

### Three Challenges Facing Modern Macroeconomics

White paper submitted to the National Science Foundation

Kenneth Rogoff, Professor of Economics, Harvard University, September 21, 2010

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There are three great challenges facing researchers in modern macroeconomics today, all brought into sharp relief by the recent financial crisis. The first is to find more realistic, and yet tractable, ways to incorporate financial market frictions into our canonical models for analyzing monetary policy. The second is to rethink the role of countercyclical fiscal policy, particularly in the response to a financial crisis where credit markets seize. A third great challenge is to achieve a better cost-benefit analysis of financial market regulation.

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There are three great challenges facing researchers in modern macroeconomics today, all brought into sharp relief by the recent financial crisis. The first is to find more realistic, and yet tractable, ways to incorporate financial market frictions into our canonical models for analyzing monetary policy. The second is to rethink the role of countercyclical fiscal policy, particularly in the response to a financial crisis where credit markets seize. A third great challenge is to achieve a better cost-benefit analysis of financial market regulation.

Prior to the recent financial crisis, the consensus monetary policy model assumed frictionless “perfect” financial markets in every aspect of the economy. This was in contrast to product and labor markets, where transitory wage and price rigidities created the possibility that unemployment and capacity could temporarily deviate from equilibrium levels, both in response to shocks and, importantly, in response to monetary policy. The argument was that whereas financial markets might not be quite perfect, they were far more so than labor and goods markets, and any departures from idealized perfection were of only minor consequence. The perfect financial markets assumption may seem absurd to a lay person, but economists often chose it because it proved a huge simplifying assumption, allowing analysis to concentrate on say, labor markets, where distortions and imperfections were thought (by many) to be much larger. Certainly, economists had developed sophisticated models of financial frictions and of debt repudiation.<sup>1</sup> However, any departure from frictionless markets, where prices (including sophisticated futures and derivative prices) move to equate demand and supply, creates considerable complications. In addition, there was no consensus model of frictions, making it hard to know what direction to push to push research

Despite the canonical models’ obviously strong assumptions, economists were encouraged by the apparent success of their frameworks in modeling monetary policy, not just in the United States but around the world. The financial crisis, of course, deeply undercut that confidence. The models not only failed to predict the crisis itself, they failed to give meaningful warning signs of any kind. Perhaps most important, they continued to perform poorly in analyzing the aftermath of the crisis. Instead, using historical data to develop benchmark trajectories based on past deep financial crises around the world has proven to be a far more powerful tool both for predicting the crisis and for projecting the economy’s post-crisis recovery path.<sup>2</sup> With the benefit of hindsight, it has become apparent that part of the consensus models’ “success” may be partly attributed to the relative ease of forecasting during tranquil periods. The failure of the consensus models is hardly a satisfactory state of affairs; policymakers need a more nuanced framework for analyzing their policy choices.

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<sup>1</sup> For financial market frictions, see Bernanke and Gertler (1990). Obstfeld and Rogoff (1996) review analyses of sovereign default. These are both important examples of departures from perfect financial markets.

<sup>2</sup> See Reinhart and Rogoff (2009).

The challenge facing macroeconomists is a daunting one and, in many ways, parallel to the challenge economists faced after the Great Depression of the 1930s. Before then, the canonical model not only assumed perfect financial markets (to the extent that concept was understood at the time), but also perfect markets for all non-financial transactions as well. But with a quarter of the population unemployed at the peak of the Depression, the notion that frictionless markets equate the supply and demand for labor appeared patently absurd. This observation was a central tenet of Lord John Maynard Keynes' seminal work. Keynes, however, while making some profoundly insightful empirical observations, did not really offer a clear approach to how to formally model labor market frictions. To make a long story short, economists debated the right approach for more than half a century, and never found a completely satisfactory solution. On the eve of the financial crisis, the consensus monetary model incorporated price and wage rigidities in a way that seemed to capture empirical reality in a useful way, although the underlying rationale for the rigidities remained somewhat crude and mechanical. Nevertheless, even after the financial crisis, it is clear that "New Keynesian" and related models are a vast improvement not only over Keynes but over later "new neoclassical" and "real business cycle" models that essentially rejected all frictions entirely. (At least, the new models are an improvement for purposes of analyzing monetary policy which would be virtually impotent in the absence of frictions.)

