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Edited by
Daron Acemoglu, Kenneth Rogoff, and Michael Woodford

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Contents

Editorial

Daron Acemoglu, Kenneth Rogoff, and Michael Woodford

The twenty-second volume of the *NBER Macroeconomics Annual* continues its tradition of featuring important debates in present-day macroeconomics and presenting major developments in the theory of macroeconomic analysis and policy.

The first paper in this volume, "Aggregate implications of credit market imperfections," by Kiminori Matsuyama, investigates the macroeconomic implications of credit market frictions. Recent years have witnessed both a recognition of the importance of credit constraints in shaping a number of major macroeconomic phenomena, ranging from business cycles to growth and economic development, and a flurry of papers on models of imperfect credit markets. Many of these models make different assumptions about how the economy works and they often reach different, and even conflicting, conclusions. Matsuyama's paper provides a useful starting point for understanding the implications of credit market imperfections and why the predictions of various different models are sometimes conflicting. Matsuyama presents a unified framework based on a simple and common model of individual credit market constraints, which feature the standard inability to borrow by individuals unless they have sufficient collateral. This constraint creates the well-known net worth (or balance sheet) effect. This partial equilibrium model is familiar to most macroeconomists and features in many papers in the literature. Where the use of a unified framework becomes particularly important is in showing the importance of general equilibrium effects. The paper illustrates how general equilibrium and macro features of models influence the implications of the standard net worth effect for business cycles and growth. For example, depending on how endogenous savings and the interaction among projects are modeled, credit market imperfections can lead to greater persistence in macroeconomic fluctuations. At the same time, they may introduce greater (and sometimes self-sustaining) volatility. Matsuyama also shows how credit market imperfections influence the direction of international capital flows, the distribution of income in society, cross-country income differences, and international trade. The framework is particularly useful in its simplicity and clarity. It will enable future researchers to more clearly isolate the features of their models of credit market imperfections that lead to specific predictions and outcomes.

The second paper in the volume, "How structural are structural parameters?" by Jesus Fernández-Villaverde and Juan Rubio-Ramírez, sheds new light on an important debate in macroeconomics. Since Robert Lucas's famous critique, macroeconomists have been careful in distinguishing structural parameters of dynamic models from their reduced-form representations. An important reason for doing so is that when the economy undergoes important policy or technology changes, reduced-form representations will change. Truly structural parameters will remain invariant, however. A major area in which the focus on structural parameters has been central is the development and application of dynamic stochastic general equilibrium (DSGE) models, which are estimated and calibrated in order to provide a good fit to business cycles fluctuations in the United States and other advanced economies. These estimates of structural parameters are also used to investigate optimal monetary and fiscal policy. This paper shows, however, that many of the simpler models of DSGE, which assume constant parameters, may be misspecified and thus may be less useful for the analysis of business cycles and optimal policy than previously thought. It calls for richer theoretical and empirical models that allow for dynamically changing parameters and incorporate individual reaction to these parameter changes. The paper also showcases new empirical methods that promise to allow DSGE models with more complex specifications of this kind to be estimated. This paper provides a constructive approach toward a richer understanding of dynamic macroeconomic models and is likely to spur new research in this exciting area.

Our next two papers deal with fiscal policy. The paper by Roberto Perotti, "In search of the transmission mechanism of fiscal policy," turns to a basic question of macroeconomics: what are the impacts of shocks to government spending on consumption, real wages, and employment? This question is not only a major one for macroeconomic analysis, but it is particularly relevant in today's environment, where major fiscal reforms and important changes in the government's purchases of goods and services are taking place because of reforms of Social Security and demands for additional government services. The answer to this question may also be important in distinguishing between leading models of short-run macroeconomic fluctuations. While the standard neoclassical model predicts that an increase in government spending should lead to a decline in private consumption (and real wages), many Keynesian models predict the opposite. Thus a careful identification of the implications of government spending on the economy may help us distinguish between leading models of short-run fluctuations. The paper notes that different methodologies used in the literature in the past have led to different answers to these important questions. Studies exploiting shocks to government spending driven by the Korean War, the Vietnam War, and the first Iraq War have found evidence broadly consistent with the neoclassical predictions, while vector autoregression analyses have often produced results more in line with the Keynesian view. The current paper tries to reconcile these results and argues that the vector autoregression evidence and the Keynesian predictions are more robust. The discussion surrounding the paper questions whether these strong conclusions on the role of fiscal policy are warranted. This paper and its associated discussion will certainly lead to more detailed investigations of the effects of fiscal policy on the economy and the channels through which fiscal policy influences economic activity.

