THE NEW POLITICAL ECONOMY OF CENTRAL BANKING

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1. THE POLITICAL ECONOMY OF CENTRAL BANK INDEPENDENCE

1.1 Inflation

Many observers believe that countries with an independent central bank have lower levels of inflation than do countries with a central bank that comes under direct control of the government. Why would central bank independence, ceteris paribus, yield lower rates of inflation? The literature (for a survey, see also Eijffinger and De Haan, 1996) provides three answers to this question: public choice arguments, the analysis of Sargent and Wallace (1981) and arguments that are based on the time inconsistency problem of monetary policy.

According to the `older' *public choice view*, monetary authorities are exposed to strong political pressures to behave in accordance with the government's preferences.[1] Monetary tightening aggravates the budgetary position of government: the reduction in tax income brought about by a temporary slowdown of economic activity, possibly lower receipts from `seigniorage', and the short-run increase in the interest burden on public debt all worsen the deficit. Thus, the government may prefer `easy money.' Indeed, some evidence exists that even the relatively independent Federal Reserve caters to the desires of the President and/or the Congress. This evidence is either based on close inspection of the contacts between the polity and the central bank (see e.g. Havrilesky, 1993,[2] and Akhtar and Howe, 1991) or builds on tests to determine whether monetary policy turns expansive before elections as predicted by Nordhaus's (1975) political business cycle theory (see e.g. Allen, 1986), or diverges under administrations with different political orientation, as predicted by Hibbs's (1977) partisan theory (see e.g. Alesina, 1988). At this stage, it suffices to conclude

[1] As Buchanan and Wagner (1977, pp. 117-18) put it: "A monetary decision maker is in a position only one stage removed from that of the directly elected politician. He will normally have been appointed to office by a politician subject to electoral testing, and he may even serve at the pleasure of the latter. It is scarcely to be expected that persons who are chosen as monetary decision makers will be the sort that are likely to take policy stances sharply contrary to those desired by their political associates, especially since these stances would also run counter to strong public opinion and media pressures … `Easy money' is also `easy' for the monetary manager ..".

[2] Havrilesky (1993) even argues that "the contemporary view is that the Administration, while granting significant leeway to the Fed, when necessary obtains the monetary policy actions that it desires" (p. 30).

that, of course, the more independent a central bank is, the less it will be under the spell of political influences as outlined above. It will be clear that this argument of Buchanan and Wagner relates primarily to personnel independence.[3] Personnel independence refers to the influence the government has in appointing procedures. The level of this influence may be discerned by criteria such as government representation in the governing body of the central bank and government influence in appointing procedures, terms of office, and dismissal of the governing board of the bank.

A second argument to explain why central bank independence may tear on inflation. This argument was first put forward by Sargent and Wallace (1981) who distinguish between fiscal and monetary authorities. If fiscal policy is dominant i.e. if the monetary authorities cannot influence the size of the government's budget deficit money supply becomes endogenous. If the public is no longer able or willing to absorb additional government debt, it follows from the government budget constraint that monetary authorities will be forced to finance the deficit by creating money. If, however, monetary policy is dominant, the fiscal authorities will be forced to reduce the deficit (or repudiate part of the debt). It is clear that the more independent the central bank is, the less monetary authorities can be forced to finance deficits by creating money. It is clear that this argument relates to financial independence. Financial independence refers to the ability given to the government to finance government expenditure either directly or indirectly through central-bank credits. Direct access to central-bank credits implies that monetary policy is subordinated to fiscal policy. Indirect access may result if the central bank is cashier to the government or if it handles the management of government debt.

A third, and indeed, the most prominent argument for central bank independence is based on the *time inconsistency problem* (Kydland and Prescott, 1977; Calvo, 1978; Barro and Gordon, 1983). Dynamic inconsistency arises when the best plan currently made for some future period is no longer

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[3] Neumann (1991) emphasizes the personnel independence of the governing board of the central bank: "The conditions of contract and of office would have to be set such that the appointee frees him- or herself from all former political ties or dependencies and accepts the central bank's objective of safeguarding the value of the currency as his or her professional *leitmotif*. We may call this a `Thomas-Becket' effect." (p. 103). Waller (1992b) develops a model for appointments to the central bank in the context of a two-party political system, in which the victor of the last election is allowed to nominate candidates, but the losing party is given the right to confirm the nominees. An interesting outcome of the model is that if society wants to minimize partisan monetary policy, it should increase the length of office of central bank policy board members relative to the length of the electoral interval.

optimal when that period actually starts. Various models have been based upon this dynamic inconsistency approach (see e.g. Rogoff, 1985; Cukierman, 1992; Eijffinger and Schaling, 1993b and Schaling, 1995). Basically, in these models the government and the public are drawn into some setting of the prisoner's dilemma. The various models differ in their assumptions with regard to government incentives. Following McCallum (1995a) the central insights of these models can be explained as follows. It is assumed that policymakers seek to minimize the following loss function:

$$L(\pi_t) = w\pi^2 + (y_t - ky_n)^2$$

where $0 < w$ and $k > 1$, whereas output is driven by:

$$y_t = y_n + b(\pi_t - \pi_t^e + u_t)$$

where π is inflation, π^e is expected inflation, y_t is output, y_n is the natural output and u_t is a random shock. We assume here that deviations of employment from its natural level are positively related to unanticipated inflation. This follows from the existence of nominal wage contracts in conjunction with a real wage that is normally above the market-clearing real wage. Policymakers have an objective function that assigns a positive weight to stimulating employment (e.g. because of re-election considerations, or for partisan reasons) and a negative weight to inflation. Policymakers minimize (1) on a period by period basis, taking the inflation expectations as given. This gives:

$$\pi_t = \frac{b(k-1)y_n}{w+b^2} + \frac{b^2}{w+b^2}\pi_t^e - \frac{b^2}{w+b^2}u_t$$

With rational expectations inflation turns out to be:

$$\pi_t = \frac{b(k-1)y_n}{w} - \frac{b^2}{w+b^2}u_t$$

If policymakers were to follow a rule taking into account private rational expectational behaviour, inflation would be:

$$\pi_t = \frac{-b^2}{w+b^2}u_t$$

As the same level of output pertains in both cases, the latter outcome is clearly superior. No matter what exactly causes the dynamic inconsistency problem[4], in all cases the resulting rate of inflation is sub-optimal.[5]

