Monetary Politics in a Monetary Union: A Note on Common Agency with Rational Expectations*

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Abstract

Is the politicisation of monetary policy in a currency union desirable? This paper shows that in a setting where political influence by national governments is modeled as a common agency game with rational expectations, the answer to this question crucially depends on whether the common central bank can commit to follow its policy.

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1 Introduction

This paper studies the effects of the politicisation of monetary policy in a monetary union in a setting in which political influence is modeled as a common agency game with rational expectations (as in Dixit and Jensen (2003), henceforth, DJ, 2003). National governments -the principals- exert political pressures on (i.e. offer incentive contracts to) the common monetary authority -the agent- before observing the realization of a shock to the economy in the attempt to influence the common monetary policy. The central bank chooses monetary policy taking into account the shock and the political pressures of national governments.

The model extends the theory of common agency with rational expectations to the case in which the agent can commit to follow its policy. It shows that "truthful" incentive contracts must be modified to account for the rational expectations constraint, as in DJ (2003). However, the only

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effect of these contracts is to distort the equilibrium policy, as in the traditional common agency literature (Bernheim and Whinston, 1986, and Grossman and Helpman, 1994).

The paper is organized as follows. Section 2 describes the basic economic framework and the optimal national and common monetary policy. Section 3 discusses the effects of political influence by national governments on the common central bank. A comparison with DJ (2003) is provided in section 4. Concluding remarks follow.

2 The economic model

The model builds on the work of DJ (2003). The economy has a population of measure one divided into N politically independent countries indexed by $i = 1, 2, ..., N$. These countries belong to a monetary union in which monetary policy is decided by a common central bank. The monetary authority chooses a policy variable x after the realization of shocks z, where z is a vector of country-specific shocks. Accordingly, the central bank's policy is a function $x(z)$. We can consider the monetary authority as directly deciding the inflation rate of the union. Individuals form rational expectations on x before the shock is realized; let $g(z)$ be the density function of z, we can write the condition for rationality as

$$x^e = E[x(z)] = \int x(z)\, g(z)\, dz. \tag{1}$$

In each country, individuals' welfare is influenced by their ex ante expectations of the central bank's ex post choice of the policy variable. Overall welfare in country i takes the general form $w^i(x, x^e, z)$. We take this as representing the objective function of the (benevolent) government of country i. Payoffs depend on the actual policy x chosen ex post by the central bank, the expectation x^e of x as well as on the realization of the shock z. We should interpret these payoffs as indirect utility functions.

2.1 Optimal monetary policy in a monetary union

As a benchmark, I find first the optimal policy from country i's perspective. The complete contingent commitment policy that member country i prefers is the one that maximizes $E\left[w^i(x, x^e, z)\right]$, subject to equation (1).

The first order condition to this problem is given by

$$\frac{\partial w^i}{\partial x} + E\left(\frac{\partial w^i}{\partial x^e}\right) = 0, \tag{2}$$

which implicitly defines the optimal commitment policy from the perspective of country i. Condition (2) implies that such optimal rule allows for policy responses by the common central bank to

shocks for which the authority has an informational advantage, but takes into account the effects of changes in x^e on the welfare of individuals in country i.

As is well understood, a single welfare-optimizing monetary policy differs from an ideal benchmark of nation-specific optimal monetary policy.[1] Assuming that there is some exogenous commitment or reputational mechanism, the common central bank simply chooses a policy rule that maximizes the expected aggregate social welfare of the monetary union:[2]

$$\max E\left[\sum_{i=1}^{N}\theta_i w^i\left(x, x^e, z\right)\right]$$

subject to the rationality constraint (1), where θ_i is the size of country i.

The commitment policy chosen by the common central bank is implicitly determined by the following first-order condition

$$\sum_{i=1}^{N}\theta_i\left[\frac{\partial w^i}{\partial x}+E\left(\frac{\partial w^i}{\partial x^e}\right)\right]=0. \tag{3}$$

The optimal common policy allows policy responses to shocks and is a weighted average of the preferred national policies, where weights depend on the size of countries.

The difference in preferences across countries implies that the optimal commitment rule for country i (condition 2) differs from the optimal common policy rule (condition 3). This creates incentives for national governments to exert political pressures on the monetary authority in the attempt to influence the common monetary policy.

3 Political pressures and monetary policy in a monetary union

Consider a monetary constitution for a currency union that allows politicians to influence the common central bank. I model the relationship between the common central bank and national governments as a common agency game. The chosen policy is the Nash equilibrium of a game that involves the N national governments and the monetary authority. The timing of the game is as follows. At the beginning of the period, politicians exert influence on the monetary authority. At a second stage, the shock is realized and the central bank chooses the policy taking into account national political pressures.[3]

[1] On the costs and benefits of a monetary union see the works by Alesina and Barro (2002) and Corsetti (2004) and the references therein.

