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What's Wrong with Modern Macroeconomics



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What's Wrong with Modern Macroeconomics? Why its Critics Have Missed the Point

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Abstract

This paper argues the case for modern macroeconomics. It explains the reasons why it has replaced previous ways of doing macroeconomics and why it deals with empirical evidence in a different way from conventional econometrics. It is claimed that, far from being in a state of crisis as a result of recent events, modern macroeconomics has received a huge stimulus. The current critics of macroeconomics, like many of those of the past, take its assumptions too literally and misunderstand how the theory should be interpreted for practical use. The financial crisis was brought about more by a failure to employ modern macroeconomics than by its failings. If used sensibly, it will lead us out of the crisis.

1. Introduction

The current financial crisis has been interpreted by many senior figures in economics as a crisis for economics and, in particular, for macroeconomics. Most of their criticisms concern the assumptions of modern macroeconomics, the inadequacies of these theories for dealing with the financial crisis and the consequent spillover effects for the whole economy. Much of this criticism has been aired in public in places like the Financial Times, The New York Times and The Economist. This conference, like several others held recently, is an opportunity to examine these criticisms carefully and to reflect on the strengths and weaknesses of modern macroeconomics.

In this paper I argue that these criticisms miss the point and that the emphasis on the lack of validity of the assumptions of modern macroeconomics is misplaced. It is not because modern macroeconomists know no better, but because, as in engineering, simple models are generally more useful than complex models. Macroeconomics never has, and almost certainly never will, be able to capture the full complexity of human decisions. This is not the criterion by which macroeconomics should be assessed. Rather, it should be judged by its usefulness: its predictive and explanatory power. For example, can it provide an understanding of the causes of the financial crisis, the consequences for the macroeconomy and give guidance on what policies ought to be adopted? Modern macroeconomics should not be treated as something that one can take off the shelf and use uncritically. Instead, it should be recognised that its assumptions are simplifications designed to provide invaluable insights for what otherwise would be intractable problems. Arguably, the financial crisis was brought about more by a failure to employ modern macroeconomics than by its failings. If used sensibly, it will lead us out of the crisis. Far from macroeconomics being in crisis, it is in rude health as the *financial* crisis has provided a huge stimulus to macroeconomic research.

The paper is set out as follows. In the next section I briefly review the main criticisms of modern macroeconomics, and in the next section I respond to these. In section 4 I consider the some strengths and weaknesses of modern macroeconomics. In section 5 I give my own account of the financial crisis. Section 6 summarises my conclusions.

2. A brief review of the main criticisms

Most of the criticism has appeared in the pages of the quality newspapers. This reflects the widespread concern about the causes and consequences of the financial crisis. It also has the advantages of a greater freedom to express views colourfully and of timely publication compared with academic journals with their long publication delays. But it has also resulted on occasion in the use of intemperate language, perhaps in order appeal to a general readership.

Some of the most articulate and best-informed criticisms of modern macroeconomics have come from one its best-known exponents, last year's Nobel Prize laureate, Paul Krugman. Writing in the New York Times (Krugman, 2009), he claims that the macroeconomics of the last 30 years is spectacularly useless at best and positively harmful at worst. He asserts that we are living through the dark age of macroeconomics in which the hard-won wisdom of the

ancients has been lost, and singles out the Chicago school of economics (“freshwater” macroeconomics) for particular criticism. He believes that “the economics profession has gone astray because economists, as a group, mistook beauty clad in impressive-looking mathematics, for truth”. “Not only did few economists see the current crisis coming”, he says, “but most important, was the profession’s blindness to the very possibility of catastrophic failures”.

Others have expressed similar views. Writing in the Financial Times, Paul de Grauwe (2009) has claimed that macroeconomics is in deep trouble, and went on to blame some of its assumptions, notably that of rational expectations. Also in the FT, Robert Skidelski (2009) has said that “economics has displayed the Ricardian vice of excessive abstraction”, “econometrics (he may have meant economics) opted for maths instead of aligning itself with other social sciences in their study of human behaviour”, and “bankers displayed blind faith in their mathematical forecasting models”. A related criticism, largely made by policy makers, is that DSGE models – notably the New Keynesian model of inflation - are too simple to be useful. The efficient market hypothesis is often a target for particular criticism, as it is perceived to embody all three “faults”.

