Preferences of the Central Bank of Brazil under the inflation targeting regime: Estimation using a DSGE model for a small open economy

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Abstract

The main objective of this paper is to estimate the preferences of the Central Bank of Brazil after the inflation targeting regime (January 2000 to December 2013), using a DSGE model with microeconomic foundations for a small open economy, based especially on the work of Kam et al. (2009). The model used in this study considers that the Central Bank minimizes a loss function, taking into account the deviation of inflation from its target, output stabilization, the interest rate smoothing and, unlike the previous works, the exchange rate. The results show that the major concern of the monetary authority in the period was the stabilization of inflation, followed by interest rate smoothing, exchange stabilization and, finally, output stabilization. The large value for the exchange rate smoothing parameter suggests the presence of fear of floating in the Brazilian case. An improved inflation targeting strategy should allow for less Central Bank intervention in the exchange rate market.
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1. Introduction and justification for the study

One of the major developments in macroeconomics in the past few decades has been the adoption of the intertemporal utility maximization paradigm and its implementation in dynamic stochastic general equilibrium (DSGE) models, which are currently the predominant approach to macroeconomic analysis, not only among scholars, but increasingly among Central Banks worldwide.

In DSGE models, economic agents (consumers and firms) are treated as optimizing agents. Thus, families maximize utility conditional on some given budget constraint and firms maximize their profits with the applicable constraints. However, the Central Bank's behavior is often described as a special case, i.e., by a monetary policy rule – the Taylor rule. Unlike other agents, mostly through DSGE models, the Central Bank does not solve its optimization problem.

The Taylor rule, the standard tool for assessing the behavior of Central Banks, empirically describes the monetary authority's response to macroeconomic variables. Although it was proposed from a purely empirical perspective, the Taylor rule has a theoretical basis, being the solution to a restricted optimization problem, where the Central Bank minimizes a quadratic loss function.[1] This way, the coefficients estimated in a reaction function are rather complex combinations of preference parameters (coefficients of the objective function) of the monetary authority and structural parameters of the model. Therefore, the coefficients found in the reaction function are reduced-form estimates and do not describe the structural characteristics of the monetary policy, and are then not useful for assessing issues concerned with the process of monetary policy formulation.

The present paper deals symmetrically the monetary authority in a DSGE model, i.e., to assume that the Central Bank is also an optimizing agent and minimizes its loss function conditional on economic constraints and, based on this problem, to estimate the monetary authority's preferences. Few works used a similar approach to the international case. Ilbas (2010, 2012) estimates FED's preferences and the preferences for the euro zone, respectively, following the model proposed by Smets and Wouters (2003), under commitment. Kam, Lees, and Liu (2009), on the other hand, estimate the central bank preferences for three of the major small open economies that operate under the inflation targeting regime: Australia, Canada and New Zealand. The authors use a quadratic loss function and the model put forward by Monacelli (2005) as a constraint on the optimization problem, taking into account the discretionary case. In the Central Bank's loss function, the following variables are used as arguments: deviation of inflation, of output, interest rate smoothing, and exchange rate. Remo and Vasícek (2009) do the same for the Central Bank of the Czech Republic, but they use commitment instead. In the loss function, the authors do not regard the exchange rate as argument.

Getting to know the Central Bank's preferences is of utmost importance. Many inflation episodes, for instance, may arise from the monetary authority's attempt to stabilize output above its natural rate. Moreover, the heavier the relative weight of output on the loss function, the larger the inflationary bias toward the economy. According to Castelnuevo and Surico (2003, p. 336), knowing the monetary policy preferences allows assessing its performance in a more accurate

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[1] Proposed by Svensson (1996).