

The macroeconomy

Professor Paul De Grauwe, *University of Leuven, Leuven, Belgium*

Professor Seppo Honkapohja, *Bank of Finland, Helsinki, Finland*¹¹

Concept and focus

The concept of the macroeconomy and the study of its functioning, macroeconomics, must of necessity cover a very wide range of issues. Macroeconomics has traditionally been split between analysis of the short to medium run and of the long run. The former consists of theories that try to explain and forecast macroeconomic fluctuations; the latter aims at understanding the factors that affect long-term economic development and growth. New developments in macroeconomics have been characterised by an ambition to integrate the short and long run in one framework.

Other aspects of macroeconomic research consider central parts of a national economy and the international economic system. Indeed, globalisation has led to intense interactions between national economies, generating a need for macroeconomists to focus on the international dimension of macroeconomics.

Macroeconomics also studies the determination of important parts of the overall economy. Important components of the macroeconomy include money and the financial system, aggregate aspects of public finance and fiscal policy, and the behaviour of central aggregate variables such as consumption, investment, employment and unemployment, inflation, exchange rates, and the external balance of a country.

It is impossible in this short position paper to do justice to the study of the different parts of the macroeconomy and the corresponding areas of macroeconomics as briefly described above. We choose to focus on two specific concerns in contemporary macroeconomics. First, we take up current challenges in macroeconomic analysis at the level of overall modelling approaches. Second, we discuss the interrelations between macroeconomic analysis and policy making. The relationship has always been close and the current global economic crisis is providing new significance to it.

Current challenges

Modern macroeconomics embodies two central tenets. The first one is that a macroeconomic model should be 'micro founded'; i.e. based on dynamic utility maximisation of individual agents, and the macroeconomic outcome must be described in terms of a general equilibrium with mutually consistent decisions of different economic agents (consumers, firms etc.).

The second tenet is that expectations of the agents should be model consistent, which implies that agents make forecasts based on the information embedded

in the model. This idea in turn implies that agents have a full understanding of the structure of the underlying model as part of the 'rational expectations equilibrium'. The most successful implementation of these ideas is to be found in the Dynamic Stochastic General Equilibrium models (DSGE-models) that are increasingly used in central banks for policy analysis (see Smets and Wouters 2003; Christiano et al. 2005).

There can be no doubt that this approach to macroeconomics has important advantages compared to the previous macroeconomic models. The main advantage is that it provides a coherent and self-contained framework of analysis. This creates a great intellectual appeal. There is no need to invoke ad hoc assumptions about how agents behave and how they make forecasts. Rational expectations and utility maximisation provide the discipline for what is acceptable in modelling the behaviour of economic agents.

Problems with the models

This paradigm is, however, increasingly subjected to criticism which has become more intense since the start of the financial crisis. This criticism has been formulated at different levels.

Theoretical problems

First, the plausibility of the underlying assumptions has been questioned. There is a very large literature (preceding the current financial crisis) documenting deviations from the paradigm of the utility maximising agent who understands the nature of the underlying economic model. For recent surveys, see Kahneman and Thaler (2006) and Della Vigna (2007). This literature has followed two tracks. One is to question the idea of utility maximisation as a description of agents' behaviour. The other puts in doubt the rational expectations assumption.

Many anomalies that challenge the rational expectations assumption were discovered; see Thaler (1994) for spirited discussions of these anomalies; see also Della Vigna (2007). We just mention 'anchoring' effects here, whereby agents who do not fully understand the world in which they live are highly selective in the way they use information and concentrate on the information they understand or the information that is fresh in their minds. This anchoring effect explains why agents often extrapolate recent movements in prices.

Thus the accumulated scientific evidence casts doubts on the plausibility of the main behavioural assumptions in modern macroeconomic models. One could object here and argue that a model should not be judged by the plausibility of its assumptions but rather by its ability to make powerful empirical predictions. However,

11. The views expressed are those of the authors and not of the institutions with which they are affiliated.



empirical tests of the DSGE-models have generally not been favourable (see Chari et al. 2009; Juselius and Franchi 2009).