A common theme of the critics is a wish to return to the economics of Keynes. According to Skidelski, Keynes “exploded these fallacies 70 years ago”. Krugman says that “Keynesian economics remains the best framework we have for making sense of recessions and depressions” while the Freshwater economists “sounded like people who had no idea what Keynesian economics was about (and) were resurrecting pre-1930 fallacies in the belief that they were saying something new and profound”. Instead of rational expectations, and noting that this formed the basis of Keynes’s investment theory, the critics urged the adoption of “animal spirits” an approach recently revived by Akerlof and Shiller (2009).

3. A response to the critics

In responding to these criticisms and, as part of my claim that the critics have missed the point of modern macroeconomics, I shall comment separately on various aspects of the criticisms: the roles of abstraction and formal mathematics in macroeconomic theory, the advantages of simple versus large-scale models of the macro-economy, why modern macroeconomics initially turned its face against traditional econometrics, the case for assuming rational expectations, why most criticisms of the efficient market hypothesis appear to have misunderstood what its claims are, the issue of risk and the nature of macroeconomic shocks.

Abstraction and formality

The argument is that abstraction, through employing unrealistically simple assumptions such as rational expectations, and that the use of mathematics, has caused macroeconomics to take a wrong path compared with the informal wisdom of the economics of Keynes who, brought up on Marshall’s methodology, deliberately eschewed the use of mathematics.

These are very old criticisms of macroeconomics which extend to economics in general. It is surprising that they should be resurrected once more as an explanation of the current financial crisis. The use of mathematics is easily justified. It simply ensures that the logic of the argument is carried out correctly as verbal reasoning is often unable to achieve this due to the intricacies of the argument. Significantly, Isaac Newton did not formulate his laws of motion using mathematics, but his followers soon did to the benefit of subsequent generations. It is now unthinkable that physics could be studied without using mathematics.

A related objection is that by formulating macroeconomics mathematically much of its complexity is lost in the process. It is, however, hard to think of examples where a mathematical representation is not helpful. A more likely difficulty is that the problem requires such a general or complex mathematical formulation that a tractable mathematical solution cannot be obtained. It is at this point that there may be advantages to simplifying the formulation in order to obtain an approximate solution. This is generally how macroeconomics proceeds. It is a practical answer to an otherwise intractable problem, and as such should be interpreted with caution. This is why, for example, it is unwise to take a piece of macroeconomics off the shelf – such as the stylised New Keynesian model of inflation – and use it uncritically for policy.

The advantage of using unrealistic assumptions is illustrated by the 1960s debate on capital theory. Cambridge (UK) economists, the immediate inheritors of Keynes, objected to the concept of an aggregate capital stock essentially on the grounds that apples and pears cannot be meaningfully aggregated. Although clearly a convenient, rather than an accurate or “realistic” assumption, the concept of aggregate capital lies at the heart of modern macroeconomics and of DSGE models. It has been instrumental in many of the insights gained from the theory of economic growth and real business cycle theory and hence is rarely challenged now. Arguably, this dispute with Cambridge (Mass) set back economics at Cambridge (UK) for a generation.

By implication, macroeconomists would, *ceteris paribus*, prefer to use “realistic” assumptions wherever possible rather than stylised assumptions. For example, although one of the aims of modern macroeconomics is to provide microeconomic foundations, it is still largely based on the relations between aggregates just Keynes’s macroeconomics was. Most of microeconomics is also based on aggregates, so there is no difference in principle between this and macroeconomics; only the degree of aggregation differs. As part of its continuous efforts to weaken its assumptions, but without losing the insights gained from simple models, current macroeconomic research is grappling with the problems of heterogeneous agents, incomplete markets, market failure and the incorporation of a banking or financial sector.

