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FEDERAL RESERVE BANK OF NEW YORK

Declarations Are Not Enough: Financial Sector Sources of Central Bank Independence

1. *Introduction*

Even before the much-cited restructuring of the Reserve Bank of New Zealand in 1990, central banks had been granted varying degrees of independence from short-term political control. The discussion underlying the current fad for central bank independence has assumed that these earlier choices about monetary regimes were made at random, either by interpreting the negative correlation between average inflation rates and indices of central bank independence as prima facie evidence of a causal relationship, or by recommending central bank independence to any and all governments, be they in Paris, Moscow, or Karachi. This paper argues that such an assumption of the exogeneity of monetary institutions is false. National differences in the degree of central bank independence in the postwar period resulted instead from differences in financial sector opposition to inflation.

Everything in economics can be construed at some level as endoge-

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nous. What makes the question of endogeneity of central bank independence meaningful is the departure from what one would expect if the time-inconsistency models[1] usually invoked to explain the negative correlation between central bank independence (henceforth CBI) and inflation adequately captured the world of monetary policy. Most importantly, enhanced CBI does not appear to be a Pareto improvement (even if on balance it enhances welfare). Disinflation costs measured in unemployment not only fail to decrease under the putatively more credible monetary regime of increased CBI, but actually appear to increase (Debelle and Fischer, 1994; Posen, 1995; Walsh, 1994); lower inflation, therefore, comes at some group's expense. In developing economies, differences in statutory CBI do not appear to predict inflation, because some governments pursue inflationary monetary policy regardless of statute (Cukierman, 1992; Cukierman, Webb, and Neyapti, 1992), implying they still believe they gain from a free hand.[2] In other words, CBI doesn't please all the people all the time, because there are distributive consequences to that choice of monetary regime.

If there are distributive consequences, there is no reason to assume that the adoption of CBI is self-enforcing. The preferences for price stability embodied by CBI require political support. If CBI does not embody such preferences, it will not affect inflation over the long run; if such preferences were universally supported, independence would be unnecessary. Shifting de jure responsibility for enforcement of these preferences does nothing to remove threats to their implementation. As McCallum (1995) puts it, "Indeed, if the absence of any precommitment technology is actually a problem, then it must apply to the consolidated central bank–government entity just as it would to an entirely independent central bank." This is why it is as important to see which societal forces supporting price stability can insure against the risk to monetary institutions as it is to examine the monetary institutions themselves.

This paper contends that the financial sector is uniquely positioned to provide that support, and central banks have been most independent where that support has been strongest. CBI is supported by the financial sector as a long-run means to price stability, one for which that interest group has no clear substitute, but one that cannot be effective without that group's ongoing protection of its counterinflationary activities. Ac-

1. See Barro and Gordon (1983) and Kydland and Prescott (1977) for the seminal models of why governments should bind their (inflationary) hands. Rogoff (1985) models why it would be optimal for some governments faced with this dilemma to set up an independent central bank, given the particular set of shocks and constraints they face.
2. The relationship between CBI and inflation is shown below to hold in developing countries under certain circumstances (see Section 4).

cordingly, the granting of CBI where neither the financial sector nor some other political force is ready to defend it in times of costly disinflation is unlikely to have the intended counterinflationary effect over the long run. Moreover, changes in a country's financial or political system will likely alter a central bank's ability to pursue price stability.

The argument is presented in four parts. In Section 2 I discuss the reasons for a role in monetary policy for interest group politics, and for the financial sector in particular. In Section 3, the elements of effective financial opposition to inflation are analyzed, and a composite measure of them is created. In Section 4 I test the prediction that CBI—and low inflation—are the result of effective financial opposition, first on a sample of 17 OECD countries from 1950 to 1989 used in prior research on CBI, then on a larger sample including those countries and 15 low- and moderate-inflation developing countries from 1960 to 1989. Section 5 examines some specific implications for current developments of this paper's argument.

2. *An Interests Model of Monetary Policy*

Why do interests as well as institutions matter? Obviously, some government institutions will be more subject to risk of change than others in any given country, with constitutionally grounded bodies being most secure. Nevertheless, even the United States Supreme Court has occasionally tempered its decisions for the sake of safety.[3] An examination of institutions must also consider the time frame. In analysis of shorter time periods, institutions and their effects are likely to remain fixed. As explanations are sought for patterns persisting over longer time spans, however—such as the average-by-decade differences in inflation rates under investigation in this paper (and generally in the debates about CBI)—the possibility and likely sources of institutional change must be taken into account.[4]

Thus, although a central bank's monetary policy decisions reflect its institutional capabilities and statutory constraints, these decisions are also responses to the political realities that determine its autonomy and

3. Examples run from Marbury *v.* Madison (1803), where the court secured its powers of judicial review at the cost of allowing Madison to dismiss the Federalists' appointments to the federal bench, to Webster *v.* Planned Parenthood (1992), where the "moderate bloc" held off from overturning Roe *v.* Wade's precedent for the sake of maintaining the court's legitimacy (a fact made explicit in the majority opinion).

4. Of course, this political process is itself partially defined by major national political institutions, such as constitutions and party structures. I would argue, however, that these differ from policy institutions both in longevity and in unresponsiveness to interest pressures.

powers.[5] This general view of monetary policymaking rests on four empirically grounded assumptions: first, inflation has significant redistribution effects, with identifiable groups more harmed by inflation; second, those groups that are most harmed (i.e., benefit most from price stability) have the most prominent role as lobbyists over monetary policy; third, certain national political structures determine the influence of interest-group lobbying on monetary policy; and fourth, without effective lobbying by inflation opponents, the political cost of disinflation would lead to government pressure on central banks to ease policy. Central bank independence arises from the desires of an interest group that is more committed to price stability than is the median voter to reducing the central bank's risk in pursuing anti-inflationary policies.

