The new macroeconomics has no clothes

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The new macroeconomics emerged from the new classical counter revolution against Keynesian economics in the 1970s. Today it is regarded as the dominant form of macroeconomic analysis despite the fact that it proved incapable of anticipating or understanding the global financial crisis (GFC) of 2007-09 and that it was based on well-known conceptual errors. The new macroeconomics is based on Walrasian/Arrow-Debreu general equilibrium microeconomic foundations that preclude any role for money, banks, finance or governments. Attempts to integrate these institutions into micro-founded general equilibrium models where no such functions are required represents a misapplication of the Walrasian/Arrow-Debreu model and leads only to confusion. The conceptual errors that existed before the GFC continue to go unrecognised or unacknowledged and undermine the post GFC attempts to correct what were perceived to be limitations of the theory. Today the new macroeconomics has no sound economic foundations, microeconomic or macroeconomic; it has no clothes.

Key words: Time-0 auction, perfect barter, Walrasian, Arrow-Debreu, new macroeconomics.

JEL codes: D5, E4, E5.

I INTRODUCTION

The new macroeconomics evolved from the new classical counter-revolution against old Keynesian macroeconomics when the rational expectations hypothesis was applied to models said to have 'sound microeconomic foundations'. Today there are three distinct theoretical strands to the new macroeconomics; the new classical, new Keynesian and new monetarist. And for policy purposes macroeconomists rely on dynamic stochastic general equilibrium (DSGE) models built on a new classical real business cycle (RBC) core with new Keynesian rigidities and frictions added. In all these cases theorists aligned with the older schools seek to apply the perceived rigour of the new approach to their world vision.

Nevertheless, the new macroeconomics experienced a setback with the global financial crisis (GFC) in 2007-09 that focussed attention on some of its limitations and led at least one prescient observer, Buiter (2009) to attribute the inability of economists to anticipate and/or understand what was going on to the complete state of uselessness of contemporary monetary theory. Yet these flaws, and earlier exposé of the conceptual flaws in these models by Hahn (1965, 1981, 1982), Hoover (1988), Kirman (1989), Laidler (1990) and Rogers (1989, 2006) had done little to shake faith in the new techniques as Solow (2008) and Goodhart (2009) noted. So today many economists continue to employ the methods and core theory of the pre-GFC new macroeconomics but acknowledge some of the earlier omissions and seek to correct them.

[1] I would like to thank two anonymous referees of this journal for constructive suggestions that greatly improved an earlier draft. Any remaining errors are mine.

Examples that illustrate such attempts are; Brunnermeier and Sannikov (2014), who seek to incorporate a financial sector into macroeconomics, something that they acknowledge was missing from earlier versions of the model; Woodford (2011), who presents the simple analytics of the government expenditure multiplier in a moneyless world of self-employed capitalists; Williamson (2012, 2013, 2014), who seeks to analyse financial crises in a new monetarist model; and, Benes, Kumhof and Laxton (2014) who replace what they describe as the previous false treatment of banks in their 'old' DSGE model with what they now regard as the correct treatment.

This brings us to the objective of this paper, which is to again highlight the fact that well known, but obviously generally misunderstood or ignored, conceptual mistakes live on in the attempts to rehabilitate the new macroeconomics after the GFC. Exponents of the new macroeconomics in all its varieties have yet to acknowledge the fatal flaw at the heart of their theoretical structure. Instead, exponents of the new classical macroeconomics continue to behave as if they are competing with the White Queen to believe more than six impossible things before breakfast.[2] As a result, the new macroeconomics is reduced to exercises in misapplied mathematics. It is little wonder that Paul Krugman (2009) thinks that macroeconomics has returned to the Dark Ages.[3]

To illuminate the Dark Ages into which the new macroeconomics has blundered section II gives a brief summary of the well-documented conceptual flaws in the new macroeconomics prior to the GFC. Section III then considers examples from real business cycle, new Keynesian and new monetarist theory after the GFC to illustrate how these conceptual and logical muddles are carried over. The same is obviously true of DSGE models built on RBC and new Keynesian foundations. Section IV concludes that theorists in the traditions of the new macroeconomics continue to ignore the fundamental properties in their economic theory and consistently misapply that theory.