Rational expectations

An assumption that has come in for particular criticism is that of rational expectations (RE). This is related to a larger issue, namely, the acquisition and processing of information thought to be relevant for a problem. This could involve forecasting the future, or the reactions of others. It is difficult to believe that any economists, including modern macroeconomists,

believe that people are completely rational. The original reason for making this assumption was the obvious drawbacks to existing assumptions such as static or adaptive expectations, both of which implied that people would persist in making expectation errors even when this was pointed out to them. The immediate attraction of RE was that it implied that current errors could not be predicted from past errors. It also enabled expectations formation to be put on the same basis as most other economic decisions, that is, they are the result of an optimising process subject to constraints and uncertainty, such as knowledge of the underlying processes.

An operational alternative to RE is still not available. Much has been made by the critics of “animal spirits”. This is what Keynes invoked to explain investment decisions; he was clearly recognising that current investment decisions take into account expectations of the future. More recently, Akerlof and Shiller (2009) in their book of the same name argued at length for replacing the assumption of RE with that of animal spirits. The problem is that animal spirits does not have a precise definition, it just represents irrationality. There are an infinite number ways of being irrational and, so far, none has commanded appeal, or has been formulated in such a way that it can usefully replace RE in macroeconomic models. Moreover, animal spirits is untestable. Until it is made operational in macroeconomics, RE will continue to be used, even though no-one believes that people are fully rational. It is a simplifying assumption and allowance should be made for this when using macroeconomic models.

The efficient market hypothesis

One of the implications of RE is the efficient market hypothesis (EMH). Most of the critics seize on the EMH to illustrate the failure of macroeconomics. They also attribute the current financial crisis largely to believing that markets are efficient and will always price assets correctly. According to Krugman, the EMH “asserts that financial markets always get asset prices right given the available information”, whereas “many real-world investors bear little resemblance to the cool calculators of efficient-market theory: they’re all too subject to herd behaviour, to bouts of irrational exuberance and unwarranted panic”. Richard Thaler (2009), agreeing that the EMH guarantees the right price for assets, argues that this is hard to reject as we need to know what the right price is in order to be able to do so. Amongst other critics of the EMH, the noted financial journalist Richard Lowenstein recently declared that “the upside of the current Great Recession is that it could drive a stake through the heart of the academic nostrum known as the efficient-market hypothesis”.

According to George Soros (2009) the EMH was falsified by the crash of 2008. He contends that financial markets always present a distorted picture of reality. Following an exogenous shock, instead of a tendency towards equilibrium, financial markets have a tendency to develop bubbles, and these bubbles are rational, at least for a while.

These criticisms of the EMH are dangerously simplistic as they ignore the many qualifications made in the EMH that are required for its prediction that the market prices all assets correctly. Strictly, the EMH asserts that financial markets are “informationally efficient”, meaning that the prices of traded assets reflect all known information, and instantly change to reflect new information, thereby making it impossible to consistently outperform

the market by using any information that the market already knows, except through luck. Information or *news* in the EMH is defined as anything that may affect prices that is unknowable in the present and thus appears randomly in the future.

Even this description requires further clarification. Known information will vary between people from the highly informed, to the not well informed, and to the uninformed, or noise traders. The assumptions of strong and weak information attempt to capture this point. The implication is that market prices will incorporate the distribution of information among participants, and this will vary through time and place. Many market trades will arise from the acquisition of new information by some but not by others. The EMH says that the market price will reflect this new information and thereby help correct informational asymmetries.

The willingness to hold an asset, and hence determine its price, also depends on the attitudes to risk of investors. This is not usually mentioned in the EMH, but pricing risk is really the key to asset pricing and asset-pricing theory. For example, in the capital asset pricing model (CAPM), often mentioned by the critics in the same breath as the EMH, the market risk premium is an asset's beta multiplied by the expected excess return on the market. Since people take different attitudes to risk, they may not assess the price of risk in the same way as the market and hence they will be willing to pay different prices to hold an asset. Moreover, assessing risk involves information about the future, as does forming expectations of the future market price, and so is subject to the above caveats on information.

Risk

Although risk is commonly associated with finance, and asset pricing is largely about pricing risk, there is a deep divide between macro and financial economists in the way that they think about risk. Financial economists tend to price one asset in relation to another (relative asset pricing), and use CAPM to price their relative risks on the basis of the past behaviour of prices, particularly their volatility and their degree of kurtosis. In contrast, macroeconomists tend to use general equilibrium models of risk that are based on how movements in the fundamentals affect consumer/investor welfare.