So in the literature devices have been suggested to reduce the inflationary bias. Barro and Gordon (1983) conclude that the best solution for the time inconsistency problem consists of the introduction of fixed rules in monetary policy, i.e. the authorities commit themselves to certain policy rules. Once uncertainty is introduced and the level of output is affected by shocks, the case becomes one for a feedback rule, in which monetary policy optimally responds to shocks. The problem with rules, however, is the absence of some higher authority to enforce a commitment. Handing over authority to the central bank by political authorities may help here, since it can be regarded as an act of partial commitment (Rogoff, 1985; Neumann, 1991 and Cukierman, 1992, chapter 18). By delegating some of their authority to a relatively apolitical institution, politicians accept certain restrictions on their future freedom of action.[6]

The degree of central bank independence, of course, plays a meaningful role only if the central bank puts a different emphasis on alternative policy objectives than does the government. The literature points to two main differences (Cukierman, 1992, chapter 18). One relates to possible differences between the rate of time preference of political authorities and that of central banks. For various reasons, central banks are often more conservative and tend to take a longer view of the policy process than do politicians. The other difference concerns the subjective weights in the

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4 Other sources of the time inconsistency problem originate with the public finances. The dynamic inconsistency of monetary policy may first arise, because the incentives for the government to inflate change before and after the public has settled for a nominal interest rate, taking into account its expected rate of inflation. Before the public commits itself, the central bank has an incentive to abstain from making inflation. After positions in government bonds have been taken, policymakers have an incentive to create inflation (Cukierman, 1992). Another source of the inconsistency problem also originates in the finances of government and may be referred to as the `revenue' or `seigniorage' motive for monetary expansion (Barro, 1983). The dynamic inconsistency of monetary policy arises here, because incentives for the government to inflate change before and after the public has chosen the level of real money balances.

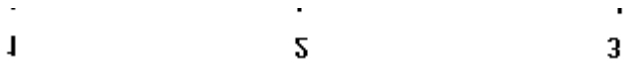
5 This conclusion generally also holds in models with incomplete information. Cukierman (1992, chapter 18), for instance, provides a model in which the public is not fully informed about the shifting objectives of the political authorities and in which there is no perfect control of information.

6 An alternative solution to the time inconsistency problem is reputation building (Canzoneri, 1985). Fratianni and Huang (1994) show, however, that the case of asymmetric information gives no assurance that reputation may work for the central bank in the Barro-Gordon model.

objective function of the central bank and that of the government. It is often assumed that central bankers are relatively more concerned about inflation than about other policy goals such as achieving high employment levels and adequate government revenues. If monetary policy is set at the discretion of a conservative central banker, a lower average time-consistent inflation rate will result.[7] The foregoing analysis makes it clear that this argument for central bank independence is primarily related to policy independence. Policy independence refers to the maneuvering room given to the central bank in the formulation and execution of monetary policy. As pointed out by Fischer (1995), it may be useful to distinguish between independence with respect to goals and independence with respect to instruments.

The best way to illustrate the argument is to present a `stripped' version of Rogoff's model. In Rogoff's (1985) model, society can sometimes make itself better off by appointing a central banker who does not share the social objective function, but instead places a higher weight on price stability relative to output stabilization. In this simplified version, output is given by equation (2), in which the natural level of output is put at zero and the parameters at one. The timing of events in the Rogoff model is as follows: first π_t^e is set (nominal wage contracts are signed), then the shock u_t occurs, and finally the central banker sets π_t (see figure 1).

Figure 1. Timing of events in the Rogoff model



Society's loss function is given by

$$L_t = \frac{1}{2}\pi_t^2 + \frac{\chi}{2}(y_t - \hat{y}_t)^2$$

where the weight on output stabilization $\chi > 0$ and $y,\hat{} > 0$, so that the desired level of output, $y,\hat{}$, is above the natural level. Rogoff shows that it is optimal for society to choose an independent

[7] Waller (1992a) analyzes the appointment of a conservative central banker in a model that distinguishes between sectors that differ in their degree of competitiveness of the labor market. The main result of this paper is that, although agents in both sectors have the same preferences over inflation and output stability, in equilibrium nominal wage rigidity in the non-classical labor market causes output in this sector to be more variable than in the classical sector. Consequently, if the classical sector were allowed to choose the `conservative' central banker, it would choose a more vigorous inflation fighter relative to the non-classical sector's choice.

(conservative) central banker who assigns a higher weight to price stability in his loss function:

$$I_t = \frac{1+\varepsilon}{2}\pi_t^2 + \frac{c}{2}(y_t - \hat{y}_t)^2$$

where ε, the additional weight on the inflation goal, lies between zero and infinity ($0 < \varepsilon < \infty$).

Substituting and taking first-order conditions with respect to π_t and solving for rational expectations, we obtain:

Install Equation Editor and double-
click here to view equation.

Policy rule (8) shows that the introduction of a conservative central banker ($\varepsilon > 0$) leads to a lower inflationary bias and a lower variance of inflation. The variance of output is, however, an increasing function of the conservativeness of the central banker. So there is a trade off between credibility and flexibility in the Rogoff model. It can be shown that the optimal value for ε, in terms of social loss function (6), is positive but finite. This implies that it is optimal for society to appoint a conservative central banker.

Rogoff makes the crucial assumption, that the central banker is completely independent and cannot be overridden ex post, when the inflationary expectations π_t^e have been set and the policy is to be carried out. This can lead to large losses for society when extreme productivity shocks u_t occur. Lohmann (1992) introduces the possibility to override the central banker at a strictly positive but *finite* cost. Therefore, society's loss function changes to

$$L_{t'} = \frac{1}{2}\pi_t^2 + \frac{c}{2}(y_t - \hat{y}_t)^2 + \delta c$$

where δ is a dummy that takes on the value of 1 when the central bank is overridden and 0 otherwise; and c is a cost that society incurs when the central bank is overridden. The central bank's loss function (7) stays the same.

