IMF Working Paper

Any Link Between Legal Central Bank Independence and Inflation? Evidence from Latin America and the Caribbean

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INTERNATIONAL MONETARY FUND

WP/05/75

IMF Working Paper

Monetary and Financial Systems Department

**Any Link Between Legal Central Bank Independence and Inflation?
Evidence from Latin America and the Caribbean**

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April 2005

Abstract

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those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are
published to elicit comments and to further debate.

This paper reviews central bank legislation in 24 countries in Latin America and the
Caribbean during the 1990s. Using panel regressions, we find a negative relationship
between legal central bank independence (CBI) and inflation. This result holds for three
alternative measures of CBI and after controlling for international inflation, banking crises,
and exchange regimes. The result is also robust to the inclusion of a broader indicator of
structural reforms that usually go along with changes in central bank legislation, illustrating
the complementary nature of various aspects of economic reform. The paper fails, however,
to find a causal relationship running from CBI to inflation.

Contents   Page

I. INTRODUCTION

The 1990s was accompanied by deep changes to central bank legislation in many countries. The common denominator was the increased autonomy and accountability granted to central banks in the design and execution of monetary policy with the objective of attaining price stability.[2] These legal reforms were considered particularly promising in countries with a previous history of inflation and excessive government interference in monetary policy for short-term political purposes (i.e., to finance fiscal expenditure or to stimulate economic activity). After a period of persistent inflation and macroeconomic instability, central bank reform was widely adopted by Latin American countries (LAC) during the 1990s. In contrast, changes to central bank legislation were largely absent among Caribbean countries (CAR).

On theoretical grounds, central bank reform has been motivated by the insights of the early time-inconsistency models of Kydland and Prescott (1977) and Barro and Gordon (1983), which showed that governments facing a trade-off between inflation and unemployment are tempted to choose higher-than-optimal inflation rates. Later work pioneered by Rogoff (1985) proved that this inflationary bias could be reduced by delegating monetary policy to an independent and conservative central bank. This class of models implied that the institutional characteristics of a central bank could have important effects on inflationary outcomes, providing the basis for a subsequent wave of central bank reform.

In fact, on the empirical side, the evidence from industrial countries seems to support the idea that increased central bank independence (CBI), usually proxied by the provisions contained in central bank laws, or by the turnover rate of central bank governors, is negatively associated with inflation (see a survey by Berger et al., 2000).[3] But the possibility of reverse

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[2] In this paper, the terms "autonomy" and "independence" are used interchangeably, as is usual in the literature. As pointed out by Lybek (1998), however, their interpretation may be different since autonomy implies operational freedom, while independence may be interpreted as the absence of political or institutional interference.

[3] However, these findings have been contested on several grounds. Some authors have argued that the relationship between CBI independence and inflation originates from a third (latent) variable such as the "opposition to inflation" (Posen, 1995) or the national "culture" toward inequality (De Jong, 2002). More importantly, Campillo and Miron (1997) showed that the negative relationship between CBI and inflation obtained in Cukierman et al. (1992) disappeared after including additional controls, suggesting that the result was driven by an omitted variable bias. Building on this critique, a more recent study by Brumm (2000) was able to recover the negative relationship between CBI and inflation after making a correction in the estimation method, to account for the possibility of measurement error in the CBI index.

causality running from CBI to inflation behind these results has not been ruled out, and is widely recognized in the existing literature (Possen, 1993, 1995).

The evidence from developing countries is both scarcer and less conclusive. An early study by Cukierman et al. (1992) reported a negative relationship between legal CBI and inflation for industrial countries, but failed to obtain similar results for developing countries. This asymmetry was attributed to a larger gap between legal and effective CBI in developing countries, possibly eroding the usefulness of the legal indicator as a measure of effective CBI. A study by De Haan and Kooi (2000), however, using the turnover of central bank governors as a more direct measure of effective CBI for a sample of 82 countries in the 1980s, also failed to find a robust relationship between CBI and inflation.[4] These two studies, however, are subject to some caveats. First, as usual in this literature, they fail to control for potential determinants of inflation, opening the possibility for an omitted variable bias. Second, the conclusions are based on a cross-country approach, and thus fail to capture the temporal dimension of central bank reform—an issue particularly relevant for the case of developing countries. Third, the results do not take into account the possible endogeneity of central bank reform. Some of these shortcomings have been addressed in other papers. The possibility of omitted variable bias was tackled by Loungani and Sheets (1997), who used a sample of transition economies and reported a negative relationship between CBI and inflation, even after controlling for other measures of economic policy such as fiscal performance and economic reforms. A step forward was taken by Cukierman et al. (2002), who extended the Cukierman (1992) index to 26 transition economies during the 1990s, keeping track of CBI both during pre- and post-reform periods. After controlling for price liberalization, they concluded that increased CBI was unable to contain the initial inflationary effects of price decontrols, but showed that higher CBI became effective against inflation after the reform process acquired momentum.

This paper is related to Cukierman et al. (2002) in two respects. First, it extends the Cukierman index to a (regional) sample of developing countries during the 1990s, keeping track of CBI during the pre- and post-reform periods, and exploiting both the cross-sectional and the time dimensions of the data. In fact, the sample of Latin American and Caribbean countries during the 1990s provides a rich experiment for the hypothesis being tested, given the widespread adoption of central bank reform and the extraordinary reduction in inflation attained during this period.[5] Second, it takes into account the effects of broader structural

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[4] In their study, the (negative) correlation between the turnover rate of central bank governors and inflation disappeared after the exclusion of a few high inflation countries from the sample.

[5] The evidence from Latin America and the Caribbean is scant and inconclusive. Jácome (2001) failed to find a clear relationship between increased CBI and inflation for a sample of Latin American countries. Gutiérrez (2003) reported a negative correlation using a sample of Latin American and the Caribbean countries and focusing on constitutional provisions on CBI.

reform policies that usually go along with changes in central bank legislation. Since these typically include trade liberalization, labor market reform, privatizations, and other structural policies with potential effects on inflation, the results obtained are less vulnerable to the possibility of omitted variable bias.

At the same time, this paper departs from Cukierman et al. (2002) in several ways. First, it builds three alternative measures of legal CBI, including the Grilli, Masciandaro, and Tabellini (GMT) (1991) index, and a new measure that adds several dimensions to the Cukierman index. These include the rules for the appointment of central banks' board of directors (in addition to those for the appointment of central banks' governors), the degree of CBI in the conduct of exchange rate policy, rules governing lender-of-last-resort (LOLR) facilities, and legal requirements on accountability and transparency.[6] Second, this paper exploits both the cross-sectional and time series dimensions of the data by using panel regressions. In contrast, the paper by Cukierman et al. (2002) works with the averaged values of the series during the pre- and post-reform periods, treating them implicitly as independent observations. Third, this paper tests for a causal relationship running from CBI to inflation, by taking into account the likely endogeneity of central bank reform.