The dangers of basing risk on either recent or average long-term price volatility are that volatility can change very quickly, that extreme but infrequent price movements tend to be discounted and that possible future volatility may be over-looked. It is clear that in the recent financial crisis all three occurred. One advantage of a fundamentals assessment of risk is that it need not be based purely on time series analysis and historic evidence particularly univariate time series evidence which ignores cross correlations and systemic risk. If households and financial companies are highly leveraged then both are vulnerable to shocks and default whatever the time series evidence suggests.

There are well-documented differences between the predictions of financial and general equilibrium models of risk. The best known is the equity premium puzzle, but the same phenomenon occurs for bonds and FOREX. The "puzzle" is that investors in financial markets seem to be willing to accept far more risk than general equilibrium models of risk would indicate. So far this has been interpreted as indicating the weakness of fundamentals theories of risk. Perhaps a reassessment of this is now due.

My own view is that a mixture of being willing to take on risk and a gross underestimate of the riskiness of assets was the prime cause of the financial crisis. The liquidity crisis, often

mentioned as the main cause, was just the result of lenders not being able to evaluate risk and so withholding refinancing capital for short-term loans. Firms like Lehman that was leveraged 44 times were then left highly exposed once the riskiness of their strategy became known. The spillover effect that made the crisis universal was the result of investors being unaware of the risks they were taking in holding the securitised assets of such companies. In other words, it was a lack of information, and the exploitation of this in financial markets, together with a willingness to take on risk, that caused the crisis, not a failure of macroeconomics. All macroeconomic theories would predict that certain shocks (informational gaps) could result in default on loans and thereby generate risks perhaps not often experienced before. The weakness is not the failure of macroeconomics to incorporate finance, but of finance to incorporate macroeconomics.

Macroeconomic shocks

Modern macroeconomics has its origins in real business cycle theory. The standard Ramsey model is a highly stylised model with one shock, a productivity shock. One of the aims of this research agenda was to examine whether a business cycle can be generated by the model as a result of a temporary productivity shock. This requires the internal dynamics of the model to propagate the shock so that output and other variables have the statistical properties – variances, serial correlation and cross correlations - observed in actual data. The general finding is that it cannot quite manage this. Among the various modifications made to the model was the inclusion of shocks other than productivity shocks, such as demand shocks, and allowance for price stickiness. These additions made the model more Keynesian and less classical in its structure. Many macroeconomists – mainly of the “freshwater persuasion – have been reluctant to allow for the possibility of demand shocks on the grounds that they are not proper shocks in the sense of innovations; their argument is that demand is an endogenous response to circumstances. This raises the interesting issue of what is a macroeconomic shock.

An obvious definition of a shock is something that was previously unpredicted. In other words, a shock is something that is determined with respect to an information set and implies incomplete information. On this basis we can have demand as well as productivity shocks. Even though demand may be a response to income, endowments and prices, new information or a change in preferences, could produce disturbances to the economy. For example, highly leveraged households facing an unanticipated fall in income, an increase in the cost of living, an increase in borrowing rates, or new borrowing restrictions are likely to cut demand and in extreme circumstances may default on their debts. This is what seems to have precipitated the financial crisis. The collapse of exposed mortgage companies and banks was a consequence.

There is nothing in this highly plausible explanation of the financial crisis that need call into question the methodology of modern macroeconomics. Indeed, a better knowledge of modern macroeconomics and an awareness of the fundamentals underlying risk assessments might well have avoided the crisis.

4. Some strengths and weaknesses of modern macroeconomics

Modern macroeconomics with its emphasis on microfounded optimal behaviour was initially largely a reaction to the weaknesses in Keynes’s macroeconomics, to the ad hocery of Keynesian models, to the incomprehensibility of large-scale macro-econometric models and to the a-theoretical data-mining of many econometric time series studies. As each of these

alternatives to modern macroeconomics has been praised for their superiority by the critics let us consider them in a little more detail to see what modern macroeconomics is said to be missing.