II CONCEPTUAL FLAWS IN NEW MACROECONOMICS PRIOR TO THE GFC

The nature of the conceptual muddle into which the new macroeconomics has blundered was clearly anticipated by Keynes's (1936, p. 192) assessment of Ricardo:

"Ricardo offers us the supreme intellectual achievement, unattainable by weaker spirits, of adopting a hypothetical world remote from experience as though it were the world of experience and then living in it consistently. With most of his successors common sense cannot help breaking in – with injury to their logical consistency".

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[2] Brian Loasby (1976, p. 27) drew attention to this feature in early versions of the new macroeconomics.

[3] Krugman (2009) is critical of the Cochrane, Lucas or Fama view that 'complete crowding out' of the fiscal policy always occurs when that result is the inevitable implication of inserting fiscal policy into a well-specified Walrasian general equilibrium model where such a policy has no role.

If we substitute Arrow-Debreu for Ricardo this is essentially what has happened to the new macroeconomics.

Two fundamental mistaken beliefs lie at the core of all the confusion that now envelopes the new macroeconomic. First is the belief that the Walrasian or Arrow-Debreu model is the developed part of economic theory so the only way to do macroeconomics and monetary theory. Second, is the belief that the Walrasian/Arrow-Debreu approach can be applied directly to analyse the behaviour of any existing, competitive, free market monetary economy. But, even if the first belief were true the Arrow-Debreu model is not intended to serve the second purpose. The Arrow-Debreu model illustrates what the world would have to look like to generate a general equilibrium solution of the type imagined by Walras. As Rogers (1989, pp. 140-141) explained, Hahn (1981, 1982) had consistently made that clear.

Recall that the Arrow-Debreu model assumes the existence of tastes (utility functions), technology (production functions) and physical endowments (commodities and, or factors of production). These elements are then combined with the assumption that a competitive equilibrium can be modelled as if it were a centralised auction conducted at time-0 and covering all goods and services across an infinite time horizon for all possible states of the model. In his recent book, King (2016, pp. 78-83) gives a graphic description of the absurdity of any attempt to apply a model based on these assumptions to any existing economy.

Nevertheless, for the technically inclined, Ljungqvist and Sargent (2004, p. 217) provided a formal definition that illustrates how the notion of competitive market-clearing equilibrium is conflated with the concept of the time-0 auction:

"In the competitive equilibrium all trades occur at *t = 0* in one market. Deliveries occur after t = 0 but no more trades. A vast clearing or credit system operates at *t = 0*."

The fact that competitive equilibrium requires the existence of this imaginary but non-operational auction is the origin of all the confusion that exists in the new macroeconomics. As it is not possible to replicate the time-0 auction the Arrow-Debreu existence proof is of academic interest only – it is an imaginary answer to an imaginary question. It certainly does not provide the basis for macroeconomics and monetary theory.

But unlike Ricardo or Arrow and Debreu many economists cannot help common sense from breaking in so they seek to put the model to use by applying it as if it were a model of an existing economy. As Keynes warned, when this step is taken logical error results. The most well-known example of where this happens is the treatment of money.

As many have noted over the years, models that rest on the assumption of a time-0 or Walrasian auction have no role for money[4]. There is no money in

[4] Recall Hahn's (1982, p.1, emphasis added) statement of the problem: "*The most serious challenge that the existence of money poses to the theorist is this: the best developed model of the economy cannot find room for it*. The best-developed model is,

Arrow and Debreu (1954) or Debreu (1959) because none is required. In other words the time-0 auction is a substitute for the institution of money and converts the model into one of *frictionless*, *perfect barter*. The following examples briefly remind the reader of the nature of the logical and conceptual errors that occur in the mistreatment of money in models based on the time-0 auction.

Perhaps the most egregious example was Wallace's (2004) attempt to find a role for a central bank's interest rate rule in a cashless Arrow-Debreu model. But as everyone agrees that the Arrow-Debreu model has no need for money it follows, *ipso facto*, that there is also no need for a central bank let alone interest rate rules in a cashless (read moneyless) model. It was never intended that the Arrow-Debreu model be applied to an existing monetary economy in this fashion.