Central bank independence can insure price stability when effective opposition to inflation establishes it as a policy goal.[6] It is politically and practically impossible for any interest group to bargain directly with the government over changes in the price level—a central bank offers the expertise, operational capability, and political legitimacy necessary to conduct monetary policy. In short, neither the politically effective will to oppose inflation, nor the statutory means to pursue such a goal, alone can achieve price stability. Jointly, effective financial opposition to inflation and CBI are sufficient. In practical terms, this means that CBI should increase, and inflation should decrease, as an anti-inflationary interest group's effectiveness in protecting counterinflationary monetary policy increases.

Isolating any one interest group as the primary source of effective opposition to inflation in all countries seems, of course, limiting. In any society, a different coalition of interests may (seek to) lobby for price stability, including small savers and pensioners, importers, and mortgage holders. The choice is eased by the existence in this policy arena of one historically prominent interest group: the financial sector.

This sector's organizational advantages over all other interest groups

5. Just as a politician must pursue reelection as a goal to achieve any other goals, central bankers must pursue the autonomy to set monetary policy in order to achieve other goals such as price stability over the long horizon.

6. Throughout this paper, increasing CBI is taken to be equivalent to increasing the relative weight of price stability over employment goals in the monetary authority's utility function. This treatment conforms with the conservative central banker of Rogoff (1985), the explicit measures used by Cukierman, Webb, and Neyapti (1992) and Grilli, Masciandaro, and Tabellini (1991), and the various institutional changes modeled on the Reserve Bank of New Zealand. As Goodhart (1994) points out, CBI has to be seen to be strengthening the central bank's counterinflationary preferences: "Otherwise one would have to note that the example of the Central Bank of Russia, *independent* of the executive, but *not* mandated to price stability, would blow the empirical correlation between independence and low inflation into bits." This point is returned to in Section 4 below.

in the political discussion of monetary policy institutions are significant. The financial sector gains access to elected government and central bank officials by being their main external source of information and advice on monetary policy. Even in countries where banks do not own, and nominate directors to, part of the central bank (as they do in the US), or hold regular meetings between financial sector association representatives and the central bank decisionmakers (as they do in Germany), the financial sector's monitoring of the central bank's actions and top personnel plays the most prominent role in the government's evaluation of central bank policy. This is accomplished through public statements, personal interaction, employment of former central bank officials, and providing part of the supply of nominees for central bank governors.

Moreover, financial interests have long revealed a preference for price stability. As stated in a report on the previous Congress's debate over proposed changes in the U.S. Federal Reserve System:

If one's goal is to minimize inflation, Fed officials reason, then a sure way to achieve that goal is to have private bankers—who are among the world's fiercest inflation hawks—appoint the regional bank presidents.[7]

Academic economists have made similar assumptions. Lohmann (1992) interprets Rogoff (1985) in the following manner:

Empirically, the appointment of a central banker with a strictly positive ε *[i.e., increased relative weight on inflation stabilization] might correspond to selecting a central banker from the conservative banking sector or deliberately allowing the central banker to be captured by the financial community.*[8]

Bankers' vulnerability to inflation, while not yet fully explained, is well established. Santoni (1986) finds that, for U.S. money-center and smaller banks, both unanticipated inflation and the variance of anticipated inflation had significant negative effects on the bank share prices (beyond that of most stocks) from 1962:1 to 1985:4.[9] Moreover, banks and the financial system more broadly have much to fear from disinflation. Sharp changes in interest rates of the type brought about by monetary

7. Greenhouse (1993).
8. Rogoff (1985) also refers directly to the financial community as a source of this preference, albeit more briefly.
9. Using a methodology that doesn't distinguish between anticipated inflation and its variance, Epstein and Schor (1989) find a negative relationship between bank profits and both unanticipated and anticipated inflation in the U.S. for 1956–1985; since the level and variance of inflation have a positive correlation, the Epstein and Schor result is consistent with Santoni's results.

tightenings can significantly diminish profitability (as illustrated by the recent troubles of the U.S. financial sector since the Fed began tightening in February 1994).

3. *Constructing a Measure of Effective Financial Opposition to Inflation*

To establish the relationship put forward here between effective financial opposition to inflation (henceforth FOI) and CBI, and between FOI (through its effect on CBI) and inflation, a consistent cross-national measure of FOI must be designed. Such a measure requires a better understanding of national differences in financial and political systems. In particular, two questions must be answered: What determines the unity of financial sector distaste for inflation? What makes a financial sector more effective in opposing inflation?

Following Olson (1965), self-interested actors are more likely to engage in collective political action when the benefits to each actor exceed that actor's costs of contributing to the effort, and when member participation can be monitored. Therefore, it is important to establish what determines a country's financial sector's distaste for inflation and capacity for collective action, since not all countries' financial sectors are equally vulnerable to harm from inflation. As more financial firms share a similar outlook, the costs of pursuing a group goal and monitoring participation become lower, and a financial sector pressure group becomes more viable.

This emphasis on unity leads to the first source of cross-country variation in the strength of financial interest in price stability: *Financial sectors with universal banking should express stronger anti-inflationary sentiment than those without.* To the extent that customers switch sources of external capital as inflation changes (say from debt to equity, as in Fischer, 1982), universal banking systems allow that switching to occur within financial firms, so no competitive divide exists among financial subsectors in their reaction to inflation. Moreover, universal banking systems have an easier organizational path to political consensus on all issues, as they already face unified regulations and markets.

