic Theory: Classic Contributions 1720-1980*, Baltimore: John Hopkins University Press.
- Patinkin, D. (1965), *Money, Interest and Prices* second edition, New-York: Harper and Row.
- Petri, F. (1991), 'Hicks' Recantation of the Temporary Equilibrium Method', *Review of Political Economy*, vol. 3, pp. 268-288.