Nevertheless, in similar vein, Cochrane (2005) seeks to adjudicate between theories of the price level in what he calls a 'well-specified Walrasian general equilibrium model', but fails to appreciate that such a model has no need for a price level so is unable to adjudicate between competing theories. Cochrane's well-specified Walrasian general equilibrium model has a perfect barter core to which a cash-in-advance (CIA) constraint has been added. As such the CIA constraint adds a friction or inefficiency to an otherwise perfect barter or frictionless core, as Clower (1984, p. 275) realised. Consequently, as Rogers (2007) explains, if there is no need for money in the core of Cochrane's frictionless (moneyless) model there is no need for the price level either.

Finally, the work by Woodford (2003) illustrates all of the points made above as it incorporates the same conceptual errors that result from adding money to a model where no money is required. Woodford attaches a CIA constraint to a complete markets Arrow-Debreu structure. He then presents the argument that as the model approaches the 'cashless limit' the central bank can still determine the rate of inflation by manipulating the nominal rate of interest. As Rogers (2006, 2011) explains, this is pure fiction and should give even the most persistent *idiot savant* pause for thought.

It should now be apparent that Woodford (2003) makes a redundant attachment of money to his general equilibrium system based on the time-0 auction and is then delighted that he can make money disappear at the 'cashless limit', the moneyless or frictionless perfect barter state of the model, without disturbing the 'real' (perfect barter) general equilibrium solution. But as we now all know, this was precisely Hahn's (1965) point when he noted the problem of proving the existence of a monetary equilibrium in models based on a Walrasian or time-0 auction; a non-monetary perfect barter equilibrium always exists. Believing that this system can then be used as a foundation for a theory of monetary policy,

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of course, the Arrow-Debreu version of a Walrasian general equilibrium. A world in which all conceivable contingent future contracts are possible neither needs nor wants intrinsically worthless money. The point is obvious and has been made quite often. But it is doubtful that it has been fully taken on board."

as Woodford (2003) and Galí (2008) suggest, might make even the White Queen blush.

It should come as no surprise, then, that Borio and Disyatat (2011, Appendix A, p. 31, emphasis added) reach the following conclusion about Woodford's (2003) model: [5]

"The canonical model is that of a money-less economy that can do away with the ultimate settlement medium (Woodford's (2003) "cashless economy"). Indeed, paradoxically*, when settlement balances (money) are introduced, they act as a "friction", not as the indispensable lubricant* in an otherwise inefficient barter-exchange mechanism. It is an economy in which credit is just a vague shadow in the background: since credit does not affect behaviour, its evolution does not need to be tracked. When banks are introduced, credit may have more information content. But, even then, intermediaries do not generate purchasing power, they simply transfer real resources from one sector to the other. *The underlying economy is, in this sense, a real economy disguised as a monetary one*. Credit is just another real resource that households make available to entrepreneurs."

Essentially, what changes after the GFC is the nature of the, usually poor, disguise that is applied to obscure the perfect barter model; the so-call 'sound microeconomic foundations'. The conceptual flaws at the heart of the new macroeconomics remain.

III CONCEPTUAL FLAWS IN NEW MACROECONOMICS AFTER THE GFC

Recall that Wallace, Cochrane and Woodford all make the same conceptual error; applying a theoretical structure that has no need for money to analyse questions of monetary theory and policy. The result is mumbo jumbo[6].

Unfortunately, as the following examples illustrate, mumbo jumbo seems to be an endemic feature of the new macroeconomics.

(i) *Brunnermeier and Sannikov's attempt to incorporate a financial sector into a macroeconomic (RBC) model*

Brunnermeier and Sannikov (2014) propose to incorporate financial markets into a RBC model; which they equate with macroeconomics.

Recall that Buiter (2009) charged that the 'complete markets' new classical and new Keynesian models did not allow questions about insolvency and illiquidity to be answered, they did not even allow them to be asked! Clearly RBC models don't pretend to have answers to Buiter's criticism. Brunnermeier and Sannikov (2014) therefore propose to fill that gap by incorporating financial markets into a RBC model.