The number of goals the interest group pursues is another source of differential effectiveness in financial sector opposition to inflation, as specialization lowers costs: *Financial sectors less under the regulatory power of the central bank should express stronger opposition to inflation than those under central bank oversight.* Where the monetary authority restricts the allocation of credit or lending rates, or where it has supervisory responsi-

bilities for banks, individual firms may come into conflict with the central bank. They may seek to limit the central bank's powers; they may lobby for a general credit easing to circumvent specific regulatory limits, despite the inflationary effect; or they may wage individual battles with the central bank. Conversely, when the central bank has no bank supervisory responsibilities, the financial sector has no distraction from its support of the central bank's autonomy.

It may appear a bit counterintuitive to state that it is better for the central bank's pursuit of independence that it have less direct leverage over prospective allies. When the financial sector interacts with the central bank solely over monetary arrangements,[10] however, the sector's only potential loss is lobbying activities which do not recoup the sector's costs. By allowing the central bank to pressure the financial sector beyond community of interest in price stability, the sector's opportunity set changes. It may then be better for the financial sector to devote its lobbying resources in the policy arena to removing the central bank's leverage, rather than to push for sufficient CBI.

When measuring a political system's openness to interest-group influence, it must be known who decides on policy goals within that system, and who implements them. The answers can be termed a political system's *discipline* of legislating and its *centralization* of policy execution. Discipline characterizes the extent to which a government's top elected officials (e.g., prime ministers, party leaders) can get the legislature to pass their initiatives without alteration. Centralization is the key to how actual day-to-day policy is set, whether by the elected officials directly or by delegated bureaucrats or even indirectly by private groups.

The concept of legislative discipline stems from Buchanan and Tullock's (1962) vision of the legislative process in democracies. Self-interested legislators will extract from the initiators of any legislative proposal side payments up to the value of their votes to the initiators—even if the bill serves their own interest. Where parties are fewer in number, or party discipline is higher, the number of veto points (and possible sources of amendment) is lower; where parties increase in number, individual members increase in importance, and points of access to legislative decisionmaking (and therefore logrolling) increase.

The basic measure usually invoked by political scientists to characterize the spread and number of parties in a legislature is fractionalization, defined as the probability that any two randomly selected legislators will

10. This, of course, abstracts away from the central bank's roles as clearinghouse and lender of last resort. For purposes of this paper, it is presumed that the former role always proceeds without dispute, and the latter role trumps any other concerns when it is invoked—neither enters day-to-day monetary politics.

come from different parties.[11] As fractionalization increases, local interests tied to particular parties or to even particular members' constituencies should see their particularistic goals better served by the legislative process. As fractionalization decreases and legislative decisionmaking shifts to the (fewer) national party leaders, interests organized at a national level with claim on these leaders' time will have more voice.[12] Given the financial sector's interest in a national issue (price stability) and claims to expertise (speaking of financial market "confidence" in various measures), we can predict that *where a country's party system is less fractionalized, financial opposition to inflation should be more effective.*

Similarly, centralization of policy execution is measured by the extent of access to policymakers by interests other than the elected government after initial legislation has been passed. The more the government delegates its policy execution, the more it allows policy outcomes to diverge from its intents, largely due to difficulties in monitoring. Moreover, since the implementation of policy always involves a great deal of discretionary interpretation and reaction to current events, decentralized policy may force the implementing institutions to turn to sources other than those the elected government might have chosen for information and support. In a decentralized system, private interest groups have more avenues of influence upon policy.

The most marked form of decentralization of a political system is to structure it as a federal state. Although this decision is usually motivated by ethnic or regional cleavages, it has the general effect of insulating what are assigned as purely national issues—such as monetary policy—from numerous other policies and of encouraging delegatory forms of policy implementation. In addition, federalism denies access to national issues except to those groups—such as the financial sector—that can offer a unified front across regions. Although federalism is perhaps not a necessary condition for policy decentralization, it is a sufficient one.

Therefore, *financial opposition to inflation should be more effective in federal systems of government.* The design and creation of the *Bank deutsches Länder,* the forerunner of the Bundesbank, in postwar West Germany illustrates this point. The occupying U.S. military encouraged the German government to avoid giving power to the central German government and to build the power of civil society (i.e., private interests and

11. See Rae (1967) and Powell (1982). Fractionalization equals one minus the (perhaps more familiar) Herfindahl–Hirschman concentration index.

12. Party organization is not the only factor that determines legislative discipline in a country, simply the most stable and easily observable. A more nuanced set of measures would pick up such events as the increased power of individual senators and representatives in the U.S. Congress since the 1974 "sunshine" reforms, despite the continuation of a two-party system.

associations) in all their arrangements of new institutions. When the monetary reform of 1948 required the creation of a new central bank to replace the defunct *Reichsbank*, it was consciously organized along federal lines, with institutionalized channels of financial sector voice. This same approach was taken in the creation of the U.S. Federal Reserve System by those concerned with centralized power.

In summary, the effectiveness of a financial sector's opposition to inflation should be seen as resulting from the unity of its interest in price stability, and of the openness of its country's political system to interest group influence. As with CBI, the measurement of qualitative economic and political factors that contribute to effective FOI is best done without illusions of precision. For use in the statistical investigations in the next section, I construct an index of effective financial opposition to inflation—denoted Effective FOI—composed of the component measures:

Univbk = 1 if banks are allowed to deal in at least two of securities, insurance, and commercial lending, = 0 otherwise;[13]
Regpow = 1 if banking supervision is not under the central bank, = 0.5 if it is shared by the central bank and another agency, = 0 if it is solely the central bank's responsibility;[14]
Federal = 1 if a country has a federal political structure, = 0 otherwise;[15]
Fractn = the probability that two legislators chosen at random from a national legislature belong to different parties.[16]

In accord with this section's discussion, a greater value for each of the first three components is assumed to represent a greater unity (Univbk, Regpow) or effectiveness (Federal) of financial opposition to inflation, while a greater value of Fractn is presumed to diminish effectiveness. This Effective FOI index is set equal to Univbk + Regpow + Federal − Fractn, and thus can run from −1 to 3. A higher value of Effective FOI indicates a greater effective financial opposition to inflation in that country.