The results obtained in this paper show a strong negative relationship between increased CBI and inflation, after controlling for international inflation, banking crises, and exchange regimes in the sampled countries. This conclusion is robust to the inclusion of an index of broader structural reforms, suggesting that the findings are not driven by an omitted variable bias. Furthermore, structural reforms are shown to have a beneficial effect on inflation, which illustrates the complementary nature of various dimensions of economic policies. The qualitative results are robust to three alternative measures of central bank independence. On the other hand, after taking into account the possible endogeneity of central bank reform, the paper fails to find a casual relationship running from CBI to inflation. Taken at face value, these results suggest that the extraordinary disinflation achieved in Latin America and the Caribbean during the 1990s cannot be attributed to the increased legal CBI. These findings, however, are subject to an important caveat, since the legal measures of CBI used in this paper may be poor indicators of the effective central bank autonomy in the conduct of monetary policy.

The rest of the paper is as follows. Section II describes the alternative indexes of CBI used in the regressions, and discusses the main differences between the Cukierman index and the modified version presented in this paper. Section III provides a map of the central bank reform in Latin America and the Caribbean using cluster analysis and the information contained in the indexes of CBI. Section IV performs an empirical exercise to assess whether increased legal CBI is somewhat related with inflation, and explores causality. Section V presents the main conclusions.

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[6] Lybek (1999) also develops an index of CBI—following a somewhat different approach—that incorporates some of these criteria for a group of transition countries.

II. MEASURES OF LEGAL CENTRAL BANK INDEPENDENCE

This section describes the three indexes of de jure central bank independence used in this paper. The quantification applies to 24 Latin American and Caribbean countries—before and after the reform in the relevant cases. The first index follows the methodology proposed by GMT (1991). The second follows Cukierman (1992), which is probably the best known and most widely accepted index of central bank independence. The third builds on the structure of the Cukierman index, but adds several dimensions to capture key features of central bank reform in Latin America, plus some factors which are nowadays considered best practices in support of central banks' autonomy and accountability.[7] In what follows, this index will be called Modified Cukierman Index (MCI).

It is worth stressing that the assessment of CBI in this paper is based exclusively on legal provisions (constitutions and central bank laws), which may not be consistent with *de facto* independence. In practice, some central banks are more independent than what is implied by the law (the Caribbean countries and Brazil since the late-1990s are good examples), while others (such as Ecuador—before the dollarization in 2000—and Venezuela) are effectively less independent. The main discrepancies between *de jure* and *de facto* independence of central banks emerge in political independence, although some differences also arise in terms of operational independence and transparency.

A. The GMT and Cukierman Indexes

Traditional indexes of CBI are based on legal criteria of political and economic independence. In the case of the GMT index, the assessment is based on the observance of 15 criteria, each using a binary score of zero or one. The overall index is then constructed by simple addition of the resulting values, so a higher score indicates higher CBI. The GMT index defines political independence in terms of central bank responsibilities, the procedures for appointing the central bank government bodies, and the degree of government control over monetary instruments. Central banks that focus their main objective on preserving price stability, and where governments' involvement in appointing and removing central bank governors are restricted, are said to be more politically independent. In turn, economic independence refers to restrictions on central banks to finance fiscal deficits and to the role they play in banking supervision. Again, a central bank is considered to be more independent when it faces higher restrictions to finance the fiscal deficit and lower responsibilities on banking supervision.

In turn, the Cukierman index assesses the fulfillment of 16 criteria of political and economic independence using a continuous scale from zero to one, with higher values also indicating higher CBI. The overall index is based on a weighted average of the individual criteria.

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[7] Lybek (1998) discusses these practices, which are now part of IMF's advice on central bank reform.

The Cukierman's index is also based on criteria of political and economic independence. On political independence, it focuses the assessment on various characteristics of the appointment and dismissal of the central bank's governor. A central bank is considered more politically independent the longer the governor's term in office, and the less dependent from the government are the procedures for his appointment and dismissal. On the other hand, a central bank enjoys higher economic independence the more restrictive are the provisions for central bank monetization of the fiscal deficit. The index also rewards CBI from the government in the formulation of monetary policy, and the focus of the legal mandate of the central bank on price stability.

The structure of the Cukierman index, including the values assigned to each criterion and sub-criterion, and their corresponding weights, is presented in detail in Appendix I. The highest weight, 50 percent, is given to the legal provisions on central bank lending to the government, since this is considered the main source of inflation. An overall weight of 20 percent is given to the modality of appointment, term in office, and dismissal of central bank governors, while the remaining 30 percent is equally distributed between policy formulation and the definition of the central bank fundamental objective.

B. The Modified Cukierman Index

The MCI builds on the structure of the Cukierman's index. It changes some of the 16 legal aspects of CBI considered in the Cukierman index, maintaining the four general classification criteria (i.e., appointment and dismissal of central bank authorities, independence for policy formulation, central bank objectives, and central bank lending), but adds a new category to measure central bank accountability. The structure and scores of the MCI are also spelled out in Appendix I, while a brief explanation of the rationale behind the main departures from the Cukierman index is provided below.

The first departure relates to the political autonomy of the central bank. The MCI assesses the rules for the appointment and dismissal of the entire central bank's board of directors, instead of focusing exclusively on the central bank governor. This innovation is relevant since the legal powers of central bank governors in the region represent only a minority fraction within the central bank board. Furthermore, the legal provisions for the appointment and term of office for the central bank governor may differ from those that apply to the rest of the board members. The criterion to evaluate the term of office of the central bank governor—and other members of the board of directors—is also different, since it considers the overlapping with the presidential term, to stress independence from the political cycle. An additional innovation emphasizes the restrictions on the executive branch to remove members of the board of directors—and not only the central bank governor. The criteria for the appointment and dismissal of central bank authorities also receive a different weight in the MCI index. In particular, the procedures for dismissal of the members of the central bank board, including the central bank governor, receive extra weight, since these are instrumental for enhancing the political autonomy of central banks.

The second innovation refers to the legal provisions for policy formulation. The MCI includes an assessment of CBI in the formulation of exchange rate policy, which is crucial for the conduct of monetary policy in small open economies. In addition, the evaluation of the central bank's role in the formulation of the government's budget, is shifted to consider the central banks' role in approving public sector debt. While no central bank in the region plays a role in the elaboration or approval of the government budget, a number of them are required to approve public debt issuance, which provides an alternative instrument to help enforce fiscal discipline.

The third variation relates to economic autonomy. The MCI simplifies the evaluation of the legal provisions on central bank lending to the government and includes two additional criteria, namely, central bank faculties as LOLR and provisions safeguarding central bank financial autonomy. The MCI rewards legal provisions that limit central banks involvement in banking crises, and those requiring the government to preserve the integrity of central bank capital. The relevance of LOLR provisions stems from the recent upsurge of banking crises in LAC, which in a number of cases involved central bank participation, with adverse effects on the conduct of monetary policy and the achievement of inflation objectives (Ecuador, Venezuela, and more recently Argentina, Uruguay, and the Dominican Republic to mention the most salient).[8] Moreover, central banks' involvement in banking crises, beyond LOLR assistance, can be viewed as a form of government financing, since the resources for banking resolution should typically come from the fiscal side. In turn, legal provisions requiring governments to preserve the integrity of central bank capital are also rewarded, as they facilitate the conduct of open market operations and, in general, the management of systemic liquidity without financial restrictions.

