The Politics of Monetary Policy*

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Abstract

In this paper we critically review the literature on the political economy of monetary policy emphasizing the questions opened by the recent financial crisis. We begin with a discussion of the issue of rules versus discretion. We then examine the independence of Central banks both in normal times and in crisis and in relation to the political cycles. Finally we address international institutional issues concerning the feasibility, optimality and political sustainabilty of currency unions in which more than one country share the same currency. A brief review of the Euro experience concludes the paper.

1 Introduction

Had we written this chapter before the summer of 2007 we would have concluded that there was much agreement amongst economists about the optimal institutional arrangements for monetary policy. Sure, for the specialists there were many open questions, but for most outsiders (including non monetary economists) many issues seemed to be settled. An hypothetical paper written (at least by us, but we believe by many others) before the summer of 2007 would have concluded that:

1)Monetary policy is better left to independent Central Banks at harms length from the politicians and the treasury.

2)Most central banks should (and must do) follow some sort of inflation targeting; that is they look at inflation as an indicator of when to loosen up or tighten up. Certain Central banks do it more explicitly than others (say the UK Central Bank versus the Fed), some other Central Banks still look at quantity of money and or credit indicators (like the so called "second pillar" of the ECB, the first being inflation) but inflation targeting had basically "won".

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3)The combination of the independence of the Central Bank and an anchor to an inflation solved theinflation bias pointed out by Kydland and Prescott (1977) and Barro and Gordon (1983a,b);

4)Politicians sometimes raise their voice and use Central Banks as scapegoats (especially in Europe) but in practice in recent years politicians in OECD countries have had little room to influence the course of monetary policy, for instance to stimulate the economy before elections Blaming the ECB in Europe was very common in the early part of this decade as a justification of the low growth due to the supposedly too high interest rates.

5)The experience of the Euro was overall relatively positive, but the European currency had not been tested yet in a period of a serious recession which was considered a serious treath to the currecncy union..

In summary, we would have concluded, most of the basic issue about the conduct of monetary policy had been solved by the burst of research and experiences that followed the disinflation of the eighties and the relative peaceful period (at least in the US) which followed, the nineties and the early 2000.

The most serious financial crisis of the post war era, has reopened the debate about monetary policy and institutions. One view is that what went wrong was the fact that monetary policy in the early part of the first decade of the new century went off the right track and has abandoned the good principles of monetary rules and inflation targeting, perhaps in response to political pressures to avoid at all cost a recession in the eraly part of the 2000s. [1] Others argue instead that inflation targeting has failed because it did not avoid financial bubbles, and rules have to be more flexible to allow monetary policy to react to a wider variety of variables in addition to inflation of goods and services. A related question is wthether and how after a crisis hits, Central Banks have to switch to "emergency" monetary measures. In addition the current crisis has given us a fresh opportunity to observe the behavior of the economies in Euroland whihc share a common currency in a period of economic stress.

Therefore the way this chapter is organized is as follows. For each topic we critically review the pre crisis literature and then we discuss what new issues the financial crisis has reopened and how it has changed our perceptions. The topic which we address in turn are: rules versus discretion (in section 2); Central Bank independence (section 3); political influence on monetary policy and political business cycles (section 4); the politics and economics of monetary unions in general (section 5) and with specific reference to the Euro (section 6). The last section concludes.

2 Rules versus Discretion

An enormous literature has dealt with this question, and we think that it is unnecessary to provide yet another detailed survey of it.[2] A brief reminder of the key issue will suffice here. Also we do not plan to go into any detail

[1] See Taylor (2009) for a forceful argument along these lines.

[2] See for instance Persson and Tabellini (2002) and Drazen (2002).

here about various type of monetary rules and the intricacies of different type of inflation targeting. In addition to Woodford (2007) other chapters in this volume address this question. In this section we only focus on some politico-economic and institutional issues regarding the implementation of monetary rules and the trade off between the rigidity of rules and the flexibility of discretion.

2.1 The basic problem

Politicians may have an incentive to inflate the economy because they believe that the unemployment rate is too high (or the GDP gap too high or the GDP growth too low). This may be because the economy is distorted by taxes or by labor unions which keep real wages too high since they care more about employed union members than unemployed non members. By rational expectations only unexpected inflation can temporarily increase real economic activity. The public understands the incentive of the policymakers to increase inflation, rationally expects it and the economy ends up with high inflation and unemployment at its "distorted" rate.

Several authors starting with Kydland and Prescott (1977) have used this model to explain how an increase in the equilibrium rate of unemployment may bring about higher inflation because of this time inconsistency problem. This was an explanation for periods of "stagflation", i.e. trend increases in unemployment and inflation. The incentive of inflating away public debt with unexpected inflation has the same effect. This is an issue especially common in developing countries but also in high inflation countries in the eighties in Europe (e.g. Italy, Belgium etc.). While we focus in the discussion on the unemployment/growth question, much of the discussion could be rephrased in terms of deflation of government bonds. The large increase in government debts which will follow the current financial crisis may make this question especially relevant.

A policy rule which commits the policy maker to a certain pre announced inflation path would solve the problem. The problem is how to make the rule stick and be credible. Precisely because of the "temptation" to deviate from the rule, one needs a mechanism of enforcement. One of this mechanism is simply the cost of giving up the accumulated stock of credibility of the central bank and the loss of reputation which would entail a deviation form the rule. Another one is some institutional arrangement which makes it explicitly costly (or impossible) for the monetary authority to deviate from the rule.

2.2 Reputation (in brief)

Models of reputation building in monetary policy derive from applications of repeated game theory, essentially repeated prisoners' dilemmas adapted to the game between a Central Banker and market expectations.[3] A very simple (and

[3] Some theorists have questioned the applicability of repeated game theory to a situation in which a "player" is a market expectations. See Persson and Tabellini (2002) and the refeences

well known) model serves the purpose of illustrating the trade-off between the rigidities of rules and the benefits of discretion. Suppose that output (y_t) is given by :

$$y_t = \pi_t - \pi_t^e \tag{1}$$

where π_t is inflation, π_t^e is expected inflation. The market level of oputput is nromalized at zero. The social planner (or Central Banker) minimizes the loss function:

$$L = \frac{b}{2}(y_t - k)^2 + \frac{1}{2}(\pi_t)^2 \tag{2}$$

where $k > 0$ is the target on output and b is the relative weight attributed to the cost of deviation of output from its target. The fact that the target on output k is greater than the market generated level of zero is the source of the time inconsistency problem. As usual in this literature we assume that the policymaker controls inflation directly. The discretionary equilibrium is obtained by minimizing (2) holding π_t^e constant and then imposing rational expectations. The solution is, where the subscript D stands for discretion[4]:

$$\pi^D = bk \tag{3}$$

$$y_t^D = 0 \tag{4}$$

The inflation bias is higher the larger is the weight given to output in the loss function and the difference between the target rate of output k and the market generated one, namely zero. The optimal rule is instead

cited therein for discussion,

[4]The problem is:
$\min_{\pi_t} \frac{1}{2}(\pi_t)^2 + \frac{b}{2}(\pi_t - \pi_t^e - k)^2$
Holding π_t^e as given.
F.O.C.
$\pi_t = \frac{b}{1+b}\pi_t^e + \frac{bk}{1+b}$

Set $\pi_t^e = E(\pi_t)$ and solve by simple algebra remembering that $E(\varepsilon_t) = 0$ for the public.

$$\pi_t^* = 0$$

$$y_t^* = 0 \tag{5}$$

where the superscript $*$ stands for rule. The rule provides a net gain: lower inflation and the same level of output. But if the public expects the optimal rule of zero inflation the Central Bank has the "temptation" to generate an unexpected inflationary shock and a short run burst in output. The cost is given by the fact that for a certain number of periods the public will not believe that the Central Bank will follow the rule and the economy will revert to the sub optimal discretionary equilibrium will instead expect discretion and the equilibrium will revert to it. This is lablled "the enforcement" namely the difference in utility between a certain numbers of periods of discretion instead of the rule. The optimal policy of zero inflation is sustainable when these cost of enforcement are higher than the temptation. Even when the optimal rule is not sutainable, in general a range of inflation rates with a lower bound relative to $\pi^D = bk$ is sustainable. The lowest level of this range which is the best sustainable outcome, is considered the equilibrium[5] The largest is the enforcement relative to the temptation the lower is the lowest inflation rate in the sustainable range.[6]

Formally the inflation rule is:

$$\pi_t = \pi^o \tag{6}$$

If the public expects the central bank to follow the rule, then the central bank will minimize the loss function by choosing:

$$\pi_t = \frac{b}{1+b}\pi^o + \frac{b}{1+b}k \tag{7}$$

The temptation to cheat on the consumers is given by the difference between the utility loss given by not cheating and the utility loss given by cheating and it is equal to:

$$\frac{1}{2(1+b)}(bk - \pi^o)^2 \tag{8}$$

We have to assume some form of expectations mechanism in order to find the cost of cheating by the central bank; following Barro and Gordon (1983a)

[5] There are of course subtle issues of multiplicity since a range not one level of inflation is in general sustainable. We do not enter into this technical discussion here.

[6] Obviously upper bound is $\pi^D = bk$ and it is always sustainable.

let's assume that the economy expects the central bank to follow the rule only if it did so last period and otherwise expects the level of inflation under discretion. Enforcement can therefore easily be determined as:

$$\frac{\beta}{2}(b^2k^2 - (\pi^o)^2) \tag{9}$$

An inflation rule is enforceable only if the cost of cheating is higher than the benefit:

$$\frac{1}{2(1+b)}(bk - \pi^o)^2 < \frac{\beta}{2}(b^2k^2 - (\pi^o)^2) \tag{10}$$

which is true if:

$$\frac{\beta(1+b)-1}{\beta(1+b)+1} \leq \pi^o \leq bk \tag{11}$$

The best enforceable rule is then:

$$\pi^o = \frac{\beta(1+b)-1}{\beta(1+b)+1} \tag{12}$$

and it features an equilibrium inflation which is higher than the first best zero inflation, but lower than the inflation under discretion.

A very large literature has investigate various cases of this based game, for instance when the public is unsure about the objective function of the policymaker (Backus and Driffil (1985 and 1985) and Barro (1986)). [7] The model with uncertainty regarding the policy preferences of the Central Bank was used to explain why the disinflation of the early eighties in the US lead to a recession. The idea was that inflationary expectations took a while to learn the new Volcker's policy rule and whether or not he was though against inflation. In other words this model explained while even with rational expectations a disinflation can have negative real effects on growth. which seemed a puzzle.

The basic conclusion of this literature is that if a Central bank has a credibility capital (i.e. it has followed the optimal rule for long time), it has a low

[7] For an extended treatment of reputational model of monetary policy see Cukierman (1992), Drazen (2000) and Persson and Tabellini (2000) and the references cited therein. Given the existence of these excellent surveys we do not pursue the technical aspect of reputation models here.

discount factor and a sufficiently long horizon it would highly value the loss in terms to a return to the sub optimal discretionary equilibrium and therefore the optimal rule would be more easily sustainable. However, as we discuss more below, low discount factors may be the norm rather than the exception, when political incentives (like upcoming elections) are explicitely taken into consideratioin.

