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The optimal choice of central bank independence and conservatism under uncertainty

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ABSTRACT

This paper examines the optimal monetary delegation arrangement of central bank independence and conservatism in the presence of uncertainty about the central bank's output objective. We show that full independence is no longer optimal with uncertain central bank preferences, and that optimal delegation involves the choice of both independence and conservatism. Further, we find that the usual trade-off between independence and conservatism no longer necessarily holds. Consequently, high central bank independence may also require a high level of conservatism.

1. Introduction

In the debate about the optimal institutional design of central banks, independence and conservatism are usually considered to be the most important ingredients for a stable and successful monetary policy. Building on Rogoff (1985), it is argued that delegating monetary policy to an independent and conservative central bank will improve its credibility and deliver, on average, a lower and less variable rate of inflation, albeit at the price of higher output variability.[1] In the literature about monetary policy delegation, however, most papers treat central bank independence and conservatism as a joint variable. Both institutional features are usually modeled by a unique parameter representing the relative weight attributed to inflation stabilisation in the central bank's objective function. Yet, independence and conservatism (henceforth, CBI and CBC) are two different concepts: independence refers to the central bank's ability to determine monetary policy without facing pressures from the government, while conservatism refers to the fact that the central bank assigns a higher relative weight to inflation control than society and the government do. In this paper, we explicitly distinguish between CBI and CBC in order to examine the socially optimal choice of both variables. This is done by means of a model of endogenous monetary policy delegation where the government (the principal) chooses the central bank (agent)'s degree of independence and conservatism to minimize the society's loss function.

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[1] The literature relating to the discussion about the design of monetary institutions is much too broad to be completely referenced here. It includes seminal contributions by, for instance, Kydland and Prescott (1977), Barro and Gordon (1983), Rogoff (1985), Alesina and Tabellini (1987), Cukierman (1992), Walsh (1995), Svensson (1997), and Cukierman and Lippi (1999). Recent surveys include Berger et al. (2001), Siklos (2008), Laurens et al. (2009), and Hayo and Hefeker (2010).

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Up to now only few papers have allowed for a formal distinction between CBI and CBC.[2] Important studies are the papers by Eijffinger and Hoeberichts (1998, 2008), Hughes Hallett and Weymark (2005) and Weymark (2007). These authors introduce an explicit parameter for independence in a monetary policy model with a conservative central banker. The idea of government influence on monetary policy is captured by the fact that the objective function that effectively governs monetary policy is a weighted average of the central bank and the government's objectives. CBI is then defined as the strength of the central bank in the negotiations with the government about monetary policy. Within this framework, they show that there exists a continuum of combinations of CBI and CBC that may be socially optimal. This result implies that an optimal degree of conservatism can be found for each given level of independence (and vice versa). It hence generalizes more specific studies focusing on the optimal degree of conservatism assuming full central bank independence. As pointed out by Hughes Hallett and Weymark (2005), this result also suggests that full independence is not a necessary condition for optimality in monetary policy. There exist alternative optimal combinations of independence and conservatism that lead to an equally effective monetary policy. Moreover, the optimal combinations of CBI and CBC identify both variables as potential substitutes, suggesting the existence of a trade-off between them. Less than full independence can be compensated by appointing a more conservative central banker.

In this paper, we add another dimension to the analysis of the optimal delegation arrangements for monetary policy by introducing uncertainty about the central bank's preference parameters.[3] The assumption is that the government and the private sector do not perfectly know the central bank's preferences.[4] As Faust and Svensson (2001, 2002), Jensen (2002), Demertzis and Hughes Hallett (2007), and more recently Westelius (2009), we assume that there is some uncertainty about the central bank's output gap target.[5] This uncertainty could be explained by a lack of central bank transparency, i.e. the fact that central banks are somewhat reluctant to disclose information about their policy objectives (see, for instance, Mishkin (2004) and Cukierman (2002), Cukierman (2009)). An alternative explanation would be the one proposed by Westelius (2009), suggesting that the central bank's uncertain output gap target reflects its measurement errors of the potential output level.

