

THE END OF THE CONSENSUS IN MACROECONOMIC THEORY?
A METHODOLOGICAL INQUIRY

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Abstract: After the acrimonious debates between the New Classical and New Keynesian economists in the 1980s and 1990s, a consensus developed, namely, the New Neoclassical Synthesis. However, the 2007 credit crunch exposed the severe limitations of this approach. This paper presents a methodological analysis of the development of the New Classical Synthesis and how the pseudo paradigmatic assumptions of the representative agent, market clearing, subject to sticky prices, excluded the Keynesian notion of involuntary unemployment arising from lack of effective demand. It explains why the foundations of the New Classical Synthesis are unlikely to ever provide a sound basis for explaining cyclical fluctuations in a monetary economy beset by coordination failures.

Keywords: New Classical Synthesis, economics of Keynes, fallacy of composition, uncertainty, paradigm, Kuhn.

JEL Codes : B4, B5 E40, E50, E60

CAMBRIDGE CENTRE FOR ECONOMIC AND PUBLIC POLICY

CCEPP WP02-12

DEPARTMENT OF LAND ECONOMY

UNIVERSITY OF CAMBRIDGE

March 2012



Introduction

Consider the following two quotations. The first is from Nordhaus. “American macroeconomists are in disarray. Like a shell-shocked army, barraged by criticism because of poor forecasts ... confused because of divided intellectual leadership, they are unsure which way to retreat. Out of the ashes of defeat rises a new phalanx of competing theories, a ragtag collection of discarded ideas from the past as well as unproved fancies for the future”. Commenting on this, Solow could not have been in more agreement. “Why, then, is macroeconomics in disarray?” ‘Disarray’ is an understatement. Thoughtful people in other university departments look on in wonder. Professional disagreements exist in their field too, but, as outsiders, they are shocked at the way alternative schools of thought in macroeconomics describe each other as wrong from the ground up. They wonder what kind of subject economics is”.

When were these words written? In 2008 or 2009 when the failure of mainstream (neoclassical) macroeconomics adequately to account for the credit crunch was being widely debated in the press?¹ The answer is ironically “No”. The words were written as long ago as 1983 (Nordhaus 1983; Solow 1983) when there was an acrimonious debate between the New Keynesians and the New Classical economists, which Mankiw (2006:38) has described as “vitriol among intellectual giants”. Yet, paradoxically, over the subsequent years there arose a synthesis of these two schools of thought, to give what is known as the New Neoclassical Synthesis (Goodfriend and King 1997; Goodfriend 2004, 2007) or alternatively the New Macroeconomic Consensus (Meyer 2001; Arestis 2007).² The general consensus in mainstream economics was that there were no longer any substantial methodological controversies left in macroeconomics. See for example Chari and Kehoe (2006), and Blanchard (2008).

At the theoretical level, the New Neoclassical Synthesis essentially consists of a general dynamic stochastic general equilibrium model, based on what are seen as rigorous micro-foundations. The model assumes rational expectations, which had initially proved so controversial in the late 1970s, but is now widely accepted by even the New Keynesians, (but not by the Post Keynesians) and the inter-temporal optimisation of utility by households, with production given by, and shocks reflected in, the real business cycle model. It is a consensus because rigidities from the New Keynesian assumptions of imperfect competition, optimal mark-ups and price rigidities arising from, for example, menu costs are now included in the New Neoclassical Synthesis model, but the benchmark is still the real business cycle (Goodfriend 2006).

However, the sub-prime crisis of 2007 and the accompanying dramatic fall in output and rise in unemployment exposed the limitations of the New Neoclassical Synthesis as destructively as the Great Depression had of the pre-Keynesian Classical economics (Allington, McCombie, and Pike 2011a, b). In 2009, Blanchflower (2009: 7), a former member of the Bank of England's Monetary Policy Committee wrote: "As a monetary policy maker I have found the 'cutting edge' of current macroeconomic research totally inadequate in helping to resolve the problems we currently face"(see also Buitter 2009).

What is interesting is that it was the external event of the sub-prime crisis that caused this radical reassessment of the state of macroeconomics. It was not because of the build-up of anomalies or the econometric specification, testing and progressive refutations of certain aspects of the model. Major economic crises, such as in the early 1970s or the Great Depression that cannot be explained by the dominant paradigm are more effective in challenging the mainstream paradigm than statistical testing of the models. The reassessment concerned the very foundations of the discipline and the pressing policy implications (DeLong 2009a,b). The critics, in Solow's (1983) words, saw the New Neoclassical Synthesis as "wrong from the ground up". See, for example, Krugman (2009) and the rejoinder by Cochrane (2009).

The level and type of debate discussed above represents *par excellence* a Kuhnian paradigmatic crisis. Of course, some do not see a crisis at all. As Kuhn (1970: 248) notes, it could be that two scientists (economists) "reach different judgements in concrete cases, one man seeing a cause of crisis where another sees only evidence of limited talent for research". In this article we analysis this methodological crisis in macroeconomics within the Kuhnian framework (Kuhn 1970, 1977, 1999) for the general economist. We emphasise the importance of rhetoric in paradigmatic choice (although drawing different conclusions from McCloskey (1985, 1995)).

Paradigms and their Incommensurability

Kuhn approached the methodology of the physical sciences from the viewpoint of a historian of science. He found that scientific theories were not immediately abandoned after a single or even several refutations. He showed that it was possible to identify a scientific school of thought or paradigm, within which certain assumptions were made untestable by fiat. The paradigm sets the agenda and provides the scientist with the legitimate problems or "puzzles" to be investigated. It also provides the methods or tools with which these puzzles can be solved, while ensuring it will only be the lack of a scientist's ingenuity that prevents this from happening. The paradigm protects the scientist for most of the time from the deeply disturbing problems that can question the whole rationale of his/her discipline and which may lead to a sense of nihilism. What is considered the acceptable method of scientific inquiry is not explicitly laid down but

occurs through demonstration and the teaching of exemplars through the textbooks. Thus the paradigm is essentially socially determined. See, for example, the Strong Programme of Barnes, Bloor, and Henry (1996) and also Hands (2004).