Note that the application of the punishment by the public (i.e the reaction to a deviation from the rule on the part of the Central Bank) relies on the fact that monetary policy is observable, namely the public can detect when the central Bank is abandoning a rule or instead is responding to some unexpected shock (like a shift in money demand). An interesting paper by Canzoneri (1985) points out that in this case reputation based models imply difficulties in implementing the optimal rule in equilibrium. Drazen and Masson (1994) argue that the implementation of contractionary monetary policies may decrease instead of increase the credibility of central banks; since policies have persistent effects, an anti-inflationary policy today may have dire effects on unemployment in the future, making the future commitment to anti-inflationary policies less credible. They present some evidence of this mechanism drawing from the experience of the EMS; in times of high unemployment the absence of a realignment was seen as lowering the credibility of fixed parities instead of enhancing it.

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2.3 Simple rules and complcated ones

Deviations from very simple rules (such as an inflation target to be reached every quarter) are easy to detect. A rigid rule allows simple verifications of derivations from it. If a rule says "inflation has to be 2 percent exactly every quarter" it is easy to detect deviations from it, but it is likely to be too rigid. In fact often real world inflation targeting rule allow for deviations from the target for several quarters, in the course of the business cycle. This is the key trade off between a policy rule that allows enough flexibility to react to various shocks, and a rule that is simple enough so that the deviation from it can be checked.

A very simple model serves the purpose of illustrating the trade-off between the rigidity of rules and the flexibility of discretion. Suppose that output (y_t) is given by :

$$y_t = \pi_t - \pi_t^e + \varepsilon_t \tag{13}$$

where we now added ε_t which is an i.i.d. shock with zero mean and variance σ_ε^2. The social planner minimizes the same loss function as above: The

shock to output ε_t captures in the simplest possible way all the random events that monetary policy could possibly stabilize. We abstract from persistence of shocks, multiplicity as well as many other complications. The discretionary equilibrium is solved minimizing (2) holding π_t^e constant and then imposing rational expectations. Expectations are formed before the shock ε_t occurs, but the policymaker chooses inflation after the realization of it. This assumption obviously is what allows a stabilization role for monetary polciy.[8]

The solution is[9]:

$$\pi_t^D = bk - \frac{b}{1+b}\varepsilon_t \tag{14}$$

The discretionary solution includes a positive inflation rate (bk) and a stabilization term ($\frac{b}{1+b}\varepsilon_t$). Thus:

$$E(\pi^D) = bk \tag{15}$$

$$E(y_t^D) = 0 \tag{16}$$

$$Var(y_t^D) = (\frac{1}{1+b})^2\sigma_\varepsilon^2 \tag{17}$$

Note that the average inflation is higher than its target (zero) The average output is the market generated level (zero) and therefore below the target k, but its variance is reduced. The optimal rule is instead:

$$\pi_t^* = -\frac{b}{1+b}\,\varepsilon_t \quad with \quad E(\pi_t^*) = 0 \qquad E(y_t^D) = 0 \;\; Var(y_t^D) = (\frac{1}{1+b})^2\sigma_\varepsilon^2 \tag{18}$$

[8] On simple and standard justification of this assumption is the existence of wage contracts like those propsed by Fischer (1977).

[9] The problem is:
$\min_{\pi_t} \frac{1}{2}(\pi_t)^2 + \frac{b}{2}(\pi_t - \pi_t^e + \varepsilon_t - k)^2$
Holding π_t^e as given.
F.O.C.
$\pi_t = \frac{b}{1+b}\pi_t^e + \frac{bk}{1+b} - \frac{b\varepsilon_t}{1+b}$

Set $\pi_t^e = E(\pi_t)$ and solve by simple algebra remembering that $E(\varepsilon_t) = 0$ for the public.

This rule keeps inflation on average at its target (zero) and allows for the same output stabilization as discretion. However, this rule is not time consistent because if the market particpants expects the rule, the policymaker has an incentive to choose the discretionary policy π_t^D,generating an unexpected burst of unexpected inflation, bk, increasing output.

This very simple example allows an illustration of the critical politico-economic issues surrounding the question of rules versus discretion, of predictability and observability of monetary policy and lack thereof. Let's begin with enforceability of the rule. Suppose that the shock ε is (ex post) perfectly observable. Then it is easy to check whether the policymaker has followed the rule or deviated. Repeated interaction and the reputation and credibility built by the policymaker would sustain the first best. But now suppose, more realistically, that the shock ε is not observable by the public. Then the latter cannot perfectly verify whether the rule has been followed or not. That is the public cannot detect whether a burst of inflation is due to a deviation from the rule or a particularly "bad" realization of ε. In this case reputation model tend to break down. Whether or not the rule has been followed is especially difficult to detect if the monetary rule is contingent on the Central Bank expectations of future shocks. More generally we can think of course of a multitude of shocks hitting the economy in the present and in the immediate future, shocks to which, in principle, monetary policy could react to. Some of these shocks are easily observable and monetary policy can be made contingent upon them, others are not so easily observable.

Suppose, then, that the policymaker can either follow a simple, non contingent rule with constant expected inflation (which would be zero, of course) or the discretionary policy π_t^D. In other words lets assume that reputational mechanism break down because of the complexity and observability of the optimal rule and let's examine a simple trade off between a simple rule and discretion The loss of discretion (L^D) is lower than the simple rule (L^{SR}) if and only iff:

$$\sigma_\varepsilon^2 > k^2(1+b) \tag{19}$$

Condition (19) can easily be obtained by computing the expected costs of the discretionary policy and comparing it with the expected cost of the simple rule $\pi^{SR} = 0$.

What does it mean? The first best rule is contingent upon the realization of one, in general, many shocks. If a rule is "too complicated " it is not verifiable by the public. Complicated contingent rules make monetary policy unpredictable. The lack of predictability has costs which in this simple model are captured by an increase in average inflation due to a return to discretionary equilibrium. The parameter k represents the cost of "discretion" , namely the cost of not having a monetary policy rule. In a more general model these costs could be modelled much more broadly, for instance all the costs due to market instability due to

"guessing games" about the future costs of monetary policy. Assuming then that the first best rule which may be contingent on a vast number of variables and a broad information set is unenforceable, the second best implies a choice between "discretion" and a "simple rule"; the condition which makes one or the other preferable is given in (19). If the variance of the environment is large, than the benefits of the partial stabilization allowed by discretion overcome its costs. To put it slightly differently in one believes that monetary policy can and should react to multitude of shocks and has much latitude in stabilizing them, than discretion is the best course of action. If one believes that there is relatively little than monetary policy can do any way and very few shocks can and should be accommodated than a rigid rule is preferable. This seems to captures the rhetoric of real world discussions about pros and cons of monetary rules. Also a change of the environment for a relatively "calm" one with low σ_{ε}^2 to a more turbulent time my switch the benefit from a simple rule to discretion.

2.4 Rules versus discretion during crises

Consider now the distinction between normal times, and crisis. We can think of the former as a situation in which the environment (summarized by the shock ε and its variance) turns extremely negative, that is a very low probability event with a large (in absolute value) and negative realization of ε, a war, or, more interestingly given recent events, of a major financial crisis. In this situation flexibility may be the primary need of monetary policy. In the language of the model the temptation to create unexpected inflation in a period when output is especially far from its target (rememebr that costs of deviations from target are quadratic) that the enforcement may not be enough to compensate for it and the simple rule is abandoned. Then we should expect rigid rules to break down in a crisis.

However, one can also think of an institutional arrangement based upon rules with escape clauses ; namely a simple verifiable rule with the clause that it would be abandoned in the case of war of major crisis. But in order for an escape clause to be enforceable as such it has to be very clearly specified. A major war could be an example, which is easily verifiable. But what about a "major" financial crisis? How does one define "major"? How deep the crisis and the recession has to be? This enforcement problems have the same nature of those dicussed above in the context of enforcing rules based upon non perfectly observable events.

Should we then conclude that in a moment of crisis any simple rule, like inflation targeting should be abandoned? Perhaps, but there are several caveats.

1) A financial crisis inducing a depp recession will lower inflation forecast. Therefore even a simple inflation targeting rule would imply loosening monetary policy without any need of abandoning inflation targeting. In the language of our model, this means that a financial crisis does not require a switch of regime, condition (8) is not satisfied and the simple rule continues to be superior.

2) One may argue that uncertainty about monetary policy (i.e. abandoning an established credible rule) may increase uncertainty in financial markets and

make the crisis even worse. In the language of our model this implies than an increase in σ_ε^2 holding k constant would lead the policymaker to abandon the simple rule, but, abandoning it would lead to an increase in k, namely to costs of discretion, modelled broadly. Therefore the rule would be preferable even with an increase in σ_ε^2.

3)A financial crisis may highlight a problem of asymmetry, which most models do not capture. The incentive to abandon the rule when the shock ε is large and negative may be much bigger than when the shock ε is large and positive. If we interpret the shock ε as a proxy of turbulence in financial markets, this means that the policymakers may have a stronger incentive to intervene heavily in financial crises (i.e. when, for instance, stock markets are falling) than when markets are booming, perhaps because of bubbles. That of course creates all sort of moral hazard issues in financial markets[10].

4) If targeting financial variables really means using a symmetric rule, to be applied to both upswing and downswing in the market, it could be justified using our "skeleton model" in two ways. One is that the one optimal contingent rule π^* given in (7) should react to shocks even in financial markets. In addition this rule is enforceable and sustainable by reputation forces.

Finally note that thus far in this subsection we have assumed that a financial crisis was exogenous to monetary policy. However one may argues that the latter may indeed be partly responsible for the crisis. For instance Taylor (2009) amongst others argues that the Fed starting in 2002 abandoned a Taylor rule created uncertainty in financial markets, kept interest rate too low all factors that contributed to the crisis. The reason might have been a misguided attempt at avoiding a recession in the early 2000 and/or a fear of deflation. Low interest rate for too long, the story goes, have created one of the roots of excessive risk taking in search of higher returns and the real estate bubble in the US.

3 Central Bank Independence

As a potentially superior alternative to the choice between a simple rule and discretion, Rogoff (1985) suggested an ingenious solution. Assuming that the parameter b represents the socially accepted relative cost of deviation of output from target relative to the deviation of inflation from target, society should appoint a Central Bank with a lower "b" than society itself. This person would be a "conservative" central banker, in the sense that he/she would care relatively more about inflation and less about output than society. In the terms of our illustrative model one can show that given a certain "b" in the cost function, expected costs are minimized by choosing $\hat{b}$ such that in general $0 < \hat{b} < b$ [11].

The inflation under discretion set by the conservative central banker is:

[10] To some extent problems of asimmetry between positive and negative shocks may be relevant even for the "basic" model in normal cycles, but in the event of financial instability the issues of asymmetry is magnified.

[11] Note that, of course if society could appoint a policymaker with k=0, that is that does not target an output level above the market generated one the entire problem would be solved and the first best solution would be enforceable.

$$\pi_t^D = \hat{b}k - \frac{\hat{b}}{1+\hat{b}}\varepsilon_t \tag{20}$$

The utility loss is therefore:

$$L = \frac{1}{2}E[(\hat{b}k - \frac{\hat{b}}{1+\hat{b}}\varepsilon_t)^2 + b(-\frac{1}{1+\hat{b}}\varepsilon_t - k)^2] \tag{21}$$

By minimizing L with respect to $\hat{b}$ society can choose the central banker that most effectively fights inflation in the interests of society. Rogoff (1985) proved that such a central banker will be more conservative than society in the sense that $0 < \hat{b} < b$. In Appendix we review the derivation of this result.

Central Bank institutional independence is a requirement because ex post after the realization of the shock the policymaker (the principal of the Central Bank) would want to dismiss the conservative central banker and choose inflation ex post following his own objective function rather than the more conservative one of the central banker. Thus the solution of the time inconsistency problem works if the central banker cannot be dismissed ex post.