Empirical problems

The main empirical problem of the 'pure' micro-founded macro model with forward-looking agents appears to be that it underestimates the degree of inertia in wages and prices. For example, it predicts that when new information reaches the market, rational agents will immediately change their optimal plans, leading to instantaneous price changes. This prediction flies in the face of empirical evidence showing quite universally that prices have a strong inertial component and react sluggishly to shocks, see Nelson (1998) for empirical evidence; see also Walsh (2003).

The observed inertia in prices, wages and output has led macroeconomists to add lags into the models. In addition, the models were loaded with exogenous shocks exhibiting strong autoregressive structures. All this has made it possible to improve the fit of the models. The

result has been that the models produce price and output dynamics that correspond to empirically observed ones but that it is not clear whether this comes from the lags and the autoregressive nature of the shocks, rather than from the rational-agent structure of the models (see Chari et al. 2009).

Despite their poor empirical record, DSGE-models have been influential in shaping macroeconomists' views about how the economy functions. This is very prominent in the way modern macroeconomists interpret the business cycle. Business cycle movements in the DSGE-models arise as a result of exogenous shocks (in productivity and preferences) and lags in the transmission of these shocks to output and inflation. This combination of exogenous disturbances and inertia in the transmission generates wave-like movements in inflation and output.

There can be no doubt that exogenous shocks matter in generating business cycles. At the same time it is equally obvious that DSGE-models miss an important feature of business cycle movements. The latter are

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also influenced by waves of optimism and pessimism ('animal spirits') that are grounded in agents' imperfect understanding of the world and that, by their self-fulfilling nature, can create booms and busts endogenously. The macroeconomic developments of the last decade testify to the power of these waves of optimism and pessimism in shaping first the boom and later the bust phase in economic activity.

Modelling individual behaviour

Modern macroeconomics has also led to a methodological step that is becoming increasingly questionable. The paradigm of the utility-maximising individual agent who understands the full complexity of the world has an important implication. Since all individuals understand the same 'Truth', modern macroeconomics has taken the view that it suffices to model one 'representative individual' to fully represent reality. Thus in such a model there cannot be any coordination failures in which decisions of individual agents can lead to undesirable aggregate outcomes.

The representative agent fully internalises the external effects of all his actions. But macroeconomic fluctuations can also arise as a result of a failure of consumers and firms to coordinate their actions to achieve a good outcome. For example, the famous 'paradox of thrift' as formulated by Keynes arises from the fact that when savers all attempt to save at the same time they will fail to increase their savings. The economic downturn that started in 2007 again shows how these coordination failures can shape a recession. Akerlof and Shiller (2009) have recently made a case for the role of 'animal spirits' in shaping macroeconomic outcomes.

Possible new directions

From the preceding analysis we learn that modern macroeconomics has hit against its own limitations and that there is a need for going beyond the rationality paradigm. One fruitful new direction of research was given an impetus by Sargent (1993), and Evans and Honkapohja (2001) who in macroeconomic models introduced the notion that agents should not be assumed to be cleverer than econometricians and that therefore they should be modelled as agents who learn about the underlying model as time passes. This has led to models of learning in macroeconomics, which assume that agents use their estimated model in decision making. Slowly this idea is being incorporated into macroeconomic models. Much remains to be done, however, to analyse the implications of learning on macroeconomic dynamics.

Another potentially fruitful direction of research uses concepts from behavioural economics. This approach starts from the proposition that individuals understand only small parts of the total information set, and they are

not capable of describing the statistical distribution of economic shocks. The cognitive limitations of individuals in understanding and processing information leads them to use simple rules ('heuristics') to guide their behaviour (see Gigerenzer and Todd 1999). They do this not because they are irrational but rather because the complexity of the world is overwhelming. In a way it can be said that using heuristics is a rational response of agents who are aware of their limited capacity to understand the world. In this sense they are 'boundedly rational'.

The problem with models based on bounded rationality is 'that everything becomes possible'. The challenge therefore is to introduce discipline in the selection of behavioural rules. This can be achieved by subjecting the selection of rules to a 'fitness' criterion, allowing agents to switch from one rule to the other. At the moment there is no 'consensus model' to bounded rationality though. Much remains to be done to achieve a formulation of bounded rationality that is broadly empirically workable and can be used in a wide variety of macroeconomic contexts.