[2] Refer to Persson and Tabellini (2000) and Walsh (1998) for surveys of the large literature on institutions and reputation in monetary policy.

[3] McCallum (1995) fameously noticed that governments can ex post renage on their contracts; an argument often used against politicisation of monetary policy. Here, I show that in a monetary union, national political pressures have negative effects *even if* governments do not change the contracts ex post.

Formally, political pressures are represented by contracts that the principals offer to the common agent. These incentive schemes are binding commitments to deliver a transfer (monetary or non monetary) to the agent when the policy is chosen and should be interpreted as specifying the intensity of political pressures by governments contingent on the policy and the shock:

$$t^i(x,z) = k^i(z) + c^i(x,z).$$

The central bank's objective function is of the Grossman and Helpman (1994) form and is given by

$$w^a = \eta \sum_i \theta_i w^i(x, x^e, z) + (1-\eta) \sum_i \mu_i t^i(x,z) \tag{4}$$

This function assumes that the agent cares about both the aggregate welfare of individuals living in member countries and about political pressures. We can think of $\eta \in [0,1]$ as capturing some elements of the institutional framework (the monetary constitution) of the monetary union, where $\eta = 0$ and $\eta = 1$ correspond to the case of *no* and *full political independence* respectively. The parameter μ_i represents the direct influence of principal i on the agent (with $\mu_i \gtreqless \theta_i$). We interpret μ_i as country-specific political (or lobbying) ability.

3.1 Equilibrium with commitment

I investigate the effects of politicisation of monetary policy under commitment. In this context, national governments exert political pressures to influence the rule that the common monetary authority adopts.

The common central bank chooses policy x to maximize the expected value of its objective function (equation 4) taking into account that expectations are formed rationally (condition 1) and the political pressures of national governments. The equilibrium is characterized by the following two expressions that implicitly define political pressures and the policy under commitment:[4]

$$\frac{\partial c^i}{\partial x} = \frac{\partial w^i}{\partial x} + E\left(\frac{\partial w^i}{\partial x^e}\right) \tag{5}$$

$$\sum_i \left[\eta\theta_i + (1-\eta)\mu_i\right]\left[\frac{\partial w^i}{\partial x} + E\left(\frac{\partial w^i}{\partial x^e}\right)\right] = 0. \tag{6}$$

Equilibrium political pressures/transfer schedules (determined by condition 5) reflect the preferences of country i in terms of the optimal commitment policy rule (see equation 2). Principals take into account how a change in the policy variable *and* in expectations will affect their payoff.

[4] The derivations are in the Appendix.

As discussed in DJ (2003), these contracts generalize the "truthful" (or compensating) equilibrium schedules of Grossman and Helpman (1994) by capturing the additional effect of the rational expectations constraint.

The equilibrium policy under commitment (condition 6) is a weighted average of the preferred policy rules of the principals where the weights depend on the relative size and political ability of each country. The only effect of political pressures is to distort the equilibrium policy in favor of some principals as in standard multiple-agency problems (Bernheim and Whinston, 1986, and Grossman and Helpman, 1994). The reason is that all relevant decisions -political pressures and the policy rule- are taken before the realization of the shock. After the shock is realized, the common central bank decides monetary policy according to the rule which is committed to follow.

The politicisation of monetary policy (a move from regime $\eta = 1$ to $\eta = 0$) has the only effect to allow more influential countries (those with larger μ_i for given μ_{-i}) to distort the common monetary policy towards what is best for their citizens. Possibly, to the disadvantage of the other members of the union.[5]

4 A comparison with Dixit-Jensen (2003)

A time consistency problem in monetary policy arises when the monetary authority cannot commit to a policy rule. DJ (2003) apply the theory of common agency with rational expectations to the case of a monetary union in which the common central bank set monetary policy under discretion. In this case, governments correctly anticipate that the central bank has an incentive to respond to the shock ex post taking expectations as given (i.e. to create surprise inflation). Optimal transfer schemes under discretion take this into account and mitigate the time consistency problem of the monetary authority.[6]

The games under commitment and under discretion "converge" when the common agent cares only about the contracts ($\eta = 0$). Under no political independence, the monetary authority will only respond to the incentives schemes that have been offered by the governments ex ante and, therefore, has no incentive to create surprise inflation. In turn, governments anticipate this and set the transfer schemes to induce the common central bank to follow their own preferred policy (implicitly determined by condition 2). Therefore, in the special case in which $\eta = 0$, the incentive schemes offered by the governments are the same under commitment and under discretion. As the monetary authority only cares about such contracts, this implies that the same policy is implemented.

[5] Note that even in the special case in which $\theta_i = \mu_i \ \forall i$, the politicisation of monetary policy is inefficient: in equilibrium, political pressures fully offset each other, but are costly for governments. In this case, all members of the union would benefit if the possibility to influence the monetary authority were removed in the first place.

[6] Their result is similar to the "optimal contract" approach (Walsh, 1995). However, in a multiple-agency game the lack of coordination between the principals may lead to a deflationary bias.