Using these definitions, values for the Effective FOI index and its components were established for a set of 32 low- and moderate-inflation countries, on a decade-by-decade basis from 1960 to 1989.[17] Seventeen

13. Assembled from various sources; a country-by-country list is available from the author.
14. The data for Regpow for the OECD countries are taken from Grilli, Masciandaro, and Tabellini (1991); those for non-OECD countries are taken from national sources.
15. Taken from *Political Atlas of the World*, various years.
16. Values for the OECD countries were taken from Grilli, Masciandaro, and Tabellini (1991); values for the non-OECD countries were computed directly from *Political Atlas of the World*, various years.
17. Moderate inflation was defined as 10-year averages of under 30% a year, as in Dornbusch and Fischer (1993). In the interest of brevity, the individual country-decade

OECD countries were included (Australia, Austria, Belgium, Canada, Denmark, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Spain, Switzerland, the United Kingdom, and the United States)[18] as well as fifteen Asian and Latin American developing countries that did not suffer from hyperinflation for more than a decade of the period examined (Bolivia, Chile, Colombia, Hong Kong, India, Indonesia, Malaysia, Mexico, Pakistan, the Philippines, Singapore, South Korea, Thailand, Turkey, and Venezuela).[19]

Observations where a country's decade-average inflation rate exceeded 30%/year (Indonesia in the 1960s, Chile in the 1970s, and Bolivia, Mexico, and Turkey in the 1980s) were excluded from the sample. The Effective FOI index for the remaining 90 observations has a mean value of 0.92, a standard deviation of 0.78, and a minimum value of −0.48 (South Korea in the 1970s), and a maximum value of 2.81 (Belgium in the 1980s). Country observations for periods when average inflation levels were driven up by hyperinflationary outbreaks are excluded, as they are believed to be situations where the process of, and support for, disinflation are likely to differ from the course described in this paper.[20]

Turning to the seventeen OECD countries coded (a subsample useful for comparison to the earlier CBI literature) and extending the index backwards to the 1950s, there are 68 observations of Effective FOI, with a mean value of 1.05, a standard deviation of 0.86, and a range from a minimum value of −0.23 (Italy throughout the era) to a maximum of 2.81 (again Belgium in the 1980s). The distribution of Effective FOI in the OECD subsample and in the larger sample do not appear to differ substantially.

4. *The Effective FOI Index as a Predictor of Central-Bank Independence and Inflation*

There is clear statistical evidence to support drawing a causal link (rather than a mere association) between more effective FOI on the one side and

observations are not reported here. A full list of the measurements is available from the author.

18. The same seventeen countries included in the samples of Grilli, Masciandaro, and Tabellini (1991) and of Alesina and Summers (1993).

19. Singapore was coded beginning in the 1970s, as in the 1960s it was a member of the Malaysian Federation.

20. As *persistent* hyperinflation induces changes in the economic structure of society, financial sectors in a repeatedly hyperinflationary economy can be expected to adapt to their environment, and to change their relationship with inflation rather than oppose it. On that basis Brazil and Argentina, while coded, were excluded from this paper's sample for statistical purposes. The consistency of these countries' experience with the spirit of this paper is discussed in Section 4.

greater CBI and lower inflation rates on the other. The index Effective FOI proves to be a significant predictor of CBI. Although this is only a correlation, it is hard to imagine a first-order causal argument that can be drawn *from* CBI *to* the various components of Effective FOI, so the argument in the other direction made here is presumed to hold. Furthermore, FOI predicts average rates of inflation significantly, although CBI does not, when both factors are accounted for. CBI's commonly presumed ability to lower inflation, independent of the central bank's political context, is not supported by the data.

One measure of CBI is used throughout this section: Cukind, Cukierman's (1992) measure "LVAU" (legal variables aggregate unweighted). The other major published indices of statutory CBI—Bade and Parkin's (1988), Grilli, Masciandaro, and Tabellini's (1991), and Alesina and Summers's (1993) averaging of those two on a four-point scale—do not appear to be as reliable as Cukierman's index, which goes into finer level of detail and captures the limited but real variation of CBI over time. In fact, Cukierman's index has a higher correlation with inflation in the other authors' own samples than their own CBI indices (Cukierman, Webb, and Neyapti, 1992). Moreover, Cukind has been computed for a wider range of countries, allowing for analysis of the relationship among FOI, CBI, and inflation beyond the subset of the OECD usually examined.[21]

The predicted effects of Effective FOI—*that CBI is greater when FOI is greater, and that inflation is lower where FOI is greater*—are tested by examining the cross-national panel formed by decade-by-decade observations of FOI and its components, Cukind, and inflation (computed from CPI figures in IMF *International Financial Statistics*) for the 32 countries in this paper's sample. In the full sample, Cukind has a mean of 0.36, with a standard deviation of 0.16 (Cukind is designed to run from 0 to 1), while inflation has a mean of 7.8% per annum, with a standard deviation of 5.5%. In the OECD subsample, Cukind has a mean of 0.39, with a standard deviation of 0.16, while the mean inflation is 5.3%, with a standard deviation of 3.1%.

