Guest Editors' Introduction: Optimal Monetary Policy: Theory and Practice[*]

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Although simple rules provide a useful starting point in determining appropriate policy, they by no means deserve the "last word"—especially in current circumstances. An alternative approach ... is to compute an "optimal control" path for the federal funds rate Yellen (2012)

1 Introduction

While optimal control theory in the academic study of monetary policy can be traced back at least to the 1970s (Peterson and Lerner 1971), it was not until 2012 that Janet Yellen—the then Vice-Chair of the Federal Reserve Board (henceforth, the Fed)—began to popularize in speeches the use of optimal control in the practice of monetary policy (Yellen 2012).

While optimal policy simulations have the potential to provide valuable insights for policymakers regarding the trade-offs faced in the conduct of monetary policy, at least four significant conceptual and methodological challenges exist. The first is the introduction of new policy instruments to the central bank's toolkit. In addition to the short-term policy rate, central banks in the past decade have added quantitative easing, forward guidance, and macroprudential policy to their toolkits, to name but a few. Yet the optimal mix of instruments remains uncertain.

Second, the frequent visits of nominal policy interest rates to their effective lower bound (ELB) has introduced unavoidable nonlinearities, making the traditional linear-quadratic approach to the study of optimal policy less appropriate for addressing contemporary monetary policy problems.

Third, forward guidance as a policy instrument has highlighted the fact that the canonical New-Keynesian model, and many of its DSGE offspring, suffer from a puzzle—that forward guidance is unconvincingly powerful in this class of models, where monetary policy can control aggregate demand today using small promises about policy very far in the future. This puzzle requires a rethinking of many of the cornerstones of the canonical model including the representative agent, rational expectations, and credibility.

Finally, the persistence of low interest rates and the aggressive use of quantitative easing in the UK, euro area (EA) and the US has placed the potential

consequences of monetary policy for redistribution and inequality into sharp public focus. Heterogeneous-agent models are rapidly advancing to address these issues but remain fledgling, with serious computational challenges hindering the way.

This special issue brings together research at the forefront of this new agenda, addressing some of the significant challenges outlined above.[1] In particular, it brings together work from 23 international experts from North America to Europe spanning academia and central banking into 8 original research articles.

2   New contributions to optimal monetary policy design

This special issue comprises 8 articles. The first three focus on optimal policy in the canonical New-Keynesian model. The next two feature richer DSGE models but continue to study monetary policy in terms of a single instrument. A further two articles introduce features to their models that call for the study of additional macroeconomic policy instruments. The final article brings new empirical evidence regarding the effects of monetary policy actions.

This special issue begins with Damjanovic et al. (2021) investigating an intriguing new time-invariant policy dubbed "unconditionally optimal Ramsey policy". This is an alternative to the two typical approaches—the "timeless perspective" al a Woodford (1999) and "unconditional optimality" which maximise the unconditional expectation of social welfare—adopted in the literature. Damjanovic et al. (2021) show how this new policy can be actioned using two institutions—the first making promises about future policy outcomes and the second maximizing welfare while respecting the expectational constraints (promises) made by the first. They show that in a purely backward-looking model there is no role for the first institution and optimal policy resembles that from the timeless perspective. Instead in a purely forward-looking model the second institution plays no role and policy is equivalent to unconditional optimality. The article shows the desirable features of this new policy in a canonical New-Keynesian model with a hybrid Phillips curve and provides

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[1]Companion work to this special issue by the authors of this introductory article include a new computational toolkit for solving optimal policy projections (de Groot et al. 2021), and a consistent methodology for mitigating the forward guidance puzzle (de Groot and Mazelis 2020).

conditions under which it welfare dominates the alternative approaches to designing time-invariant policy.

The second article in this special issue, Cho et al. (2021), also studies the canonical New-Keynesian model yet gains new insights through the inclusion of uncertainty shocks. The previous literature has shown that uncertainty shocks in New-Keynesian models manifest themselves as cost-push shocks due to a precautionary pricing channel. Despite the fact that inflation and the output gap move in opposite directions in response to such shocks, Cho et al. (2021) prove the surprising result that the "divine coincidence" holds and optimal policy can therefore continue to close both gaps.