5 Conclusions

This paper examines the theory of common agency with rational expectations under commitment. The model shows that, while the equilibrium schedules need to be modified to account for the rational expectations constraint (as in DJ, 2003), the multiple-agency game with rational expectations delivers the same result as in standard common agency games (Bernheim and Whinston, 1986, and Grossman and Helpman, 1994), where the only effect of transfer schemes is to distort the policy in favor of more influential principals. This result implies that the desirability of politicisation of monetary policy in a currency union depends critically on whether the monetary authority can commit to follow its policies.

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Appendix

The game is solved backward. At the last stage, the agent maximizes the expected value of the objective function (4) taking into account that expectations are formed rationally (i.e. according to condition 1) and for given political pressures. We can write the Lagrangian of the agent maximization problem as

$$L^a = E\{w^a\} + \lambda_1\{x^e - E(x)\}.$$

Combining the first order conditions of this problem, we find the policy rule that the agent chooses ex ante is implicitly determined by

$$\eta \sum_i \theta_i \left[\frac{\partial w^i}{\partial x} + E\left(\frac{\partial w^i}{\partial x^e}\right)\right] + (1-\eta)\sum_i \mu_i \frac{\partial t^i}{\partial x} = 0. \tag{A1}$$

Before observing the shock, each national government chooses political pressures to maximize the expected value of welfare in country i. Formally, government i's choice variables are the functions $k^i(z)$ and $c^i(x,z)$ and the government maximizes $E\left[w^i(x,x^e,z) - t^i(x,z)\right]$ subject to several constraints. First, principals recognize that the agent will set the policy according to (A1), this is kept implicit in the Lagrangian below. Second, political pressures need to satisfy a participation constraint for the agent of the form $E(w^a) \geq w_0^a$, where w_0^a is an outside opportunity utility -i.e. the level of utility that the agent gets in the absence of political pressures. Principals also recognize that expectations will be formed rationally. We regard each principal as if it directly chooses the expectation of x subject to the rationality constraint (1).

Consider the decision problem of government i, the Lagrangian (where we omit function arguments for brevity) is

$$L_i = E\left\{w^i - \left[k^i + c^i\right]\right\} + \lambda_1^i\{x^e - E(x)\} + \lambda_2^i E\left\{\eta\sum_i \theta_i w^i + (1-\eta)\sum_i \mu_i\left[k^i + c^i\right] - w_0^a\right\},$$

where λ_1^i and λ_2^i are the Lagrange multipliers on the rationality constraint and on the participation constraint of the common agent.

We can simplify the Lagrangian noting that it depends only on the expectation $E\left[k^i(z)\right]$ and not directly on the function $k^i(z)$. From the first order condition with respect to this, we find that the Lagrange multiplier on the agent's participation constraint is $\lambda_2^i = 1/[(1-\eta)\mu_i]$. Using this, we can rewrite the Lagrangian above as

$$L_i = E\left\{w^i\right\} + \lambda_1^i\{x^e - E(x)\} + \frac{1}{(1-\eta)\mu_i} E\left\{\eta\sum_i \theta_i w^i + (1-\eta)\sum_{j\neq i}\mu_j\left[k^j + c^j\right] - w_0^a\right\}.$$

Now consider the effect of a change of x on this Lagrangian and use condition (A1) to simplify it, we get

$$dL_i = \left\{ \frac{\partial w^i}{\partial x} - \lambda_1^i - \frac{\partial c^i}{\partial x} - \frac{\eta}{(1-\eta)\,\mu_i} \sum_i \theta_i E\left(\frac{\partial w^i}{\partial x^e}\right) \right\} g\left(z\right) de\left(z\right).$$

This implies that the optimal choice of government i's political pressure on the common central bank needs to satisfy

$$\frac{\partial c^i}{\partial x} = \frac{\partial w^i}{\partial x} - \lambda_1^i - \frac{\eta}{(1-\eta)\,\mu_i} \sum_i \theta_i E\left(\frac{\partial w^i}{\partial x^e}\right). \tag{A2}$$

Next, we can find the Lagrange multiplier λ_1^i from the first order condition for the choice of x^e:

$$\frac{\partial L_i}{\partial x^e} = E\left(\frac{\partial w^i}{\partial x^e}\right) + \lambda_1^i + \frac{\eta}{(1-\eta)\,\mu_i} E\left(\sum_i \theta_i \frac{\partial w^i}{\partial x^e}\right) = 0.$$

Substituting the Lagrange multiplier λ_1^i into condition (A2) and rearranging, we get condition (5) in the main text.

The equilibrium policy needs to be consistent with the maximization problem of the agent. We therefore substitute the expression that implicitly defines the optimal contract of principal i into condition (A1). Moreover, we can eliminate the Lagrange multiplier λ_1^i by using the first order conditions for the choice of x^e. This leads to condition (6) in the main text.