The null hypothesis is the one assumed by the literature to date on CBI: that CBI is not meaningfully endogenous to effective financial opposition to inflation (or to any other factors for that matter). As evidence in

21. The FOI index developed in this paper and its components significantly predict the other three measures of CBI. For example, an OLS regression of the Alesina–Summers index on FOI and a constant for OECD sample observations by decade over 1950–1989 yields a significant (at the 0.5% level) positive coefficient on FOI, with an adjusted R^2 of 0.50. In a regression of the Alesina–Summers index on the FOI components using the same sample, all coefficients have the predicted sign, and all but the coefficient on Fractn are significant at the 1% level, with an adjusted R^2 of 0.53.

support of this paper's model of monetary policy, I will take a significant positive coefficient on FOI in equations estimating CBI, and a significant negative coefficient on FOI in equations estimating inflation when CBI is also included as an explanatory variable. In addition, all equations are estimated with the components of FOI as explanatory variables; the coefficients on Univbk, Regpow, and Federal are predicted to have the same sign as that on Effective FOI, while the coefficient on Fractn should have the opposite sign.

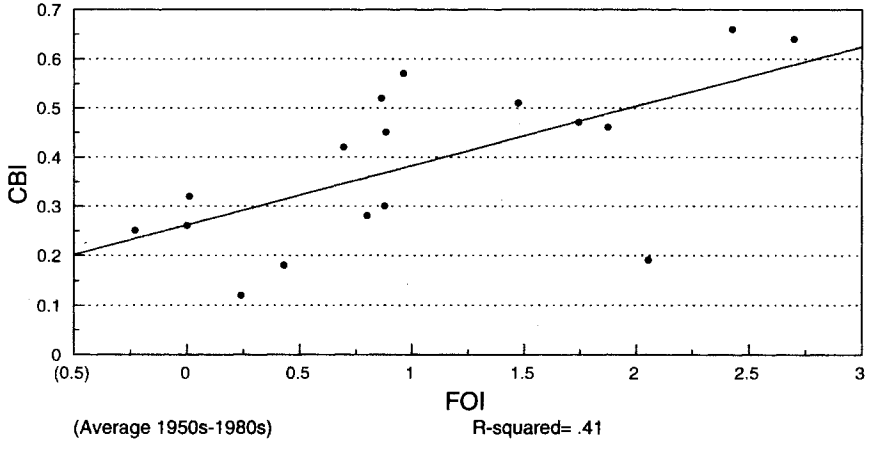
To control for factors beyond the interactions of our variables of interest, indicator variables are introduced to control for decade-specific shocks across countries and for regional effects. In addition, a variable equal to one for any decade in which the country was a member of a fixed-exchange-rate regime for more than 5 years, and zero otherwise, is included in regressions where inflation is the dependent variable. Since inflation shows an upward trend over the 1950–1989 period even after controlling for decade-specific shocks, all equations where inflation is the dependent variable are estimated by weighted least squares, where the observations are weighted by an index number by period (e.g., 1950s = 1, 1960s = 2). All equations where CBI is the dependent variable are estimated by ordinary least squares.

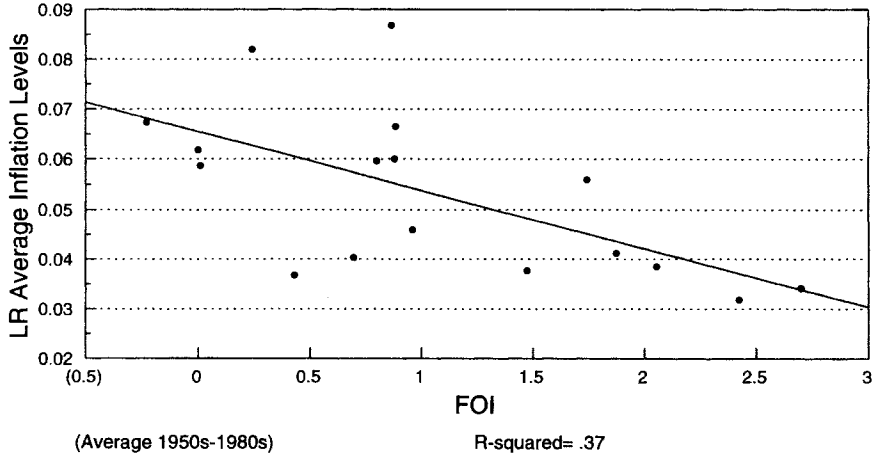
The main test of this paper's argument is determining the ability of FOI to explain CBI levels and inflation rates in the same OECD sample as that used to establish the much-cited negative correlation between CBI and inflation (Grilli, Masciandaro, and Tabellini, 1991; Alesina and Summers, 1993). In keeping with the literature on CBI, Figure 1 plots CBI and inflation against FOI for the seventeen countries' average values over 1950–1989. The predicted relationships appear clearly.

Turning to more formal explorations of the relationships in question, Table 1 shows the results of OLS regressions of Cukind upon Effective FOI and its components, both with and without decade-specific variables. Membership in a fixed-exchange-rate regime is also included, in case this form of government commitment to monetary restraint substituted for CBI.[22] The results strongly support the role of financial interests in determining CBI. The coefficient on Effective FOI is positive and significant at the 1% level in both equations (I and III) where it appears. In equations II and IV, each FOI component's coefficient has the pre-

22. Since membership in a fixed-exchange-rate regime proves to have no predictive power for CBI in either the OECD subsample (see Table 1) or in the broader sample (not shown), these two forms of institutional constraint on monetary policy cannot be considered substitutes. This result is worthy of further examination, given that it implies either that at least one of these does not enhance credibility in its commonly presumed manner, or that governments have a strange utility function in monetary regime benefits.