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[5] For a more favourable view of Woodford that does not mention these limitations see Fischer (2016).

[6] This development is not restricted to economics, see Wheen (2012). In this context, the new macroeconomics results in bewilderment and confusion.

As we may by now anticipate this does not end well. Allowing common sense to dictate that financial markets and liquidity should be introduced into a model where they are not required inevitably leads to confusion; in this case changing the meaning of words. Obviously, in the Brunner and Sannikov model there is no money so introducing 'financial markets' into a RBC model where they are not required will simply convert financial markets into 'frictions' in what was otherwise a frictionless world of perfect barter.

Brunnermeier and Sannikov (2014, p. 384, emphasis added) actually state this clearly:

"In an economy *without financial frictions and with complete markets,* the flow of *funds* to the most productive agents is unconstrained, and, hence, the distribution of wealth [endowments] is irrelevant*. With frictions, the wealth distribution may* change with macro shocks and affect aggregate productivity*.* When the net worth of productive agents becomes depressed*, the allocation of resources (such as capital) in the economy becomes less efficient,* and asset prices may decline."

The deep, but nevertheless trivial, conceptual errors in the Brunnermeier and Sannikov description are further revealed by their use of the word 'funds'. From this description we are told that in a world without financial 'frictions' there is no constraint on the flow of 'funds' to the most productive agents. But, as pointed out previously, there is no need for 'funds' or money in the complete markets model; it is an imaginary world of perfect barter in which all physical endowments are equally liquid in the sense that they can be exchanged against each other under the time-0 auction. This is a well-known property of Walrasian/Arrow-Debreu general equilibrium systems noted by Hahn (1982); but see also Lucas (1984).

This is most obvious when Brunnermeier and Sannikov (2014, p. 386) also assume the existence of a 'fully liquid' market in which *physical capital* is traded between households and firms. Now this is obviously a false statement about the economy in which we live (no such market exists) but, as all well-educated Walrasian general equilibrium theorists know, *it is a property of the perfect barter (real) business cycle model* in which all physical endowments are perfectly liquid in the sense that they can always be exchanged directly across time and space for any other commodity, without the need for money or credit, under the time-0 auction.

Thus, in the Brunnermeier and Sannikov 'economy without financial frictions' if all endowments are equally liquid no 'funds' are required. Hence, in this 'economy', 'funds' are not finance or money but any endowment, be it jam, an iPad or a Porsche! Brunnermeier and Sannikov are confusing 'funds' with the time-0 auction and changing the meaning of the word 'funds'. The same conclusion applies to their use of the concept of liquidity. As any monetary theorist knows, liquidity is defined as the ability to convert any asset into money at short notice with minimum loss. But as there is no money in a real business cycle model the concept of 'liquidity' as employed by Brunnermeier and

Sannikov (2014) is not the concept of liquidity relevant to the understanding of financial crises.[7]

We seem to be in the world of Humpty-Dumpty (an associate of the White Queen) where words can mean what we want them to mean. There are no 'funds' or 'liquidity' in the model as these terms is commonly understood or defined in monetary theory.

Ultimately, in addition to changing the meaning of words, Brunnermeier and Sannikov also produce the counterintuitive conclusion that their 'economy' is less efficient with a financial sector than it is without one. Adam Smith would not be impressed. Like Woodford and Cochrane who convert money from a lubricant to a friction Brunnermeier and Sannikov convert finance from a lubricant to a friction. That begs the obvious questions: why does the financial sector exist? Why doesn't the world revert to perfect barter as in the real business cycle model? The answer is obvious but seems to have escaped exponents of these models.

(ii) *The simplistic analytics of government expenditure multipliers*

The previous examples dealt with the treatment of money and finance in the new macroeconomics to illustrate the conceptual confusion that occurs when those concepts are introduced into a model or theoretical structure where they are not required. Unfortunately, the same is true when it comes to attempts to model the role of government and fiscal policy. Woodford (2011) is a revealing example of how the Walrasian/Arrow-Debreu inspired model at the core of the new macroeconomics has distorted clear thinking. The most obvious example is its inability to deal with Keynes's concept of involuntary unemployment and the concept of an output gap followed closely by changing the meaning of the word 'multiplier'.