3.1 Independent Central Banks and rules

We have presented the case for independent and conservative Central Bank as an alternative to a policy rule. One could think of institutional arrangements that are a mixtures of policy rules enforced in some ways by independent Central Bankers. Two have been discussed in the literature.

3.1.1 Instrument versus goal independence

One argument put forward by Fischer and Debelle (1994) is that the policy goal, say the target level of inflation, should be chosen by elected politicians, ahile the Central Bank should have the independence of choosing the policy instruments more appropriate to achieve that goal. That is the Central Bank could choose whether to target, say, interest rates or quantities of credit and/or money in order to implement the goals chosen by politicians.

This is a rather "minimalist" view of the meaning of Central Bank independence. If policy goals and therefore rules can be changed at will by politicians it is unclear (at least to us) how this instrument independence would solve the problem of commitment. To put it differently nobody would probably argue against the view that the legislature should stay out of the intricacies of day to day choices of interest rates, discount rates and quantities of credit or money supply. The question is whether politicians should be free to choose the direction of monetary policy or whether this decision should be delegated to an indipendent authority. One may or may not agree with the idea of Central Bank independence. But the "compromise" of instruments independence does

not reconcile the two views, it is essentially a refinement of the idea that Central Banks should not be independent, at least for what really matters.

3.1.2 The Contracting approach

Another "mixed" approach is what is referred to as the "contracting" approach to Central Banking, as in work by Persson and Tabellini (1993) and Walsh (1995a). The appointed central banker has the same utility function of the social planner, there is no "conservative" Central Banker as in Rogoff's approach. The Central Bank can choose monetary policy independently but "Society" (i.e. the policymaker, the principal of the Central Bank) sets up a system of punishments and rewards which would induce the Central Bank to follow the first best policy and avoid the inflation bias problem. These authors show that a very simple incentive scheme, linear in inflation, would enforce the first best. This scheme essentially punishes the Central banker as a linear function of the deviation of inflation form the first best.[12] In general the idea of introducing incentives, even contractual incentives in the public sector is an interesting and valid one. Whether it is usefully applicable to monetary policy is questionable and this approach after some initial enthusiasm has died down.

In theory it is reasonably straightforward to devise an incentive contract that creates the right incentives for implementing the optimal policy. In practice there are complex practical similar in spirit to our discussion above concerning the rigidity versus flexibility of monetary rules. The verification of whether a "contract" has been violated or not is tricky. Implementation of "punishment" in case of violation of a contract by a Central Banker may be "ex post" politically costly especially in turbulent times and in periods of financial instability.

3.2 Central Bank (in)dependence in times of crisis

Let's now return to the case of a conservative Central Banker following a discretionary policy using a "distorted" i.e. more conservative cost function than society's. Suppose that ex post one observe a really bad realization of the shock, i.e. ε is very negative. The independent Central Bank would follow the policy:

$$\hat{\pi}_t^{CB} = \hat{b}k - \frac{\hat{b}}{1+\hat{b}}\varepsilon_t \tag{22}$$

instead of

$$\pi_t^p = bk - \frac{b}{1+b}\varepsilon_t \tag{23}$$

[12] A much popularized proposal in New Zealand (which was actually never implemented) was to link the salary of the head of the Central Banker to the achievement of a prespecified inflation target (see Walsh (1995b)).

where with the π_t^p notation we capture the discretionary policy which would be followed if the "politicians had the control" of monetary policy. Note that

$$\pi_t^p - \hat{\pi}_t^{CB} = k(b - \hat{b}) + \varepsilon_t(\frac{\hat{b}}{1+\hat{b}} - \frac{b}{1+b}) \tag{24}$$

this difference becomes larger the larger in absolute value is the negative realization of ε_t (remember that $\hat{b} < b$).

So if ε is very large (and negative), the inflation rate chosen by the CB would be much less than what the policymakers would choose. With a little algebra one can show that ex post the temptation of the policymaker to "fire" the Central Banker and choose a more inflationary policy is increasing in the absolute value of ε[13]. Obviously without any cost of firing the Central Bank ex post, the arrangement of the conservative Central Banker would not be credible and only the discretionary policy with the parameter "b" of the policymaker would be enforceable. With "infinite" costs the policymaker could never fire the Central Banker with any realization of ε.

Lohmann (1992) extends Rogoff's model and shows that, in fact, the optimal institutional arrangement is to have costs of "firing" the Central Banker, but not infinite costs. This argument is similar to a rule with escape clauses. That is, in normal times, with "normal" realization of ε the Central Bank is "allowed" to follow a policy based upon $\hat{b}$. But for large realization of ε the policymaker takes control of monetary policy and fires the Central Banker. In anticipation of this the Central Bank accommodates the desires of the policymaker for realization of a certain threshold on the absolute value of ε. This threshold is determined by the condition of the equality of the costs (institutional, etc.) to eliminate Central Bank independence and the cost of not "accommodating" enough the shock ε. This arrangement generates a non linear policy rule, in which above a certain threshold policy follows not the central banker's conservative cost function, but that of the society's.

Thus, in this model, the degree of Central Bank independence varies, in normal times there is independence in period of crisis there is none. Notice that this institutional arrangement is fully understood by a rational public. Therefore there would no surprise in the conduct of monetary policy even at this switching point, which is know and understood by the public. This is of course easier said than done. In a theoretical model it is straightforward to write a condition, known and understood by all, in which monetary policy switches from "normal times" to "crisis times". In practice who decides when a crisis is such? Uncertainty about the switching point introduces lack of predictability of monetary policy, perhaps precisely when it is most needed, that is in relatively turbulent times when the public may wonder whether the economy and financial markets are entering a crisis or not.

[13] Once again the model is ,for simplicity, symmetric even though the "story" seems especially realistic in one direction.

3.3 Central bank independence and macroeconomic performance: The evidence

There have been many obstacles that the empirical literature dealt with, but the most engaging challenge has been the measurement of the independence of monetary authorities. The early literature focused on the statutes of the central banks to evaluate the degree of independence. Four characteristics have emerged as crucial: first the process of appointment of the management, who is in charge of it, how often it occurs and how long is the tenure, obviously the CB is more independent the more independent is the appointment process from political pressures and the more secure is the tenure; second the amount of power the government has on the CB, whether the political authority can participate in and overturn the policy decisions of the CB; third the presence of a clear objective, like inflation targeting; last but not least financial independence. Many have criticized de jure measures for two reasons: the laws cannot foresee all the possible contingencies and even when it does it is not necessarily applied. In addition, especially in developing countries where the rule of law is less held in respect than in more advance democracies, written rules are often circumvented by de facto procedures. Therefore, one would need de facto measures of the degree of independence in addition or even instead of de iure measure es;especially when dealing with developing countries. For instance, the actual turnover of central bank governors is a good example; even if the length of the appointment is specified by the law, the actual duration may differ and how often a governor is removed from office is a good proxy of the independence that the central bank enjoys. Another de facto indicator is derived from survey data, questionnaire are sent to experts and the answers are used to create an index of independence.

The early literature, Bade and Parkin (1982) Alesina (1988) and Grilli, Masciandaro and Tabellini (1991) focused on OECD countreis found an inverse relationship between CBI and inflation using de jure measures of independence. Alesina and Summers (1993) confirm these results and show no evidence of an impact of CBI on real variables, such as growth, unemployment and real interest rates. Since then many studies have revsited thsi isuues. Many authros have stressed the difficulty in measuring CBI and choosing the right control variables; Campillo and Miron (1997) present some evidence against a negative correlation of CBI with inflation; they perform cross-country regressions of average inflation rates on country characteristics finding that economic fundamentals like openness, political stability, optimal tax considerations have a much stronger impact on inflation than institutional arrangements, like central bank independence. Oatley (1999) employs the same empirical strategy and finds that by including other controls the significance of CBI on inflation disappears. Brumm (2000) claims that previous studies, Campillo and Miron (1997) in particular, do not take into consideration the presence of strong measurement error and therefore obtain non robust results; employing a covariance structure analysis to address the problem of measurement error he finds a strong negative correlation between inflation and CBI.

As stressed earlier, the problem is that the legal measures of central bank independence may not represent actual central bank independence and for this reason de facto measures of CBI have been proposed; for instance Cukierman, Webb and Neyapti (1992) use three indicators of actual independence: the rate of turnover of central bank governors, an index based on a questionnaire answered by specialists in 23 countries, and an aggregation of the legal index and the rate of turnover; they also compare these indicators with a de jure measure showing that the discrepancy is higher for developing countries than for industrial ones; using data on the period '60-'80 they find that CBI has a negative statistically significant impact on price stability among industrial countries, but not among developing countries.

The degree of CBI probably has become less important after the period of the great inflation when most countries have converged to lower and more stable levels of inflation. In fact using de jure measures of CBI the early studies found a statistically significant correlation between CBI and low inflation for the period pre 90s. Using the same measures on recent data, 2000-2004, Crowe and Meade (2007) cannot find any meaningful statistical relationship; they compute the rate of turnover with updated data and find that it has a correlation close to zero with the de jure measure of CBI concluding that turnover must capture some other dynamics. The most recent study is Klomp and de Haan (2008): they perform a meta regression analysis of studies on the relationship between CBI and inflation finding that the inverse relationship between CBI and inflation in OECD countries is sensitive to the indicator used and the estimation period chosen; they also find that there are no significant differences between studies based on a cross-country or panel settings.

These results on the (alleged) beneficial effects of central bank independence seem to have been internalized by the politicians and the public opinion, as the empirical evidence suggests that in the last quarter of the 20th century there has been a global movent towards more independence of monetary authorities. Crowe and Meade (2007) study the evolution of central bank independence using data from Cukierman, Webb and Neyapti (1992); these authors computed four indexes for the period 1980-89 in 72 countries based on the legal characteristics of the central banks' statutes, each index going from zero (least independent) to one (most independent); from these four indexes was then obtained an overall independence measure. The four indexes measure the insulation of the CB's management from political pressure by secure tenure and independent appointment, the impossibility for the government to overturn its policy decisions, the presence of a clearly defined objective for monetary policy and the financial independence of the CB. Crowe and Meade (2007) replicate this index using data from 2003 and broadening the sample adding above all Eastern European countries; they then compare their 2003 index with that of Cukierman, Webb and Neyapti (1992) noting that CBI has increased a lot, eighty-five percent of the central banks in 2003 had a score above 0.4, compared with only 38 percent in the 1980s and average independence has risen from 0.3 in the 1980s to above 0.6 in 2003. They also break the sample in two groups, advanced and emerging economies, finding that both experience an improvement in CBI; the increase in

independence of the monetary authority is greater in developing countries, two thirds of the 15 central banks that are rated as highly independent, with scores above 0.8, are eastern European countries.

Crowe and Meade (2008) pushes the analysis further: looking at the change in the level of the four indexes above mentioned, they note that in the developing countries all of them show a statistically significant increase since the 1980s, but in the advanced economies only the second and the fourth show a statistically significant increase, mainly because central banks in these countries were already scoring very high in the first and third index. They then perform a regression analysis to highlighten the determinants of the reforms to CBI; reforms is correlated with low initial levels of CBI and high prior inflation, meaning that the failure of past anti-inflation policies lead to more independence for the central bank; reform is also correlated with democracy and less flexible initial exchange rates. Acemoglu, Johnson, Querubin and Robinson (2008) measure CBI by considering only the reforms to the charter of the monetary authority and constructing a simple dummy which takes a value of 1 in every year after a major reform to the constution or central bank law leading to increased independence and zero elsewhere. They find that most of the reforms in the post Bretton-Woods period 1972-2005 took place in the 1990s.