The challenge ahead is to incorporate financial frictions also. Although many young economists are already working on the problem, there is no reason to presume that a consensus will arise any more quickly than after Keynes, and it might well take many decades before the dust settles. Nevertheless, until macroeconomics meets this challenge, the credibility of its models will remain deeply compromised.

A second great challenge is to develop a better understanding of how government fiscal and debt policy affects the economy. On top of all the issues confronting analysis of monetary policy (introducing frictions in financial, labor and product markets), there are several additional problems. In the case of government spending increases, it has to matter greatly what the government is spending money on. An increase in infrastructure spending presumably has very different effects than an increase in military spending. Also, deficits that are due to tax cuts arguably have a very different impact than deficits that are due to government spending increases. There is also a question of how private savings might be influenced by deficit spending and the prospect of higher taxes in the future, a problem famously emphasized by Harvard economist Robert Barro. A related question is how large a government debt burden can an economy sustain without risking a loss in market confidence. Future research needs to better incorporate the striking non-linearities that historical analyses reveal in the data. Up to a point (a "debt ceiling") countries seem to be able to borrow freely with little consequence on the interest rate they pay. But as debt rises, and especially if growth slows, interest rates on a country's debt can rise quite suddenly, prompting either default or a sharp and painful adjustment.<sup>3</sup> The inadequacy of economists' models of fiscal and debt policy was again brought to the fore by the financial crisis. The US government had to make profoundly difficult choices on how much fiscal stimulus to introduce on the back of disturbingly thin economic research. Fiscal and debt policy will of

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<sup>3</sup> See Reinhart and Rogoff (2009, 2010).

course become a much more popular topic now, but again, as in the case of financial market frictions, it will take a great deal of research to make lasting progress.

The third great challenge is to develop a better cost-benefit analysis of financial market regulation. Most analyses of regulation take a microeconomic industry- or firm-level perspective. But in the case of financial market regulation, there are important economy-wide risks. Remarkably, whereas economists have looked a great deal at how financial deepening fosters development, there is far less understanding of how to balance risks in a more sophisticated economy. How does one do a proper cost-benefit analysis of bank capital adequacy rules? Does high-frequency trading improve an economy's stability and growth, or is it more likely to be destabilizing? Again, these are issues that have always existed, but have now been given fresh urgency by the global financial crisis.

I have detailed three important challenges facing modern macroeconomic research. In concluding, I want to take up the issue of methodology in economics. My basic contention is that although macroeconomists should certainly give more attention to historical analysis and empirics, the profession still very much needs to continue deepening its mathematical and analytical frameworks, certainly along the lines of the three challenges outlined above.

A central thrust of modern economics, especially since World War II, has been to introduce greater mathematical rigor and discipline into analysis. Although this approach has been much criticized, mathematical rigor serves two essential roles. First, it makes it far easier to make the field cumulative, so that researchers can generalize, refine, advance and refute existing theories. Secondly, in conjunction with modern statistical methods, it has made it possible to formally parameterize and test specific theoretical models, greatly expanding their applicability.

As noted, the recent financial crisis has raised huge criticism and discontent with the canonical approach to macroeconomics, some justified, some not. A fair criticism is that because academic researchers place great emphasis on internal consistency, there is a tendency to give far less rigorous attention to external consistency. As noted, the small number of economists who looked at long-term historical data on financial crises were far better able to analyze and predict the economy's vulnerability to the financial crisis, as well to project its likely aftermath.

But the current limitations of sophisticated mathematical and statistical models for real world macroeconomic applications should not be viewed as a reason to reject modern technical economics. Over the very long term, as economics advances as a science, frameworks that are amenable to concrete mathematical and statistical methods are likely to continue to improve dramatically, especially as computational methods expand and databases become deeper and easier to manipulate. One can imagine that future developments will allow much more nuanced models of how large-scale markets work, and of the interconnection between financial variables, political and regulatory constraints and macroeconomic outcomes. Ultimately, success in meeting the three challenges detailed here must involve a deepening of research in technical economic methods, not abandonment.

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