The timing of events in the Lohmann model is as follows: In the first stage the central banker's additional weight ε on the inflation goal is chosen as well as the cost c of overriding the central banker. Then the inflation expectations are set. In the third stage the productivity shock realizes. Then the central banker sets the inflation rate, which is either accepted or not. If it is not accepted, society overrides the central banker, incurs the cost c and resets the inflation rate. Finally, inflation and output realize (see figure 2).

Figure 2. Timing of events in the Lohmann model

In equilibrium, the central banker will not be overridden. In the case of an extreme productivity shock he will set the inflation rate so that society is indifferent between overriding or not. Rogoff's model is a special case of Lohmann's, where $c = \infty$. Lohmann shows that the optimal central bank institution is characterized by $0 < \varepsilon^* < \infty$ and $0 < c^* < \infty$.

An important result from the Rogoff model is that the reduction in the equilibrium inflation rate resulting after appointing a conservative and independent central banker generally comes at the expense of greater output variability from supply shocks, since the central banker offsets output shocks to a lesser extent than would governments.[8] Nevertheless, gains from lower inflation exceed losses due to decreased stability. Therefore, on net, society is made better off by appointing a conservative central banker. It is, however, not optimal in the Rogoff model to appoint a central banker whose only concern is low and stable inflation.

The Rogoff-model has been criticized by McCallum (1995a), who contends that it is inappropriate simply to presume that the central bank behaves discretionary rather than setting the constant term and p^e_t coefficient in equation (3) equal to zero and thereby eliminating the inflationary bias while retaining the desirable countercyclical response to the shock u_t. All that is needed for avoidance of the inflationary bias is for the central bank to recognize the futility of continually exploiting expectations that are given for the moment while planning not to do so in the future, and to recognize that its objectives would be more fully achieved on average if it were to abstain from attempts to exploit these temporarily given expectations. McCallum (1995b, p. 18) argues that "there is nothing tangible to prevent an actual central bank from behaving in this "committed" or "rule-like" fashion, so it is my contention that some forward-looking banks will in fact do so. Analytical results that presume non-committed or discretionary behaviour may therefore be misleading". Although McCallum has a point, the problem of course with a highly dependent

[8] Recently, Alesina and Gatti (1995) have introduced another source of output variability in a Rogoff-type model, namely variability introduced in the system by the uncertainty about the future course of policy. This uncertainty is due to uncertain electoral outcomes in case there are two contending parties with different preferences over inflation and unemployment. Now the overall effect of central bank independence on output variability is ambiguous.

central bank is that it may not be able to behave in such a way.

Apart from a legislative approach to create by law an independent central bank and to mandate it, also by law, to direct its policies towards achieving price stability, other mechanisms have been suggested to overcome the incentive problems of monetary policy. This so-called contracting approach regards design of monetary institutions as one that involves structuring a contract between the central bank and the government.The optimal contract is an application of ideas from the principal-agent literature. In this application government is viewed as the principal and the central bank as the agent. The principal signs a contract with the agent according to which the bank is subject to an ex post penalty schedule that is linear in inflation. The nature of the contract will affect the incentives facing the bank and will, thereby, affect monetary policy (Walsh, 1993). Persson and Tabellini (1993) suggest a targeting approach, in which the political principals of the central bank impose an explicit inflation target and make the central bank leadership explicitly accountable for its success in meeting this target. Such a system exists since 1989 in New Zealand, where the governor of the Reserve Bank can, under certain circumstances, be dismissed if the inflation rate exceeds two percent.

It is interesting to note that it follows from the analysis of Persson and Tabellini (1993) that the optimal contract with the central bank implies no loss in terms of stabilization policy. As pointed out above, this results contrasts with the outcomes of most models where monetary policy is delegated to an independent central bank, where credibility is increased at the expense of an optimal output stabilization policy. Walsh (1993, 1995) and Persson and Tabellini (1993) show that the optimal central bank contract may serve to eliminate the inflation bias, while still preserving the advantages of stabilization. This conclusion holds even if the central bank has private information.[9] From the foregoing analysis, it will be clear that the contracting approach is clearly related to instrument independence, but not to goal independence.

The contracting approach has also been criticized. For one thing, although they perform a useful function as benchmarks, social planners do not exist in practice. Hence, government has to be relied upon to impose the optimal incentive schedule on the central bank ex post. Governments are also subject to an inflationary bias and usually to a greater extent than the central bank

[9] Walsh (1995) also considers the situation in which candidates to head the central bank differ in their competency, the central bank's monetary policy stance is not observable, and the informational content of a publicly observable signal about an aggregate supply shock is affected both by the central bank's competency and by its implementation of given policies. In this model the principal can induce the central bank to behave as demanded by using a contract that resembles an inflation targeting rule with a reporting requirement.

(Cukierman, 1995). McCallum (1995a) argues that if government cannot commit to the optimal penalty schedule before various types of nominal contracts are concluded the optimal contract will not be credible. A contract does not overcome the motivation for dynamic inconsistency; it merely relocates it.

Svensson (1995) has recently shown that when the objective function of the central banker differs from that of society with respect to desired inflation (rather than with respect to the relative preference for price stability) delegation of authority to a central banker with the `right' desired inflation level or target achieves the same results as the optimal contract. This implies that the socially optimal level of welfare can be achieved through delegation of authority to a central banker with a suitable desired level of inflation rather than via an incentive contract for the bank. As pointed out by Cukierman (1995), the big advantage of the first institution is that it does not have to rely on the ex post implementation of the optimal contract by inflation bias ridden governments. It would appear, therefore, that Svensson's result implies that it is possible to reach the social optimum simply by delegating authority to an appropriately chosen type of central banker. A practical difficulty, that may prevent the implementation of such an institution, is that the political principals may not be able to identify ex ante the desired levels of inflation of potential candidates for the central bank. Svensson suggests that this problem may be circumvented by giving the bank only instrument independence, but not goal independence, so that the target or `desired' rate of inflation in the Bank's loss function is mandated by government.