The fourth and final innovation of the MCI is the addition of criteria for accountability, which is an integral component of central bank independence. Holding central banks accountable strengthens institutional credibility and hence underpins monetary policy effectiveness. Thus, the MCI rewards legal provisions that require central banks to report on a regular basis on their policy targets and achievements. Since transparency is an instrumental component of accountability, the MCI also gives credit to the mandatory publication of central bank financial statements on a regular basis and, in particular, when the disclosure of financial statements follows international accounting standards and is certified by an independent auditor.

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[8] In a number of countries in the region, central banks can potentially provide resources to troubled financial institutions in a number of ways, including extended LOLR support, financing bank resolution and restructuring, and financing deposit insurance schemes and government's deposit guarantees.

III. A Map of Central Bank Reform in Latin America and the Caribbean During the 1990s

The early 1990s witnessed major structural reforms in Latin America and the Caribbean. Following the "lost decade", these reforms were intended to consolidate stabilization efforts and pave the way to economic growth.[9] As part of the policy agenda, many countries introduced changes to central bank legislation with the objective of increasing CBI.[10] This section briefly describes progress in CBI in the region and depicts a map of central bank autonomy using information drawn from central bank laws and constitutions. The main features of central bank legislation are organized under the following five categories: (i) definition of the primary policy objective, (ii) political independence in the design and execution of monetary policy, (iii) economic independence, (iv) financial autonomy, and (v) accountability and transparency provisions.

Overall, central bank reform was widespread in LAC but almost absent in CAR countries, with most central banks enjoying higher independence under the new regimes. The most prominent features of central bank reform in the region comprised a more focused mandate on price stability and the formalization of restrictions on central bank lending to the government. After the reforms, central banks also enjoyed increased autonomy in the conduct of monetary policy, including interest rate policy. On the other hand, there are some dimensions where central bank reform was insufficient and CBI could be further improved. Political independence in some countries could still be enhanced by restricting government's capacity for unilaterally appointing and removing central bank governors and directors. Operational independence could be also improved by limiting excessive central bank discretion in the LOLR function, including the size and the financial conditions of LOLR facilities and the circumstances under which LOLR is triggered.[11] In a number of countries,

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[9] A number of studies have assessed the costs of inflation in terms of economic growth. Empirical evidence suggests a negative correlation between inflation and growth, which becomes stronger at higher levels of inflation. See for example Fischer (1993), Sarel (1996), and De Gregorio (1992) in relation to Latin American countries.

[10] Countries with central bank reform include: Chile (1989), El Salvador (1991), Argentina (1992 and 2002), Colombia (1992), Nicaragua (1992 and 1999), Venezuela (1992 and 2001), Ecuador (1992 and 1998), Peru (1993), Mexico (1993), Bolivia (1995), Costa Rica (1995), Uruguay (1995), Paraguay (1995), Honduras (1996 and 2004), Guyana (1998), and more recently Guatemala (2001) and the Dominican Republic (2002).

[11] While the notion of "constructive ambiguity" (see Enoch, Kamis, and Stella, 1997) is in general a valid recommendation in the design of the role of the central bank as LOLR, it may expose countries featuring institutional weaknesses—like many LAC—to undue exogenous pressures when dealing with banking crises and resolution.

there is also room for improving central bank financial independence and transparency, including the disclosure of financial statements.[12]

The comparison of CBI across countries is relatively complex given the large number of aspects involved. A convenient approach to circumvent this complexity and to depict a map of central bank reform in the region is to use cluster analysis. This methodology creates groups of countries based on their relative similarities along various dimensions of CBI, which requires an index of central bank independence, and a metric for comparison purposes. The exercise presented here is based on the MCI, using the Euclidean distance as a measure of dissimilarity between countries, which has the advantage of being widely used.[13] The algorithm, known as hierarchical single linkage clustering, proceeds as follows. Initially, the N countries are treated as N separate groups. The distance between each pair of countries is computed, and the two closest countries are then merged into one group, producing N-1 total groups (one with two countries, and the rest of size one). Next, the closest two groups are merged using a similar method (so that the number of groups becomes N-2), and the process is repeated until all countries are merged into one large group.

The results of the grouping based on the MCI are shown in Figure 1. Countries are identified by a three-letter acronym at the bottom of the tree. Countries with central bank reform were treated as two separate cases and identified by adding either a "-0" or a "-1" to their acronyms, to specify pre- and post-reform periods, respectively. Countries grouped together within a given branch tend to share similar central bank legislation along the dimensions considered. The large vertical bars in the upper part of the tree indicate that the groups tend to be dissimilar, therefore revealing a strong clustering. By inspection, three groups of countries, shown in Table 1, emerge. Post-reform countries (with the exception of Chile) tend to be fall together under Groups 1 and 2, while Group 3 includes pre- and non-reform countries, most of them in the CAR region. To facilitate the comparison across groups, Table 2 presents the averages of the MCI and its subcomponents for each group, together with the averages of the fiscal deficit, inflation, and the index of structural reforms. The results indicate that the legal independence of central banks in Groups 1 and 2 is stronger along most of the dimensions considered. In particular, countries in these two groups tend to have a more focused mandate on price stability and greater economic independence. On the other hand, no differences arise between groups in the LOLR function, while Group 2 tends to display a relative low degree of political independence, comparable with pre-reform countries. Interestingly, countries in Groups 1 and 2 have lower average inflation combined

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[12] Jácome (2001) provides a summary of the main features of the central bank legislation in Latin America as of end-1990s.

[13] The metric used in the exercise is given by: $d_{ij} = \sqrt{\sum_{k=1}^{18}(x_{ki}-x_{kj})^2}$, where x_{ki} indicates the value of the dimension k in country i, and x_{kj} indicates the value of the dimension k in country j.

with higher fiscal deficits, but they are also more advanced in the implementation of structural reforms.