As I have written elsewhere - Wickens (2008) – I am surprised that Keynes, having written two path-breaking books (*The Treatise* and *The General Theory*), and having, according to Skidelski (1992), realised that neither resolved one of the key theoretical issues he was concerned about - namely, how to define equilibrium – yet was the editor of *The Economic Journal* in which Ramsey's path-breaking paper that contained a solution to this problem was published. *The General Theory* improved on *The Treatise* by having two variables (income and the interest rate) instead of just one (the interest rate) to clear two markets, but this only gave a flow equilibrium when what is required is a stock equilibrium as there are potentially an infinite number of flow equilibria associated with each stock equilibrium. As the Ramsey model is the starting point of modern macroeconomics, the notion of going back to Keynes's formulation of macroeconomics seems retrogressive.

Even if Keynes did not have a theoretically sound framework, did he have a superior understanding of the economy? Three features of Keynes's economics often cited by the critics are that it explains the persistence of recessions and unemployment, that government intervention via fiscal policy is required to get out of depressions, and that financial markets are a "casino" reflecting animal spirits rather than a process which correctly prices assets. Having already discussed animal spirits and asset pricing, let us focus on the macroeconomy particularly as Keynesian economics, the successor to the economics of Keynes, is based mainly on the first two and, in particular, on the roles of price and wage stickiness in causing and prolonging recessions.

The main point to make is that modern macroeconomics does not overlook the evidence of serial correlation in unemployment and output - but not so much in growth rates - or in prices and wages. On the contrary, the latest generation of DSGE models, also known as New Keynesian models, explicitly focuses on modelling the causes of price and wage stickiness and of analysing whether this can explain observed macroeconomic behaviour. It does so, however, by attempting to endogenise pricing behaviour rather than treating it as exogenous. The Smets-Wouters models of the EU and US, Smets and Wouters (2003, 2007), and the model of Christiano, Eichenbaum and Evans (2005) are well-known examples. However, whether the explanation really lies in price and wage stickiness or in autoregressive shocks still remains unresolved, see Del Negro, Shorfheide, Smets and Wouters (2006) and Mai, Minford and Wickens (2009).

While it is true that the first generation of DSGE models did not incorporate these features, as the DSGE paradigm spreads, ways are being found of adopting more realistic assumptions without losing their advantages of being simple, logically consistent and providing the essential intuition required to understand the behaviour of the macroeconomy. A similar argument applies to other aspects of modern macroeconomic research. It is particularly noticeable since the financial crisis how many DSGE models are now including a banking sector and more elaborate financial sectors.

This shows not the bankruptcy of modern macroeconomics or that it is a catastrophic failure, as Krugman claims, but its vibrancy. Nonetheless, there are many aspects of modern macroeconomics that could with benefit be improved and many questions that remain unresolved. This does not entail the abandonment of the modern approach as the critics demand, but further refinements. In other words, normal progress is all that is required.

No doubt we all have our particular preferences and interests for future research. Before giving a list of my own, it is important to emphasise the advantages of keeping DSGE models simple and, as far as possible, tailored to answer a specific problem. The larger and more complex they become, the more we will need to rely on simulation methods to determine their properties. This would reduce their value in giving immediate guidance and intuition in, for example, policy discussions, and render them more like the discredited macro-econometric models of the past.

Having entered this caveat, at the top of my list of things to do is the need to better integrate macroeconomics and finance. The key issue is to be able assess risk in order to price assets and take investment decisions. This may necessitate more institutional detail in the form of the explicit inclusion of banks, both commercial and investment. Other tasks, in no particular order of preference, include modelling market imperfections and wedges and evaluating policies designed to improve general welfare, given these imperfections; analysing fiscal policy in the same detail as monetary policy; constructing models better suited to different problems of emerging market economies; finding ways of analysing the interactions in the global economy, arising especially from finance and the need to re-cycle current account surpluses, without allowing the models to become too cumbersome.