3.4 Causality

In the previous section we have shown some correlations between some measures of central bank independence and inflation. Regardless of whether or not these correlations are robust in different time periods and samples, as Posen (1993,1995) pointed out first, there is also an issue of causality Can we really say that Central Bank independence "causes" low inflation or that countries which prefer (for whatever reason) low inflation choose to delegate monetary policy to independent Central Banks? Intellectuality the question is well posed, since institutional choices are certainly not exogenous: institutions are generally not imposed exogenously (with few exceptions) on any country and they are ly slow moving and path dependent.[14] Posen argues that Central Bank Independence really lead to a reduction of inflation in OECD countries only when it reflects an underlying agreement in society about lower inflation or when groups that prefers low and stable inflation to other policies is prevalent in society. He points so several characteristics of the financial sector and some optical aspect. One in particular if party frcationalism of the party structure The latter has been shown to be correlated with deficit and inflation (Grilli Masciandaro and Tabellini (1990) and Perotti and Kontopoulos (1999)amongst others), Fractionalized systems may have an especially hard time delegating monetary policy to independent experts given the conflicts amongst groups. One mat argue, incidentally that fractionalization of party systems is itself not an exogenous variable but is the result of deeper socio economic and historical characteristics

[14] See Aghion, Alesina and Trebbi (2004) and Trebbi Aghion and Alesina (2008) for discussions about the issues of "endogenous institutions" in more general terms.

of a country (Aghion Alesina and Trebbi (2204)). In fact fractionalized systems may be those than are more in need of an independent Central Bank committed to stopping various pressures that lead to inflation but such systems may or may not be able to achieve that institutional arrangement. Posen makes similar argument, perhaps slightly less convincingly regarding federal systems versus centralized systems. This author concludes that it is an illusion to think that simply imposing an independent central bank in a country that for whatever reason is not ready to accept low inflation will work. and this may explain the musky correlation between de iure measure of CBI in developing countries versus OECD countries.[15] This is a valuable point. Nevertheless a country with a porblem of high inflation may use an increase in CBI as something that helps achiveing that goal. While an indepdent central bank dropped in a society non at all intolerant of high inflation may serve very little purposes, a move towards more indepnce in a country were anti inflation sentiments are presnet but yet not strong enough may help.

To put it differently, from a normative point of view, a social planner should recommend in our view to an hypothetical new country to adopt a systems with an indepdent central bank. Posen's argument is well taken in the sense that if in this hypothetical country there aren't enough political interest to allow this institutional arrangement to survive, it would not. Also once an indepedent Central Bank has been established. institutional inertia and a risk of loosing insitutional credibility may protect at least up to a point, direct and frontal attacks to that institution, as we discuss below this has been the case of the European Central Bank. But at least up to a point (se also our discussion bout times of crises), independent Central Banks may be able to stand the attacks against their independence.

3.5 Independent Central Banks: a democratic deficit?

In the previous section we have reviewed some of the potential benefits of an independent authority taking charge of an important policy area: monetary policy. But, this leaves open two questions. First, isn't there a democratic deficit in allowing an independent bureaucracy make important policy decisions? Second, if the time inconsistency issue is the only justification for this why single out only monetary policy? One may ask, what is so special about monetary policy? Issues of time inconsistency problems, rules versus discretion, reputation building are not a unique prerogative of monetary policy. Think only of fiscal policy, full of dynamic inconsistencies, not to mention non economic example, like foreign policy where commitment versus flexibility is also a key trade-off.

[15] There have been a couple of attempts at using instrumental variable to address endogeneity. problems Crowe and Meade (2008) employ both an IV and a Limited Information Maximum Likelihood strategies finding a statistically significant negative effect of CBI on inflation; as instruments they use two governance measures, the rule of law and voice and accountability. Jacome and Vazquez (2005) present evidence based on Latin American and Caribbean data in favor of a negative relationship between CBI and inflation; but they also find that using instrumental variables the significance of the correlation goes away.

Drazen (2002) argues that there is nothing non democratic in delegating certain policies to independent agencies and the nature of monetary policy makes it an ideal candidate for delegation. This is because, he argues, monetary policy can be easily used strategically by politicians to achieve short term goals with cost hard to detect for the voters for possibly a long time. he also argues (correctly) than there is probably much more agreement about the "correct" long run goal for monetary policy than fiscal policy. Alesina and Tabellini (2007,2008) formally address these questions using a normative and a positive model of delegation which builds upon Dewatripont, Jewitt and Tirole (1999 a,b)[16].

From a normative point of view these authors ask the question of whether society might benefit in delegating certain tasks to bureaucrats in general that is above and beyond monatrey policy, taking them away from direct control of politicians. They focus on a different incentive structure between the two types of policymakers. Politicians's goal is to be reelected and to do so they need to provide enough utility to a majority of the voters. Voters are rational and cannot be fooled and have a minimum threshold of utility that they expect from an incumbent. Bureaucrats instead have career concerns. They want to appear as competent as possible looking ahead toward future employment opportunities[17]. Voters cannot distinguish effort from innate ability: they only observe policy results which are a combination of the two . Applying effort to an activity is costly for both bureaucrats and politicians.

Given these different incentives, it is optimal for society to delegate certain types of activities to non elected bureaucrats with career concerns, while others are better left in the hands of elected politicians. Delegation to bureaucrats is especially beneficial for tasks in which there is imperfect monitoring of effort and talent is very important because the issues are technical in nature. The intuition is that in technical issues where monitoring is uncertain, career concerned bureaucrats are eager to invest much effort to signal their ability. Politicians instead only need a minimum threshold to win a majority and since there is difficulty in distinguishing effort and ability have lower incentives than bureaucrats to invest in effort. Tasks with the opposite characteristics instead create the opposite incentives. To the extent that monetary policy is a policy task relatively technical in nature and where the "ability" of who is in charge is relatively hard to judge, than it would be a good candidate for delegation to a career burocrat. The idea that career bureaucrats might be better at technical tasks is reinforced if judging their ability is also a prerogative of specialists, and, in fact career bureaucrats may be much more interested in appearing competent in the eyes of specialists, given their career concerns. This incentive would in fact be stronger for bureaucrats than for politicians who needs to be liked vy

[16] For a review of the discussion on prs and cons of delegation see Epstein and O'Halloran (1999). For recent contributions by economists on issues of delegation see Besley and Gathak (2005), Maskin and Tirole (2001) and Schultz (2003).

[17] In reality the distinction between the two incentive structures may not be so stark. Politicians may also look for future employment opportunities and burocrats may want to enter politics.

voters not specialists[18]. Note that this result is not based on the assumption that career bureaucrats are intrinsically more gifted than career politicians in dealing with technical issues; obviously such an assumption would reinforce the result.

Alesina and Tabellini (2007,2008) also analyze a "positive" model of delegation, namely the case in which politicians can delegate or not certain tasks to bureaucrats having in mind their objective function, namely reelection. One result which is quite important for our discussion of monetary policy versus fiscal polciy is that politicians will prefer not delegate redistributive policies. The reason is that theys are critical to build minimum winning coalition amongst voters. "Playing around" with redistributive flows from groups to groups, income groups to income groups, regions to regions is what politics is mostly about. This is a reason while fiscal policy is virtually never delegated to independent agencies even though it is plagued by time inconsistency problems just as much, if not more than monetary policy[19]. To be sure monetary policy has redistributive aspects. More or less inflation, a more or less active anticyclical policy certainly has redistributive implication. But these redistributive flows are less obvious and direct than those cause by fiscal policy such as, for instance, an increase in the progressivity of the income tax. For these reasons politicians may be more willing to grant independence to Central Bank more than they would with an independent Treasury.

In summary, Alesina and Tabellini (2007,2008) argue that monetary policy, in addition to the time inconsistency issue, is a good candidate for delegation to an independent agency. It is a relatively technical task where it is often difficult to attribute blame and praise. Just think to what happened to Alan Greenspan who fell from a heroic status to that of an almost villain in a few months. It is a task where career oriented bureaucrats may have superior incentives than politicians to perform well. It is also a task that politicians may be willing to delegate (at least up to a point) because of its less than direct and clear redistributive and coalition building effects. Also an independent Central bank may also serve occasionally as a perfect scapegoat for politicians: when the economy is not doing well having an non elected official to be blames is a welcome opportunity.[20]

4 Political Business Cycles

The literature on political business cycles has been reviewed extensively in Alesina and Roubini (1997), Drazen (2001) and Persson and Tabellini (2002). Here we highlight some key points and focus upon recent research in the area. poltical business cycles models can be divided into two group. In partisan mod-

[18] On related points see Maskin and Tirole (2007) and Epstein and O'Halloran (1999).

[19] See Blinder (1997) for arguments in favor of the social optimality of delegation of certain aspects of fiscal policy and, along similar lines, Council of Australia (1999).

[20] See Fiorina (19"") for a discussion of the role of scapegoats in politics.

els the two parties have different preferences over inflation and unemployment , in opportunistic cycles the only objective of the parties is to win elections and they have preferences on the economy per se.

4.1 Partisan Cycles

Hibbs (1987) argues that in the post war US the two major parteis have systematically differ in gtheir emphasis on the relative cost of inflation and unmploment, the Repubblican more sntive to the cost of the former the Democrat of the latter. His work was empircal and was based on an exploitable Phillips curve. Alesina (1987) revsited the issue emphasizing the role of polic uncertainty when the two potential policy,makers do not have the same objectives This uncertainty can generate policy cyklces even with rational expectation wioth some form of stickyness in wage/preice adjustment, like a lkabro contract model. The economy is again described by:

$$y_t = \pi_t - \pi_t^e$$

The elections take place every other period and two candidates compete for the office: an incumbent and a challenger; expectations are formed rationally. The left-wing party (L) cares relatively more about growth whereas the right-wing party (R) cares relatively more about inflation: in the context of our simple model $b^L > b^R$:

$$L^L = \frac{b^L}{2}(y_t - k)^2 + \frac{1}{2}(\pi_t)^2 \tag{25}$$

$$L^R = \frac{b^R}{2}(y_t - k)^2 + \frac{1}{2}(\pi_t)^2 \tag{26}$$

By minimizing the loss functions we can find the inflation that would prevail if either party wins the elections as a function of expected inflation:

$$\pi^L = \frac{b^L}{1 + b^L}\pi^e + \frac{b^L}{1 + b^L}k \tag{27}$$

$$\pi^R = \frac{b^R}{1 + b^R}\pi^e + \frac{b^R}{1 + b^R}k \tag{28}$$

If P is the probability that party R wins the election, the expected inflation in the period after the election will be:

$$\pi^e = \frac{b^L(1+b^R) - P(b^L - b^R)}{1 + b^R + P(b^L - b^R)}k \tag{29}$$

Given the expectations of inflation it is easy to determine the levels of inflation and output in the period immediately after the elections:

$$\pi^L = \frac{b^L(1+b^R)}{1 + b^R + P(b^L - b^R)}k \tag{30}$$

$$\pi^R = \frac{b^R(1+b^L)}{1 + b^R + P(b^L - b^R)}k \tag{31}$$

$$y^L = \frac{P(b^L - b^R)}{1 + b^R + P(b^L - b^R)}k > 0 \tag{32}$$

$$y^R = \frac{-(1-P)(b^L - b^R)}{1 + b^R + P(b^L - b^R)}k < 0 \tag{33}$$

Two periods after the elections inflation goes back to the discretion level previously determined, $\pi = bk^i$, where i is the identity of the party in office, and output goes back to zero. Rational partisan cycles therefore produce a deviation of output from its natural rate for a period and the magnitude of this deviation depends on the extent of the political polarization. The right-wing party causes recessions because the expectations of inflation are kept high by the possibility of a victory of the left; the higher the degree of surprise of the electoral result, the lower the probability P of electing the right-wing government, the larger the recession.