Figure 1. Cluster Analysis Based on the Components of the Modified Cukierman,
(Dissimilarity Measure is Euclidean Distance)
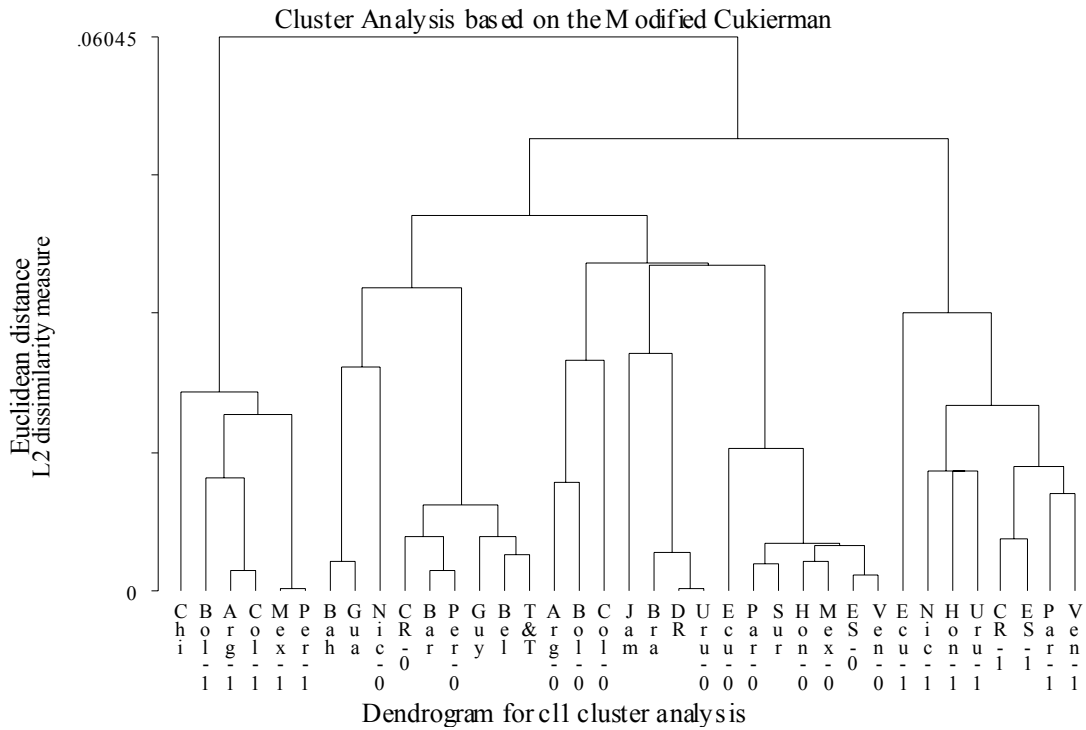
This figure presents the dendrogram of the cluster analysis based on the components of the *Modified Cukierman* index. The list of countries included in the study is provided at the bottom of figure. For countries with legal central bank reforms, a "-0"zero indicates the pre-reform sub-period, and a "-1" indicates the post-reform sub-period. Countries with similar central bank laws in terms of the dimensions of the MCI are shown together and linked by lines. Overall, three main groups emerge, with pre- and non-reform countries clustered together (see Table 1).

Table 1. List of Country Groups Based on Cluster Analysis

	Country	Period		Country	Period
Group 1			**Group 3**		
Arg-1	Argentina	1992-2001	Arg-0	Argentina	1992-2001
Bol-1	Bolivia	1990-2002	Bah	Bahamas	1990-2002
Chi	Chile	1990-2002	Bar	Barbados	1990-2002
Col-1	Colombia	1992-2002	Bel	Belize	1990-2002
Mex-1	Mexico	1990-2002	Bol-0	Bolivia	1990-2002
Per-1	Peru	1993-2002	Bra	Brazil	1990-2002
			Col-0	Colombia	1992-2002
Group 2			CR-0	Costa Rica	1990-2002
CR-1	Costa Rica	1990-2002	Ecu-0	Ecuador	1990-1999
Ecu-1	Ecuador	1990-1999	ES-0	El Salvador	1992-2001
ES-1	El Salvador	1992-2001	Gua	Guatemala	1990-2002
Hon-1	Honduras	1990-2002	Guy	Guyana	1990-2002
Nic-1	Nicaragua	1992-2002	Hon-0	Honduras	1990-2002
Par-1	Paraguay	1990-2002	Jam	Jamaica	1993-2002
Uru-1	Uruguay	1990-2002	Mex-0	Mexico	1990-2002
Ven-1	Venezuela, Rep. Bol.	1993-2002	Nic-0	Nicaragua	1992-2002
			Par-0	Paraguay	1990-2002
			Per-0	Peru	1993-2002
			DR	Republica Dominicana	1990-2002
			Sur	Suriname	1990-2002
			T&T	Trinidad and Tobago	1990-2002
			Uru-0	Uruguay	1990-2002
			Ven-0	Venezuela, Rep. Bol.	1993-2002

This table lists the groups of countries resulting from the cluster analysis. Reform countries are indicated with a "-0" (pre-reform sub-period) or a "-1" (post-reform sub-period).

Table 2. Summary Statistics Across Country Groups

	Group 1	Group 2	Group 3
Modified Cukierman Index (average by group)	0.84	0.70	0.44
Political Independence	0.91	0.55	0.27
Government of the Central Bank	0.88	0.45	0.31
Term of office Governor	0.67	0.37	0.46
Who appoints the Governor	1.00	0.33	0.17
Appointment and term of Board	0.83	0.58	0.20
Dismissal of Governor and Board	0.92	0.33	0.24
CEO Allowed to hold another office in government	1.00	0.89	0.70
Central Bank primary objective	0.96	0.69	0.23
Price stability	0.96	0.69	0.23
Economic Independence	0.77	0.78	0.52
Policy formulation	0.75	0.81	0.70
Who formulates monetary policy	0.89	0.85	0.83
Conflict resolution	1.00	0.93	0.78
Central Bank and public debt	0.00	0.50	0.28
Central Bank lending	0.78	0.77	0.45
Advances to government	0.84	0.85	0.60
Loans to government	0.71	0.78	0.41
Beneficiaries of financing	1.00	0.86	0.39
Who decides terms of lending	0.93	0.81	0.55
Interest rates	0.90	1.00	0.45
LOLR	0.50	0.50	0.50
Financial autonomy Central Bank	0.72	0.63	0.35
Accountability	0.93	0.73	0.54
Accountability norms	0.96	0.78	0.50
Transparency	0.83	0.58	0.66
Selected Macroeconomic Variables			
Fiscal Deficit (percent of GDP)	2.60	2.31	1.08
Inflation (in percent)	9.83	15.81	35.65
Structural Reform Index	0.60	0.53	0.49
Number of countries 1/	6	9	23

This table presents average values for the components of Modified Cukierman Index, using the groups of countries produced by the cluster analysis exercise. Countries with central bank reform are split in two sub-periods (pre- and post-reform).

1/ Countries with central bank reform are treated as two cases, corresponding to the pre- and post-reform periods.

IV. LEGAL CENTRAL BANK INDEPENDENCE AND INFLATION IN LATIN AMERICA AND THE CARIBBEAN, IS THERE A LINK?

During the 1990s, the decline of inflation in Latin America and the Caribbean was remarkable, from an average of about 500 percent at the beginning of the decade to 7 percent in 2002. Interestingly, disinflation in the region was coincident with—and probably supported by—a general trend worldwide (Figure 2). The magnitude of disinflation achieved in Latin America and the Caribbean, however, suggests that its main driving forces are attributable to the economic policies and institutional reform implemented by individual countries. This section tests for a negative relationship between increasing CBI and inflation.[14]

To provide a first look at the data used in the regressions, Table 3 presents summary statistics for selected variables and Table 4 their pair-wise correlations together with the significance levels for the null of zero correlation. The sample was split into two groups, separating LAC countries (lower triangle) from CAR countries (upper triangle). Several regularities emerge. First and foremost, inflation is negatively correlated with the indexes of CBI in both sub-samples. Second, there is a high positive correlation between the index of structural reforms and the indexes of CBI, especially in the LAC sub-sample, which implies that changes to central bank legislation were coincident with a broader agenda of structural reforms. Third, there is weak evidence that lower fiscal deficits are associated with higher central bank independence. Fourth, as expected, the three indexes of CBI are highly correlated in both sub-samples. In fact, the information content of the three indexes and their main components (i.e., economic and political independence) is similar, especially for the LAC sub-sample, as apparent from their correlations (Table 5).