To examine what he calls the *simple analytics* of government expenditure multipliers Woodford (2011) begins with a benchmark neoclassical model of competitive equilibrium that is a particular version of a model proposed by Barro and King (1984). In addition to tastes, endowments, technology *and the time-0 auction*, Woodford introduces another agent called 'government'. This agent simply consumes some of the output - acquired by imposing a lump-sum levy (tax) on other agents.[8]

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[7] Nor is the definition of liquidity used by Allen and Gale (2007, Chapter 3: 59) who define liquidity as follows: "*The liquid asset (also called the short asset) is a constant returns to scale technology that takes one unit of a good at date t and converts it into one unit of the good at a date t+1, where t = 0, 1*". Clearly this is nothing more than an implication of the time-0 auction and makes Buiter's point.

[8] Taxes other than lump-sum introduce distortions into the physical commodity exchange rates produced by the time-0 auction introducing what RBC or new classical theorists call 'inefficiency wedges'. RBC theorists have convinced themselves that government can make welfare improvements by minimising the size of these inefficiency wedges. Of course the logical outcome in the model is for government to remove itself.

From this set-up Woodford produces what looks like the simple expression from an old Keynesian income-expenditure model; expression (1.3) below (equation numbers follow Woodford).

$$Y_t = C_t + G_t \qquad (1.3)$$

Appearances can be deceptive, however. Expression (1.3) cannot be interpreted in old Keynesian fashion to derive Kahn-Keynes multipliers. The model from which (1.3) is derived is not an aggregate model based on the traditional consumption function but a model with 'sound microeconomic foundations' where the representative agent is a self-employed capitalist and equilibrium is derived under a time-0 auction.

This becomes obvious when Woodford subtracts government consumption from output in the utility function of the self-employed capitalist (he assumes an infinite 'number' of identical capitalists) and then examines how total output, Y changes when the size of this government consumption changes. Introducing an agent called government is a redundant addition to the model that leads to the now familiar conceptual confusion and false conclusions.

To begin with, it is apparent that in the model used by Woodford, government is a parasitic welfare-reducing agent.[9] If government were removed the remaining agents would be better off because they would no longer be subjected to lump-sum taxes that reduce their consumption. Government does nothing useful in the model so is best removed to allow the time-0 auction to do its job; that is, government is a 'friction' in the model. This is a conclusion that would appeal to the exponents of no or small government, but obviously ignores the fact that governments perform welfare improving activity by the provision of public goods. The possibility that government may play a role in stabilising the aggregate economy is also not even considered in models of the type presented by Woodford (2011). In particular, the inclusion of 'agents' as self-employed capitalists means the concept of involuntary unemployment has been defined away so this leaves little for stabilisation policy to do.[10]

The conceptual confusion is compounded when Woodford derives what he calls the government 'expenditure multiplier' which he writes as expression (1.7) below,

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[9] Woodford's model could perhaps apply to the period after the Norman Conquest of 1066 where taxes were imposed once the Doomsday Book established the tax base in England.

[10] That involuntary unemployment is defined away in models with well-specified microeconomic foundations and populated by self-employed capitalists has disastrous consequences when such models are applied to assess the stance of fiscal policy - as Spanish economists discovered when they were informed by the European Commission that the natural rate of unemployment in Spain had risen to 26 per cent in 2011, Andrés and Doménech (2013). That converted what was largely a cyclical fiscal deficit into a structural one!

$$\frac{dY}{dG} = \frac{\eta_\mu}{\eta_\mu + \eta_\nu} \qquad (1.7).$$

Where, $\eta_\mu > 0$ is said to be the negative of the marginal utility of consumption and $\eta_\nu > 0$ the elasticity of the marginal product of labour in production. Clearly, this expression must inevitably be less than one in any state of the model so is in stark contrast to a Kahn-Keynes multiplier that is dependent on the state of the aggregate economy and when relevant is expected to be greater than one but not very large.[11]

Now, clearly, whatever expression (1.7) describes it is not an *expenditure* multiplier. There is no money so there can be no expenditure in Woodford's model. The variable *G* in expression (1.3) refers to physical consumption by the parasitic and redundant agent called 'government'. Like Brunnermeier and Sannikov, Woodford is changing the meaning of words.