The second paper on fiscal policy, by Philippe Aghion and Ioana Marinescu, "Cyclical budgetary policy and economic growth: What do we learn from OECD panel data?" investigates the implications of the cyclicality of government budget deficit. Many Keynesian models suggest that the government should pursue a countercyclical budget deficit in order to smooth business cycle fluctuations. However, with the European Fiscal Stability Pact the European countries have moved away from countercyclical fiscal policy because of the need to contain their budget deficits. This paper investigates whether a more cyclical fiscal policy in Europe would lead to more positive macroeconomic outcomes, including more rapid economic growth. The authors suggest that countercyclical budget deficits may have an impact on growth by relaxing credit constraints on firms and thus allowing them not to cut a range of growth-enhancing investments, such as investments in research and development, during downturns. They then investigate how important these effects might be using panel data from the OECD. They first construct measures of the countercyclicality of the budget deficit for each economy. Using these measures, they then investigate the effect of countercyclical fiscal policy on economic growth. The results suggest that countercyclical budget deficits have an important positive effect on economic growth, and perhaps more importantly, that this effect is more pronounced in societies with less-developed financial markets (which is indirect evidence that the cyclical behavior of fiscal policy may be interacting with credit market behavior). On the basis of these results, the authors note that European economies could have a significantly more growth-promoting fiscal policy, both because their current budget deficits are quite countercyclical and because they have relatively low levels of financial development compared to the United States (and thus have more to gain from countercyclical fiscal policy). This paper may have important implications for future theoretical and empirical work in macroeconomics and for the conduct of macroeconomic policy. The lively and interesting discussion surrounding the paper focuses on whether the effects emphasized in the paper are quantitatively plausible and whether such effects can be identified from macroeconomic data.

The fifth paper in the volume, "Monetary policy and business cycles with endogenous entry and product variety," by Florin Bilbiie, Fabio Ghironi, and Marc Melitz, develops a rich macroeconomic model to study the role of cyclical entry of new firms and products on the nature of business cycle fluctuations and on the effects of monetary policy. Standard models of business cycles, which are also typically used for monetary policy analysis, assume either perfect competition or monopolistic competition with a given number of firms and products. The current paper endogenizes the number of products in the economy with a free-entry condition. Periods of economic expansion are predicted to lead to further entry by new products, which is consistent with the available data. This entry margin affects not only the real side of the economy but also the inflation dynamics. For example, the no-arbitrage condition in the asset markets between bonds and private equity creates a new channel for the impact of monetary policy, incorporating the fact that the price of equity will depend on future entry and future interest rates. The authors show that the implications of the model with endogenous entry for business cycles differ in important ways from those of traditional models. Moreover, this new model suggests that the impact of and the transmission channels for monetary policy can be quite different. They also take a first step toward analyzing optimal monetary policy in this context. The paper is an important methodological innovation and poses new questions relevant for macroeconomic theory and for the conduct of monetary policy.

Our final paper, by Charles Engel, Nelson Mark, and Kenneth West, "Exchange-rate models are not as bad as you think," turns to another major topic of macroeconomic research and policy debate. Despite considerable research on international exchange rates and financial flows across countries, macroeconomists have not reached a consensus on what class of models of the exchange rate are most promising for the analysis of international financial equilibria. The standard neoclassical models of the exchange rate are attractive because they provide a tractable framework for linking exchange rates to product prices, interest rates, and output. However, a plethora of papers, beginning with Meese and Rogoff (1993a, b), point out that these models do not perform very well out of sample, either when measured by forecasting performance or out-of-sample fit. In fact, they almost universally fail to improve on a simple random walk model (with no drift) except at very long horizons. This paper argues that these types of forecasting tests may overstate the failure of empirical exchange rate models, and presents a range of different types of evidence suggesting that the models have at least modestly more power than is commonly appreciated. For example, the authors present evidence that, consistent with theory, exchange rates do indeed incorporate news about future prices, interest rates, and output, and that the standard models are flexible enough to account for the observed large volatility in exchange rates. They also show how the forecasting performance of these models can be improved by incorporating expectations information from surveys, and by focusing on panel data estimation and long-horizon forecasts. The results in the paper should lead to a reexamination of some of the most negative assessments of the standard exchange-rate models, and will certainly help stimulate new research in this important area. The insights of the paper are also likely to be useful in the recent policy debate concerning the overvaluation and undervaluation of certain exchange rates.

We would like to take this opportunity to thank Martin Feldstein and the National Bureau of Economic Research for their continued support for the *Macroeconomics Annual* and the associated conference. We would particularly like to thank the conference staff, especially Rob Shannon, for outstanding logistical support and organization throughout, and the conference rapporteurs, Luminita Stevens and Justin Svec, for helping to summarize the discussions for this volume. We also gratefully acknowledge financial support from the National Science Foundation.