1.2 Inflation variability

The preceding analysis suggests that central bank independence may reduce pre-election manipulation of monetary policy. In that case, central bank independence may also result in more stable money growth and, therefore, less inflation variability. A related argument exists to explain why central bank independency may lead to less inflation variability. Politicians not only strive to remain in office as long as possible, they are also partisan and wish to deliver benefits to their constituencies (Hibbs, 1977). Some evidence indicates that the pattern of unemployment and inflation tends to be systematically related to the political orientation of governments. Whereas right-wing governments generally are thought to give a high priority to lower inflation, left-wing governments are often supposed to be more concerned about unemployment. Alesina (1988) reports that the unemployment rate in the US is generally higher under Republican administrations than it is under Democratic administrations, whereas the inflation rate is lower in case of a Republican president. Similar results have been reported by Tabellini and La Via (1987) and Havrilesky (1987).

Existing evidence lends support to the view that the redistributional consequences of inflation provide an incentive for the left to endorse expansionary policies and for the right to fight inflation (Alesina, 1989). This implies that if the government changes regularly, inflation variability may be high especially if the monetary authorities are dominated by elected politicians. However, a relatively independent central bank will not change its policy after a new government has been elected. Central bank independence thus, may reduce inflation variability (Alesina, 1988).

Milton Friedman (1977) named another reason why central bank independence may affect inflation variability. Friedman wanted to explain why a positive correlation exists between the level of inflation and the variability of inflation across countries and over time for any given country. In Friedman's analysis a government may temporarily pursue a set of policy goals (output, employment) that leads to high inflation, which subsequently elicits strong political pressure to reduce the debasing of the currency. The relationship between the level and the variability of inflation has been extensively investigated. Recently, Chowdhury (1991) reexamined this issue for a sample of 66 countries over the 1955-85 period. His results indicate the presence of a significant positive relationship between the rate of inflation and its variability.

1.3 Level and variability of economic growth

With respect to the effect of central bank independence on the level of economic growth two opposing views have been expressed in the literature. Some authors have argued that the real interest rate depends upon money growth; they assume that the Fisher hypothesis does not hold due to the Mundell-Tobin effect.[10] A low level of inflation that is caused by restrictive monetary policy results in high real interest rates, which may have detrimental effects on the level of investment, and hence on economic growth (Alesina and Summers, 1993). There seems to be some evidence in support of the first part of the argument: countries with a low level of inflation have high ex post real interest rates (De Haan and Sturm, 1992).

Other arguments, however suggest that central bank independence may further economic growth. First, as outlined above, an independent central bank may be less prone to political pressures and therefore behave more predictably, which may enhance economic stability and reduce risk premia in interest rates, thereby stimulating economic growth (Alesina and Summers, 1993).

[10] A rise in expected inflation will lead, according to Mundell (1963), to substitution of liquid assets by long-term financial assets and, according to Tobin (1965), to substitution of liquid assets by physical capital goods, lowering the marginal efficiency of capital and, thereby, also the expected (ex ante) real interest rates.

Second, high levels of inflation may obstruct the price mechanism; it is likely that this will hinder economic growth. Many economists, especially those involved in central banking, believe, however, that even moderate rates of inflation impose significant economic costs on society (Fischer, 1993).[11] Recently, Grimes (1991) and Fischer (1993) have provided evidence in support of the view that inflation harms economic growth.[12] One channel through which this effect may operate is increased inflation uncertainty. As pointed out previously, a strong link exists between the level and the variability of inflation. Strong variation may lead to high inflation uncertainty which, in turn, may damage economic growth. If central bank independence reduces the variability of inflation and promotes less inflation uncertainty, economic growth may prosper. Empirical studies on the links between inflation variability and inflation uncertainty, and economic growth provide, however, only mixed support for this point of view. Using annual data for 24 countries, Logue and Sweeney (1981) find no evidence for a significant negative impact of inflation variability on real growth. A similar conclusion is reached by Jansen (1989). Engle (1983) found little evidence for a link between the relatively high rates of inflation experienced by the United States in the 1970s and inflation uncertainty. Cukierman and Wachtel (1979), however, report a positive correlation between the rate of inflation and the dispersion of inflation forecasts gathered from the Michigan and Livingston inflation surveys. Furthermore, Evans (1991) has published evidence consistent with the point of view that uncertainty about the long-term prospects for inflation is strongly linked to the actual rate of inflation.

Concerning the impact of central bank independence on the *variability of economic growth*, various theoretical positions have again been delineated. On the one hand, if the central bank introduces restrictive measures to combat inflation it is likely to provide recessions. In this view inflation has become too high, since in previous periods the monetary authorities were too lax. An independent central bank striving for price stability will not that easily let inflation run out of control, and therefore will not follow such a stop-go policy. Consequently, fluctuations in real output will be smaller (Alesina and Summers, 1993). On the other hand, the models of Rogoff (1985) and Eijffinger and Schaling (1993b) conclude that when the central bank gives priority to price stability,

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[11] Fischer (1994) points out that the relationship between inflation and economic growth may be non-linear. Furthermore, the link between inflation and growth for low levels of inflation (1-3 percent) is difficult to determine empirically.

[12] See, however, also Karras (1993) who argues that the correlation reported by Grimes (1991) is a consequence of the cyclical character of both variables.

the variability of income will be greater than in the case where the central bank also strives for stabilization of the economy.

2. THE DETERMINANTS OF CENTRAL BANK INDEPENDENCE

The question arises which factors ultimately determine the degree of central bank independence. It is quite remarkable that the literature dealing with this question is, so far, hardly developed. Before discussing some determinants of central bank independence in greater detail, we will first review the recently developed theory. Cukierman (1994) presumes that the delegation of monetary policy to (partly) independent central banks is used as a `(partial) commitment device.' By specifying the objectives of the central bank more or less tightly and by giving it broader or narrower powers, politicians determine the extent of their commitment to a policy rule. Such policy action leads to more credibility of monetary policy which, in turn, is reflected in lower inflationary expectations and, thereby, lower (capital market) interest rates and more moderate wage demands. From the politician's viewpoint, the costs of an independent central bank consist mainly of the loss of flexibility in monetary policymaking. The balance between flexibility and credibility, depending on the relevance of various economic and political factors to delegate authority, determines the optimal degree of central bank autonomy in a country. Based on these or other theoretical considerations, various economic and political determinants of central bank independence have been formulated. Such determinants can be categorized as follows:[13]

1. the equilibrium or natural rate of unemployment;
2. the stock of government debt;
3. political instability;
4. supervision of financial institutions;
5. financial opposition to inflation;
6. public opposition to inflation; and
7. other determinants.