4.2 Opportunistic Cycles

The behavior of politicians can often be described as opportunistic, most people would agree that politicians love holding office and sometimes promote policies only to please the voters and win elections. Nordhaus (1975) analyzes in a very simple model what would happen in an economy where inflation is set by an incumbent who is facing elections and is willing to use monetary policy to win. In the model voters like growth, but dislike inflation and unemployment; they heavily discount the past, but their voting decision is influenced by the performance of the government in the period immediately before the election. Politicians are identical and they prefer to be in the government rather than out of office. In the elections two candidates face each other, an incumbent and a challenger and the timing of elections is exogenously fixed. Inflation expectations in this

model are adaptive and not rational. In equilibrium the incumbent stimulates the economy before elections in order to boost growth and win the elections; this policy produces in the post-election period a suboptimally high inflation. In this model political business cycles are produced by the short-sightedness of citizens in two ways. First they have adaptive and non rational expectations about inflation. Second as voters they heavily discount the past. When a new election comes they have forgotten the early recession and remember only the pre electoral boom.

Nordhaus' 1975 model became immediately popular, and the experiment of the 1972 election won by Richard Nixon with waht seemd to be a freindly help from tghe Fed and some "cheks in the mails" sent in the summer and fall of 1972, was often cited as a perfect example of the Nordhaus' model at work. In fact propbaly it was that election whihc inspired the paper itself. At the same time however, the :"rational expecation revolution" was taking please in macroeconomics, and any paper written without rational expectations was cast aside. As a result the poltical busness cycle models fell out fashion, at least in the maibnstream of the profession. [21]

Persson and Tabellini (1990) show how political business cycles may arise even when voters behave rationally. In their model politicians are identical in everything but c"ompetence,". More competent governments are better at managing economic policies and will achieve higher levels of output for given inflation and expected inflation. Voters are rational and want to maximize their expected utility; they will obviously want to elect the most competent politician among the candidates. Again the timing of the elections is fixed and only two candidates participate. The incumbent controls the inflation and wants to win the elections: he knows that in order to do so his expected competence must be above the challenger's expected level. There are two types of equilibria. In the separating equilibrium it is too expensive for the incompetent type to distort policies and therefore the competent type is able to achieve a level of growth unattainable by an incompetent incumbent; voters will therefore be able to tell the two types of politicians apart. There is also a pooling equilibrium in which the incompetent type sets a high inflation level to achieve the same output level as the competent type who, on the other hand, does not deviate from the optimal level of inflation. In the more interesting separating equilibrium it is the competent incumbent who chooses a higher than optimal inflation rate in order to achieve a high level of output, whereas the incompetent incumbent would choose the one-period optimal inflation rate because he cannot achieve the same level of output. Voters do not know beforehand the competence of the incumbent, thus expectations of inflation in the period immediately before elections must be an average of a higher and a lower inflation: inflation will be higher than expected if the incumbent is competent and lower than expected viceversa; the competent policy-maker produces an economic expansion before elections and is reelected. The political business cycle here is different from the

[21] Several poltical scientists and some economists connued to work on this topic, see Alesina and Roubini (1997) and Drazen (2002) for a survey.

one in the Nordhaus model, only one type of politician is able to create economic growth, the other type determines a downturn; furthermore in this model there is no post-electoral recession. In Appendix we sketch the derivation of these results.

This model has the advantage of not being based on irrationality or short slightness of voters, However it is difficult to test empirically since difference in the nature of the electoral cycle are related to unobservable variable (by the econometricians) like competence (and expected competence) of policymakers.

The model of competence was in fact introduced by Rogoff(1990) and Rogoff and Sibert (1989) in the context of political budget cycles. These authors argue that politicians may bias fiscal expenditures towards easily observed interventions and away from long-term investments in order to signal competence; the political budget cycle is therefore driven by temporary information asymmetries on competence.

Andrea: queste referces vanno aggiunte e aggiungi qui due frasi per raccontare i ridsulktrtai di questi due papers.cThe application to budget polcies seems in fact more promising both theoretically and empirically. It goes beyond the scope of this paper to review political models of fiscal policy, but as we discussed below, opportunistic models of fiscal policy have been empirically more successful than opportunistic models on inflation and growth. One of the reasons is that while fiscal policy is directly controlled by politicians, the independence of Central banks reduces the latitude an scope of political business cycles, an issue to which we now turn to.

4.3 Political Cycles and Central Bank Independence

Central Bank indepdendence also implies that monetary policy cannot be used (at least directly) by policymakers to generate political business cycles, neither of the "opportunistic type" nor of the partisan type, as discussed by Drazen (1999), and Waller (1994) amongst others.Alberto: Il paper di drazen e' in un libro che non si trova online. Non sembra esserci in biblioteca, se vuoi posso provare a comprarlo, ma ci vorra' tempo prima che lo recupero. Waller non e' citato da Alesina e Gatti. A quale paper ti riferisci? Nel 94 non

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Following Alesina and Gatti (1995) we provide an illustration of the effect of Central Bank independence in a partisan model where different parties have different policy goals.

Consider the partisan cycles model we have seen before in section 4.1 introducing uncertainty and the possibility to delegate monetary policy to an independent central bank. The economy is now described by:

$$y_t = \pi_t - \pi_t^e + \epsilon_t \tag{34}$$

where an uncertainty term is added. As before the left-wing party (L) cares relatively more about output than the right-wing party (R), $b^L > b^R$; P is again the probability that the right-wing party wins the elections. Like before expected inflation is given by:

$$\pi^e = \frac{b^L(1+b^R) - P(b^L - b^R)}{1 + b^R + P(b^L - b^R)}k \tag{35}$$

Using expected inflation we can determine inflation and output that prevail under the two parties in the period after elections:

$$\pi^L = \frac{b^L(1+b^R)}{1 + b^R + P(b^L - b^R)}k - \frac{b^L}{1+b^L}\epsilon_t \tag{36}$$

$$\pi^R = \frac{b^R(1+b^L)}{1 + b^R + P(b^L - b^R)}k - \frac{b^R}{1+b^R}\epsilon_t \tag{37}$$

$$y^L = \frac{P(b^L - b^R)}{1 + b^R + P(b^L - b^R)}k + \frac{1}{1+b^L}\epsilon_t \tag{38}$$

$$y^R = \frac{-(1-P)(b^L - b^R)}{1 + b^R + P(b^L - b^R)} k + \frac{1}{1 + b^R} \epsilon_t \tag{39}$$

The variances of inflation and output are therefore equal to:

$$var(\pi) = \frac{(1-P)P(b^L - b^R)^2}{[1 + b^R + P(b^L - b^R)]^2} k^2 + \left[P \left(\frac{b^R}{1 + b^R} \right)^2 + (1-P) \left(\frac{b^L}{1 + b^L} \right)^2 \right] \sigma_\epsilon$$

$$var(y) = \frac{P(1-P)(b^L - b^R)^2}{[1 + b^R + P(b^L - b^R)]^2} k^2 + \left[\frac{P}{(1 + b^R)^2} + \frac{1-P}{(1 + b^L)^2} \right] \sigma_\epsilon \tag{40}$$

The variance of output has an intuitive explanation: the first term represents the variation of output determined by the electoral uncertainty, it is increasing in the difference between the two parties' preferences, $(b^L - b^R)$ and disappears when P is either 0 or 1; the second term comes from the economic uncertainty due to the shock ϵ.

The politicians have the possibility to improve on this outcome by agreeing before the election to appoint an independent central banker with preference $\hat{b}$ who cannot be removed from the office; we have seen before that under an independent central bank the outcome would be:

$$E(\pi^D) = \hat{b} k \tag{41}$$

$$E(y_t^D) = 0 \tag{42}$$

$$Var(\pi_t^D) = (\frac{\hat{b}}{1 + \hat{b}})^2 \sigma_\varepsilon^2 \tag{43}$$

$$Var(y_t^D) = (\frac{1}{1 + \hat{b}})^2 \sigma_\varepsilon^2 \tag{44}$$

Alesina and Gatti (1995) show that there is a range of values for $\hat{b}$ such that the two parties are better off delegating the monetary policy to the independent central banker. The creation of an independent monetary authority can therefore help solve the problems posed by political cycles.

4.4 The Evidence

Ther ahve been many sirvey of the evdiecne on poltical business cycles, including Alesina, Roubini and Cohen (1997), Drazen (2001,2002), Persoon and Tabelluini (2000).

Alesina Roubini ad Choen (1997) use data on the United States for 1947-1994 and find evidence to support the partisan models. We refer the readers to that bnook for a survey of the litarture until 1997. These authros report systematic differences in the rates of growth, the average inflation rate and the unemployment rate between Democratic and Republican administrations with a pattern consistent with the Rational Partisan Theory reviewed above. Instead they find no evidence of opportunistic business cycles: monetary policy is not more expansionary during election years and there seems to be not much preelectoral opportunistic manipulation of fiscal policy, with some expecytion, notably 1972. Most of these results hold using data on eighteen OECD countries for the period 1960-93: the evidence supports the rational partisan model especially in countries with a two-party system and rejects the opportunistic models, but there is some evidence of electoral cycle on the inflation rate. They also test also the implication of the rational partisan theory that the size of the political cycles should depend on the degree of electoral surprise; using a proxy for the probability of electoral outcomes they find evidence in support of the theory. They also find evidence that the U.S. Treasury bond market responds to changes of the probability of a Republican administration with a decline in the expected future nominal interest rates.

The most recent literature on political business cycles has focused not on growth or unemployment but upon fiscal variables. Persson and Tabellini (2005) empirically test a large theoretical body of literature on the impact of different political institutional settings on the economic development of a country. They analyze a 60-country panel over almost 40 years in order to uncover the influence of constitutions on the behavior of governments; they find that even if all countries are affected by political budget cycles, different constitutional features have a strong impact on which type of fiscal policy is involved. Democracies with proportional representation tend to raise welfare spending before elections, whereas majoritarian democracies cut spending. Presidential regimes postpone unpopular fiscal policy adjustments, but all types of governments seem to cut taxes during elections periods. Brender and Drazen (2005, 2007) show convincingly that political budget cycles exist only in "new democracies"; they argue that in more experienced democracies voters punish those politicians who opportunistically manipulate fiscal policy to be reelected. In other wordsas it is not the nature of the electoral system as in Persson and Tabellini but the "age" of democratic institutions which influence the existence of political budge cycles [22] Gonzalez (2002) presents evidence on Mexican political business cycles; she shows that the government used public spending in infrastructure and current

[22] Drazen and Eslava (2006) design a model of political business cycles which is consistent with this recent empirical evidence.