But in the natural sciences with their emphasis on controlled experiments, anomalies accumulate and become more and more difficult to ignore which eventually leads to a shift to a competing paradigm. However, the reason to change from one paradigm to another is not made for objective reasons. This is because some problems become non-problems and some concepts have no meaning within the new paradigm. In other words, competing paradigms have elements of incommensurability. This concept is essential for the understanding of controversies in macroeconomics.^{3,4}

Certain concepts in one paradigm will either have no meaning in the other or there will be meaning change. What are deemed to be the important questions and the standards will also change. Kuhn cites the concepts of the Newton and Einstein mechanics as being incommensurable and having different meanings which are untranslatable in the different paradigms. A favourite example of Kuhn (1970:115, 128-129, and 130-134) of extensional meaning change is that after the Copernican revolution the earth became a planet while the sun and moon ceased to be called that. Because paradigms are not completely commensurable, then there is no objective way of deciding between them.

In the 1980s, Kuhn turned from a discussion of incommensurability in terms of a gestalt switch to one in linguistic terms and also narrowed the term to a more local concept. It is local in that it does not apply to all concepts in competing paradigms. Kuhn draws on the analogy of two languages that an individual may learn, but there may be certain concepts in one language that it is not possible to express in the other. Not all the concepts employed in both theories change meaning in the transition to a new paradigm. There is only local incommensurability otherwise “anomaly would be everywhere, and correspondingly unrecognizable” (Kuhn 1999).

This allows a refutation of the charge of relativism; “It is not the case that a proposition (sic) [proposition] true in one language (or within one paradigm) can be false in another. It is rather that some proposition which may be true (or false) in one language cannot even be formulated in another. It is not truth value but effability that varies with language.” A further misunderstanding of Kuhn is that incommensurability implies incomparability and discontinuity, which is not the case (see Hoyningen-Huene 1993: 218-222).

McCombie (2001) dichotomised incommensurability into strong and weak incommensurability. Strong incommensurability is where theoretical terms in one paradigm have literally no explanatory meaning in another, even though their explanatory domains may be similar. An example of this is the fact that the central tenets of the Marxian paradigm are the concepts of class, viz., labor and capitalists, together with economic power, the labor theory of

value, and the rate of exploitation or surplus value. These terms as an explanation of economic phenomena have no role to play in the neoclassical theory of price. Conversely, the approach of methodological individualism with “agents” maximising utility subject to a budget constraint has no explanatory meaning in the Marxian schema. In the neoclassical aggregate production function, capital and labor enter as factor inputs on the same footing. But in the Marxian paradigm it is labor that ultimately provides value. Consequently, there is strong incommensurability between the neoclassical and the Marxian paradigms.

But in economics especially there are problems where the same concepts (and indeed the same mathematical notation) are used, but their interpretation is still incommensurable. This is weak incommensurability. For example, Fisher’s (1992) theoretical work that showed the impossibility of aggregating micro-production functions into an aggregate production function was essentially a critique within the neoclassical paradigm (Felipe and Fisher 2003). He regarded reswitching and capital reversing as nothing more than a logical consequence of the more general aggregation problem. For Harcourt (1976: 29) there is much more to it than this: “What is involved [in the Cambridge capital theory controversies] is the relevant ‘vision’ of the economic system and the historical processes associated with its development”.

Yet the neoclassical participants saw it rather as Fisher does, as an interesting, but not vital technical (Kuhnian) “puzzle”. It can be seen here that there is *weak* incommensurability. It is ‘weak’ because the debate centred on the *same* models and concerned matters of logical inference, not empirical issues that could be subject to different interpretations. In this regard, there was agreement over the formal results, but not over their implications. Many of the debates in macroeconomics can best be understood in terms of weak incommensurability.

The boundaries of what are acceptable puzzles are determined by the *paradigmatic pseudo-assumptions* or the *paradigmatic heuristics*. The term pseudo-assumption is used because, in the natural sciences, these assumptions are a hybrid of analytic-synthetic, or quasi-analytic, statements. They are analytic because they are deemed not falsifiable by fiat. They are taken as self-evident and demarcate the paradigm. But they are synthetic in that they may initially have been part of the empirical basis of the paradigm, but “they are by no means the product of arbitrary definitional stipulations. They are rather in part the products of painstaking empirical and theoretical research” (Hoyningen-Huene 1993: 210). Hence, it is in this sense that they are termed pseudo-assumptions rather than just assumptions. An example that Kuhn gives is Newton’s second law of motion. Though it was derived after many years of observation, it “behaves for those committed to Newton’s theory very much like a purely logical statement that no amount of observation could refute” (Kuhn 1970: 78). It is these paradigmatic pseudo-assumptions that change between paradigms.

Within economics, the pseudo-assumptions are not necessarily, or indeed usually, based on empirical testing, but may be simply theoretical presuppositions. An example, which we shall elaborate below, is that the New Classical assumption of price flexibility and market clearing means that there can be no such thing as “involuntary unemployment”. For this reason, we shall use the term “paradigmatic heuristic”.

Economics differs from the natural sciences in that, as we have seen, there can be a “reswitching” of economic paradigms. For example, the New Classical Economics is seen by some as the formalisation and development of the neoclassical economics after the Keynesian interregnum. In turn, the subprime crisis has led to a resurgence of interest in, for some, the previously discredited Keynesian economics. Kuhn, in an attempt to refute the charge that his methodology was “mere relativism” was at pains to argue that if a scientist were to consider two scientific paradigms, there are sufficient criteria that “would enable an uncommitted observer to distinguish the more recent theory time after time” and crucially one of these criteria was the “accuracy of prediction, particularly of quantitative prediction”. “Scientific development is, like biological, an unidirectional and irreversible process” (Kuhn 1970: 206.)