Figure 1 CENTRAL BANK INDEPENDENCE AND LONG-RUN AVERAGE INFLATION, OECD COUNTRIES, VERSUS EFFECTIVE FINANCIAL OPPOSITION TO INFLATION





dicted sign, with all but Regpow significant at the 1% level in both equations. To get some sense of the magnitudes, note that a one-standard-deviation increase in FOI will increase Cukind by nearly two-thirds of a standard deviation (0.10).

Given the clear picture of Table 1, the similarly supportive evidence of Table 2 for this paper's predictions comes as no surprise. The coefficient on Effective FOI is negative and significant at the 1% level in all three equations estimating inflation by (time) weighted least squares where it appears (V, VII, IX), whether or not Cukind, fixed-exchange-rate mem-

Table 1 CENTRAL BANK INDEPENDENCE AND EFFECTIVE FOI[a]

	Equation I	*II*	*III*	*IV*
Constant	0.263[b]	0.316[b]	0.276[b]	0.333[b]
	(0.024)	(0.028)	(0.054)	(0.052)
Eff. FOI	0.119[b]		0.119[b]	
	(0.018)		(0.018)	
Univbk		0.197[b]		0.200[b]
		(0.032)		(0.034)
Regpow		0.060		0.058
		(0.034)		(0.036)
Federal		0.133[b]		0.130[b]
		(0.032)		(0.033)
Fractn		−0.543[b]		−0.532[b]
		(0.164)		(0.170)
1950s			0.013	0.018
			(0.052)	(0.048)
1960s			0.009	0.014
			(0.052)	(0.048)
1970s			−0.012	−0.018
			(0.058)	(0.055)
Fixed exch.			−0.023	−0.033
			(0.064)	(0.062)
No. of obs.	68	68	68	68
Adj. R^2	0.392	0.485	0.355	0.453
S.E. reg.	0.126	0.116	0.130	0.119

[a] Observations—averages by decade, 1950–1989, 17 OECD countries. Dependent variable: central bank independence LVAU (Cukierman, 1992). Estimated by ordinary least squares. Standard errors given in parentheses.
[b] Significant at the 1% level.

bership, or decade-specific effects are included. In the other three estimated equations, coefficients on all FOI components have the predicted sign, with the coefficients on Regpow and Federal being significant at the 5% level or better in each equation.

Cukind never has a significant coefficient in equations predicting inflation as long as Effective FOI is included, and it shows a positive coefficient in three of the four equations, contrary to the expectations of the institutions-only literature. The adjusted values of R^2 for equations V–X are comparable to those of published regressions of inflation on CBI without FOI. The picture certainly seems to be one where the FOI index captures the correlation with inflation normally associated with CBI. A one-standard-deviation increase in Effective FOI drops inflation by 1.3% per year, about 40% of a standard deviation.

Is the relationship among FOI, CBI, and inflation specific to industrialized democracies? This question is of interest not only to assure us that

Table 2 INFLATION AND EFFECTIVE FOI[a]

	Equation V	*VI*	*VII*	*VIII*	*IX*	*X*
Constant	0.087[b]	0.085[b]	0.086[b]	0.087[b]	0.060[b]	0.062[b]
	(0.007)	(0.008)	(0.010)	(0.012)	(0.011)	(0.013)
Eff. FOI	−0.015[b]		−0.015[b]		−0.015[b]	
	(0.004)		(0.005)		(0.004)	
Univbk		−0.002		−0.001		−0.009
		(0.008)		(0.010)		(0.009)
Regpow		−0.025[b]		−0.024[b]		−0.021[b]
		(0.008)		(0.009)		(0.007)
Federal		−0.020[b]		−0.019[c]		−0.014[c]
		(0.008)		(0.008)		(0.007)
Fractn		0.057		0.053		0.039
		(0.039)		(0.043)		(0.037)
Cukind			0.002	−0.007	0.008	0.003
			(0.028)	(0.030)	(0.023)	(0.026)
Fixed Exch.	−0.023[b]	−0.028[b]	−0.023[b]	−0.028[b]	0.019[c]	0.013
	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)
1950s					−0.033[b]	−0.030[b]
					(0.011)	(0.011)
1960s					−0.031[b]	−0.029[b]
					(0.009)	(0.009)
1970s					0.037[b]	0.034[b]
					(0.009)	(0.009)
No. of obs.	68	68	68	68	68	68
Adj. R^2	0.239	0.295	0.227	0.284	0.475	0.470
S.E. reg	0.029	0.028	0.029	0.028	0.024	0.024

[a] Observations—averages by decade, 1950–1989, 17 OECD countries. Dependent variable: inflation (average annual rate). Estimated by weighted least squares (by period). Standard errors given in parentheses.
[b] Significant at the 1% level.
[c] Significant at the 5% level.

the relationship among FOI, CBI, and inflation is not somehow an artifact of the particular OECD sample examined, but to ascertain CBI's applicability as a norm for monetary arrangements in transitional and developing economies (as many advocate). Until now, the only statistical examination of CBI and inflation to include developing countries in its sample[23] indicated that statutory CBI was not effective against inflation outside the OECD.

This section's statistical investigations show, however, that when the focus is limited to those countries with low or moderate inflation rates, yet irrespective of their developing country status, the relationships predicted do exist (albeit more weakly than in the solely OECD sample).