transfers to win elections; this paper provides an example of "new democracy" affected by oppurtinistic politics. In the same spirit Khemani (2004) proves the same point using data on Indian elections. Keebone and Mckenzie (2001) use Canadian province level data and find opportunistic political business cycles both in revenues and in spending: governments stop increasing taxes before elections and increase spending in visible projects like roads, schools and hockey rinks. Block (2002) uses annual data on 44 Sub-Saharan African countries in the period 1980-1995 finding clear patterns of electorally timed interventions in key monetary and fiscal policy variables, such as money growth, interest rates, inflation, seignorage and nominal exchange rate changes, fiscal deficits, expenditures and government consumption. Akhmedov and Zhuravskaya (2004) use a monthly panel data set on Russia in the period 1995-2003 and find strong evidence of opportunistic budget cycles. They discover that the budget cycle is short-lived and this may be a reason why previous literature could find only weak evidence of cycles; public spending takes the form of direct monetary transfers to voters; they also find a negative correlation between the magnitude of the cycle and democracy, government transparency, media freedom and voter awareness. Finally they claim that preelectoral manipulation seems indeed to increase incumbents' chances for reelection. Shi and Svensson (2006) present compelling evidence on the presence of political budget cycles; they assemble a panel data of 85 countries for the period 1975-95 and they find that on average government deficit as a share of GDP increases by almost one percentage point in election years; these budget cycles, though, seem to be statistically significant only in developing countries. They also control for the election variable being endogenous relative to fiscal policy, as both timing of elections and fiscal policies could be influenced by a number of unobserved variables, such as crises or social unrest; in order to do this they use only those elections which were predetermined, either because specified by the constitutions or because occuring in the last year of a constitutionally fixed term for the legislature or because announced at least a year in advance; employing this strategy they find that the election dummies are statistically significant in the whole sample and in the developing countries' sample, but not in the developed countries' sample. Last but not least they also try to to explain the variation in the size of political budget cycles across countries developing a simple moral hazard model and testing it with the data; intrestingly they find that institutional factors can indeed explain some of the difference between developed and developing countries, in particular they focus on the incentives that a politician have to obtain power, incentives which depend on the size of the private benefits that the politician would gain when in power, and the ability of the voters to distinguish pre-electoral manipulations from incumbent competence, which depend on the access to free media; they find that both these institutional features have a statistically significant impact.

5 Currency Unions

In a currency union several countries share the same currency. In 1947 at the end of the second world war there were 76 countries in the world. Today there are 193 (with a seat at the UN). Unless one believe that there is a natural "law" according to which each country has to have its own currency, either there were too few currencies in 1947 or there are too many today! [23]The question of whether we have too many or too few currency today is a relevant one. There has been much talk about dollarization especially in South America, and some countries have made steps in that direction (Argentina, Ecuador). Eleven countries in Europe formally adopted the same currency and other countries then joined bringing the total of today at 16. A few countries after decolonization have maintained the currency of the former colonizer (the French Franc zone). The decisions about relinquishing their own currency has both economic and political implications.

One can think of two types of currency unions. One in which a relatively "small" country unilaterally adopt the currency of a large country, say Panama adopting the dollar, or some former colonies keeping the currency of an old colonizers like the French franc zone in Africa . A second type of currency union is one in which a number of countries decide to give up their own currency and create a new common one. The European Monetary Union (EMU) is of course the primary current example. [24]

One cannot begin discussing currency unions without a reference to the pioneering work by Mundell (1961). He pointed out that the optimal currency area is the result of two countervailing forces. On the one side we have the benefits of a currency union in facilitating trade in goods, services and financial transaction. Weighing against those is the loss of independent monetary policy for each country which gives up its own currency. Mundell stressed the role of wage flexibility and labor mobility asa key variables affecting this trdae off. More flexibility and mobility make an independent monetary policy less advantagoeus thus weighing in favor of monetary unions. In fcat much of the debate in Europe before the Euro adoption was precsily on the issue of whther Europe satified teh condition of wage flexiblty and labor mobilty identified by Muindell. Alesina and Barro (2002) have revisited the question for optimal currency areas extending Mundell's framework and incorporating it in the discussion of rules versus discretion in monetary policy. While many of the issues are common for the two types of currency unions (a unilateral adoption or a creation of a new currency like the Euro) it is useful to analyze them separately.

[23]See Alesina and Spolaore (1997) and Alesina Spolaore and Wacziarg (2000) for teoretical and empirical discussion of the evolution of the number of countries in the world.

[24]In addition there have been several example of currency boards which lasted more or less, like Hong Kong, Argentina and Lithuania with the dollar and Estonia and Bulgaria with the German mark first and then with the Euro.

5.1 Unilateral adoptions

Consider a world of two countries a large one one indicated with the subscript L and one indicated with the subscript S. Their GDP per capita is given by:

$$y_t^L = \pi_t^L - \pi_t^e + \varepsilon_t^L \tag{45}$$

$$y_t^S = \pi_t^S - \pi_t^e + \varepsilon_t^s \tag{46}$$

The two shocks ε^L and ε_t^S are i.i.d., with zero average, the same variance (for simplicity) and a covariance equal to $\text{cov}(\varepsilon_t^L, \varepsilon_t^S)$. The loss functions of the two governments are given by:

$$L^i = \frac{1}{2}(\pi_t^i)^2 + \frac{b}{2}(y_t^i - k)^2 \qquad\qquad i : L, S \tag{47}$$

where $k > 0$. Suppose that country L is committed to the optimal monetary rule:

$$\pi_t^L = -\frac{b}{1+b}\varepsilon_t^L \tag{48}$$

The other country instead, has not been able to solve the problem of time inconsistency of monetary policy and its monetary policy is the discretionary one:

$$\pi_t^S = bk - \frac{b}{1+b}\varepsilon_t^S \tag{49}$$

Suppose now that country S adopts the currency of L, and in doing so adopting the inflation rule of the large country (π_t^L) given above. Three effects occur relative to the case in which the country S keeps its own currency. First average inflation goes to zero, eliminating the inflation bias. In this respect the country L serves as an "anchor" that keeps inflation of the other country low. Second, monetary policy responds to the "wrong" shock from the point of view of country S, namely it responds to ε_t^L rather than ε_t^S.

Country S chooses the foreign currency iff and only if:

$$k^2(1+b) > 2\sigma^2 - 2cov(\varepsilon_t^S, \varepsilon_t^L) \tag{50}$$

This condition is instructive. The factor that weight against a currency union is a low covariance of the shocks. If the covariance is low country S finds itself often with the "wrong" monetary policy: expansionary during boom and contractionary during recessions. Factor that weigh in favor of the currency unions is a large value of k, which is a measure of the reduction of average inflation for country S, namely the value of having an "anchor" to low inflation. Obvioulsy country S would never adopt the currency of a country bot committed to a credible low inflation polciy. Otherwise it would not gain in terms of average inflation and it would import a monetary policy target to the "wrong" shock.

In general example of unilateral adoption involve small country adopting the currency of large ones, in which case we could interpret our superscript as L for large and S for small. Note that in addition to these purely monetary aspects of the monetary union there can be significant additional effects due to trade. The small country is too small to generate significant trade benefits for the large country but these benefits could be extremely large for the small country (more on this below). Note that the large country is completely unaffected by the currency union. This example captures well cases like Panama or Ecuador adopting the dollar. [25]

The case of one or more average sized countries adopting unilaterally a currency like the dollar or the euro may generate political complications. For instance, imagine if several countries in Latin America all adopted unilaterally the US dollars, or several Central and Eastern European countries adopted the Euro. In both cases the Fed and the ECB may come under political pressure if Latin America and Central Europe at some point in time needed some monetary policy different from the one responding solely to the cycle of the US economy or of the 12 original countries of the Euro Area.

5.2 Unilateral currency unions and "crisis"

Currency unions may come under stress during a crisis both for the small country but also for the large anchor country. The most obvious example of a crisis is an exceptionally "bad"realization of the shock of the small country (i.e. a very low value of ε_t^S). In this case the small country would need a very expansionary monetary policy, which is not provided by the anchor country. To make matter worse for the small country the anchor may be pursuing a contractionary monetary policy in response to an inflationary shock. In this case, it may be too costly in the short run, to maintain the currency union. The situation is similar analytically to the case discussed above of a negative shock with an independent, inflation averse Central banker committed to low inflation. In that case, we argued, one could think of intermediate institutional arrangements in which a Central Bank looses independence during a crisis. But in the case of a unilateral adoption of a foreign currency this switch is impossible. Either a currency union is broken, or it is not.

The more costly it is to break a currency union the more profound has to be the crisis (i.e. to lower the realization of ε_t^S) to lead to a breakdown of the currency union. Note the analogy and difference with the fixed exchange rate system. In that case abandoning fixed exchange rate to return to flexible is much less costly, institutionally, than abandoning a currency union. Therefore even a relatively "small" crisis would lead to a breakdown of fixed rate systems. This is precisely the reason why certain countries may prefer a currency unions

[25] Even though we have refereed to a large anchor country and a small "client" country, economically speaking the size of the country is irrelevant, all that matters is the monetary policy of the anchor country. In that respect Switzerland could be just as good an anchor country as the US. However the trade benefit for the client country are increasing with the size of the anchor country.

to fixed exchange rates, precisely to make the arrangement (and the anchor to a low inflation country) more credible avoiding speculative attacks to the home currency. An arrangement intermediate between fixed rates and currency union would be a currency board, like the one which Argentina had with the US from %%% to &&&. This was a good example of how a crisis in the "small" country lead to the breakdown of the currency arrangement in &&&.

But even a crisis in the large country could lead to a breakdown of the currency union. As we have discussed above, a crisis in the anchor country (i.e. an especially low realization of ε_t^L) may lead to a breakdown of the monetary policy rule. In this case the large country may not be any more a good "anchor" for the small country which may decide to abandon the currency union. An inflation prone US, say , would not be a useful anchor for an inflation prone Latin American country.

5.3 Multilateral Currency Unions

Andrea: ricontrolla bne che l algebra sia giusta qui

Consider now two countries of roughly equal size considering forming a currency union with a new currency and a new Central Bank. Let's name the two countries "Germany" (G) and "Italy" (I).The output gap is, as usual:

$$y_t^i = \pi_t^i - \pi_t^e + \varepsilon_t^i \qquad\qquad i = G, I \tag{51}$$

the shocks ε_t^i $(i = G, I)$ have mean zero, the same variance, and covariance $\text{cov}(\varepsilon_t^G, \varepsilon_t^I)$.

The loss function of the two governments are, as always:

$$L^i = \frac{1}{2}(\pi_t^i)^2 + \frac{b}{2}(y_t^i - k)^2 \qquad\qquad i = I, G \tag{52}$$

Even without a currency union, in Germany the inflation bias problem has been solved and the monetary policy follows the optimal policy rule:

$$\pi_t^G = -\frac{b}{1+b}\varepsilon_t^G \tag{53}$$

In Italy, instead, monetary policy follows "discretion":

$$\pi_t^I = bk - \frac{b}{1+b}\varepsilon_t^I \tag{54}$$

How would a currency union between the two countries look like? Let's begin with an hypothetical case in which the two countries adopt a new currency and

create a new Central Bank which follows the optimal monetary policy for the entire currency union. In which case the policy (π_t^{CU}) would be:

$$\pi_t^{CU} = -\frac{b}{1+b}(\varepsilon_t^G + \varepsilon_t^I) \tag{55}$$

Germany would never join such a union purely based upon consideration of monetary policy. It would have to adopt a monetary policy not targeted to its own cycle and would not gain anything in terms of commitment or credibility This was precisely the discussion which predated the adoption of the euro, namely the question was "why would Germany join?". The answer has to rely on considerations outside of purely monetary policy. one is the trade gain for Germany, other considerations are mor political in nature, and we return to those below when we discuss in more detail the Euro.