Yet within economics, while we can usually tell which of two economic theories is the later merely by its degree of formalism and mathematical technique, if we were to reconstruct it in verbal terms or to compare them in terms of their conclusions, could we be so certain? Certainly, in no sense is the development of economics “an unidirectional and irreversible process”. The reason why this is the case lies in Kuhn’s revealing phrase, “the accuracy of prediction”. Paradigmatic crisis occurs in the natural sciences by the build up of anomalies, largely the result of repeated controlled experiments.

Within economics, econometrics can never have this role, as was initially shown by the Keynes-Tinbergen debate (Garrone and Marchionetti 2004). Summers (1991) convincingly argues that econometric results rarely if ever affect the “profession’s belief” and considers a couple of influential econometric papers that substantiate his point. Mankiw (1990: 1648) argues that had there been confidence in the underlying Keynesian macroeconomic model, the stagflation of the 1970s could have been explained in terms of OPEC supply shocks. “The remainder could always have been attributed to a few large residuals. Heteroskedasticity has never been a reason to throw out an otherwise good model.” Hendry and Ericsson’s (1985) “Assertion without Empirical Basis” which was a devastating econometric critique of Friedman and Schwartz (1982) had little or no impact on the adherents to monetarism. Kenny and Williams (2001) provide a compelling critique of Barro-type growth regression models. Leamer (2010) provides more general criticisms.

We have also seen that while some see a linear change of mainstream macroeconomics from the “economics of Keynes” through Keynesian economics (the IS-LM and AD-AS

models), New Classical and New Keynesian economics to the New Neoclassical Synthesis, the sub-prime crisis has resulted in a reconsideration of macroeconomic theory from a Keynesian /Mynskian view (see, for example Posner 2009 and Skidelsky 2009). It should be noted that other paradigms such as the Post Keynesians and Sraffians have also co-existed with the dominant neoclassical paradigm. Kuhn puts such a proliferation down to the immaturity of the social sciences (Kuhn 1970: 179)).

In the light of these comments, how is it that paradigmatic revolutions can ever occur in economics? To understand this it is necessary to consider the literature of the sociology of knowledge and the use of rhetoric (McCloskey 1985, 1994). Garnett (2004) provides a good overview. How do economists persuade? McCloskey, most notably, has used the tools of literary criticism and rhetorical analysis to understand the “economic conversation”. There is not space here to discuss this and it should be noted that McCloskey’s rhetorical use of rhetoric is controversial. Most notably, her instance that the “market in ideas” will ensure the most worthy ideas will eventually dominate. (This is itself a rhetorical use of a metaphor from neoclassical economics which provides support for mainstream neoclassical economics, with obvious self-referential problems). However, she does admit that rhetoric, or the power of persuasion, “may block science for years” by allowing a paradigm to persist. For a more detailed discussion, see McCombie (1998: 49-56) and the references cited therein. But the main message is clear: there are no objective, or logical, foundations for paradigmatic choice as this article will confirm.

We next turn to a methodological assessment of the debate concerning the New Neoclassical Synthesis paradigm and consider first its heuristic. But our discussion ranges more broadly than this, contrasting the New Neoclassical Synthesis and Keynesian approach.

The New Neoclassical Synthesis Paradigm

Microfoundations and the Representative Agent

One of the paradigmatic heuristics of the New Neoclassical Synthesis is the need to explain the workings of the macroeconomy in terms of agents maximising an objective function subject to appropriate constraints. In other words, macroeconomics needs to rest on sound microfoundations and theory must be exclusively modelled using mathematics. Much of the debate concerning these assumptions has been directed at the New Classical Economics, but they apply equally to the New Keynesian models (on this see Wren Lewis 2007). We therefore emphasise the New Classical Economics which, as we noted above, is seen as the benchmark model. Given the complexity of constructing mathematical models with heterogeneous

individuals and disparate production technologies, recourse is made to the representative agent model, where the economy is simply taken to be a blown-up version of the representative agents as households and producers. Moreover, although not often discussed by the New Neoclassical Synthesis economists, there is a mistaken belief that the analysis is firmly and successfully grounded in general Walrasian general equilibrium theory and hence is supported, if at one remove, by rigorous microfoundations.

Hoover (2009) identifies three types of reductionist arguments, with the first two closely related. The first is the view that there is no useful distinction between microeconomics and macroeconomics and he cites Lucas (1987: 107-8) as a proponent of this view. As all economic outcomes are ultimately the result of human actions, any scientific explanation must be couched in terms of the agents' optimising behaviour. This is the neoclassical "primitive notion" in terms of which all explanation must eventually be reduced. The second is the view that macroeconomics is essentially just a subfield of microeconomics, distinguished only by the material it covers. The third admits different methods between macroeconomics and microeconomics and "sees macroeconomics only as a pragmatic compromise with the complexity of applying microeconomics to economy-wide problems. This view asserts that macroeconomics reduces to microeconomics in principle but, because the reduction is difficult, we are not there yet" (Hoover 2009: 288). We may term the first two types *strong* reductionism and the last one *weak* reductionism.

The approach taken by Keynes and the Post Keynesians may seem initially to be a case of weak reductionism, but there are important differences. Keynes gave an intuitive explanation of macroeconomic phenomenon in terms of individuals' behaviour, but not within an explicit maximising model. For example, Keynes explained the consumption function in terms of individual preferences (the "fundamental psychological law") and the liquidity preference. Trevithick (1992: 111-113), for example, uses the representative firm in his discussion of the procyclicality of wages, as does Kaldor (1961) (see Harcourt 2006: 117). Nevertheless, the fallacy of composition, emphasised by both Keynes and Post-Keynesians cannot be reduced to micro-economic principles, as it is an emergent property of the economic system.