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[14] Despite the dramatic reduction in inflation achieved in Latin America and the Caribbean, opposition to increased CBI has gained some ground in recent years, as new legislation has been passed undermining previous improvements in central bank autonomy. Examples include changes to the central bank charter in Argentina to allow central bank financing of the fiscal deficit in 2002, the decision by the Colombian Constitutional Court in 1999 to cap mortgage interest rates, and the reform of the central bank charter in Venezuela in 2001 to validate the previous transfer of exchange rate devaluation gains to the government. It is also relevant to mention the approval of laws in Honduras and Paraguay, requiring central banks to transfer money—rather than providing credit—to finance government expenditure.

Figure 2. International Inflation and Inflation in Sampled Countries, 1990–2002

——— Inflation (in percent) ·········· World Inflation (in percent)
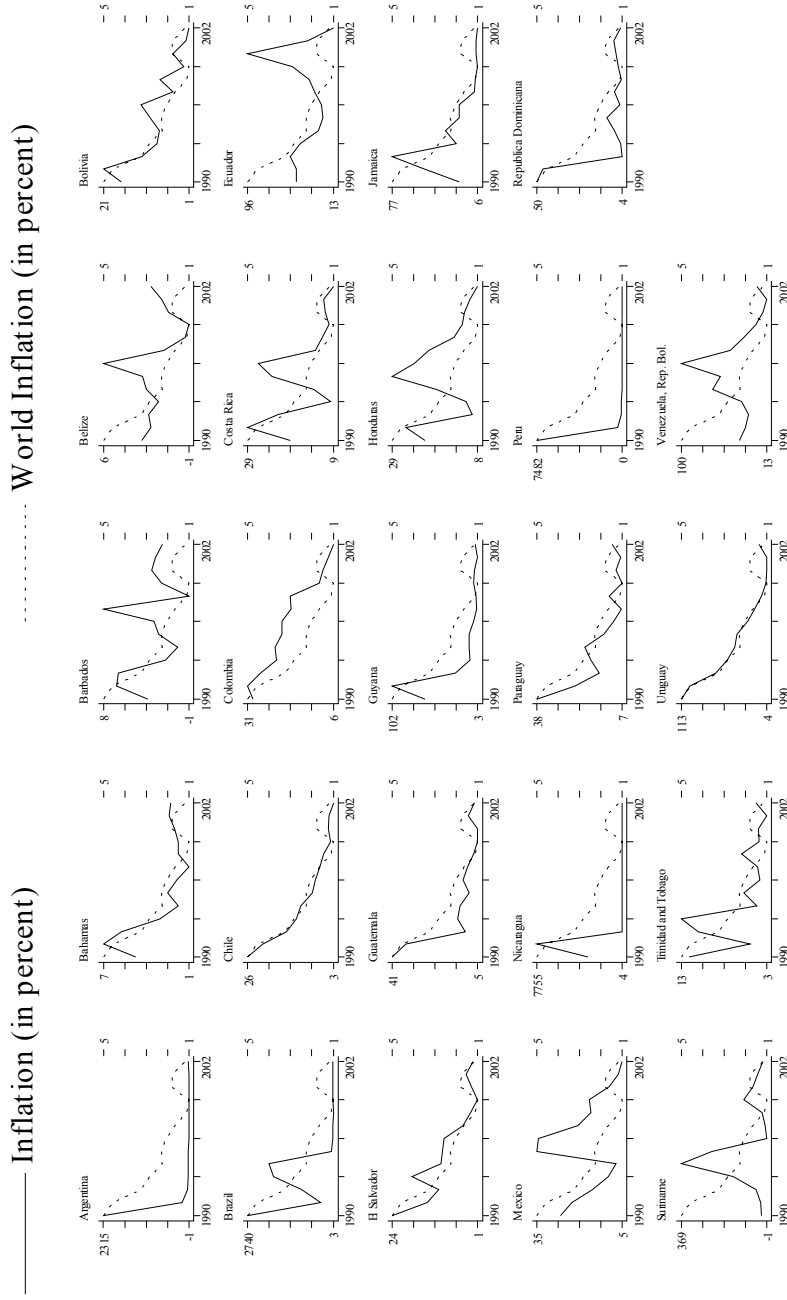
This figure compares the evolution of inflation in the sampled countries with international inflation, measured by the average of industrial countries.

Table 3. Summary Statistics by Regions, 1990–2002

		Mean	Std. Dev.	Min	Max	Observations	
Caribbean countries							
Inflation							
	overall	18.84	50.17	-1.30	368.50	N =	88.00
	between		29.15	1.84	82.83	n =	7.00
	within		41.90	-64.69	304.51	T-bar =	12.57
Fiscal Deficit							
	overall	-3.19	6.53	-23.52	11.10	N =	70.00
	between		5.07	-10.49	4.39	n =	6.00
	within		4.75	-16.22	6.81	T-bar =	11.67
Structural Reform Index							
	overall	0.60	0.05	0.54	0.67	N =	19.00
	between		0.00	0.59	0.60	n =	2.00
	within		0.05	0.54	0.67	T-bar =	9.50
GMT total							
	overall	7.23	0.89	6.00	9.00	N =	88.00
	between		0.95	6.00	8.31	n =	7.00
	within		0.18	6.92	7.92	T-bar =	12.57
Cukierman							
	overall	0.50	0.06	0.41	0.69	N =	88.00
	between		0.06	0.41	0.58	n =	7.00
	within		0.03	0.45	0.61	T-bar =	12.57
Modified Cukierman							
	overall	0.50	0.06	0.38	0.63	N =	88.00
	between		0.06	0.38	0.55	n =	7.00
	within						
Latin American countries							
Inflation	overall	19.43	33.36	-1.20	413.30	N =	198.00
	between		15.21	4.15	59.14	n =	17.00
	within		30.35	-36.51	373.59	T-bar =	11.65
Fiscal Deficit	overall	2.88	4.26	-10.73	23.26	N =	193.00
	between		2.93	-0.30	11.65	n =	17.00
	within		3.23	-18.76	18.09	T-bar =	11.35
Structural Reform Index	overall	0.53	0.07	0.37	0.71	N =	168.00
	between		0.05	0.44	0.62	n =	17.00
	within		0.05	0.40	0.66	T-bar =	9.88
GMT total	overall	10.20	2.23	6.00	14.00	N =	198.00
	between		1.69	8.00	14.00	n =	17.00
	within		1.48	3.90	12.97	T-bar =	11.65
Cukierman	overall	0.66	0.16	0.36	0.86	N =	198.00
	between		0.13	0.43	0.84	n =	17.00
	within		0.10	0.31	0.82	T-bar =	11.65
Modified Cukierman	overall	0.64	0.17	0.29	0.86	N =	198.00
	between		0.12	0.43	0.85	n =	17.00
	within		0.13	0.15	0.87	T-bar =	11.65

The sample excludes eight years with inflationary episodes above 1,000 percent per year.