23. Cukierman (1992) and Cukierman, Webb, and Neyapti (1992).

Table 3 CENTRAL BANK INDEPENDENCE AND EFFECTIVE FOI[a]

	Equation XI	*XII*	*XIII*	*XIV*	*XV*	*XVI*
Constant	0.271[b]	0.250[b]	0.202[b]	0.152[b]	0.206[b]	0.155[b]
	(0.024)	(0.032)	(0.030)	(0.039)	(0.038)	(0.044)
Eff. FOI	0.093[b]		0.082[b]		0.082[b]	
	(0.020)		(0.019)		(0.019)	
Univbk		0.119[b]		0.117[b]		0.117[b]
		(0.033)		(0.030)		(0.031)
Regpow		0.082[c]		0.009		0.009
		(0.035)		(0.036)		(0.036)
Federal		0.086[c]		0.109[b]		0.109[b]
		(0.034)		(0.031)		(0.031)
Fractn		−0.022		0.017		0.018
		(0.076)		(0.079)		(0.080)
OECD			0.099[b]	0.146[b]	0.099[b]	0.146[b]
			(0.034)	(0.037)	(0.034)	(0.037)
Latin Amer.			0.165[b]	0.205[b]	0.166[b]	0.205[b]
			(0.048)	(0.053)	(0.049)	(0.053)
1960s					−0.006	−0.002
					(0.037)	(0.036)
1970s					−0.007	−0.006
					(0.036)	(0.035)
No. of obs.	90	90	90	90	90	90
Adj. R^2	0.186	0.180	0.285	0.333	0.268	0.317
S.E. reg.	0.148	0.149	0.139	0.134	0.140	0.136

[a] Observations—averages by decade, 1960–1989, 32 countries with no inflation >30%/year for more than one decade (hyperinflations omitted). Dependent variable: central bank independence LVAU (Cukierman, 1992). Estimated by ordinary least squares. Standard errors given in parentheses.
[b] Significant at the 1% level.
[c] Significant at the 5% level.

Table 3 shows the results of replicating the estimations of Table 1 for this paper's 32-country sample from 1960 to 1989, allowing for common effects across country groups (OECD, Asia, Latin America).

Effective FOI has a positive, significant (at the 1% level) coefficient in all three regressions (XI, XIII, XV) in which it appears. A one-standard-deviation rise in Effective FOI (0.78 in this sample) leads to a rise of over 40% of a standard deviation in Cukind (0.07). Univbk, Regpow, and Federal have the predicted positive sign in the three equations in which they appear, with Univbk and Federal always significant at the 5% level or better. As in Table 1, Regpow does not seem to be independently important for CBI. Unlike in the OECD sample, the independent effect of Fractn on CBI disappears (perhaps because including nondemocracies in the sample makes party structures less important).

Table 4 INFLATION AND EFFECTIVE FOI[a]

	Equation *XVII*	*XVIII*	*XIX*	*XX*	*XXI*	*XXII*
Constant	0.079[b]	0.063[b]	0.086[b]	0.085[b]	0.076[b]	0.080[b]
	(0.014)	(0.015)	(0.013)	(0.015)	(0.015)	(0.013)
Eff. FOI	−0.018[c]		−0.013		−0.013[c]	
	(0.008)		(0.007)		(0.006)	
Univbk		−0.004		0.004		0.000
		(0.012)		(0.011)		(0.010)
Regpow		−0.001		−0.008		−0.008
		(0.013)		(0.012)		(0.011)
Federal		−0.034[b]		−0.030[b]		−0.025[c]
		(0.012)		(0.011)		(0.010)
Fractn		0.081[c]		0.025		0.032
		(0.027)		(0.027)		(0.024)
Cukind	0.073	0.057	0.049	0.041	0.043	0.050
	(0.039)	(0.037)	(0.037)	(0.037)	(0.034)	(0.033)
Fixed Exch.	−0.015	−0.016	−0.010	−0.014	0.006	0.009
	(0.012)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
OECD			−0.024[c]	−0.023	−0.025[c]	−0.027[c]
			(0.012)	(0.014)	(0.012)	(0.011)
Latin Amer.			0.064[b]	0.057[b]	0.058[b]	0.065[b]
			(0.018)	(0.020)	(0.018)	(0.016)
1960s					−0.038[b]	−0.040[b]
					(0.012)	(0.012)
1970s					0.022[c]	0.023[c]
					(0.010)	(0.010)
No. of obs.	90	90	90	90	90	90
Adj. R^2	0.045	0.160	0.303	0.334	0.464	0.445
S.E. reg.	0.054	0.051	0.046	0.045	0.040	0.041

[a] Observations—averages by decade, 1960–1989, 32 countries with no inflation >30%/year for more than one decade (hyperinflations omitted). Dependent variable: inflation (average annual rate). Estimated by weighted least squares (by period). Standard errors given in parentheses.
[b] *Significant at the 1% level.*
[c] *Significant at the 5% level.*

Table 4 shows the results of replicating Table 2's estimations for the broader sample, with additional regressors allowing for country-group effects. Effective FOI always has the predicted negative coefficient, falling just short of the 5% significance level in equation XIX, but significant in the other two regressions where it appears. Regpow, Federal, and Fractn have the predicted signs in each equation in which they appear, with the coefficient on Federal significant in all equations. Again, Cukind never has a significant negative coefficient (in fact, the coefficient is always positive). The statistical evidence continues to strongly support this pa-

per's predictions, even when low- and moderate-inflation (but not high- or hyperinflation) non-OECD countries are included in the sample.

A useful distinction between countries on the basis of average inflation levels is difficult to reconcile with the literature on CBI to date. When monetary institutions alone are seen as explanatory variables, there is no reason to think that CBI offers less of a commitment to price stability for a country in the throes of hyperinflation than for a country with an inflation rate in the teens, once the transition between regimes is made. CBI should predict inflation for all countries (assuming some reasonable scaling of the range of inflation outcomes) in that framework. When it does not, factors external to the model must be invoked[24] to justify a distinction between OECD and non-OECD countries—a distinction that this section's results show to be misleading.