Table 1 summarizes empirical studies on the determinants of central bank independence. The second column shows the measure(s) of central bank independence used. The third and fourth columns present the sample of countries and the estimation period, respectively. The last column contains the economic and political variables examined in these studies.

[13] Of course, these seven determinants are not mutually exclusive and may (partly) overlap.

2.1 The equilibrium level of unemployment

The first determinant of central bank independence may be the average employment-motivated inflationary bias in a country. This inflationary bias can be approximated empirically by the equilibrium or natural rate of unemployment.[14] Cukierman (1994) shows that the larger the average employment-motivated inflationary bias in a country is, the higher are the costs for the government to override the central bank, and therefore, the more independent the central bank will be.[15] Because in the case of nominal wage contracts unexpected inflation has positive effects on the level of both production and employment, a higher equilibrium or natural rate of unemployment implies that surprise inflation is more valuable for the government.

[14] In this case the natural degree of unemployment is referred to as the non-accelerating inflation rate of unemployment or, briefly, NAIRU. Of course, this implies that the desired unemployment rate is being held constant and, thus, that the inflationary bias is driven by the difference between the desired and natural unemployment rate. This assumption is questionable.

[15] Similarly, Eijffinger and Schaling (1995) suggest that the higher the natural rate of unemployment is, the higher the optimal degree of central bank independence will be. The intuition behind this proposition is as follows. A higher natural rate of unemployment leads to a higher time-consistent rate of inflation and, consequently, to an increase in society's credibility problem. Hence, with an unaltered relative weight placed on inflation stabilization versus unemployment stabilization, the monetary authorities' commitment to fighting inflation is now too low.

Table 1. Empirical studies on the determinants of central bank independence

Study:	Measure(s) used:	Countries:	Estimation period:	Variables examined:
Cukierman (1992)	LVAU and LVAW	14 middle income countries	1972-1979 and 1980-1989	political instability (party and regime)
Posen (1993a)	LVAU	17 OECD countries	1950-1989	financial opposition to inflation (FOI)
De Haan and Van 't Hag (1995)	GMT, LVAU and SUMLV	19 (16) OECD countries 21 (18) OECD countries 17 OECD countries 16 (13) OECD countries	1980-1988 1980-1989 1950-1898 1900-1940	natural rate of unemployment (NAIRU), government debt ratio, frequency of (significant) government changes, banking supervision, universal banking, very long-term inflation
Cukierman and Webb (1994)	political vulnerability	64 OECD and developing countries	1950-1989	four types of political instability (high and low level)
De Haan and Siermann (1995)	TOR	43 developing countries	1950-1989 and subperiods	political instability (party and regime)
Moser (1994)	average of GMT and LVAW	22 OECD countries	1967-1990	political system index (PSI), standard deviation of output growth
Eijffinger and Schaling (1995)	AL, GMT, ES and LVAU (latent variables method)	19 OECD countries	1960-1993 (for NAIRU: 1960-1988)	NAIRU, relative number of years of socialist (left-wing) government, variance of output growth, compensation of employees paid by resident producers

De Haan and Van 't Hag (1995) have tested this hypothesis, using two measures of Cukierman (LVAU and SUMLV)[16] and the index of Grilli, Masciandaro and Tabellini (GMT). Proxies for inflationary bias are the equilibrium rate of unemployment, as estimated by Layard, Nickell and Jackman (1991) for nineteen OECD countries, and the difference between the actual and the equilibrium rate of unemployment during the 1980s. In simple cross-country regressions with each measure of central bank independence as a dependent variable, the coefficients of both proxies proved to be insignificant. Eijffinger and Schaling (1995) employed a latent variables method (LISREL) in order to distinguish between the actual (legal) and optimal degree of central bank independence in these countries. As measures for actual central bank autonomy, the indices of Alesina, GMT, Eijffinger-Schaling (ES) and Cukierman (LVAU) were chosen. These authors also found an insignificant coefficient for the natural rate of unemployment. We may therefore conclude that empirical studies provide no support for any relationship between the equilibrium or natural rate of unemployment and the degree of central bank independence.

2.2 Government debt

The stock of government debt is another potential determinant of central bank independence. The larger the sum the government wants to borrow on the capital market, the more weight is placed on lower inflationary expectations and, thus, on lower nominal capital-market interest rates. The benefits of a once-and-for-all reduction of the real value of government debt by unexpected inflation do not outweigh (in this case) the costs of permanently higher interest payments as a consequence of lower credibility. Cukierman (1994) has argued that the larger the debt, the more politicians tend to delegate authority to the central bank and the more independent the central bank will be. This hypothesis has been empirically investigated by De Haan and Van 't Hag (1994) for several measures of independence (LVAU, SUMLV and GMT) during the period 1980-1989. Using gross government debt as a percentage of GDP in their regression analysis, these authors found no significant coefficient for the debt ratio.

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[16] The index SUMLV measures the *total* score of sixteen legal variables of Cukierman (1992) with respect to (1) the appointment, the dismissal and the term of office of the central bank president, (2) the solution for conflicts between the government and the central bank, (3) the policy goals of the central bank, and (4) the legal limitations for the government to borrow with the central bank.

2.3 Political instability

The influence of political instability on central bank independence is, at first sight, less obvious than the impact of the other factors discussed so far.[17] It could be argued that when politicians in office are faced with a greater probability that they will be removed from office, they have a stronger interest in delegating authority to the central bank as an apolitical institution, in order to restrict the range of policy actions available to the opposition if the latter would come into office. This implies that greater political instability leads to a more independent central bank. Conversely, we might argue that the incumbent politicians will fortify their hold on the central bank, if there is a greater probability of government change, and will eventually overrule central bank decision making. The short-term benefits of surprise inflation can, thereby, exceed their long-term costs. It follows that greater political instability would result in a more dependent central bank.