Strong reductionism uses the explicit functional forms of the individual agent's utility functions and firm's production function within the context of mathematical models. A specific form of reductionism is the use of the *representative agent*, which is used in order to make the mathematical solutions of the model tractable. While early New Classical models were not based on the representative agent model (Hartley 1997), the latter was later used to provide the "deep structural" parameters (from the representative utility and production functions) which were assumed by Lucas to be constant and hence immune from the Lucas critique.

Kirman (1992) has presented further serious problems that the representative agent faces. There is simply no correspondence between individual and collective behaviour, even when the former acts in a rational optimising way. Even the Weak Axiom of Revealed Preference does not carry over with aggregation. Collectively, x may be preferred to y in one situation and the converse in another. It is also possible for a representative agent to prefer situation a to b while all the agents that are “represented” prefer b to a (see Kirman, 1992: 124-5 for an intuitive explanation). In an early critique, Mishan (1961: 1) came to the conclusion that the “[practising economist] would be no worse off if he remained ignorant of all theories of consumer behaviour, accepting the obvious indispensable ‘Law of Demand’ on trust”.

The production side of the model also faces equally serious problems. It has long been established that identical micro-production functions obeying all the standard assumptions of neoclassical production theory cannot be aggregated to give a well-behaved aggregate production function, *even as an approximation* (Fisher, 1992, Felipe and Fisher, 2003). These are essentially intra-paradigmatic criticisms as they are logical challenges to the theoretical assumptions within the New Neoclassical Synthesis paradigm.

Kirman’s (1992: 119) conclusions are extremely damaging for the New Neoclassical Synthesis paradigm. “The way to develop appropriate microfoundations for macroeconomics is not to be found by starting with the study of individuals in isolation, but rests in an essential way on studying the aggregate activity resulting from the direct interaction between different individuals. Even if this is too ambitious a project in the short run, it is clear that the ‘representative’ agent deserves a decent burial, as an approach to economic analysis that is not only primitive, but fundamentally erroneous.”

But these criticisms have been simply ignored. The defence of the New Neoclassical Synthesis paradigm is primarily an instrumental one. Primacy is given to the articulation of aggregate models derived from the representative agent approach that closely mimic the observed path of the economy (Lucas, 1977). What matters is that there should be a fully articulated model based on the paradigmatic heuristic that has been shown to be capable of replicating the path of the economy using either preferably calibration or else econometric techniques. It is not that the new classical model can “satisfactorily account for all the main features of the observed business cycle. Rather we have simply argued that no sound reasons have yet been announced which even suggest that these models are, as a class, incapable of providing a satisfactory business cycle” (Lucas and Sargent 1979: 14).⁵

Market Clearing and the Irrelevance of Involuntary Unemployment

The New Classical economics has two further paradigmatic heuristics, namely that agents or households maximise utility and what Lucas calls the “equilibrium discipline” of that “markets always clear”. De Vroey (2007: 331) argues that the change brought about by Lucas was “not only of substance, it was also methodological”. He also states that “it [the claim that markets clear and agents act in their own self-interest] is considered so obvious and universally accepted that no justification for it seems required” (De Vroey 2004: 400).

Cleared markets is simply a principle, not verifiable by direct observation, which may or may not be useful in constructing successful hypotheses about these series [employment and wage rates] (Lucas and Sargent 1979: 21).

It is a methodological imperative that has been made irrefutable, because Lucas and Sargent continue:

Alternative principles, such as the possibility of the existence of a third-party auctioneer inducing wage rigidity and uncleared markets are similarly “unrealistic” in the not especially important sense of not offering a good description of observed labor market institutions.

Consequently, while it is conceded that in principle it may be possible to test these assumptions, (otherwise how could they be deemed unrealistic), the paradigmatic heuristic is “whether [for example] actual contracts can be adequately accounted for within an equilibrium model, that is, a model in which agents are proceeding in their own best interests” (Lucas and Sargent 1979). At the heart of the equilibrium assumption is that if there were any unexploited opportunities in markets they would eventually be exploited. The only “scientific” explanation can be, it is argued, in terms of individual agent’s optimisation (as modelled by the representative agent) and that markets clear. Consequently, there can be no coordination failures leading to lack of effective demand and therefore there can be no involuntary unemployment. Indeed, the very term is an empty theoretical concept that was introduced by Keynes, and, as such, there is no need for the modern economists (that is, New Classical theorists) to explain it. It also means that “meaningless phrases” such as full capacity and slack are absent. The problem is “to explain why people allocate time to a particular *activity* – like unemployment - we need to know why they prefer it to *all* other activities” (Lucas 1987: 54, emphasis in the original).

This methodological view of Lucas, especially with respect, to Keynes’s notion of involuntary unemployment has been analysed in detail by De Vroey (2004). It is sufficient for

our purposes to note how the paradigmatic heuristics, including the use of the representative agent, lead inexorably to this conclusion. If markets are assumed to clear, then by definition, all unemployment must be voluntary (if frictional unemployment is included in the latter term). The Keynesian view that *all* firms may simultaneously layoff workers because of lack of effective demand has no meaning in the New Classical paradigm. Neither does the proposition that unemployment may exceed vacancies in all industries. Moreover, it may not even be profitable for a worker to sell apples on a street corner, as Lucas (1978) suggests, in view of the competition and low prices from the large supermarkets. (Weitzman (1982) somewhat controversially has argued that the presence of increasing returns is a necessary condition for involuntary unemployment for this reason.) Consequently, Blinder's (1987) recourse to empirical evidence in his methodological discussion of "Keynes, Lucas and Scientific Progress" is unlikely to influence anyone, but the already committed.

Inter-Paradigmatic Criticisms

In this section, we consider two criticisms that have arisen from the Post Keynesian paradigm and which illustrate the role of weak incommensurability.

Risk, Uncertainty and the Investment Demand Schedule.