The next article in this special issue, Nunes et al. (2021), studies optimal policy in an extension of the canonical New-Keynesian model with both sticky prices and wages. The novelty of the article is to study the effect of imperfect credibility—a policy that spans the two extreme cases of full commitment and full discretion—and therefore one that is arguably a more realistic characterization of policy. The article addresses a recent debate about whether wage flexibility is welfare improving. They show that if credibility is low, monetary policy may not counteract the potential feedback loop between wage and price inflation, and as a result, wage flexibility can be detrimental for welfare. However, they also show that once wage markup shocks are incorporated, wage flexibility becomes key to dampen welfare losses.

The next four articles in this special issue sharply increase the quantitative nature of model under study. The first, Busetti et al. (2021), carefully calibrate a Smets and Wouters (2007)-style model to the EA and study monetary strategies when the natural rate of interest is persistently low, making the ELB a recurring constraint on policy. They show that a price-level targeting policy is optimal as it implicitly commits the central bank to keep the policy rate "lower for longer" during ELB episodes.

The second article, by Maih et al. (2021), also builds on the Smets and Wouters (2007) model, but the article estimates a Markov-switching process to capture asymmetries in the setting of monetary policy, both for the EA and the US. In an environment with the ELB and a low natural rate, they find that an optimal simple rule prescribes more aggressive reaction when inflation is below target compared to when it is above target, and they quantify the optimal

degree of asymmetry in the estimated model. This optimal policy prescription is in contrast to the EA experience pre-2014, where the estimates show the ECB responded more aggressively to inflation above target than below.

The next two articles study monetary policy within the broader macroeconomic policy landscape and with a focus of financial market imperfections. The first of these two, Filiani (2021), studies the optimal monetary-fiscal policy mix (under full commitment) in the EA in response to liquidity shocks in sovereign bond markets as seen during the European sovereign debt crisis. The article shows that optimal policy calls for a substantial central bank balance sheet expansion to restore liquidity and a EA-wide countercyclical fiscal stimulus to offset the effect of the ELB constraint.

The second, Ozhan (2021), studies news-driven international credit cycles, employing a two-country model in which financial crises are associated with an occasionally binding leverage constraint on banks and calibrated to mimic the financial flows and current account dynamics of Spain in the run up to the European sovereign debt crisis. The article compares two unconventional monetary policy instruments—liquidity injections into and direct assets purchases from the non-traded sector—and finds that the former is more effective.

The final article in this special issue, Walerych and Wesołowski (2021), completes the arc of travel from abstract theory to fully empirical. The article presents new evidence on the relative importance of international spillovers of Fed and ECB monetary policy to Emerging Market Economies (EMEs). Employing novel identification and estimation techniques, one important finding new to the literature, is the relative importance of the ECB shocks for Central and Eastern European economies. This evidence is important because international spillovers are often overlooked in the optimal monetary policy literature in which it is typical to model the policymaker as seeking to maximize a domestic welfare objective.

3   Looking ahead

Research in the field of monetary economics is experiencing a golden period, prompted by the coming together of three forces: 1) new and open questions raised by emergence of multiple new policy instruments and the "new-normal"

period of low interest rates; 2) a deluge of high frequency and granular data providing us with new empirical evidence on the effects of monetary policy actions; and 3) quantitative and methodological advances allowing us to simulate monetary experiments using larger and more richly-specified models.

Incorporating these changes to enhance our collective understanding of the optimal design and conduct of monetary policy is a project that is likely to continue for many years to come. This special issue hopes to serve as a key stepping stone in this research agenda. Even since this special issue was conceived, new challenges such as the Covid-19 pandemic and new opportunities such as central bank digital currencies have emerged. While this special issue has not directly addressed these, we hope some of the conceptual and methodological advances presented in this special issue will still help to address these new challenges and opportunities as they arise.

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