Towards new microfoundations for macro

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Marcus Miller surveys the challenges facing modern macroeconomics, and suggests ideas whose time may have come.

Michael Woodford’s masterly monograph on *Interest and Prices*, published in 2003, marked a decisive shift in monetary economics from looking at the quantity of money to the cost of borrowing – a shift from Milton Friedman back to Knut Wicksell. It was, moreover, inspired by an over-arching vision – the creation of a new synthesis that would reconcile mainline macroeconomics with dynamic general equilibrium modelling, as practised by real business cycle theorists in particular.

How was this done? By subtle modifications of the relations describing equilibrium in the money, goods and labour markets – known in brief as the LM, IS and Phillips Curve relations, respectively. First, the Hicksian LM curve was replaced by a Taylor rule for anti-inflationary interest rate setting. Second the IS curve was reinterpreted as a forward-looking Euler equation that takes current and future policy rates and inflation trends into account. And third, the Phillips curve was remodelled as the outcome of forward-looking wage/price setting. With these three deft strokes, it was claimed, Wicksellian monetary theory had been reconciled with dynamic general equilibrium, creating a “new neoclassical synthesis”, with the interesting feature that monetary aggregates – a red rag for real business cycle types – can be omitted from the analysis altogether! This approach has indeed become the new paradigm for modern macroeconomics.

Simple and attractive as this compromise may seem, it comes with strings attached. For the Euler equation referred to belongs to a representative agent (consumer-worker-entrepreneur) and the agent is endowed with rational expectations. So principal-agent issues and coordination problems are not on the menu – nor is

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asset mispricing. It not just money that is omitted from the story, moreover – anything to do with banking and credit is missing too. From whom would a representative agent borrow? (How to handle disruptions to banking lending and other forms of credit from such a perspective?)

At a more fundamental level, the approach involves following the lead of general equilibrium where the static model of trade in goods and services is elegantly and effortlessly extended over time (and states) without regard to issues of asymmetric information, contract enforcement and default. But what if this is the Achilles heel of dynamic general equilibrium? What if, in the absence of collateral or other credible enforcement, the core of the inter-temporal general equilibrium model is not “subgame perfect”? Well then, in the words of Peter Hammond,² it means that Humpty Dumpty will have a great fall! But not just general equilibrium as we know it: so too the synthesis so carefully constructed by Woodford and his co-workers to be compatible with dynamic general equilibrium.

The policy test Can this really be true? Or is it just a nasty pipe dream? Fortunately – if that is the right word – the paradigm has been put to the test of guiding practical policy. A key feature of monetary management inspired by the new synthesis been to focus on stabilising consumer-price inflation to the detriment of concern over credit, banking, asset prices and financial stability – with central banks busily implementing dynamic stochastic general equilibrium models for the purpose. The policy and its institutional implementation was hailed as a major success, leading to the “Great Moderation” of inflation and – some said – to the end of the business cycle. The autonomy of central bankers, the fashion for the “light-touch” regulation of finance and benign neglect of asset prices continued right up until 2006/7 when the house price bubble burst in the United States and the Western financial system had to saved from collapse and put on life-support, leaving businesses starved of credit and taxpayers with an enormous bill to pay.

The reaction of Alan Greenspan, the former chairman of the Federal Reserve – heretofore Zeus among central bankers gathered on Mount Olympus – was a confession. In testimony before the US Congress, he acknowledged that his philosophy was flawed: that market self-regulation had not led to financial stability as he had believed it would, but to asset bubbles followed by financial meltdown. *Sic transit gloria mundi.*

Woodford’s reaction provides a sharp contrast. Despite allowing for heterogeneous households with “financial frictions” between borrowers and lenders, the key features of the new synthesis remain reassuringly intact apparently. In a paper presented at the Bank for International Settlements in June 2008, Woodford concludes: “the basic view of the way in which monetary policy influences aggregate expenditure and inflation presented in New Keynesian models need not be modified in any fundamental way as a consequence of the observation that substantial spreads exist on average between different interest rates in the economy.”³ All that is necessary are in-course corrections to the Taylor rule, which should be ‘spread adjusted’. So, if Libor spreads are 300 or 400 basis points above Treasury bill rates, official lending rates should be reduced. This sounds sensible enough: but why should spreads be so high (and for many much higher) in the first place? This needs to be explained, not treated as an exogenous shock. To do so would, however, involve studying money, banking and credit after all – especially if cheques for some $700 billion are to be written in favour of the financial sector!
Broadly speaking, there are two reactions to the impact of the crisis on the state of macroeconomics: the first is denial; the second is paradigm shift – to contemplate fundamental reshaping of the discipline.