The first criticism concerns how the future is modelled, in other words it involves the fundamental distinction between both rational expectations and risk *vis-à-vis* uncertainty. The importance of the last was the central point of the *General Theory* and has been repeatedly emphasised by Post Keynesians, such as Davidson (1982-83, 2007). The most succinct statements of Keynes's views on the instability of the capitalist economy are to be found in Chapter 12 of the *General Theory*, "The State of Long-Term Expectation" and in his rejoinder to his critics in the 1937 *Quarterly Journal of Economics*. In this he outlined the way fluctuations in investment and hence aggregate demand could lock the economy into a period of sustained unemployment. "Given the psychology of the public, the level of output and employment as a whole depends on the amount of investment. I put it this way ... because it is usual in a complex system to regard as the *causa causans* that factor which is more prone to sudden and wide fluctuations" (Keynes 1937: 121). The key is the volatility of "conventional expectations", expectations that in the presence of uncertainty, rather than Knightian risk, are formed by conventions.

The parting of the ways came with Hicks' formalisation of the *General Theory* as a simple equilibrium IS-LM model. This, and the comparative static exercises that followed from

it, exclude the role of volatile expectations or “animal spirits”. Hicks himself later partially realised this when his whole methodological approach to economics changed (Hicks 1980). He increasingly emphasised the importance of temporal (not logical) time and the role of history (Pasinetti and Mariutti 2008). An inter-paradigm critique of the New Neoclassical Synthesis is, as Davidson repeatedly pointed out, that the world is *non-ergodic* not *ergodic*. With rational expectations, the effect of Knightian uncertainty is assumed away. The fact that the world is not deterministic is modelled by simply the introduction of a stochastic element characterised by well-defined probability distributions.

A good example of the way the Hicks IS-LM model abstracts from uncertainty is through the treatment of the investment schedule and the IS curve in comparative static analyses. A form of IS curve appears in the New Macroeconomic Consensus but is derived from an explicit optimisation process within the representative agent model (Meyer 2001). Nevertheless, it is convenient for expositional purposes to use the Hicks model.

A fall in the interest rate in the IS-LM and AD-AS models increases the volume of investment through the investment schedule. This assumes away any adverse changes in expectations. Thus the investment schedule is assumed not only to be downward sloping with respect to the interest rate, but is stable and not affected by changes in expectations concerning the future net revenue stream. However, suppose that in the presence of falling demand, the interest rate is cut by the central bank. If it is not clear that demand will necessarily rise because of coordination failures, then with this uncertainty, the expectations about the size of the net revenues from a new investment will fall. In these circumstances, as Keynes and Davidson have argued, the firm will stay liquid and not invest. This has the effect of shifting the investment schedule to the left. If expectations may worsen to the extent that total investment and demand might actually fall, notwithstanding the decline in the interest rate, this leads to a self-fulfilling prophecy. This means that it is not possible to determine within the comparative static framework of the IS-LM whether or not output will unambiguously increase or decrease, although one can, of course, show the various possible outcomes within this framework.⁶ With the representative agent model, of course, this problem does not arise as the act of investment must *pari passu* raise demand as there cannot, by definition be any co-ordination failure.

We may illustrate this argument by considering the investment decision facing a typical firm which is deciding whether or not to purchase a piece of capital equipment.⁷ It is assumed that the payback period is five years. Consequently, the decision of the firm is whether or not at time $t = 0$ to irrevocably commit funds (any expenditure is subsequently sunk costs) to this investment which comes on-stream a year later. The expected net present value of the machine $E(V)$ is given by:

$$E(V) = \sum_{t=1}^5 \frac{E(R_t)}{(1 + E(i_t))^t} \quad (1)$$

where R is the net revenues of the goods produced by the machine, i is the cost of borrowing (which is a function of the bank rate). All values are in real terms. $E(\cdot)$ is the expectations operator which may not be well defined mathematically, as a non-ergodic world is assumed.

To see the importance of expectations, let us assume that at time $t = 0$, the real rate of interest is 5 per cent per annum and at this value, $V = V^*$ and $R = R^*$ where the superscript $*$ denotes the Marshallian critical value at which it pays to invest in the machine, i.e.,

$$V^* = \sum_{t=1}^5 \frac{R_0^*}{(1 + i_0)^t} \quad (2)$$

For simplicity, we assume that R_t does not vary over the five years, although its value is uncertain at time $t = 0$. Suppose the economy moves into recession and it is announced that the real interest rate will be cut substantially by five percentage points to zero from $t = 1$, and this is credible. It may be easily shown that if the expected revenues fall by more than 13.5 per cent, compared with R_0 , then notwithstanding the cut in interest rates, it will not be profitable to invest.⁸

The illustrative 13.5 per cent may seem large, but in fact the expected fall in total revenue of the firm will be much smaller than this, because by definition, the production from this new machine is the *marginal* output. For example, suppose that the new investment equals a net addition to the firm's capacity of 10 per cent. Then it would only require a downturn of 1.2 per cent in total revenues to cause the 13.5 per cent decline of the proposed new machine's revenues and hence for the investment not to be undertaken. The picture is more complicated than this because we have abstracted from vintage effects and scrapping, but the argument follows through.

A key variable in the firm's decision is the expected revenue, which will be a function of what it expects other firms do and *vice versa*. Hence, the reason for the crucial role of Keynesian conventional expectations in the investment decision.

Dixit (1992) has incorporated a measure of risk into the net present value equation which shows how, with an increase in risk, it becomes optimal for the firm to delay investing. The measure of risk is simply taken as the volatility of the revenue stream and is assumed to follow a geometric Brownian motion. Nevertheless, the model shows how in principle uncertainty may lead to an inward shift of the aggregate investment schedule, especially if the degree of uncertainty is a function of other firms' investment decisions.

One of the reasons why these criticisms have had little effect within the New Neoclassical Synthesis paradigm is that they lead to ambiguous results. It raises the problem of how to construct models when the relationships are not stable. Nevertheless, recent work by Frydman and Goldberg (2008, 2010) has shown a way forward in terms of modelling expectations more realistically, which necessitates abandoning the rational expectations hypothesis.