For Italy the trade off is similar (in fact more advantageous) than the one discussed above for the case of unilateral currency unions. In fact country to a unilateral adoption of the German mark, the new Central Bank would target a shock which is a sort of average of the Italian and German shock. The condition which makes the currency union advantageous for Italy is:

$$\sigma^2 < k^2(1+b) \tag{56}$$

Italy looses an independent monetary policy but gains an anchor. In addition Italy would have a trade gain due to the currency union. In fact, precisely because Italy would gain more than Germany Italy would be willing to join a currency union even with a monetary policy more tailored to the needs of Germany than to those of Italy (namely reacting more to ε_t^G than ε_t^I),say a policy like:

$$\pi_t^{CU} = -\frac{b}{1+b}(\alpha\varepsilon_t^G + (1-\alpha)\varepsilon_t^I) \qquad with\ 1 \geq \alpha > \frac{1}{2} \tag{57}$$

It is easy to check that the benefit for Italy to form the currency union are decreasing with α

$$\frac{\partial[E(L^I) - E(L^{CU})]}{\partial\alpha} = \frac{2b^2\alpha(cov(\varepsilon_t^I, \varepsilon_t^G) - \sigma^2)}{1+b} < 0 \qquad for\ Italy \tag{58}$$

In general there exist a value of $\alpha > 1/2$ such that Italy would be indifferent between joining the union or not. for certain parameter values, Italy might be willing to adopt a currency union in which monetary policy is fully delegated to Germany, in which $\alpha = 1$. That is for Italy the condition given above for a unilateral currency union (i.e. $\alpha = 1$) might be satisfied.

5.3.1 Discussion

This very simple example captures some of the discussion underlying the creation of the European Monetary Union. First, the benefits of the union are

unevenly distributed. The countries in need of a monetary anchor gain more. But there is an answer to why the anchor country, say Germany, may want to join, namely the gain emerging from a larger common market with smaller and fewer transaction cost in trade, more competition etc.

Second, with multiple countries joining the currency unions one needs certain institutional rules to decide monetary policy, even certain voting rules. With multiple countries we can think of voting rules which affect the choices of the weight "α^i" with i indicating all the member countries. Alesina and Grilli (1993, 1995) discuss precisely this issue. In the first paper (Alesina and Grilli (1993)) they analyze a median voter model in which the median country chooses the objective function of the central bank.[26] For the same reason discussed above for the case of the conservative central banker" the median voter (i.e. the median country) in the union would choose an objective function for the supranational central bank more inflation averse that the median voter's preference. The institution is essentially identical to that of Rogoff's (1985) which we reviewed above. Alesina and Grilli (1995) discuss how the structure of the voting rules would influence the incentive to allow more countries to join in. new countries would change the median voter and this move may be seen favorably or unfavorably by those already in. In reality, there has been discussion of a two tier system: some countries in the euro area would be member of the ECB board other would not and would simply adopt the euro unilaterally without any direct influence ion the course of monetary policy of the union. The political sensitivities of weight in voting rules, is the reason why the ECB has from the very beginning tried to present itself truly as a supranational institution rather than a committee of national authorities. Had it chosen the other strategy there would have been an explicit, politically costly and potentially damaging debate about the value of the parameters "α" which entered the ECB objective function. There have been lenght discussion about weights and voting rules for other bodies of the European Community and lenghty discussion about supermajorities, unanimity rules etc. The ECB has, judiciosly, maintained an aura of suopernationality

Third, the covariance between shocks, namely $\text{cov}(\varepsilon_T^G, \varepsilon_t^I)$ may be affected by the formation of the union. In fact there are two countervailing effects. One is that a currency union by increasing the policy coordination between members and by increasing market integration, may increase the covariance between national shocks. This would reinforce the benefits of the union. On the other hand an increase in trade between members might lead to a specialization in different sectors of the economies of the country members. This would reduce the covariance of the economic shocks of member countries.

Fourth, the union would come under stress in times when the national shocks are very divergent, in our example say when ε_t^G is, say, very large and positive and ε_t^I negative and very large in absolute value. This is a situation analogous to that of a stress in a unilateral union discussed above. The difference is that the formation of a common (new) currency like, say the Euro, may imply even

[26] In the model there is an objective function common to all citizens of a country, each country is. therefore homogenous.

bigger cost in breaking it up. therefore the degree of commitment of say, Italy and Germany linked together by the Euro is larger than say Ecuador adopting, and then abandoning the US dollar.

5.4 Currency unions: some empirical evidence

5.4.1 Trade benefits of currency unions

A renet lively literature on the trade benefits of currency unions was started by the controversial findings by Rose (2000). Using a United Nations panel dataset on trade among around 200 countries, Rose estimated a standard gravity model with the addition of a currency union dummy, which turned out to be strongly statistically significant; he found that currency unions triple trade among their members. Initially these results were received with skepticism, Persson (2001) for instance raised the problem of endogeneity: the decision of joining a currency union clearly depends on the trade relations with the other members and therefore is endogenous; OLS estimates of currency unions on bilateral trade will be biased and this bias may account for the unusually large estimates of Rose (2000). He also showed that the group of countries sharing the same currency had systematically different characteristics: countries in a currency union are smaller and poorer, share a language or a border and they more often had the same colonizer.

Since the beginning of the new millennium many studies have tried to address the endogeneity issue and have confirmed the initial estimates of Rose, finding statistically significant effects of currency unions on trade. Frankel and Rose (2002) analyze a large cross-section of countries and find that giving up the currency by joining a currency union or a currency board both enhances trade and income. Glick and Rose (2002) provide some time-series evidence using a panel data set covering 217 countries from 1948 through 1997; they find using different techniques that leaving a currency union decreases trade. Rose and Stanley (2005) perform a meta-analysis of thirty-four papers studying the effect of currency unions on trade and finds that the hypothesis of no effect is robustly rejected at standard significance levels. Barro and Tenreyro (2007) adopt a new instrumental variable approach. They argue that the decision of creating a currency union between two countries is sometimes due to the independent decision of these two countries to peg to a third country's currency; they estimate the probability that each country adopts the currency of a main anchor country and then compute the joint likelihood that two countries independently peg to the same anchor: these likelihoods are then used as instruments for being member of a currency union.

Alesina and Barro (2002) discuss the tradeoffs in the adoption of another country's currency and find that the countries that most gain in joining a currency union are those that trade most with each other, have the largest comovements in outputs and prices and have stable relative price levels. Alesina,

Barro and Tenreyro (2002) try to empirically determine "natural" currency areas: using the criteria of Alesina and Barro (2002) they determine which countries in the world would gain by choosing as anchor either the euro or the dollar or the yen. They find a dollar area involving Canada, Mexico, most of Central America and parts of South America (except Argentina and Brazil) and a euro area including all of western Europe and most of Africa; empirically there seems to be no clear yen area though, being Japan a rather closed economy.

6 The Euro[27]

The Euro is about 10 years old at the time of this writing (summer 2009). . Overall the Euro has been a success and it will probably be with us for the indefinite future. It has not been a miraculous "deus ex machina" that would have prompted extraordinary growth for Europe as some of the most naive (and irritating) euroenthusiasts would have dreamed. But it has been more successful than the skeptics would have predicted. Even in the midst of a deep financial crisis the survival of the European common currency does not seem in jeopardy, and in fact one may argue that the weak currency country of Europe might have had a much worse performance during the financial crisis without the currency union. Not only but some of the European non euro members would have liked to be in after the crisis erupted. It is useful to review what one could have said about the Euro before the financial crisis started in the summer of 2007 and how the euro performed during the crisis.

6.1 The pre crisis period of the Euro

At the end of the nineties many (especially American) economists were rather skeptical about the Euro idea. An excellent example of very careful analysis of pros and cons ending with a relatively negative tone was given by a masterful piece by Obstfeld (1997).[28] In favor of the union were the anchor effect for high inflation countries, a reduction of trade costs and barriers, a deepening of the common market financial integration, and for those who believed in it, a move towards more political unity in Europe. The critics pointed out the problem of abandoning a policy instruments in an area full of rigidity in labor markets, which did not seem to satisfy any Mundell's conditions of an optimal currency area, in particular the lack of wage flexibility and the low mobility of labor within the union would have made the less of an independent national monetary policy very costly.

On there latter point the optimists replied, with a bit of a leap of faith, that the monetary union would have given an impulse to adopt those liberalizing reforms. Alesina, Ardagna and Galasso (2009) investigate whether or not the adoption of the euro has facilitated the introduction of structural reforms,

[27] This section is based on Alesina and Giavazzi (2009)

[28] See also the exhaustive set of references provided in that paper which y summarizes the pre euro discussion regarding the monetary union.

defined as deregulation in the product markets and liberalization and deregulation in the labor markets. The find that the adoption of the euro has been associated with an acceleration of the pace of structural reforms in the product market. As for the labor market the evidence is more complex. Reforms in the primary labor market have proceeded very slowly everywhere and the euro does not seem to have generated much of an impetus here. [29] On the other hand in many countries including many euro ones like France Italy and Spain new form of labor contracts have been introduced based upon temporary agreements between employers and workers. The authors also explore whether the euro has brought about wage moderation: they find evidence of wage moderation in the run up (1993 1998) of euro membership but not afterwards. [30] Thus at least in part the optimist might have been right on this point.

The most radical critics of the Euro, in particular Feldstein (1997) Andrea find the referecne(s)objected that the divergent needs of monetary policy in the euro area would have created more tensions amongst members who would have reduced rather than increased economic cooperation in Europe. he went as far as saying that the probability of conflict within Europe would have increased. This was rather extreme but even one of us (Alesina 1997) was also worried about conflict regaridng the conduct of monetary policy. Eichengreen (2009) after reviewing these arguments concludes (correctly in our view) that reality turned out to be more in line with the predictions of the optimists rather with those of the worst pessimists. To be sure there were indeed conflicts and dissatisfaction in the first years of the Euro. Countries withe specially low growth, like Italy, blamed the euro for being locked in a system which did not allow devaluations. [31] A second source of tension related to the policy of the ECB. Several European leaders, especially from Italy, France and Spain attacked the ECB for its policies which were, allegedly, too concerned about inflation than growth, for having a too low b in the language of our model. the rhetoric in the first part of century was that the ECB was chocking the growth in Europe, while the Fed under the miraculous hands of Greenspan was promoting growth in the US. The accusation to the ECB were largely wrong and, in fact the ECB served the purpose of a scapegoat, an issue discussed above regarding independent Central Banks. It goes beyond the scope of the present paper a detailed analysis of the policies of the ECB but the view that this institution is responsible for the low average growth of several large countries in continental Europe in the decade before the 2008 crisis is simply

[29] See Blanchard and Giavazzi (20030 for a discussion of the sequencing of labor and product market reforms in Europe.

[30] Bugamelli, Schivardi and Zizza (2009) further pursue this question from a different angle and find that productivity growth has been relatively stronger in those countries and sectors that before the euro was adopted relied more on competitive devaluations to regain price competitiveness.

[31] The current (2009) economic mister of Italy Giulio Tremonti repeteadly expressed very negative views about the role of the Euro in explaining the Italy decline and one memebr of the italian patrliament who then later became Interiror Minister called for an exit fo Italy from the Euro. Fortunately the markets paid no attention.

wrong.[32] The ECB was also in the spot light for the wide fluctuations of the value of Euro the Euro against the dollar: the Euro went which went from a minimum of 0.85 cents on the dollar in 2000 to close to 1.6 a few years later. Pundits (often the same ones) were ready to criticize the ECB before for a ow and than for a high Euro.

Finally it would appear that the common currency did increase trade amongst members, namely it made the European common market more effective, a major argument in favor of the common currency. Frankel (2009) finds a 15/20% increase in trade over just seven years (1999-2006): this is small compared to the large effects found by Rose studying other currency unions, (see our discussion above) but the effect is by no means negligible especially considering that Euro area countries were already heavily integrated before the adoption of the common currency.