In contrast, the empirically supported distinction between countries by inflation levels arises logically out of the argument offered here. A country with persistent high inflation or hyperinflation will have a financial sector that gave up opposing inflation long ago. To survive, banking and other financial firms would have adapted to their monetary environment and would now likely *support* continued inflation. And those attributes of the country's financial and political system which would enhance effective financial opposition to inflation in a less inflationary environment then enhance this support for inflation. With its main protector joining the forces for ease, an independent central bank cannot pursue a sustained counterinflationary policy; statutory CBI will not affect inflation in this case. The pattern of which countries' inflation levels correlate negatively with CBI is explained by the incentives facing the financial sector.

This pattern is best illustrated by Brazil, which has been suffering from hyperinflations for much of the postwar period. Brazilian banks have invested heavily in automation and local branches to cope with the pace of price shifts, committing them to a structure suitable for hyperinflation. They have reaped large profits from lending to the government and aggressively managing the float. In fact, with the recent introduction of the new Brazilian currency, the *real*, bank profitability dropped. Importantly, Brazil is a federal state, which had universal banking in the 1970s and 1980s, and only moderate party fractionalization. Brazil would lie almost

24. For example, Cukierman (1992) attributes the OECD–non-OECD distinction in part to a "norm of general adherence to the law," which is asserted to be "probably more deeply rooted in developed Western democracies than in absolute regimes or newer democracies" (p. 454).

one standard deviation above the mean on the FOI index. It is perhaps no coincidence that Brazil has had less success removing hyperinflation than its neighbors.[25]

5. *Implications: Monetary Policy When Interests Delimit Institutions*

My fundamental argument—that CBI levels reflect national differences in effective financial opposition to inflation—rejects the assumption that the pattern of CBI seen prior to 1989 was random. As a result, central banks with comparable statutory independence as a matter of planning, rather than political pressure, will offer significantly differing degrees of protection from inflation over time as the political situation alters. Both central bank independence and a coalition in society committed to protecting that independence are necessary to achieve the low inflation heretofore ascribed solely to CBI; either alone is insufficient.

An analogy can be made to the United Kingdom's entry into the European Monetary System in October 1990 at what proved to be an unsupportable deutsche-mark–pound exchange rate of 2.95, and its subsequent exit in September 1992. The tying of hands by the government through the EMS failed to induce changes in the British economy. The plan to create price stability would only have worked the other way around, with the structural changes made allowing adherence to the exchange rate. Granting CBI in countries unready for strong counterinflationary policies may be a similar exercise in limiting reach only to find no expansion of grasp.

This paper's interests analysis also implies that heretofore seemingly unrelated changes in the organization of financial markets or political debate will affect inflation rates. On the financial side, deregulation toward universal banking and disintermediation by financial firms place conflicting pressures on the interest of the financial sector in opposing inflation. The net outcome of these trends will have macroeconomic effects by influencing financial support for disinflationary policies. On the political side, the tendency toward decentralization within European countries, and towards European federalism in general, should increase price stability by insulating financial influence on monetary arrangements.

25. I am grateful to John Williamson for first suggesting I consider the phenomenon of inflation-loving Brazilian banks. The details of Brazilian banking tactics described in this paragraph were taken from *Financial Times*, March 21, 1990; *LDC Debt Report*, September 5, 1994; and *The Banker*, January 1995.

Interestingly, from this standpoint, the anti-inflationary effect of the proposed European Central Bank should be quite large. Because financial supervision will not come under its responsibilities, the financial sector should rarely come into direct conflict with it. Moreover, the overwhelming majority of European national financial interest groups already support it explicitly in hopes that it will suppress their respective domestic inflations. As a symbol of European unity, and enshrined in a virtually sacrosanct international treaty, the European Central Bank is secure from attacks on its structure and existence to an extent no national central bank is ever likely to be.[26] Finally, Europe's supranational federalism should limit influence upon its decisionmaking to the most organized and recognized interests.

My explanation of the cross-national inflation differences usually attributed to CBI alone does not imply that the structure of central banks is irrelevant, or that the financial sector is the only external influence on monetary policy. Instead, my emphasis on the political power of interests in society and the conflictual basis of inflation should be taken to identify central bankers' actual role in setting macroeconomic policy: as experts who must ascertain the actual and future state of the economy, as well as select the targets and instruments necessary to achieve agreed upon goals. What matters most is what central banks can actually do, not whether they appear to be a "commitment technology" for an elected government in the world described by Barro–Gordon and Kydland–Prescott.

Furthermore, the success of this paper's model in predicting both CBI and inflation leads to two suggestions for future studies of macroeconomic policy. First, monetary economics might find it fruitful to reexamine the distributive conflict over monetary policy arising from the real costs to interest groups of inflation and disinflation. Treating inflation solely as the result of a representative agent's fears about the government springing inflationary surprises upon it is only occasionally appropriate at best. Second, it would be useful to add a cautionary element to institutional explanations of long-run patterns in policy, as well as to recommendations of institutional solutions for macroeconomic problems. Although institutional factors certainly determine some outcomes, especially in the short to medium term, consistent policy outcomes over time may well depend as much upon consistent political contexts for those institutions as upon the institutions themselves.

26. That is, unless European unity were to be taken for granted. If EU rule were to become largely unquestionable, its perceived fragility to alteration of one of its building blocks would decrease, and the European Central Bank might lose some of its supplementary protection from risk. But that is a very long-term concern.

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