Apart from adding to this list, which could continue indefinitely, I shall make two further observations. First, more attention should be paid to the time dimension of DSGE models when interpreting their predictions. It is, for example, common to formulate the household utility function with consumption and leisure as arguments and from this derive the supply of labour, which is then interpreted as responding instantaneously to real wages. The obvious implication is that there can be no involuntary unemployment as observed employment lies on the labour supply function. This result is the basis of much criticism of DSGE models. My own view is that the time scale of this prediction is that, at best, it holds over a very long time horizon. It then helps explain the secular decline in labour supply by individuals. In the short run, however, it would be more plausible to interpret the supply of labour as highly inelastic with respect to real wages and hence most unemployment as involuntary. Certainly, this would be true during recessions. This would suggest omitting leisure from the utility function for short-run analysis. Such an interpretation would be significant for assessing the effectiveness of fiscal policy during a recession. It would imply that households would not work less hard today as a result of anticipated future tax increases that are required to pay for the fiscal expansion.

Second, when the first generation of DSGE models were introduced, namely, real business cycle (RBC) models, most of the criticism came from macro-econometric modellers. They objected to the use of calibration rather than classical statistical estimation as employed in

econometrics. Here I think that the criticism has some merit, though there is still much to be said in defence of RBC analysis as originally carried out. Prescott, one of the RBC pioneers, took the view that an RBC model should be calibrated *to* the economy under consideration. In an interview with Evans and Honkapohja (2005), however, Sargent reveals that the main reason for using calibration rather than traditional econometric estimation methods was that this was rejecting “too many good models”.

A possible justification for this apparently damaging admission is that it takes very little to reject a model. Rejection may be due to a failure to capture the short-run dynamics while the longer run performance of the model may be good. Conventional macro-econometric models get around this, often without much theoretical justification, by data-mining the short dynamics to provide a good statistical fit. Increasingly, current practice is not to calibrate DSGE models, but to estimate them using conventional econometric estimation methods, see for example Smets and Wouters (2003, 2007). This removes much of the former concerns connected with calibration, but does not do so entirely as frequently Bayesian estimation is used. In principle, this is in order to incorporate prior information about key parameters; in practice, it often confines these parameters to narrower ranges than would be found using non-Bayesian estimation. One justification for using Bayesian methods is that the data may not be informative enough about these parameters and so generate wide confidence bands. Whatever the outcome of this is an on-going research issue, the main point is that the aim of this research is to reconcile deliberately stylised DSGE models with classical statistical inference.

Some early findings of RBC models still resonate in recent results based on such estimation methods. Two of these findings from RBC models were that consumption simulated from the model was too smooth compared with actual data, and that real wages were too volatile. These discrepancies have only been removed in conventional macro-econometric models by including longer lags or autoregressive error processes. The latter is, however, simply a confession of ignorance. The original problems, first uncovered by highly stylised RBC models, still remain to be resolved.

In summary, my view is that modern macroeconomics does have its weaknesses, but they are minor compared with its strengths, and do not come near to justifying the claims of one of its critics that the macroeconomics of the last 30 years is spectacularly useless.

5. What caused the crisis?

In my view the crisis was the result of a sequence of events. Briefly, the collapse of the dot com bubble in 2001 led, in the US, to a fiscal and monetary stimulus. The resulting monetary expansion and low interest rates encouraged excess consumer borrowing and a low savings rate, the excessiveness being due to an under-assessment of the subsequent risks of such an expansion. Banks and mortgage companies satisfied this demand for loans by borrowing heavily short term in international capital markets that were awash with the proceeds of large Chinese and oil-producer current account surpluses.

The Chinese current account surpluses and the US (and UK) current account deficits were a consequence of the deliberate undervaluation of the renminbi as China pursued its domestic policy of shifting from an agricultural to a manufacturing nation. This shift has been characteristic of economic development over the centuries, and is at the heart of the globalisation debate earlier this century. In part mitigation of US policy, it should be recalled that as the US dollar is the main reserve currency, for some time, in order to generate sufficient reserve assets, the US has had to run large current account deficits. Only a devaluation of the US dollar can prevent this. As China would be the main loser from this, it has sought to avoid a devaluation of the dollar/appreciation of the renminbi.

The expansions in the US and in the wider world increased the demand for raw materials and resulted in large increases in commodity and metals prices. This, as in the 1970s, generated a major disturbance to western economies. Food and finished goods prices rose causing a tightening of interest rates and a contraction in demand and hence output, employment and income. This precipitated large-scale defaults on mortgage loans and credit card debt, especially in the US where default does not carry such a stigma as in Europe.