Table 4. Pair-Wise Correlations Between Selected Variables, by Regions, 1990–2002

	Inflation	Fiscal Deficit	Structural Reforms Index	GMT Total	Cukierman	Modified Cukierman
Inflation		*-0.037*	*-0.688*	*-0.308*	*-0.314*	*-0.462*
		(0.761)	*(0.001)*	*(0.004)*	*(0.003)*	*(0.000)*
Fiscal Deficit	0.228		*0.410*	*-0.262*	*-0.342*	*-0.077*
	(0.001)		*(0.081)*	*(0.028)*	*(0.004)*	*(0.527)*
Structural Reforms Index	-0.360	-0.052		*0.075*	*0.075*	*0.075*
	(0.000)	(0.510)		*(0.761)*	*(0.761)*	*(0.761)*
GMT Total	-0.137	-0.046	0.561		*0.820*	*0.863*
	(0.055)	(0.524)	(0.000)		*(0.000)*	*(0.000)*
Cukierman	-0.167	-0.130	0.441	0.819		*0.849*
	(0.019)	(0.072)	(0.000)	(0.000)		*(0.000)*
Modified Cukierman	-0.205	0.003	0.557	0.892	0.903	
	(0.004)	(0.962)	(0.000)	(0.000)	(0.000)	

This table presents pair-wise correlations between selected variables. *Correlations in the upper triangle correspond to Caribbean countries.* Correlations in the lower triangle are for Latin American countries. Significance levels for the null of zero correlation are in parenthesis.

Table 5. Correlations Between Indexes of Legal Central Bank Independence, by Regions

	Economic Independence	Political Independence	Total Index
Latin American countries			
GMT, Cukierman	0.730	0.615	0.811
GMT, Modified Cukierman	0.761	0.796	0.891
Cukierman, Modified Cukierman	0.929	0.869	0.896
Caribbean countries			
GMT, Cukierman	0.295	0.550	0.830
GMT, Modified Cukierman	0.434	0.312	0.859
Cukierman, Modified Cukierman	0.782	0.452	0.845

This table presents the pair-wise correlations between the three indexes of legal central bank independence and their main sub-components, by regions. All coefficients are statistically significant at the 5 percent level. The sub-indexes of economic and political independence of the Modified Cukierman index do not include accountability (which is, however, included in the total Modified Cukierman). Political independence covers the rules for appointment and dismissal of the Central Bank governor and board, as well as the Central Bank objectives (see Appendix I). In turn, economic independence covers the characteristics of policy formulation and various restrictions on central bank lending.

A. Baseline Results

Baseline results on the relationship between CBI and inflation were computed using a set of bivariate regressions of *Inflation* on the three indexes of *CBI* (one at a time to avoid multicollinearity). The regressions covered the whole sample, with the exception of a few observations corresponding to countries adopting official dollarization (Ecuador 2000–2002 and El Salvador 2002), and years with hyperinflation.[15] Following the literature (Cukierman et al., 1992, De Haan and Kooi, 2000), *Inflation* was computed as the yearly change in the average consumer price index taken from IFS (series 64), and rescaled using $\pi/(1+\pi)$ to ameliorate potential heteroscedasticity. However, since this treatment has the undesirable effect of bounding the dependent variable in the interval [0, 1], affecting the normality assumption, an alternative measure, $log(1+\pi)$ was also applied, with similar results. The regressions were computed using OLS with fixed effects at the country level and robust standard errors (White, 1980). In all cases, the results (not reported) showed a strong negative relationship between increased CBI and inflation, with significant coefficients at the one-percent level.

A somewhat more rigorous test was conducted adding several control variables. As before, *Inflation* was treated as endogenous, with the target variables being the three indexes of *Central Bank Independence*, taken one at a time. The set of control variables included the following: a *Banking Crisis Dummy*, to isolate the inflationary effects associated with systemic banking problems, a *Fixed Exchange Regime Dummy* to account for the effects of exchange rate anchoring on inflation, and *International Inflation*, to control for the contribution of the external disinflation trend . The inclusion of the *Banking Crises Dummy* is important, since banking crises were more common after central bank reform, with 7 episodes against 1 in the pre-reform period.[16] Therefore, ignoring this effect would introduce a bias against the hypothesis tested. The inclusion of the *Exchange Regime Dummy* follows previous studies (Cukierman et al., 2002, De Haan and Kooi, 2000). It was constructed from the IMF database on *de facto* exchange regimes, using a one for regimes classified as: "another currency as legal tender," "currency board," or "conventional peg against a single

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[15] A filter was applied, excluding eight cases with yearly inflation above 1,000 percent per year: Argentina 1990 (2,315); Brazil 1990 (2,740); Brazil 1992 (1,023); Brazil 1993 (1,927); Brazil 1994 (2,076); Nicaragua 1990 (3,128); Nicaragua 1991 (7,755); Peru 1990 (7,482). Applying more restrictive filters (i.e., filtering out cases below the 1,000 threshold) would produce no significant changes in the sample. The next high inflation episode is Brazil 1991 (413), and there are four additional cases with inflation between 150 and 400 percent per year.

[16] The list of systemic banking crises in the sampled countries is: Argentina (2002), Colombia (1998), Colombia (1999), Dominican Republic (2002–2003), Ecuador (1998–1999), Mexico (1995), Nicaragua (2000–2001), Uruguay (2002), Bolivarian Republic of Venezuela (1994–1995).

currency," and zero otherwise. The first year after the introduction of a fixed regime, and the last year before switching to a floating regime, were also given a value of zero to account for lags in the effects of exchange rate anchoring on prices, and the fact that the abandonment of a hard peg tends to coincide with rising inflationary pressures. The *International Inflation* was proxied by the average inflation rate of industrial countries, computed from IFS (series 110).

An initial estimation was performed using OLS and with fixed effects at the country level. However, taking into account both the cross-sectional and a time-series dimensions of the data, the errors were checked for heteroscedasticity across panels (countries) and for autocorrelation. As for heteroscedasticity, a likelihood-ratio test was implemented comparing the results of the unrestricted model (i.e., allowing for a heteroscedastic error structure) with those obtained from the restricted (homoscedastic) model. The test supported the presence of heteroscedasticity across panels. As for autocorrelation, a test in panel-data models proposed by Wooldridge (2002) also indicated the presence of serial correlation. Based on these results, the estimation was computed again using Feasible Generalized Least Squares (FGLS), allowing for heteroscedasticity across countries and a common AR(1) error process.

The results are presented in Table 6. Columns [1]-[3] indicate that, after controlling for banking crises and the degree of exchange rate rigidity, higher central bank independence, as measured by any of the three indexes, is related to lower inflation. The coefficient associated with the Cukierman index is comparable in magnitude to the MCI, reflecting the close relationship between the two series. As expected, fixed exchange regimes are associated with lower inflation rates. These results are qualitatively robust to the addition of world inflation, as indicated by the regressions presented in columns [4]-[6]. The new variable enters positively and significantly at conventional levels, in line with the observed co-movement described earlier. As an alternative specification, the regressions were computed again, after adding the *Fiscal Deficit* in percent of GDP to control for underlying inflationary causes, with similar results.[17] This specification, however, was rejected since the *Fiscal Deficit* entered not significantly in the regressions, which is in line with previous work (see for example Click, 1998, and Fisher et al., 2002), although a recent study suggests otherwise (Catao and Terrones, 2003).