Cukierman (1992) argues that it is possible to combine both hypotheses into one single, internally consistent hypothesis. In countries with a sufficiently high degree of national consensus, greater political instability may be associated with increased independence of the central bank, whereas the reverse may apply for countries with a relatively low level of national consensus. Cukierman has tested this combined hypothesis using two indices of political instability constructed by Haggard, Kaufman, Shariff and Webb (1991) for fourteen middle-income countries over the 1970s and 1980s. The first index, party political instability, measures the degree of political instability under a given regime and refers to a relatively high level of national consensus. The second index, regime political instability, reflects the degree of political instability in case of a relatively low level of national consensus. Regression analysis by Cukierman for legal independence measures during the periods 1972-1979 and 1980-1989 shows that the indices have the expected signs. This result may be questioned, however as legal measures of central bank independence may not be a very good proxy for actual central bank independence in developing countries. Two studies have recently employed non-legal measures of central bank independence.

Cukierman and Webb (1995) use a measure of political vulnerability i.e. the fraction of times that political transition is followed by a change of central bank governor as a dependent variable and four types of political instability as explanatory variables for a mixture of developed and developing countries during the period 1950-1989. Only high-level political instability (change

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[17] For the effect of political instability on variables like the (increase of) the stock of government debt and seigniorage, see Persson and Svensson (1989), Alesina and Tabellini (1990), Tabellini and Alesina (1990), Cukierman, Edwards and Tabellini (1992) and De Haan and Sturm (1994).

in regime) and the dummy for developing countries proved to be significant.

De Haan and Siermann (1995) have estimated the relationship between central bank independence and political instability. By using data on the turnover rate of central bank governors for 43 developing countries over four periods (1950-59, 1960-71, 1972-79 and 1980-89) as provided by Cukierman, Webb and Neyapti (1992). Proxies for political stability are the number of regular and irregular government transfers (coups). In the regressions of De Haan and Sierman, only the variable `coups' exerts a significantly negative effect on central bank independence.

In a recent study, Cukierman (1994) states that the larger the political instability is, the higher the degree of central bank independence will be ".... provided political polarization is sufficiently large" (p. 65). The intuition behind this proposition is that the ruling party prefers a more independent central bank, when the prospects for its re-election are slim. As the probability of re-election shrinks, benefits of central bank independence increase in terms of restricting public expenditure by the other (opposition) party. This hypothesis of Cukierman is investigated by De Haan and Van 't Hag (1995) for three different measures of central bank autonomy (LVAU, SUMLV and GMT) during the 1970s and 1980s with regression analysis based on industrial countries. These authors used both the frequency of government changes, as well as the frequency of significant government changes, i.e. in case another party or coalition comes to office, as indices of political instability. For the first index all three measures of central bank independence showed a significant, negative relationship; the second is not significant.

We may therefore conclude that the empirical results regarding political instability are mixed, but the various studies are hard to compare properly, as they refer to different groups of countries, diverging measures of central bank independence and various proxies for political instability.

2.4 Supervision of financial institutions

A political-economic determinant of the degree of central bank independence can also be the supervision of financial institutions (`banking supervision'). Goodhart and Schoenmaker (1993) analyzed the supervision of financial institutions in 26 countries. Table 2 shows that in approximately half of these countries the central bank is also responsible for the supervision of financial institutions and, thus, that the function of supervisory agency is combined (C) with the responsibility for monetary policy. In the other half of the countries there is a separated (S) responsibility between the central bank and the Ministry of Finance, or other supervisory agencies.

From table 2, it may be inferred that the supervision of financial institutions has little impact on the

independence of central banks. Practical policy in these countries, as a matter of fact, does not allow clear-cut conclusions regarding the relationship between a combined or separated responsibility for financial supervision and monetary policy, on the one hand, and central bank independence, on the other. Hence, we will discuss the main arguments *for* and *against* a *separation* of both *responsibilities*, according to CEPR (1991) and Goodhart and Schoenmaker (1993).

The first argument in favor of a separation of financial supervision and the conduct of monetary policy is the possibility of a conflict of interests between both activities. A central bank, responsible for supervision of the financial system and, thus, also for failures of financial institutions, could be tempted to admit lower (money market) interest rates or higher money growth than would be desirable from the perspective of price stability, in order to avoid such failures.[18] A separation of responsibilities could, thereby, increase the autonomy of the central bank. A second argument to separate the authority on financial stability from that on monetary stability is the bad publicity usually associated with failures or rescue operations. This bad publicity could harm the reputation of the central bank in its function as a supervisory agency. A loss of reputation may also affect the credibility of monetary policy. Separated responsibilities could, therefore, underpin the independence of the central bank in practice.

The following arguments can be seen against a separation of financial supervision and the conduct of monetary policy. First, the central bank plays a crucial role in the smooth operation of the payments system and the associated financial risks. To limit these risks, the central bank (reasonably so) wishes to supervise and regulate the participants of the payments system. Furthermore, the central bank has a function as `lender of last resort' for the financial system and has in that capacity the task to supply instantly enough liquidity in the case of structural liquidity problems or, even, rescue operations. This, again, would argue for a combined responsibility.

[18] Goodhart and Schoenmaker (1993) refer to the recent `savings and loan crisis' in the United States and its influence on the policy of the Federal Reserve System as an example. It is also stated that the Federal Reserve is smoothing interest rates because of financial stability. See, in this respect, chapter 7 of Cukierman (1992).