The Neoclassical Labor Market and the Fallacy of Composition

The second problem with the Hicks IS-LM model was that while it showed the importance of demand and provided a pedagogical explanation of the Keynesian revolution, it contained the seeds of its own destruction. This was the absence of an explicit supply side; it was assumed that the supply of labor was infinitely elastic at the given price level. This ushered in the first or ‘Samuelson’ neoclassical synthesis, namely the AD-AS model where the price level was endogenised. As the model is short run and the capital stock is fixed, the demand for labor is given by the neoclassical marginal product of labor based on the representative firm’s profit maximising and the supply of labor is determined by households’ optimisation, trading off leisure for work depending upon the real wage.

In the early models, this led to the “old” neoclassical synthesis conclusion that Keynesian “involuntary” unemployment was the result of the real wage being too high. This follows from the paradigmatic heuristic that the labor market is the same as any other competitive market with excess supply the result of the price being above the market clearing level.⁹ The following draws partly on McCombie (1985-86).

Figure 1 displays the standard textbook neoclassical labor market diagram where the demand for labor is given by the marginal product of labor curve. It should be emphasised that we are examining the case where the neoclassical analysis breaks down, even though we still make the assumptions of the existence of a well-behaved production function and the marginal product theory of factor pricing. Like Keynes, we are trying to show the problems of the (neo)classical economists by granting them all their standard concepts.

In anticipation of our later discussion, let us assume a classical savings function where all profits are invested and total wages go to consumption. This is usually omitted in the standard discussion as the driving force behind the model is seen as the flexibility of the real wage. (Assuming workers do not save is not essential for the argument but helps the exposition.)

Consequently, if the real wage is w_l , then total investment (profits) is given by the area abc and total wages (consumption) by the area $bchg$. The amount of labor employed is L_l and is

below the market clearing level of L_e . The proximate cause of ‘involuntary’ unemployment in this scenario is the fact that the real wage is above its market clearing value, w_e . It can be seen that if the real wage falls to w_e for whatever reason, the labor market *must* clear and employment must increase to L_e . Output and profits *must* increase to afg and afd respectively, by the construct of the model. (This is a “paradigmatic prediction”, a result that is in principle empirically testable, but which is assumed to hold by dint of the paradigmatic heuristic.) In effect, Say’s law holds and the determination of the volume of investment by, say, animal spirits as discussed in the last section is ruled out, *ab initio*.

[Figure 1 about here]

However, a stylized fact is the real wage moves procyclically not contracyclically as Keynes (1939) originally thought. Dunlop (1939) and Tarshis (1939) first drew attention to this.¹⁰ This is incompatible with the analysis discussed above. As there are some econometric results where this is not the case, one paradigmatic strategy is to shelve the finding as an anomaly to await further estimates. The other is to develop a model that can allow for this procyclicality, while still maintaining the crucial paradigmatic heuristic of the representative firm and optimisation. The New Classical model does this by relaxing the assumption that the technology is constant and allows for productivity shocks. Within the context of the one-sector model depicted in Figure 2, a increase in the level of technology from A_1 to A_2 (a positive shock) shifts the labor demand curve upwards. The labor supply is assumed to shift upwards to the left as a consequence of a fall in the interest rate (from i_1 to i_2) and the intertemporal optimisation by households. There is a simultaneous adjustment process. Firms produce extra output and increase the wage rate. It can be seen that equilibrium level of employment must, as a consequence of the paradigm, move from L_{e1} to L_{e2} and the real wage moves procyclically. Optimising households, given the increase in the wage rate, increase their employment (i.e., move up their supply curve) and thereby their demand for goods and services which matches the increased output supply. The equilibrium occurs where households are on their labor supply curve. In terms of figure 2, this is at point b . Employment can never be constrained by aggregate demand to be off its supply function, because there is no independent determinant of demand through, for example, a separate investment function where animal spirits can play a crucial role. The position is slightly more complex when prices are sticky, but essentially the argument is the same.

[Figure 2 about here]

The above is a simplification of the New Neoclassical Synthesis model, where firms have a mark-up pricing policy and, in imperfectly competitive markets, they are willing to supply as much as is demanded as the wage is below the marginal product of labor (Goodfriend 2004). There is thus a “Keynesian” transmission mechanism because if demand increases firms will raise the wage to attract the extra labor necessary to supply the output. Thus, through the production function, the demand for output determines the supply, which in turn determines the level of employment. But at the same time, “the classical perspective takes the view that the actual employment [...] must equal labor willingly supplied by households [...] *regardless of the strength of aggregate demand*” (Goodfriend 2004: 30). Employment is determined exactly as in the core real business cycle. The answer to this conundrum, at the risk of over-simplification, is that aggregate demand here is not Keynes’s concept of aggregate demand.

But the “Old” and the New Neoclassical Synthesis suffer from the fallacy of composition and once this is taken into account, involuntary unemployment, in Keynes’s sense of the term, can occur. The short-run production function is given by $Y = f(\mu\bar{K}, L)$ where Y is output, \bar{K} is the fixed capital stock, μ is the rate of capacity utilization, and L is employment. There is a family of marginal product of labor curves, conditional on the rate of capacity utilization. For example, figure 3 shows two such functions, one where there is full capacity utilization μ_e and one where, with a reduction in the use of the capital stock, capacity utilization has declined to μ_l . Although capital is a sunk cost, it is assumed, that given costs of rehiring labor and the damage to worker morale, it is optimal for a profit-maximising firm not to allow labour to bear the whole brunt of the fall in production and for labor hoarding to occur.¹¹ A fall in worker morale, for example, means that less labour services are forthcoming for any given level of employment which, in the absence of any effective control mechanisms by the firm, in terms of figure 1 has the aggregate effect of shifting the marginal productivity curve to the left and reducing total profits.¹²