(i) Denial: rally round the paradigm

For some economists, bringing together macroeconomics and business cycle theory in consistent framework, buttressed by calibration and simulation, has given the new paradigm serious scientific appeal. These aspects of dynamic stochastic general equilibrium are stressed by Michael Wickens in *Macroeconomic Theory* published in 2008. Others in the profession who do not, or cannot, practise the arcane arts of dynamic stochastic general equilibrium simulation can be summarily dismissed as algebraic amateurs or numerical neophytes. And those with new ideas to bring to the table can be smartly challenged to “show us your calibrated model”.

To say that a paradigm that has fitted well during the Great Moderation only needs “spread adjusting” in the light of an unpredicted economic crisis affecting output and employment world-wide smacks of denial. Nonetheless denial may be a tempting strategy. It seems to protect earlier intellectual investment – publications in top journals that have supported a reigning paradigm, for example. There are, in addition, powerful inertial forces at work in academia – the editorial policy of these journals may be slow to change, for example; and younger staff seeking promotion will be required to publish in them nevertheless – with long and variable lags in the publication process. Could it be for this reason that voices of dissent often surface first in book form: in Paul Krugman’s *Depression Economics*, for example, or in George Akerlof and Robert Shiller’s *Animal Spirits*? Defence of the status quo may be left to others: what else is on offer?

(ii) Paradigm shift: reshaping macroeconomics

For sciences like physics or chemistry, the current state of the subject may well provide an efficient summary of everything that has been discovered. But for economics, as John Hicks has argued, the history of thought is also crucial. Economics has a problem-solving orientation and the problems change over time – from population growth to industrial revolution, from class warfare to constitutional design, from famine to global warming. As a discipline, not a science, the current state of the subject may not reflect earlier concerns. This is especially true of macroeconomics which, in many respects, is the child of the Great Depression, when US unemployment went above 20% and Hicks came up with his IS/LM popularisation of Keynes’s *General Theory of Employment, Interest and Money*. In time, this was duly eclipsed by supply-side shocks on the 1970s and 1980s – when inflation was seen as the major problem, rising above 20% in the United Kingdom in 1974 for example. This led to a revival of classical thinking.

As the title of Woodford’s monograph, *Interest and Prices*, indicates, the effort of bridging the gap between this revived classicism and orthodox macroeconomics led him to drop reference to employment and money, but to add prices. In short, modern macro is largely about controlling inflation with the aid of...
Wicksell instead of Friedman, on the assumptions that the real economy is well-behaved and that financial markets self-regulate. For a while, during the Great Moderation, this compromise seemed to work. Then money began to misbehave as did asset prices, and so finally has employment. When, as now, there is a wrenching change in the issues to be faced, the key to intellectual progress, from the Hicksian perspective, is first to identify the problem and then to use both current theory and the lessons of history in addressing it. The idea that there is a timeless structure of a few first-order conditions for a representative agent good for all states and all places is a delusion. Robert Solow made this point forcefully by rejecting the attribution of fatherhood given him by dynamic stochastic general equilibrium theorists.\textsuperscript{6}

The real business cycle approach seems, nonetheless, to be the maintained hypothesis in a major study of American business cycles by Chari, Kehoe and McGrattan.\textsuperscript{7} The main finding of their 55 page paper – the insignificance of financial frictions as analysed by Bernanke and Gertler, or Kiyotaki and Moore\textsuperscript{8} for the study of US business cycles – seems, however, to have been contradicted by economic developments almost as it went to press! If problem-solving is more important than finding harmony among discordant academics this means, sadly for Woodford, that the synthesis that he has urged upon the profession has suddenly lost its relevance.

What next for macro? If the way forward was self-evident there would be little need for this article. As a first step, however, one might consider relaxing some of the powerful assumptions that underpin the paradigm that has failed. Where this may lead is what micro-economists and game theorists, together with colleagues in industrial and labour economics, have been exploring in glorious detail for many years. Highlights of particular interest to macroeconomists include a surprisingly wide variety of issues, such as:

- The implications heterogeneous or \textbf{asymmetric information} for insurance markets, credit markets and labour markets. This has been a major topic of study – with key contributions from George Akerlof and Joseph Stiglitz (to mention only two of those awarded Nobel Prizes in this area).