Table 2. Central banks and the supervision on financial institutions

Country	Supervisory Agency			Combined or Separated
	Central Bank	Ministry of Finance	Other	
Australia	X			C
Austria		X		S
Belgium			Banking and Finance Commission	S
Brazil	X			C
Canada		X		S
Denmark			Finance Inspectorate (Industry Ministry)	S
Finland	X	X		S
France	X		Commission Bancaire	C
Germany			Bundesaufsichtsambt für das Kreditwesen	S
Greece	X			C
Hong Kong	X			C
Ireland	X			C
Italy	X			C
Japan	X	X		S
Luxembourg	X			C
Netherlands	X			C
New Zealand	X			C
Norway		X		S
Philippines	X			C
Portugal	X			C
Spain	X			C
Sweden			Swedish Financial Supervisory Authority	S
Switzerland			Federal Banking Commission	S
United Kingdom	X			
United States	X		Comptroller of the Currency,	C
			FDIC and State Governments	S
Venezuela			Superintendency of Banks	S

Source: Goodhart and Schoenmaker (1993)

De Beaufort Wijnholds and Hoogduin (1994) distinguish between general or macro-

supervision, and specific or micro-supervision. These authors consider the arguments for a separation of responsibilities, such as a potential conflict of interest, to be applicable only to the micro-supervision situation because of the close contacts with individual banks. They conclude that it appears possible to maintain central bank autonomy both when micro (prudential) supervision and monetary policy are separated, as well as in cases where they are combined. The choice between separation and combination depends on the structure of the banking system and the conduct of monetary policy in a country which is in turn associated with the relative size of its economy. In smaller open industrial countries - e.g. the Netherlands - with an exchange rate target, the probability of a conflict of interest between both activities seems, in their opinion, to be considerably lower than in the case of large industrial countries with a monetary target, such as Germany.

Empirical evidence on the relationship between financial supervision and central bank independence provides no uniform conclusion. Heller (1991) compares the average rate of inflation (as a proxy of the degree of central bank independence) of countries with central banks which have no, partial or complete responsibility for financial supervision. Central banks without any supervisory authority generate, according to Heller, the lowest inflation and those with complete supervisory authority the highest inflation. Consequently, he favors a separation of both responsibilities. In contrast, De Haan and Van 't Hag (1995) find no empirical relationship between two of the three different measures of independence and an index measuring the degree of banking supervision. This index is taken from Posen (1993a) and includes also the central bank restrictions on lending rates and on the amount of bank credit to the private sector. Only for one measure of independence there appears a significant, negative relation with the index for the degree of banking supervision. This result also contrasts with the view put forward by Posen, to which we will now turn.

2.5 Financial opposition to inflation

Posen (1993a, 1993b) advocates a new view of monetary policy and central bank independence which are, in his opinion, determined by the degree of financial opposition to inflation, and the effectiveness of the financial sector to mobilize - through the political system - its opposition to inflation. According to Posen, the causal relationship between central bank independence and low inflation is illusory. Posen maintains that central bank autonomy has no noticeable effect on cross-country differences in inflation rates. He argues that a third factor exists, which explains the negative correlation between central bank independence and the level of inflation: financial

opposition to inflation (FOI) in a country.

Posen asserts that monetary policy is driven by a coalition of political interests in society, because central banks will be prepared to take strong anti-inflationary actions only when there is a coalition of interests politically capable of protecting their anti-inflationary policy. In industrial countries, the financial sector represents such a (powerful) coalition of interests. Therefore, Posen developed a measure of effective financial opposition to inflation, predicting both the degree of central bank independence and the rate of inflation in the various countries.[19] Posen tested four propositions regarding indicators that explain and measure financial opposition to inflation:

1. countries with financial sectors having universal banking are expected to have a stronger financial opposition to inflation than those without;
2. countries with less regulatory power (supervision) of the central bank over the financial sector are expected to have more financial opposition to inflation;
3. countries with federal systems of government are expected to have a more effective financial opposition to inflation; and
4. countries with less fractionalization of the political party system are expected to have a more influential financial opposition to inflation.

According to Posen (1993a), these indicators constitute the ultimate determinants of central bank independence and the level of inflation. He claims to have found clear statistical evidence that supports a causal link between FOI on the one side and central bank independence (i.e. Cukierman's LVAU) and lower inflation rates on the other, for the period 1950-1989. However, De Haan and Van 't Hag (1995) have tested the proposition of Posen on universal banking by means of a dummy variable for the presence (1) or not (0) of a universal banking system. Only for one of the three independence indices did they find a significant, positive relationship with the dummy for universal banking. As explained before, these authors report a similar finding with respect to the relationship between prudential supervision and central bank independence. So it seems that Posen's conclusion is sensitive with respect to the measure of central bank independence used.

Cukierman (1992) states that countries with broad financial markets and a substantial amount of financial intermediation are more likely to grant high levels of independence to their central banks.[20] He argues that possible disruptions due to less central bank autonomy and more

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[19] As stated by Posen (1993a): "This implies as well that *CB independence and low rates of inflation should occur together, without a causal link between them*, because they both are reflections of effective FOI" (p. 47).

[20] See Cukierman (1992), p. 449. Of course, the broadness of financial markets and the degree of financial intermediation are (strongly) associated with the depth of capital

inflation (uncertainty) in the process of intermediation between savings and investment are proportional to the size of the financial sector in a country. As a result, countries with large financial markets are more likely to have more independent central banks than do those with narrow financial markets. This conclusion is, according to Cukierman, supported by a comparison of the size of financial markets and the ranking of central banks by overall independence (for DCs: LVAU, and for LDCs: LVAU and TOR) during the 1980s. Countries with well developed financial markets (for example France, Germany, the United Kingdom and the United States) have relatively independent central banks, whereas those with narrow (internal) financial markets (like most LDCs) have relatively dependent central banks. Nevertheless, we believe that a two-way causal relationship exists between the size of financial markets and independence: high autonomy and low inflation will also foster the development of financial markets.

2.6 Public opposition to inflation

Another important determinant of central bank independence is public support for the objective of price stability or, analogous to the former determinant, the public opposition to inflation.[21] It is quite obvious that this determinant should not be analyzed apart from the financial opposition to inflation as defined by Posen (1993a, 1993b), but that it has a much broader meaning. The experience of the public with extremely high inflation or even hyperinflation in the past is, generally, seen as the cause of such public opposition to inflation. This implies that a two-way causal relationship can exist between central bank independence and the level of inflation: on the one hand, an independent central bank may foster low inflation in the medium and long run, but on the other hand, high inflation may result in the very long run in the creation of an autonomous central bank. There seems to be a threshold value for the level of inflation, above which public opposition to inflation in a country will be mobilized and taken into account by the politicians. Cukierman (1992) argues, however, that inflation, when sufficiently sustained, erodes central bank independence after a while. Society becomes accustomed to inflation (wages are for instance indexed), thereby reducing opposition to inflation and the public pressure for an independent central bank.

