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Monetary policy design and transmission asymmetry in EMU: Does uncertainty matter?

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Abstract

In this paper, we consider how uncertainty affects the choice between federal monetary policy based on national and union-wide aggregate data under conditions of asymmetry in the transmission of monetary policy. We find that the uncertainty about the transmission process sustains (and, in some cases, even reinforces) the need to take into account information about national economies in the formulation of monetary policy. Also the forecasting process matters when uncertainty is additive: in particular, when union-wide forecasting is more accurate than national-based forecasting, this advantage can compensate for the welfare loss from using union-wide aggregation. There is, however, a strong case for using national information in the optimal design of common monetary policy.

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1. Introduction

The conduct of monetary policy in the European Union is complicated by within-union asymmetries both with regard to macroeconomic shocks and the transmission of monetary policy. Recent theoretical analysis (see De Grauwe, 2000; Gros and Hefeker, 2002; Nolan, 2002) has shown that asymmetries in the transmission of monetary policy of the ECB call for design of monetary policies that takes into account national data. So, in order for monetary policies to be

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set optimally, it is not sufficient to use area-wide (euro) data on inflation and output gaps. Evidence also seems to support this view for the Federal Reserve System in the United States (see Meade and Sheets, 2002).[1]

This result obtains in models where there is no uncertainty regarding monetary policy. In this paper, we consider whether it holds when there is uncertainty about the transmission process (multiplicative uncertainty) or when the policymaker decides on monetary policy on the basis of forecasts that reflect an imperfect knowledge of shocks (additive uncertainty).

Monetary-policy transmission uncertainty is an important issue in the European context. Several studies (see, for example, Dornbusch et al., 1998; Mihov, 2001; European Central Bank, 2001) have pointed out that the degree of uncertainty in the transmission of monetary policy is important in the euro-zone, partly because of the heterogeneity in national transmission channels.

The optimal design of monetary policy with transmission uncertainty has been analysed in detail in the theoretical literature. The main insight is that transmission uncertainty may call for caution on the part of the monetary authorities. Faced with this kind of uncertainty, the authorities should tend to stabilise less than when no uncertainty exists. See Brainard (1967) for the original argument, and Söderström (1999) and Peersman and Smets (1999) for an application to the European context.[2]

Implications of additive uncertainty for monetary policy have received little attention in the context of a monetary union. A few papers have addressed the issue of whether the national or union-wide based content of forecasts affects the stabilisation properties of monetary policy. Some empirical studies (see, e.g., Massimiliano et al., 2003) have shown that the predictive power of the forecasts made by the central bank of the monetary union is influenced by the decision to base these forecasts on national rather than (direct) union-wide information.

To address the uncertainty issue, we use a model for the design of monetary policy in a monetary union with transmission asymmetries across member countries. We allow for uncertainty in the transmission process (Section 2), and introduce forecast-based monetary policies to address the case of additive uncertainty (Section 3). The robustness of our results is briefly discussed in Section 4 where we also conclude our study.

2. Parameter transmission uncertainty in an heterogeneous monetary union

2.1. The underlying modelling framework

Our framework is the Barro-Gordon model, which we apply to a monetary union of N different countries.[3] We introduce asymmetries in the model by allowing for differences in the national Phillips curves, so that:

$$U_i = U_i^* - a_1\left(\pi_i - \pi_i^e\right) + \varepsilon_i \tag{1}$$

where i is the country ($i=1, 2, \ldots, N$), U_i is the unemployment rate in country i and U_i^* is its natural counterpart; a_i denotes the transmission parameter of (unexpected) inflation shocks. As our objective is to focus on the implications of asymmetries in transmission, we assume that this

[1] See Heinemann and Hüfner (2004) who provide some evidence for the first years of EMU.
[2] Empirical evidence on the caution principle is more ambiguous (see European Central Bank, 2001).
[3] A similar modelling framework was used by De Grauwe (2000), Gros and Hefeker (2002) and Nolan (2002).