6.2 The Euro in time of crisis

The financial crisis of 2008 made the Euro more popular amongst European politicians and leaders. The impression was that high debt, traditionally weak currency countries like Italy, Greece, Portugal or Belgium would have suffered Argentinian like currency crises. speculative attacks etc. Those who had argued against the Euro in Italy for instance, after the outset of the crisis were singing its praise! Not only, but European countries which had chosen not to join the Euro might have been prompted to reconsider their decisions. For instance Sodestrom (2009) argues that an independent monetary policy and exchange rate fluctuations hurt the Swedish economy at the outset of the crisis. In fact until the crisis since the start of EMU the exchange between the krona and the euro has remained remarkably stable—so stable that one could have argued whether the Riksbank was really targeting domestic inflation But since the crisis erupted the krona in a few months has depreciated by almost 10% against the euro. This has confronted Sweden with a difficult policy choice: raise interest rates to stabilize the krona-euro exchange rate or lower rates to avoid financial trouble and also a possible recession.

It is interesting that Denmark, Sweden and the UK reacted to the crisis moving in opposite directions. Sweden and the UK have given up on exchange rate stability and have lowered rates; the Danish central bank has intervened heavily in the foreign exchange market and has been forced to raise interest rates from 5 per cent to 5.5 per cent – a full 1.75 points higher than the ECB's rate, in order to stabilize the exchange rate. As a result, a renewed debate about the benefits of euro membership has opened up in Denmark: some argue that the country should run a new referendum on the euro. Even Iceland now speaks about the benefits of the euro, even if this country is not even a member of the European Union. We read that diplomats from Iceland are making discreet inquires in Brussels about accession. Willem Buiter and Anne Sibert (2008)

[32] See several chapters in the book edited by Alesina and Giavazzi (2009) on the first ten years of the Euro for more discussions.

argue that Iceland is only an extreme case of a more general phenomenon – of a small country with its own currency, and banking sectors too large to be bailed out by national authorities. Others are Denmark, Sweden and Switzerland. The UK is larger and also enjoys – according to Buiter and Sibert – "minor-league legacy reserve currency" status. But some of the arguments apply to the UK as well. And in fact a renewed debate about euro area membership has started in the UK as well.

Similar problems have manifested themselves in Central and Eastern Europe. In Hungary almost all mortgages are denominated in Swiss francs or euros: a currency depreciation would trigger a series of personal and banking failures. Thus the country is struggling between the desire to stabilize the exchange rate and the need to provide liquidity to the economy. In the Spring of 2009 the IMF suggested that several central and Eastern European countries should have considered joining the Euro area even without a seat in the ECB board.

The Eurosceptics before the adoption of the Euro argued that it would not have service the firs major crisis. Indeed it would appear that the popularity of the Euro seemed to have come stronger with crisis. Why?. The type of tension that eurosceptics had in mind were disagreements over the conduct of monetary policy and asymmetric business cycle shoc kss. This indeed in part augured in the first 7-8 years of the cycle. Business cycle fluctuations continued to be not perfectly correlated. However when the crisis of 2008 hit, it affected everyone. Injection of liquidity y from the ECB were welcomed by all and all countries felt some how "protected" by the umbrella of the Euro.

7 Conclusion

To be written

8 Appendix

8.1 Independent Central Banker

The independent central banker is chosen by minimizing the loss function with respect to the parameter $\hat{b}$. The utility loss is:

$$EL = \frac{1}{2}E[(\hat{b}k - \frac{\hat{b}}{1+\hat{b}}\varepsilon_t)^2 + b(\frac{1}{1+\hat{b}}\varepsilon_t - k)^2] \tag{59}$$

With one line of algebra we can simplify the loss function to:

$$EL = \frac{1}{2}[k^2(\hat{b}^2 + b) + \frac{b+\hat{b}^2}{(1+\hat{b})^2}\sigma_\epsilon^2] \tag{60}$$

Minimizing the loss with respect to $\hat{b}$ we obtain the following first order condition:

$$F(\hat{b}) = \hat{b}k^2 + \frac{\hat{b} - b}{(1+\hat{b})^3}\sigma_\epsilon^2 = 0 \tag{61}$$

It can be easily checked that $F()$ is an increasing function for the range of coefficients we are interested in, which means that the second order condition is satisfied. If we call $\hat{b}^*$ the value that satisfies the first order condition, $\mathrm{F}(\hat{b}^*)=0$, since $F()$ evaluated in b gives $bk^2 > 0$ and $\mathrm{F}()$ is an increasing function, then we can deduce that $\hat{b}^* < b$, which means that the central banker chosen is going to be more "conservative" than the general public.

8.2 Central Bank (in)dependence in times of crisis

The economy is described by:

$$y_t = \pi_t - \pi_t^e + \varepsilon_t \tag{62}$$

The government appoints a conservative central banker and commits to let him choose the monetary policy by setting a cost c that she has to pay to override the decisions of the central banker. The loss function becomes:

$$L = \frac{\hat{b}}{2}(y_t - k)^2 + \frac{1}{2}(\pi_t)^2 + \delta c \tag{63}$$

where δ is a dummy variable equal to 1 only when the government fires the central banker and takes over monetary policy. In this model action takes place in three stages: in the first the government chooses $\hat{b}$, the degree of conservativeness of the central banker, and the cost c of reneging on her commitment. In the second stage expectations are rationally formed; in the third stage the output shock is realized, the central banker sets inflation, the government decides whether to take over monetary policy and finally inflation and output are realized. The model is solved by backward induction and it can be shown that the optimal contract features a conservative central banker, $\hat{b} < b$, and a strictly positive but finite cost of reneging on commitment, $0 < c < \infty$. In equilibrium the central banker will choose his favorite policy if the output shock is below a certain threshold and therefore in normal conditions inflation will be lower; in extreme conditions, i.e. when the shock exceeds the threshold, the central banker will choose the policy preferred by the median voter so that he is never fired in equilibrium.

8.3 Opportunistic Business Cycles

Political cycles influence economic outcomes even when politicians are identical in ideology but differ in competence; voters would like to elect the most competent policy-maker and therefore politicians are willing to distort optimal policies in order to signal their abilities. Let us continue assuming that the economy is described by a simple Phillips curve, but we add a competence term:

$$y_t = \pi_t - \pi_t^e + \eta_t \tag{64}$$

where competence has the following time structure:

$$\eta_t = \mu_{t-1} + \mu_t \tag{65}$$

Competence can assume only two values:

$$\begin{aligned} \mu_t &= \bar{\mu}, \quad with probability \quad \rho \\ &= \underline{\mu}, \quad with probability \quad 1-\rho \end{aligned}$$

such as:

$$E(\mu_t) = \rho\bar{\mu} + (1-\rho)\underline{\mu} = 0$$

Voters' utility is represented by:

$$U = E\left\{\Sigma_{t=0}^{\infty}\beta^t[-\frac{1}{2}(\pi_t)^2 + by_t]\right\} \qquad 0 < \beta < 1 \tag{66}$$

We also assume rational expectations and that the policy-maker directly controls inflation. Let's focus on a two period model where elections are held only at the end of the first period. The model is solved by backward induction. Since there are no elections, in period two the policy-maker has no incentive to signal his competence; he will maximize the period utility so that inflation and output will be: $\pi_2 = \pi_2^e = b$ and $y_2 = \eta_2$. The incumbent expected net gain from winning the election is the difference between his utility if he wins, U^i, and his utility if he loses, U^o, plus a private benefit from being in office H:

$$W(\mu_t^i) = U_{t+1}^i - U_{t+1}^o + H \tag{67}$$

$$= -\frac{1}{2}(b)^2 + bE(\eta_2^i) - [-\frac{1}{2}(b)^2 + bE(\eta_2^o)] + H \tag{68}$$

where η_2^o is the competence of the opponent and is in expectation equal to zero. Simplifying we obtain:

$$W(\mu_t^i) = b\mu_1^i + H \tag{69}$$

We also assume that even an incompetent politician has the incentive to be in office rather than not: $H > -b\underline{\mu}$. Since in the first period voters do not observe inflation, they are not able to understand whether the incumbent is competent

or not; both types of politician have therefore an incentive to appear competent by boosting economic growth. The incumbent sets inflation above expectations:

$$\pi_t(\mu_t^i) = \pi_t^e + y_t - \mu_t^i - \bar{y} \tag{70}$$

Obviously choosing inflation in order to surprise the public has a cost, which can be written as the difference between utility evaluated at the time consistent level of inflation b and utility evaluated at $\pi_t(\mu_t^i)$:

$$C(\mu_t^i, y_t) = -\frac{1}{2}b^2 + b[\bar{y} + b - \pi_t^e + \mu_t^i] - \{-\frac{1}{2}[\pi_t(\mu_t^i)]^2 + b[\bar{y} + \pi_t(\mu_t^i) - \pi_t^e + \mu_t^i]\} \tag{71}$$

There are two types of equilibria: separating and pooling.

8.3.1 Separating Equilibrium

The two types of politician achieve two different levels of output so that voters are perfectly able to tell them apart. Voters attribute probability $\rho_{t+1} = 1$ to the incumbent's being competent if and only if output is higher than a certain level: $y_t \geq y_t^s$. The competent politician can achieve this threshold y_t^s, but the incompetent one cannot; for this reason the latter will choose $\pi_t = b$, but the former will choose a higher level of inflation in order to boost the economy. The expected inflation will therefore be:

$$\pi_t^e = (1-\rho)b + \rho\pi_t(\bar{\mu}) = b + \rho\frac{y^s - \bar{\mu} - \bar{y}}{1-\rho} \tag{72}$$

Another way to say that only the competent politician can achieve the high level of output is that the discounted net gain from reelection is higher than the cost of signaling; the opposite must be true for the incompetent politician:

$$\beta W(\bar{\mu}) > C(y^s, \bar{\mu}) \tag{73}$$

$$\beta W(\underline{\mu}) \leq C(y^s, \underline{\mu}) \tag{74}$$

The competent politician will obviously choose to achieve minimum level of output that the incompetent incumbent would not be willing to target, y^s will be equal to the value that satisfies (73) with equality.

8.3.2 Pooling Equilibrium

In the pooling equilibrium both types of incumbent achieve the same level of output; voters attribute the prior probability $\rho_{t+1} = \rho$ to the incumbent's being competent if output is higher than a certain threshold y^p. The competent incumbent chooses inflation without signaling, which implies:

$$y_p = b - \pi_t^e + \bar{\mu} + \bar{y} \tag{75}$$

The incompetent incumbent will have to set inflation above expectations in order to achieve y^p:

$$\pi_t(\underline{\mu}, y^p) = y^p + \pi_t^e - \underline{\mu} - \bar{y} \tag{76}$$

Expected inflation will be:

$$\pi_t^e = \rho b + (1-\rho)\pi_t(\underline{\mu}, y^p) = b + \frac{1-\rho}{\rho}(y^p - \underline{\mu} - \bar{y}) \tag{77}$$

Plugging (77) in (75) we find that $y^p = \bar{y}$. Since voters cannot tell apart the two types of politicians, the probability that the incumbent will be reelected will be $\frac{1}{2}$; the incompetent incumbent must find convenient to achieve the high level of ouput $\bar{y}$, which means that:

$$C(y^p, \underline{\mu}) \leq \frac{1}{2}\beta W(\underline{\mu}) \tag{78}$$

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