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markets.

[21] See, in this respect, Neumann (1991), Bofinger (1992), Debelle (1993), Issing (1993, 1994), Eijffinger (1994) and Fischer (1994). Issing (1993) notes that "…. it is no coincidence that it is the Germans, with their experience of two hyperinflations in the 20th century, who have opted for an independent central bank which is committed to price stability" (p. 18).

Using cross-country OLS regressions with the average level of inflation between 1900 and 1940 as an explanatory variable of three different measures of central bank independence in industrial countries, De Haan and Van 't Hag (1995) have shown that a significant positive relationship exists between very-long-term inflation and independence.

Not referring to the very long run, but to the medium and long run, Eijffinger and Schaling (1995), using their game-theoretical model, arrive at the following proposition: the stronger society's preferences for unemployment stabilization relative to inflation stabilization are, the higher the optimal degree of central bank independence will be. The underlying intuition of this proposition is as follows. If society becomes more concerned with unemployment, the time-consistent rate of inflation goes up. Therefore, society's credibility problem becomes more pressing. With an unaltered relative weight placed on inflation stabilization, the balance between credibility and flexibility needs to be adjusted in favor of an increased commitment of the authorities to fight inflation. Eijffinger and Schaling have tested this proposition with the number of years of socialist (left-wing) dominated government over the total period studied as a proxy for society's preference for unemployment versus inflation stabilization. These authors found a positive relationship between society's preferences for unemployment relative to inflation stabilization and the optimal degree of central bank independence, although it was not significant.

In general, the conclusion may be drawn that central bank independence is strongly associated with society's fundamental support for the objective of price stability. Notwithstanding the theoretical and empirical arguments for an independent central bank as discussed before, not every society and, thus, not every government will be prepared to accept such an autonomous position of its central bank.

2.7 Other determinants

Recent literature on determinants of central bank independence, also mentions economic and political factors that cannot be categorized under the former headings. We will discuss these determinants only briefly here.

Moser (1994) tries to identify the conditions under which an independent central bank can be credibly supplied by politics. His model analyzes the interaction between a central bank and two political decision bodies. Delegation is credible only if there are at least two veto players in the legislative process and if they disagree to some extent about monetary policy. Moser constructs a

political system index that reflects differences in commitment ability of the political systems.[22] Controlling for a potential effect of external real shocks, he finds a significant, positive effect of his political system index on an average of the GMT and LVAU measures of independence for 22 OECD countries during the period 1967-1990. Apparently, countries with extensive checks and balances are associated with more independent central banks.

Based on their game-theoretical model, Eijffinger and Schaling (1995) propose that the higher the variance of productivity shocks, the lower the optimal degree of central bank independence will be. The intuition here is that if the variance of productivity shocks increases, *ceteris paribus*, the economy becomes more unstable and, thus, the need for active stabilization policy becomes greater. With an unaltered relative weight placed on inflation stabilization, the balance between credibility and flexibility will shift towards more monetary accommodation by the authorities. Eijffinger and Schaling tested this proposition with the variance of annual output growth to approximate the variance of productivity shocks. Distinguishing legal independence from optimal independence with the latent variables method (LISREL), they found the expected, negative relation between the variance of productivity shocks and the optimal degree of central bank independence for nineteen industrial countries during the period 1960-1993. However, the coefficient was insignificant.

Furthermore, Eijffinger and Schaling (1995) state that the steeper the slope of the Phillips curve is, the higher the optimal degree of central bank independence will be. If the slope of the Phillips curve increases, then the benefits of unanticipated inflation rise. It therefore becomes more tempting for the government to inflate the economy and, *ceteris paribus*, society's credibility problem gains in importance. With constant relative weights on inflation stabilization, the balance between credibility and flexibility needs to shift towards more commitment to fight inflation. This proposition has been tested by Eijffinger and Schaling with the compensation of employees paid by resident producers as a ratio of GDP as a proxy for the slope of the Phillips curve. Using the latent variables method, a significant positive relationship was found between the slope of the Phillips curve and the optimal degree of central bank independence for nineteen industrial countries in the period 1960-1993.

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[22] This political system index ranges from a value of one for pure unicameral legislatures and bicameral legislatures with both chambers being equally composed to a value of four for strong bicameral systems, i.e. systems with equal power and unequal composition. The last are characterized by a high degree of federalism.

3. CONCLUDING COMMENTS

This survey has critically discussed, the theoretical literature on central bank autonomy.

Is the only good central bank one that can say `no' to the politicians?[23] An independent central bank is *not* a *sufficient* and/or a *necessary* condition for price stability. In accordance with the theoretical literature, we must conclude, however, that a country with an independent central bank, *ceteris paribus*, will have a lower rate of inflation than does a country where politicians can steer the central bank's policy. Attaining lower inflation rates bears no costs in terms of lower long-term economic growth. So, in principle, we may answer the above-mentioned question positively. The tendency towards greater central bank autonomy which can, currently, be perceived in many countries should, in our opinion, thus be regarded positively. Nevertheless, with respect to this conclusion some important caveats are in order.

First, the absence of a significant influence of central bank independence on the rate of economic growth can also be interpreted in a less positive way. Stable monetary policy aimed at low inflation is, usually, considered to be an important condition for sustainable economic growth. However, most empirical studies (see Eijffinger and De Haan, 1996) show that central bank autonomy does not enhance economic growth and employment. Moreover, there is no proof that countries with a relatively independent central bank have lower costs of disinflation than those with a more dependent central bank. Indeed, most studies suggest that central bank independence is associated with higher disinflation costs.

Second, the tendency towards central bank autonomy may conflict with the goal of *accountability* of central banks. In the short run, there seems to be a trade off between central bank independence and accountability. We believe that such a trade off, however, does not exist in the longer run. A central bank, continuously conducting a policy which lacks broad political support, will sooner or later be overridden. At the same time, our conclusion underscores the importance of broad public support for a central bank's autonomy and its anti-inflationary policy. Although the determinants of central bank independence have only recently been investigated, current research leads us to the conclusion that every society gets the central bank it deserves.

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[23] Quotation from *The Economist* of February 10th, 1990.

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