- For Kiyotaki and Moore\textsuperscript{9} it is \textbf{heterogeneity} of borrowers and lenders - together with the \textbf{non-contractability} of human capital – that plays a central role in credit cycles. Their more recent work studies the impact of \textbf{credit frictions} on the allocation of resources in the context of heterogeneous investors.

- Many years ago, Diamond and Dybvig\textsuperscript{10} showed formally how banks can reconcile productive long-term investment with random needs for early consumption by heterogeneous consumers lacking liquidity insurance: but it is a fragile equilibrium susceptible to changes of belief and fraught with problems of incentives. For banks to survive, depositors must find the appropriate solution to a \textbf{coordination game}. Selection criteria for non zero-sum games have been studied by game theorists – with the so-called global games approach stressing the potential role of private, but correlated, information in resolving multiplicity.
• If banks are agents, how to ensure they deliver what the public wants? The special case of principal-agent problems in banking is examined by Dewatripont and Tirole in The Prudential Regulation of Banks, and in the Microeconomics of Banking by Freixas and Rochet.11

• The interaction between economic and political factors has been given great prominence by Acemoglu and Robinson’s The Economic Origins of Democracy and Totalitarianism. In a topical application of this political-economy perspective, Rochet’s Why are there so many banking crises? which argues that public policy may lie at the roots of many financial crisis – banks know they are too big to fail!12

• Asset mispricing can have its origins in unsolved principal-agent problems: but behavioural economists stress the psychological and societal forces at work in asset price bubbles. Akerlof and Shiller’s Animal Spirits makes the case for macroeconomics to be reshaped in the light of behavioural economics.13

• The way to measure and control risk exposure has been a focus of attention in financial economics: and the value-at-risk models developed for the purpose have had a powerful influence on prudential regulation, as in Basel II for example. But value-at-risk measures have been criticised for their failure to tackle macro risk: what happens when many agents all try to sell?14 How financial derivatives can redistribute risk has been another focus of research and product development. But innovations in this field have encouraged excessive risk-taking in the financial sector. High leverage multiplies the gains to agents who can fool their principals; and financial products can be designed so sophisticated they are too complex to value – except by those who sell them! If macroeconomics faces a crisis, what about finance?

• Last but not least are the lessons of economic history. Indeed, Kindleberger’s Panics, Manias and Crashes has not sold as well for many a year.15 Those who forget the bubbles of yesteryear may be condemned to repeat them.

To check our bearings, why not look outside economics at an intellectual revolutions in another discipline – in biology for example? Charles Darwin intended to study theology at Cambridge: but association with natural scientists and careful observation of geological processes and of natural biology led him to uncover principles that challenged prevailing religious beliefs. The principles he claimed to see at work have, nonetheless, radically reshaped beliefs about the origins of the world and of its animal species.

That new thinking can successfully challenge the orthodoxy, both Darwin and Keynes have amply demonstrated. In biology there is no going back; but in economics, as Hicks noted, the problems can change, leaving reformers beached. Faced with the evidence of mass unemployment, Keynes challenged the prevailing classical orthodoxy by writing his General Theory of Employment, Interest and Money in 1936.16 But as the Great Depression faded into history, many leading American economists have reverted to a classical perspective, now refined to include inter-temporal optimisation in the context of rational expectations.
But what does it have to say about the credit crunch – or on how to limit its effects and avoid repetition?

**Goodbye Great Moderation**

If it is in the nature of economics to focus on problems as they arise, it is financial factors must come back into the picture; that is evident. But the spectrum of possibilities that emerge as key assumptions of the ‘new synthesis’ are relaxed is surprisingly wide – as modern microeconomists have shown in their study of asymmetric information, strategic behaviour and heterogeneity. This should be intellectually exciting, but it is also a threat. For what will be the shape of modern macroeconomics when all is said and done? And what if the sway a prevailing paradigm in social science has over its practitioners is like a religious belief – common adherence to a set of propositions providing a consistent account of macroeconomic phenomena despite a good deal of evidence to the contrary? The stakes – and the passions involved – must then run high.

A financial crisis beyond the wit of current orthodoxy is a fine trigger for fresh thinking But macroeconomists who challenge the prevailing paradigm need all the support they can find: from micro and behavioural theorists who look at incentives; from econometricians who look at facts; and from economic historians who study intellectual revolutions.

**Notes**