B. An Alternative Specification: The Role of Structural Reforms

While suggestive, these results are subject to two main challenges. First, they may be influenced by an omitted variable bias, since central bank reforms are usually part of broader policy packages that include privatizations, trade reform, and other structural policies that affect macroeconomic performance, including inflation. Equally important, broader

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[17] This variable was measured by the nominal deficit of the central government on a cash basis, as reported in the IFS (series 80), and scaled by nominal GDP, also taken from IFS (series 99b).

Table 6. Panel Regressions of Inflation on Contemporaneous Central Bank Independence

	[1] FGLS	[2] FGLS	[3] FGLS	[4] FGLS	[5] FGLS	[6] FGLS
Dummy Banking Crises	0.023	0.023	0.026*	0.036**	0.037**	0.038**
	[0.016]	[0.015]	[0.016]	[0.015]	[0.015]	[0.015]
Dummy Exch. Regime	-0.082***	-0.080***	-0.081***	-0.079***	-0.079***	-0.076***
	[0.012]	[0.013]	[0.012]	[0.012]	[0.012]	[0.012]
World Inflation (in percent)				0.035***	0.035***	0.033***
				[0.004]	[0.004]	[0.004]
GMT Total	-0.009***			-0.005**		
	[0.002]			[0.002]		
Cukierman Weighted		-0.129***			-0.066**	
		[0.031]			[0.030]	
Total Modified Cukierman			-0.137***			-0.079***
			[0.026]			[0.025]
Observations	297	297	297	297	297	297
Number of countries	24	24	24	24	24	24
Rho	0.74	0.74	0.72	0.67	0.66	0.67

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

This table presents the results of panel regressions for the whole sample of countries during 1990–2002, excluding (eight) hyperinflation episodes. The dependent variable is inflation (π), scaled as $\pi/(1+\pi)$. The coefficients were estimated using Feasible Generalized Least Squares (FGLS), allowing for heteroscedasticity across countries and an AR(1) autocorrelation structure within countries, with a (Rho) coefficient common to all countries. The target variables are the three indexes of CBI. Control variables include a Dummy Banking Crises, which equals one during years with banking crises and zero elsewhere, A Dummy Regime, which equals one during periods of fixed exchange regimes and zero elsewhere, and World Inflation, measured by the average inflation of industrial countries.

economic reforms may entail changes in the behavior of market participants, affecting money demand, the direction of capital flows, and the alternatives to finance a given fiscal position, all of which may also have an effect on inflation. A second caveat is the possibility of reverse causality. The argument here is that the decision of implementing central bank reform may depend itself on inflation. For example, central bank reform may be easier to implement— and actually implemented—in the wake of a disinflation period.

To take into account a possible omitted variable bias, the regressions were computed again after adding an index of *Structural Reforms* as an additional control. This index, constructed by the Inter-American Development Bank, captures the evolution of economic reform in several sectors, including labor markets, financial markets, tax, trade, and privatizations. Besides, as the index does not incorporate changes in central bank legislation, it is a good complement to the indexes of CBI considered here.

The inclusion of the additional control rendered the coefficients of CBI statistically non-significant in all regressions (columns [1]-[3] in Table 7). On the other hand, the coefficients of the *Structural Reforms* entered negative and statistically significant at the one-percent

level. It is worth noticing the change in the sample size after the inclusion of the new variable, which is mainly due to lack of data on structural reforms for years 2001–2002, as well as for some Caribbean countries (Bahamas, Barbados, Belize, Guyana and Suriname). However, the results are not attributable to differences in the samples, since they remained after the samples were matched. At first glance, this outcome suggests that the effects of central bank reform on inflation can be better understood in the context of broader economic reform packages, and that the negative relationship between CBI and inflation reported previously may be driven by an omitted variable bias. However, this conclusion merits further checking. In particular, the effects of central bank reform on inflation may not be immediate, since the implementation of a new institutional environment usually requires the enactment of more specific regulations, and the build-up of central bank reputation, which is the main factor from the perspective of market participants.

Table 7. Panel Regressions of Inflation on Contemporaneous Central Bank Independence
(Including Structural Reforms)

| | [1] | [2] | [3] | [4] | [5] | [6] |
| | | | | FGLS | FGLS | FGLS |
	FGLS	FGLS	FGLS	Lagged CBI	Lagged CBI	Lagged CBI
Dummy Banking Crises	0.044**	0.045**	0.045**	0.044**	0.048**	0.048**
	[0.019]	[0.019]	[0.019]	[0.020]	[0.020]	[0.020]
Dummy Exch. Regime	-0.043***	-0.042***	-0.042***	-0.053***	-0.050***	-0.051***
	[0.016]	[0.016]	[0.016]	[0.010]	[0.010]	[0.009]
World Inflation (in percent)	0.030***	0.030***	0.030***	0.022***	0.022***	0.021***
	[0.005]	[0.005]	[0.005]	[0.008]	[0.008]	[0.007]
Index Structural Reform	-0.421***	-0.428***	-0.412***	-0.399***	-0.416***	-0.408***
	[0.105]	[0.100]	[0.102]	[0.090]	[0.090]	[0.087]
GMT Total	-0.002			-0.005***		
	[0.002]			[0.002]		
Cukierman Weighted		-0.039			-0.068***	
		[0.033]			[0.023]	
Total Modified Cukierman			-0.043			-0.071***
			[0.029]			[0.021]
Observations	198	198	198	149	149	149
Number of countries	19	19	19	19	19	19
Rho	0.6	0.6	0.6	0.44	0.44	0.44

Standard errors in brackets
 * significant at 10%; ** significant at 5%; *** significant at 1%
This table presents the results of panel regressions for the whole sample of countries during 1990–2002, excluding (eight) hyperinflation episodes. The dependent variable is inflation (π), scaled as $\pi/(1+\pi)$. The coefficients were estimated using Feasible Generalized Least Squares, allowing for heteroscedasticity across countries and an AR(1) autocorrelation structure within countries, with a (Rho) coefficient common to all countries. The target variables are the three indexes of CBI. Columns [1] to [3] use the contemporaneous indexes of CBI. Columns [4] to [6] use the (three-lag) indexes of CBI. Control variables include a Dummy Banking Crises, which equals one during years with banking crises and zero elsewhere, A Dummy Regime, which equals one during periods of fixed exchange regimes and zero elsewhere, World Inflation, measured by the average inflation of industrial countries, and an Index of Structural Reforms which varies in the interval [0, 1] with higher values indicating deeper economic reforms.

