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A Keynesian macroeconometric framework for the analysis of monetary policy rules

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Abstract

In the framework of a Keynesian based monetary macro model, we study the implications of targeting monetary aggregates or targeting the interest rate as two alternative monetary policy rules. Whereas the former targets the inflation rate indirectly, through the control of the money supply, the latter, also called the Taylor rule, implies direct inflation targeting. Our monetary macro model exhibits: asset market clearing, disequilibrium in the product and labor markets, sluggish price and quantity adjustments, two Phillips curves for the wage and price dynamics and expectations formation which represents a combination of adaptive and forward looking behavior. The parameters of different model variants are estimated partly through single equation and partly through subsystem estimations for US quarterly time series data 1960.1–1995.1. With the estimated parameters system simulations for the two monetary policy rules are performed. Although the two rules have slightly different stability properties, we show that discretionary monetary policy, i.e. policy that responds to the state of macro variables, has stabilizing effects. We also show that our model with either of the two rules generate in terms of impulse response functions roughly the same responses to shocks as one obtains from standard VAR studies. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

Recently, in macroeconomics the quantitative study of monetary policy rules has been undertaken in a variety of frameworks. Such frameworks are, for example, the large-scale macroeconometric models (Fair, 1984 and the contributions collected in Taylor, 1999), the

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VAR (Bernanke and Blinder, 1992 and Sims, 2000) and the optimization based approach (Rotemberg and Woodford, 1999 and Christiano and Gust, 1999). Usually two alternative monetary policy rules have been considered, namely the monetary authority (1) targeting monetary aggregates or (2) targeting the interest rate. The former implies an indirect and the latter a direct inflation targeting. The latter rule originates in Taylor (1993) and has also been called the Taylor rule.¹ As has been shown historically, most central banks of OECD countries switched during the 1980s from the policy of controlling monetary aggregates to targeting inflation rates through controlling short-term interest rates.² The second type of monetary policy rule, the Taylor rule, has recently been given much attention and has extensively been evaluated in the context of macroeconomic frameworks, see Taylor (1999).

This paper employs a small scale Keynesian integrated macromodel to evaluate the above monetary rules of central banks. Our approach is novel in the sense that we employ a consistently formulated and complete Keynesian macroeconomic framework to study monetary policy issues. The Keynesian model presented and estimated here exhibits along the lines of Flaschel et al. (1997) asset market clearing, disequilibrium in product and labor market, sluggish price and quantity adjustments, two Phillips curves for the wage and price dynamics and expectations formulation which represents a combination of adaptive and forward looking behavior. Moreover, as in Chiarella and Flaschel (2000), the current paper also includes real growth, inflationary dynamics and inventory adjustment. As to the historical tradition, on the demand side it is Keynesian, it makes use of Kaldor's distribution theory, uses the asset market structure as in Sargent's (1987) Keynesian model, employs Malinvaud's (1980) investment theory, and a Metzler type inventory adjustment process and uses an expectations mechanism which is forward and backward looking.³

The model's dynamic features for the two policy regimes are explored for certain parameter constellations. The general dynamic behavior of our system can be analytically studied locally but the global behavior has to be inferred from numerical simulations. For the model with money supply rule it is indicated that for a certain range of parameter constellations interesting dynamics, for example, persistent cycles, may arise. On the other hand, the Taylor rule appears to add further stabilizing forces to this type of model, since it counteracts the destabilizing Mundell effect of inflationary expectations and thus brings more stability into the macro model.

In order to match the model with the US macroeconomic time series data, we estimate key parameters through single equation or subsystem estimations using US quarterly data from 1960.1 to 1995.1. In the estimation of the parameters for the wage–price dynamics and for the inventory dynamics as well as investment and consumption functions expectations variables appear which are not observables. We can, however, transform the equations to be estimated and estimate the adjustment speeds involved in the expectations dynamics. Those estimations are undertaken with two stage least square (2SLS). We want to remark that this kind of estimation strategy can also be found in recent literature on macro estimations for large systems with many parameters. Note that, since we are interested here in developing a model that replicates the empirical effects of policy actions, we explore less to what extent

¹ A rule of this type, however, can already be found in Fair (1984).

² See Svensson (1997).

³ For a similar treatment of expectations, see for example, recent contributions collected in Taylor (1999).

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