Furthermore, it is far from clear what the term 'multiplier' means in Woodford's benchmark model. Expression (1.7) describes how output changes as a utility maximising, self-employed capitalist changes consumption, work effort and output under a time-0 auction when a new agent called government requisitions some of her output without compensation. Hence only elasticities of consumption and effort (production) are included in the expression (1.7).

For comparison, the old Keynesian multiplier derived from the traditional income-expenditure interpretation of expression (1.3) is reproduced as (1.7')

$$\frac{dY}{dG} = \frac{1}{(1-c)} \qquad (1.7').$$

Where, *c* is the marginal propensity consume derived from an *aggregate* consumption function.

Consequently, it should now be clear that the 'multiplier' in expression (1.7) has nothing in common with the Kahn-Keynes multiplier in (1.7'). The 'multiplier' in expression (1.7) is derived from a model that rests on a *time-0 auction* and as such is entirely imaginary without any coherent empirical basis. By contrast, the multiplier in expression (1.7') is based on the concept of an aggregate consumption function that produces a multiplier that has a long established empirical existence. At best expression (1.7) should be described as the government consumption factor rather than 'multiplier' – there is no multiplier effect in Woodford's model!

The above discussion of 'multipliers' by Woodford provides another simple illustration of how concepts from old macroeconomics are redefined by exponents of the new macroeconomics even when the same words are used to

[11] As Blanchard and Leigh (2013) demonstrated.

describe them. Changing the meaning of concepts and words in this way is nevertheless an inevitable consequence of introducing concepts into a model where they are not required.

(iii) *Money in new Monetarist models*

The new monetarists are represented by Williamson and Wright (2000) and propose to deal specifically with questions of liquidity and financial crises as in Williamson (2012, 2013, 2014). In short they also take up Buiter's challenge. New monetarists are rightly critical of new Keynesian monetary theory on the grounds that the models employed have no 'essential' role for money in Hahn's (1965, 1973a, b) sense. They therefore seek to give money an essential role without the need to fall back on the old monetarist doctrine based on monetary aggregates. To this end they incorporate search theory and require that all participants use money to make purchases. In this way they allow money to lubricate the search process as monetary exchange dominates barter by avoiding the constraint imposed by the double coincidence of wants, for example.

Unfortunately search theory alone produces intractable indeterminacy. So to render their models tractable new monetarists restrict the search-theoretic component of their analysis to what they call *decentralised trading* and augment the model with what they call *centralised trading*. As they acknowledge, what they call centralised trading is simply a version of the Walrasian centralised 'market', in other words the time-0 auction. New monetarist models therefore consist of two elements; a component with decentralised trading where money helps to improve trade outcomes and a Walrasian general equilibrium component where money has no role.

The difficulty with this strategy should now be obvious; the model includes elements where money is required or is 'essential' – the decentralised markets- with elements where it is not required – the centralised Walrasian 'market'. Consequently, for the model as a whole, this strategy is logically equivalent to the imposition of a CIA constraint because although money may be a lubricant in the search process, search clearly leaves a residual inefficiency or indeterminacy that must be removed in the centralised Walrasian 'market'. That again begs the questions: Why do the decentralised markets exist if they are inefficient relative to the centralised 'market'? Why doesn't the efficient centralised Walrasian market crowd out the inefficient decentralised money-using markets? The obvious answer is that monetarists would then have nothing to say because money would have no essential role. But inserting money into a model with a centralised Walrasian 'market' results in the by now familiar confusion.

This is revealed by Williamson's (2013, p.5) version of the model when we are told that money trades at a 'price' in terms of goods in the centralised Walrasian 'market'. Clearly this is what new macroeconomists like Cochrane would call the price level. To compound the conceptual confusion a central bank is also said to exist in the centralised Walrasian 'market' and trades money for short and long-term government bonds. As we already know, there is no need for a central bank or government bonds in a Walrasian component of the model based on a time-0

auction. What looks like an analytical short cut, the use of centralised trading in the Walrasian 'market', turns out to be the same *cul-de-sac* into which new classical and new Keynesian theorists have blundered.