Connections between policy and research

Macroeconomics has, for a fairly long time, had a close connection with current economic problems and policy making. Central banks, ministries of finance and major international organisations employ numerous economists with research training and many of these institutions have major research departments or institutes. While the connections between research and policy exist in different areas of economics, it can be argued that the link between policy and research is particularly close in macroeconomics.

The global crisis

The current global economic crisis is the best example of this connection. On the one hand, research on macroeconomic policy – both historical and analytical – plays an important part in policy making even if it is only one input to the policy-making process. There have been numerous financial crises since the 1970s, when the post-Second World War fixed exchange rate environment broke down and a gradual process of deregulation and liberalisation of financial markets started. Often these crises took place in developing countries, but there were also financial crises in advanced market economies (for example, see Reinhart and Rogoff, 2009).

The current financial crisis, which started in August 2007, differs from the earlier ones in that it is global in nature affecting all economies in the globe. The global nature of the current crisis means that policy is being

made in an environment where much is unknown and, in particular, empirical precedents do not exist. Another new feature of the current crisis is that it manifested itself in misguided financial innovation. See Rajan 2006 for an early warning, which was initially made at the 2005 Jackson Hole conference. The current crisis is providing several lessons that are going to require a re-orientation of macroeconomics, both in terms of areas of emphasis and also in terms of emerging huge gaps in knowledge requiring new research to fill these gaps.

Finance and banking

Given that the current crisis originated in the financial system, several areas in finance require a major research effort. One case is the failure of the efficient market doctrine. Most of the currently employed macroeconomic models assume market efficiency. This is not satisfactory. Problems with imperfect and asymmetric information and the behaviour of economic agents in response to these information problems will require greatly increased attention. In this field the paradigm of full rationality appears to be facing its limits. In practice individual agents cannot prepare in advance against all conceivable contingencies and, in situations of asymmetric information, different agents do not necessarily agree on the possible contingencies against which they would need to respond under full rationality (for example, see Tirole 2009).

The functioning of the international financial system and the behaviour of banks are two other major areas in which new research is badly needed. These areas have a direct connection to policy making and research can at best make a positive contribution to the beginning reforms of public policies and institutions. The new plans to reform the regulation of the financial system require that thinking moves away from the hypothesis of efficient financial markets and the associated very liberal attitudes. Providing input to changing financial regulation and reform of international institutions is a big challenge to the research community in macroeconomics and finance.

Economic growth

The preceding discussion has taken up policy issues and research challenges that arise from the current economic crisis. At the moment, these topics generate a lot of interest, but one should not lose sight of other major macroeconomic policy and research issues. To conclude this section we want to return briefly to the earlier distinction between short-to-medium term and long-term macroeconomic issues to stress the study of economic growth both as a programme of research and as a major area of policy concern.

Understanding the origins and factors behind long-term economic growth and development is perhaps the most important economic policy issue of the time. Differences in standards of living between countries continue to be large as a result of very differential performances in long-term economic growth. There are a number of growth miracles – especially among Asian countries – for which the accumulation of human capital, deployment of new technologies and various political and institutional factors are said to be the key element behind the success. In contrast, there are also notable cases of economic decline. Adverse political developments are often thought to be a key reason behind such declines. A third category consists of countries that have never taken off in terms of economic growth and improvement in material living standards.

Many models and theories yield explanations for good growth performance (see e.g. Aghion and Howitt 2009). These theories have provided a major input to various agendas for growth policy, such as the Lisbon agenda for the EU. Yet, the wide variety in long-term macroeconomic performance among countries leads to further questions. One should also try to analyse the reasons for failure in economic growth, both when countries decline after initial success and when they fail to take-off. Understanding the failures is as equally important as understanding the successes.

There is now a burgeoning literature identifying the factors that lead to failures in economic growth and development (see e.g. Rodrik 2007). This literature is still in its infancy. It is to be hoped that further research into the growth failures will allow us to develop methodologies to design growth policies that can be applied in different cultural and institutional settings, and in so doing will contribute towards improving the well-being of the world's poor.