A series of papers has investigated the reaction of the public (the private sector and the government) to uncertainty in monetary policy.[6] Yet, the focus here is more normative. Closest in spirit to our analysis are papers by Beetsma and Jensen (1998) and Muscatelli (1999) that examine the implications of uncertain central bank preferences for the optimal design of monetary institutions. They demonstrate in particular that high conservatism may be desirable in the presence of monetary uncertainty as it helps to reduce the volatility of central bank decisions. These studies only consider the extreme case of full central bank independence however.

We offer new insights into the optimal delegation arrangements for monetary policy. Our first and most important contribution is to show that, in the presence of uncertainty about the central bank's output gap target, full central bank independence is no longer necessarily optimal.[7] Indeed, when the central banker's output objective is not clearly defined, giving him full autonomy exacerbates the uncertainty surrounding his decisions and may lead to higher macroeconomic volatility. As a consequence, just focusing on the determination of the optimal degree of conservatism while assuming given extreme values for the independence parameter can lead to suboptimal arrangements. The design of monetary delegation arrangements actually involves an optimal choice of both conservatism and independence.[8]

The second innovation of our paper is that it qualifies the idea of a trade-off between independence and conservatism. More precisely, we show that if the uncertainty surrounding the central bank's output gap target is high, a positive correlation may emerge between the optimal degrees of independence and conservatism, presenting them as complements rather than substitutes. In this case, rendering the central bank more independent increases the need for conservatism.

2. The New Keynesian framework with monetary uncertainty

This section presents a simple version of a New-Keynesian model (see, for instance, Clarida et al., 1999 or Woodford, 2003) which is extended to allow for uncertainty about the central bank's preferences. The development of inflation is de-

[2] In the empirical literature, most papers construct indices of central bank characteristics that combine information on the legal independence with information on the inflation aversion of the central bank (see, for example, Cukierman et al. (1992) or Alesina and Summers (1993)). Notable exceptions are the papers by de Haan and Kooi (1997) and Berger and Woitek (2005) and, more recently, Berlemann and Hielscher (2010) that propose separate indices for independence and conservatism.

[3] Such uncertainty plays a crucial role in practice and could have important consequences for the design of monetary institutions. Goldberg and Klein (2010) show that the initial years of the European monetary union where characterized by a significant degree of uncertainty about the ECB's preferences. Berger et al. (2009) show that there still seems to be uncertainty about the ECB's policy reactions in parts of the common monetary area.

[4] Again, there is a broad literature on monetary uncertainty, too large to be fully referenced here. Important contributions are the papers by Brainard (1967) and Cukierman and Meltzer (1986). Recent surveys include Blinder et al. (2008), Crowe and Meade (2008), Geraats (2009), and Dincer and Eichengreeen (2010).

[5] In the literature, a distinction is often made between "political" uncertainty, referring to the relative weights the central bank assigns to inflation and output stabilization, and "economic" uncertainty that refers to the output target (see Demertzis and Hughes Hallett, 2007).

[6] Sorensen (1991) and Grüner et al. (2009), for instance, consider the wage setters' reaction to uncertain central bank preferences, whereas Hefeker and Zimmer (2011) study the influence of monetary uncertainty on fiscal policies.

[7] AsEijffinger and Hoeberichts (1998, 2008), among others, we define central bank independence as the strength of the central bank in negotiating with the government about monetary policy. This definition corresponds to a special case of a Nash cooperative bargain.

[8] A related result is obtained by Lippi (2000) who examines the optimal degree of CBI and CBC from the median voter's point of view, considering the latter's preferences as uncertain. The main difference between Lippi's approach and ours is that he considers uncertainty about the principle (median voter)'s preferences while we consider uncertainty about the agent central bank's preferences.