Consequently, like all other exponents of the new macroeconomics, Williamson introduces institutions and concepts that actually exist, into the Walrasian 'market' component of his model where those institutions and concepts have no role under the time-0 auction. He fails to notice this because he treats his assumption of a 'continuum of buyers and sellers' as a mathematical expression for perfect competition, which in turn he tacitly treats as the same thing as the time-0 auction.

As should be well-known, the assumption of perfect competition does not necessarily imply a time-0 auction. It certainly did not in Marshall. So Walrasian/Arrow-Debreu general equilibrium theory does not provide the relevant microeconomic foundations for the macroeconomics of Keynes or Friedman – both professed Marshallians – and Solow (1986, 2010) has consistently warned about conflating microeconomic foundations with Walrasian general equilibrium theory.

(iv) *Banking in DSGE models*

The treatment of money and banking in DSGE models also exhibits all the conceptual and logical flaws outlined above. This should not come as a surprise as the theoretical structure of DSGE models set out by Galí (2008) embodies all the conceptual flaws inherited from Wallace, Cochrane and Woodford.

More formally, as outlined in Rogers (2013, 2014), Galí (2008) has parameters that control the degree of competition and price stickiness and when these are set to zero the model reverts to a simple RBC model to which a CIA constraint or quantity equation has been added, when convenient. And, as McCandless (2008, p. 184) recognised, but seemed to condone, that inevitably produced a model in which money was a friction rather than a lubricant. That conceptual muddle is, of course, easily removed by setting the CIA constraint to zero in the cashless limit. Unfortunately, that produces a model at odds with experience and of little use to policy makers.

In addition, the perfect barter or frictionless properties of the DSGE methodology and theory make it impossible to incorporate money, banking or financial markets. At the risk of repeating ourselves; to do so would simply convert those elements into frictions or distortions to what is otherwise a frictionless world of perfect barter.

That is indeed the fate of the new DSGE model of Benes, Kumhof and Laxton (2014) when they propose to replace what they rightly note is a false model of banking, where banks make physical loans, e.g., lending tractors in a perfectly liquid market for physical capital as assumed by Brunnermeier and Sannikov (2014) above, with the true model where banks make money loans that create deposits. In the context of their DSGE model, money and banks are redundant additions to the model so when they are added they convert banks into a friction.

Furthermore, as we have seen repeatedly above, we reach the by now familiar counter intuitive conclusion that when the true theory of banking is embedded in the model it is less efficient than the model with the false theory.

Borio (2012, p. 1) anticipated this outcome:

"However, the prevailing, in fact almost exclusive, strategy is ..... to graft additional so-called financial "frictions" on otherwise fully well behaved equilibrium macroeconomic models**,** built on real-business-cycle foundations and augmented with nominal rigidities. The approach is firmly anchored in the New Keynesian Dynamic Stochastic General Equilibrium (DSGE) paradigm."

IV CONCLUSION

The new macroeconomics, be it new classical (RBC), New Keynesian or new monetarist rests on two unfounded beliefs; First, that the Walrasian,/Arrow-Debreu approach to general equilibrium theory is the advanced part of economic theory so the only way to do macroeconomic analysis; and, second, that this advanced theory can be applied directly to study aspects of existing economies.

It was never intended that so-called well-specified Walrasian/Arrow-Debreu models be applied directly to study existing economies. In particular, the rigorous existence proof provided by Arrow and Debreu specifies what the world would have to look like if a general equilibrium solution of the sort imagined by Walras were to occur. As those conditions are so implausible only an *idiot savant* would be tempted to apply the Arrow-Debreu model directly. Yet this is where we find ourselves today.

Exponents of the new macroeconomics, by allowing common sense to break in, seek to introduce institutions from the world of experience into the Arrow-Debreu model where they are not required with the consequential damage to their logical and conceptual coherence.

Contra the recent assessment by Wren-Lewis (2016), the new macroeconomics does not exhibit internal logical consistency – it is littered with conceptual and logical error – so cannot represent a progressive research program in the sense of Lakatos. The sooner new Keynesians realise this the sooner we can bring macroeconomics back from the Dark Ages.

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