Banks and mortgage companies had been financing the consumer boom, offering credit at what proved to be suicidally low rates based on the availability of massive short-term liquidity. Partly, this was achieved through securitising their assets and selling them at inflated prices, because the holders believed that a portfolio of such assets was far less risky than holding individual mortgages. So keen were they to hold these securitised assets, that the leverage ratio at Lehman was 44.

Once households began to default, the asset side of many investment banks' balance sheets looked very weak. Having lent long and borrowed short, they needed to roll over their debts quickly, but not knowing how risky these loans had become, the inter-bank market began to seize up. The globalisation of financial markets meant that the whole world was caught up in this. Not only did banks not lend to banks, they stopped lending to the rest of the economy too. Trade credit, a key to exporting, also collapsed. As result, the world found itself in a deep recession.

Although the initial source of the problem was not of Europe's making, the single currency has clearly exacerbated the problem. By delivering negative real interest rates in high inflation countries like Ireland, Portugal and Spain, the single currency caused property booms which, when they collapsed, brought about severe recessions. Germany has also suffered a deep recession, but this was more due to a loss of export markets caused by the world recession. Nonetheless, the single currency played its part here too as, having low inflation, and hence a relatively high real interest rate compared with other eurozone countries, it lacked the same stimulus to domestic demand but, as it gained in competitiveness with respect to other eurozone countries, this was compensated to some extent by vigorous export growth. This resulted in Germany being heavily dependent on exports.

Is modern macroeconomics to blame for all of this? Hardly at all. On the contrary, the macroeconomic aspects of the crisis are easy to understand, and easily predictable from

modern theory. In my view the causes were a mixture of poor policy – over-loose monetary policy in the early 2000s, and an over-ambitious Chinese development policy – and a failure of the banking system and households to assess risk correctly: the risks of providing cheap credit based on short-term finance, and the risks of taking out large loans when default is a strong possibility.

Even so, it is a moot question as to whether the crisis showed a lack of rationality. For government, the over-riding need is to be re-elected. This requires maintaining a strong economy and avoiding recession. For households, especially US households, the downside to defaulting seems to be fairly minor. So why not take a chance, live more comfortably and hope for the best? For individual salesmen of mortgages the incentives were to sell more and not take into account possible negative consequences for the bank. For banks, the expectation was that they were too big to be allowed to fail. A good understanding of macroeconomics is clearly not sufficient to avoid another crisis if such individual incentives remain.

6. Conclusions

To summarise, the financial crisis is not due to the failure of modern macroeconomics. A better understanding of macroeconomics might have prevented the crisis. The critics of modern macroeconomics, with their emphasis on the lack of realism of its assumptions, the need for complex models, and a return to the economics of Keynes, have missed the point. A macroeconomic theory is more likely to be useful if it is simple to understand. This indicates the need to tailor models to the problems they are designed to address and to avoid complex theories. Nonetheless, because DSGE macroeconomic models are so stylised, it is necessary to take great care in interpreting their predictions, especially for policy purposes. Whilst Keynes made an outstanding contribution to macroeconomics, a return to his way of analysing the economy would be a retrograde step.

Where there are concerns is in the field of finance, and especially investment banking. Like macroeconomic theory, the theory of finance is a stylised attempt to assist in the analysis of highly complex financial markets. The practical problem for finance and banking is to reform financial markets to induce them to behave more like the predictions of the EMH. This requires realigning private incentives in banking with public welfare so that the riskiness of private decisions is not transferred at great expense to the public, providing a greater cushion for absorbing shocks and increasing the transparency of market activity. How to do this is still in dispute. Suggestions include paying bonuses in the form of firm equity to help re-aligned incentives, separating the retail and investment activities of banks and higher capital requirements - including higher loan-to-value ratios - to help avoid default in the face of a shock (this requires an end to off-balance sheet liabilities), and the central clearing of derivatives markets to make the holdings and prices of derivatives more transparent. In this way, economic theory would have a normative as well as a positive value, just as it did when improvements in option pricing theory led to the development of option markets even though the theory made many unrealistic assumptions.

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