As the real wage falls, with some simple dynamics, so does aggregate demand. Consequently, inventories will accumulate and firms will begin to cut back on production. In the light of this, they are reluctant to commit themselves to their present level of investment, even though the real interest rate may have fallen, as discussed in the previous section. Capacity utilization falls, the labor demand curve shifts to the left, and labor is laid off. The path of the economy is from a to b in figure 3. For expositional purposes, it is assumed that the real wage falls to $w_2 = w_e$. (Note that we are still adopting the neoclassical assumption that the wage rate is equal to the marginal product of labor.) At this point, the level of aggregate demand, determined by the level of investment has fallen enough to extinguish the excess inventories. After a period of time, capital scrapping will occur and so the $L^D(\mu_l)$ curve becomes the full

capacity utilization labor demand curve. At this point the equilibrium level of employment and the wage rate is now lower than previously, even though firms are profit maximising and the labour supply function is given by the optimisation of households. The neoclassical model (without excess capacity and a shift in the marginal product of labour curve) cannot handle this case, as the above analysis is logically incompatible with employment increasing as w_l falls to w_e in figure 1.

This critique is a case of weak incommensurability, because the same neoclassical concepts are used. Namely, firms and households optimize and the demand for labour is given by neoclassical aggregate production function. The only difference is that the model now allows for excess capacity and a dynamic adjustment process such that a falling real wage drives down demand and hence employment. We thus get involuntary unemployment, notwithstanding the existence of real wage flexibility.

The New Neoclassical Synthesis has to explain the observed fluctuations in capacity utilization in terms of an optimising framework. It does so by assuming that changes in capacity utilization implausibly reflect the optimal amount of time that is used for maintenance (Greenwood, Hercowitz, and Huffman 1988, Barro 2008, chapter 9). No direct test of this hypothesis is provided by Greenwood, Hercowitz and Huffman (1988) who merely adopted the standard calibration exercise and find that the variance of the macroeconomic variables are close to those observed in the real data. It should be noted that the detailed discussion of the empirics of capacity utilization by Corrado and Matthey (1997: 166) make no reference to variations in it being due to changes in maintenance, but attribute it explicitly to variations in aggregate demand.

[Figure 3 about here]

New Keynesian Menu Costs, Unemployment and the Fallacy of Composition.

As Caplin and Spulber (1987) show the fallacy of composition equally applies to the New Keynesian model of pricing policy under menu and other adjustment costs. These adjustment costs imply that firms do not adjust prices until a trigger point is reached where the increased profits from raising the price exceeds their implementation costs. The New Keynesians, thus, see unemployment occurring because of lack of instantaneous price flexibility, which is due to an optimal pricing policy by firms. It also leaves a role for monetary policy. (This stands in contrast to the Post Keynesians who do not see price rigidity as the *cause* of involuntary unemployment.) Thus, the price stickiness of the representative firm (although the firms are assumed to have staggered price setting) provides the microfoundations

for price stickiness at the macroeconomic level. However, Caplin and Spulber show that money shocks do not have aggregate real effects when price changes are endogenously determined in response to the size of monetary shocks, rather than occurring at preset times with fixed-length contracts, as in many such models. On aggregating across firms, price stickiness disappears even when the timing of price adjustments is staggered. Hence, monetary shocks are neutral and the New Keynesian explanation of cyclical fluctuations in employment is considerably weakened.

Caballero (1992) constructs a simple probabilistic model that also shows the effects of the fallacy of composition. He considers the asymmetric case where employment creation by a firm during an upswing is less than employment destruction in a downswing, but occurs with greater frequency. This is due to asymmetric adjustment costs. The outcome is that if all firms have identical adjustment costs and face the same (that is, perfectly correlated) demand shocks, then this will carry through to the macroeconomic level and will cause cyclical fluctuations in employment. In other words, this can be analysed using a representative agent model. But if the firms' shocks are not perfectly correlated with each other then in the aggregate these employment asymmetries are washed out and aggregate causes are required to explain the employment fluctuations. While Caballero argues that this does not mean that the microeconomic forces are irrelevant to the explanations of aggregate phenomenon, he does concede that "*direct application of micro economic explanations to aggregate data can be seriously misleading, since they typically do not consider the natural probability forces that tend to undo such explanations*" (1992: 1291, emphasis in the original). This reinforces the problems of using the representative firm as the basis of the explanation given the problems posed by the fallacy of composition.

Both the Caplin and Spulber (1987) and Caballero (1992) arguments are intra-paradigmatic critiques and ironically strengthen the New Classical emphasis at the expense of the New Keynesian in the New Neoclassical Synthesis. Given these results, the alternative explanation for cyclical fluctuations in employment is that it is due fluctuations in aggregate demand in Keynes's sense of the term and emphasised by the Post Keynesians. But, as we have seen above this explanation, which involves the existence of involuntary unemployment, is ruled out by the neoclassical paradigmatic heuristic.

Conclusions

In this article a Kuhnian approach has been followed in an attempt to understand the continuing controversies in macroeconomics. First, the *intra*-paradigm criticisms of the New Neoclassical Synthesis which go beyond the puzzle solving of normal science were discussed.

They challenge the logical foundations of the paradigm and therefore should not be shelved as anomalies, although with respect to the New Neoclassical Synthesis they are. These critiques include the problems concerning the stability of equilibrium (the Sonnenschein-Mantel-Debreu theorem) and the insuperable problems of aggregating both household utility functions and micro-production functions. The last two invalidates the use of the representative agent.

Secondly, we discussed the *inter*-paradigm criticisms that involve weak incommensurability, where many of the variables and assumptions are the same, but the paradigmatic heuristics differ. Most notably, we considered the effect of uncertainty on the investment schedule and the introduction of an assumption, the possibility of excess capacity, that vitiates the result that “markets always clear” and that employment fluctuations (even with price stickiness) are always optimal, that is, the assumption that labor is always on its supply curve.