Abstracts

1 Aggregate Implications of Credit Market Imperfections

Kiminori Matsuyama

Credit market imperfections provide the key to understanding many important issues in business cycles, growth and development, and international economics. Recent progress in these areas, however, has left in its wake a bewildering array of individual models with seemingly conflicting results. This paper offers a road map. Using the same single model of credit market imperfections throughout, it brings together a diverse set of results within a unified framework. In so doing, it aims to draw a coherent picture, so that one is able to see close connections between these results, thereby showing how a wide range of aggregate phenomena may be attributed to the common cause. They include, among other things, endogenous investment-specific technical changes, development traps, leapfrogging, persistent recessions, recurring boom-and-bust cycles, reverse international capital flows, the rise and fall of inequality across nations, and the patterns of international trade. The framework is also used to investigate some equilibrium and distributional impacts of improving the efficiency of credit markets. One recurring finding is that the properties of equilibrium often respond nonmonotonically to parameter changes, which suggests some cautions for studying aggregate implications of credit market imperfections within a narrow class or a particular family of models.

2 How Structural Are Structural Parameters?

Jesús Fernández-Villaverde and Juan F. Rubio-Ramírez

This paper studies the question of the stability over time of the so-called "structural parameters" of dynamic stochastic general equilibrium

(DSGE) models. To answer this question, we estimate a medium-scale DSGE model with real and nominal rigidities, using U.S. data. In our model, we allow for parameter drifting and rational expectations of the agents with respect to this drift. We document that there is strong evidence that parameters change within our sample. We illustrate variations in the parameters describing the monetary policy reaction function and in the parameters characterizing the pricing behavior of firms and households. Moreover, we show how the movements in the pricing parameters are correlated with inflation. Thus, our results cast doubts on the empirical relevance of Calvo models.

3 In Search of the Transmission Mechanism of Fiscal Policy

Roberto Perotti

Most economists would agree that a hike in the federal funds rate will cause some slowdown in growth and inflation, and that the bulk of the empirical evidence is consistent with this statement. But perfectly reasonable economists can and do disagree even on the basic effects of a shock to government spending on goods and services: neoclassical models predict that in general, private consumption and the real wage will fall, while some neo-Keynesian models predict the opposite. This paper discusses alternative time series methodologies to identify government spending shocks and to estimate their effects. Applying these methodologies to data from the United States and three other OECD countries provides little evidence in favor of the neoclassical predictions. Using the U.S. input-output tables, the paper then turns to industry-level evidence around two major military buildups to shed light on the effects of government spending shocks.

4 Cyclical Budgetary Policy and Economic Growth: What Do We Learn from OECD Panel Data?

Philippe Aghion and Ioana Marinescu

This paper uses yearly panel data on OECD countries to analyze the relationship between growth and the cyclicality of the budget deficit. We develop new yearly estimates of the countercyclicality of the budget deficit and show that the budget deficit has become increasingly countercyclical in most OECD countries over the past twenty years. However, European Monetary Union (EMU) countries did not become more countercyclical. Using panel specifications with country- and year-fixed effects, we show that: (a) an increase in financial development, a decrease in openness to trade, and the adoption of an inflation-targeting regime move countries toward a more countercyclical budget deficit; (b) a more countercyclical budget deficit has a positive and significant effect on economic growth, and this effect is larger when financial development is lower.

5 Monetary Policy and Business Cycles with Endogenous Entry and Product Variety

Florin O. Bilbiie, Fabio Ghironi, and Marc J. Melitz

This paper studies the role of endogenous producer entry and product creation for monetary policy analysis and business cycle dynamics in a general equilibrium model with imperfect price adjustment. Optimal monetary policy stabilizes product prices, but lets the consumer price index vary to accommodate changes in the number of available products. The free-entry condition links the price of equity (the value of products) with marginal cost and markups and hence with inflation dynamics. No-arbitrage between bonds and equity links the expected return on shares, and thus the financing of product creation, with the return on bonds, affected by monetary policy via interest rate setting. This new channel of monetary policy transmission through asset prices restores the Taylor Principle in the presence of capital accumulation (in the form of new production lines) and forward-looking interest rate setting, unlike in models with traditional physical capital. We also study the implications of endogenous variety for the New Keynesian Phillips curve and business cycle dynamics more generally, and we document the effects of technology, deregulation, and monetary policy shocks, as well as the second moment properties of our model, by means of numerical examples.

6 Exchange Rate Models Are Not As Bad As You Think

Charles Engel, Nelson C. Mark, and Kenneth D. West

Standard models of exchange rates, based on macroeconomic variables such as prices, interest rates, output, and so forth, are thought by many researchers to have failed empirically. We present evidence to the contrary. First, we emphasize the point that "beating a random walk" in forecasting is too strong a criterion for accepting an exchange rate model. Typically models should have low forecasting power of this

type. We propose a number of alternative ways to evaluate models. We examine in-sample fit, but emphasize the importance of the monetary policy rule and its effects on expectations in determining exchange rates. Next we present evidence that exchange rates incorporate news about future macroeconomic fundamentals, as the models imply. We demonstrate that the models may well be able to account for observed exchange rate volatility. We discuss studies that examine the response of exchange rates to announcements of economic data, and then present estimates of exchange rate models in which expected present values of fundamentals are calculated from survey forecasts. Finally, we show that out-of-sample forecasting power of models can be increased by focusing on panel estimation and long-horizon forecasts.