Given that the paradigm heuristic is determined by the textbooks, worked examples and demonstration, the neoclassical approach with its emphasis on the representative agent and methodological individualism has a powerful inertia effect. We have shown how a Keynesian explanation of unemployment can be couched in neoclassical terms, but because of weak incommensurability is not persuasive to neoclassical economists. In spite of the sub-prime crisis, the New Neoclassical Synthesis is seen by many to be relatively unscathed (but with the imperative to build in assumptions that allow for debt default and bankruptcy) and the Treasury view has returned to UK macroeconomic policy.

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Notes

¹ Krugman's title of his *New York Times* (6 September, 2009) article on the 2008 crisis says it all: "How Did Economists Get it so Wrong?"

² The former term is normally applied to the theoretical models and the latter to the applied work resulting from these models on monetary policy, including inflation targeting.

³ See, for example, Hoyningen-Huene (1993, p.207, fn. 58), Hoyningen-Huene and Sankey (2001) and Soler, Sankey, and Hoyningen-Huene (2008).

⁴ The work of Lakatos which is essentially an interpretation of Kuhn within a Popperian framework has proved an attractive alternative to the paradigm. However, the great weakness of Lakatos is his belief that any putative incommensurable theories can be made comparable by the use of a suitable 'dictionary'. (Lakatos 1970: 79, fn 1).

⁵ However, in an unguarded moment Lucas (2004: 23) noted "The problem that the new theories, the theories embedded in general equilibrium dynamics of the sort that we know how to use pretty well now – there's a residue of things they don't let us think about. They don't let us think about the U.S. experience in the 1930s or about financial crisis and their real consequences in Asia and Latin America,

They don't let us think, I don't think (*sic*), very well about Japan in the 1990s". As Laidler (2010: 42) comments, "some residue!"

⁶ See Bibow (1998) for a discussion of the interrelationship between confidence, investment and the liquidity preference.

⁷ See Baddeley (2003) for a discussion of the various theories of investment and the empirical evidence.

⁸ To see this assume that $R_0 = R^*$ is 100. With an interest rate of 0.05, the net present value of the machine is 433, which we assume is the price of the machine. If i falls to zero, *ceteris paribus*, the net present value rises to 500. Under these circumstances, if there is then a fall in total net revenues by 13.5 percent over the five years due to a fall in demand, the net present value declines to 433 again, the critical value. Any further fall beyond 13.5 per cent will make the investment unprofitable even though the interest rate is zero.

⁹ This is notwithstanding the argument of some Post Keynesians (see especially Davidson, 1982) that there is a direction of casualty absent in the neoclassical paradigm. Aggregate demand determines output which in turn determines the level of employment (via the production function) and then, in turn, the real wage via the marginal product of labor. More fundamental problems are that the aggregate marginal product of labor curve theoretically does not exist (Fisher, 1992). Nor can econometric testing provide any support for the proposition that it can be treated as an approximation, as the results are merely a statistical artefact (Felipe and McCombie, 2009).

¹⁰ See Bils (1985), and Solon, Barsley, and Parker (1994).

¹¹ An alternative explanation is to assume a putty-clay production function and that there are *ex post* fixed coefficients of production, but this is not the normal neoclassical approach.

¹² This is related to the efficiency-wage hypothesis.

Figure 1: The Neoclassical Labour Market

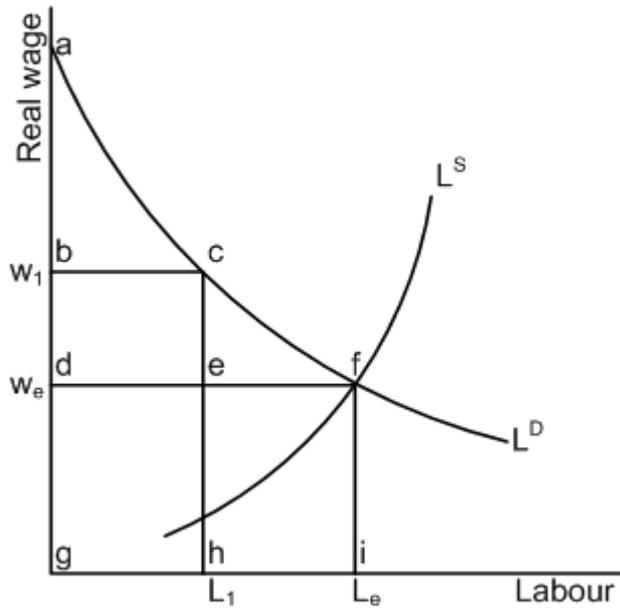


Figure 2: The New Classical Labour Market

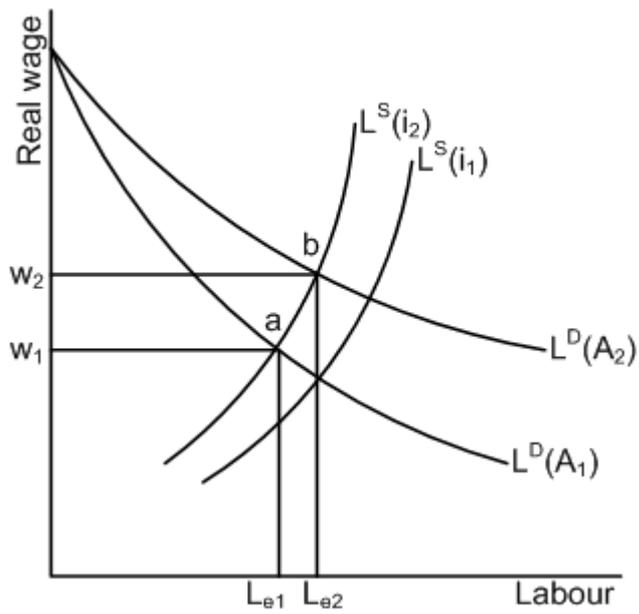


Figure 3: The Post Keynesian Labour Market