To check for the possibility of lagged effects associated with changes in central bank legislation, the regressions were computed again exploring various combinations, with one to four lags for the indexes of CBI. The use of lagged values may also contribute to reduce the possibility of reverse causality mentioned previously. With this treatment, the coefficients of CBI became statistically significant again for three- and four-lag specifications (columns [4]-[6] in Table 7). As a robustness check, parallel regressions were computed using one to four lags for both the indexes of CBI and structural reforms, with similar results. An alternative specification, including an interactions term between the CBI indexes and the structural reform index, produced non-significant coefficients possibly due to multicollinearity, and was rejected.[18] All these conclusions hold when the sample is restricted to the LAC sub-sample, which includes most of the reform countries.

Overall, these results point to the complementary nature of various aspects of economic reform, and are consistent with the hypothesis that both structural reform and increased CBI played a role in disinflation in the sampled countries during the 1990s. However, a causal relationship running from central bank reform to inflation performance cannot be established from these exercises, due to the possibility of reverse causality. In fact, the use of lagged CBI may not be sufficient to correct the potential endogeneity of central bank reform, especially since inflation tends to display inertia.

C. Accounting for Endogeneity

A more appropriate treatment to account for the possible endogeneity of central bank reform requires the use of instrumental variables. This section uses two alternative methods: Generalized Two Stage Least Squares (G2SLS) developed by Balestra and Varadharajan-Krishnakumar (1987) and Error Correction Two-Stage Least Squares (EC2LSL) described in Balgati and Chang (2000). In both cases, lagged values of the MCI were used as instruments for CBI. The results of the first stages, not reported, suggested that the instrument was appropriate, with the associated coefficient significant at the one-percent level in all cases.

The regressions are presented in Table 8. Those in columns [1] and [2] treat CBI as endogenous and apply the Swamy and Arora (1972) estimators of the variance components, which include a small-sample correction. The use of a random-effects estimator requires accepting that the idiosyncratic error term is uncorrelated with the set of explanatory variables, which is a strong assumption given the nature of the data. However, the Hausman (1978) specification test was unable to reject the null of coefficient equality between the random- and the fixed-effects models in all cases, as indicated by the p-values reported at the bottom of the table. As before, the results indicate that inflation in the sampled countries is positively correlated with world inflation, higher during banking crises, and negatively correlated with structural reforms. However, the coefficient of CBI became not significant.

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[18] The correlation between the indexes of central bank independence and the interaction term exceeded 0.92 in all cases.

Table 8. Panel Regressions of Inflation on MCI Using Instrumental Variables

	[1] G2SLS instrumented: mct	[2] EC2SLS instrumented: mct	[3] G2SLS instrumented: sr mct	[4] EC2SLS instrumented: sr mct	[5] G2SLS instrumented: sr mct	[6] EC2SLS instrumented: sr mct
Dummy Banking Crises	0.117***	0.102***	0.112***	0.097***	0.124***	0.108***
	[0.028]	[0.026]	[0.028]	[0.026]	[0.029]	[0.027]
Dummy Exch. Regime	-0.056**	-0.073***	-0.054**	-0.070***	-0.060***	-0.074***
	[0.024]	[0.021]	[0.024]	[0.022]	[0.022]	[0.020]
World Inflation (in percent)	0.030**	0.037***	0.028**	0.032***	0.029**	0.033***
	[0.013]	[0.012]	[0.013]	[0.012]	[0.013]	[0.012]
Index Structural Reform	-0.444***	-0.547***	-0.483***	-0.643***	-0.524***	-0.643***
	[0.129]	[0.114]	[0.158]	[0.131]	[0.137]	[0.119]
Total Modified Cukierman	-0.100	0.070	-0.109	0.068	-0.073	0.072
	[0.109]	[0.062]	[0.117]	[0.063]	[0.096]	[0.057]
Observations	149	149	149	149	149	149
Number of countries	19	19	19	19	19	19
R-Sq. within	0.25	0.25	0.25	0.24	0.25	0.24
R-Sq. between	0.49	0.60	0.47	0.59	0.53	0.60
R-Sq. overall	0.36	0.41	0.35	0.41	0.38	0.41
Estimator of variance	S-A	S-A	S-A	S-A	B-C	B-C
Ho: Difference in coef. not systematic						
(p-values)	0.433		0.509		0.286	

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

This table presents the results of panel regressions for the whole sample of countries during 1990–2002, excluding (eight) hyperinflation episodes. The dependent variable is inflation (π), scaled as $\pi/(1+\pi)$. The regressions were computed using instrumental variables, to account for the possible endogeneity of Central Bank Independence and Structural Reforms. Two estimation methods were used: Generalized Two-Stage least Squares (G2SLS) and Error Correction Two-Stage least Squares (EC2SLS), each combined with two different estimators of the variance components: the Swamy and Arora (1972, S-A), which contains a small sample correction, and the consistent estimators proposed by Balgati and Chang (2000, B-C). In columns [1] and [2] CBI was instrumented by the lagged values of the MCI, while columns [3] to [6] further instrument structural reforms by its lagged values. Control variables include a Dummy Banking Crises, which equals one during years with banking crises and zero elsewhere, A Dummy Regime, which equals one during periods of fixed exchange regimes and zero elsewhere, and World Inflation, measured by the average inflation of industrial countries.

While the case of reverse causality from inflation to structural reforms is less likely, parallel regressions are presented in columns [3] and [4], treating as endogenous both CBI and structural reforms (the latter also instrumented by its lagged values). The regressions reported in columns [5] and [6], use the Balgati and Chang (2000) consistent estimator of the variance components. In both cases, the results are qualitatively similar to those discussed previously.

Summing up, these regressions fail to show a significant causal relation running from CBI to inflation in all cases, and indicate that the negative coefficients of CBI reported in the previous section are biased downwards, due to the possible endogenous nature of central bank reform. Similar conclusions were obtained using the other two indexes of CBI (not reported). At face value, these results suggest that the extraordinary reduction in inflation achieved in Latin America and the Caribbean during the nineties is probably attributable to a broad range of economic policies, with a negligible role to the legal central bank reform. A

remaining caveat, however, is the validity of these indexes to account for the evolution of effective CBI.

V. CONCLUDING REMARKS

After two decades of high inflation, most countries in Latin America and the Caribbean entered into a phase of more prudent macroeconomic management in the 1990s, with the aim of reducing inflation and improving economic performance. A far-reaching reform of central bank legislation was adopted in many countries to strengthen central bank autonomy from the government and facilitate the control of inflation.

Based on the assessment of central bank charters and the relevant part of constitutions in 24 Latin American and Caribbean countries during the 1990s, three conclusions emerge. First, a comparison of legal CBI in the sampled countries shows significant regional differences between LAC and CAR countries. Central bank reform was widely implemented in LAC during the 1990s, but largely absent among CAR countries. As a result, most central bank in LAC today enjoy higher formal operational and political independence, while CAR central banks are still politically dependent on the executive branch. Leaving aside a few hyperinflationary episodes in LAC, however, inflation performance in LAC and CAR countries did not differ much during the 1990s.

Using three alternative indexes of legal CBI and after controlling for international inflation, the exchange regime, and the occurrence of banking crises, a negative correlation between legal CBI and inflation is obtained. This result survives the inclusion of an index of structural reforms that illustrates the complementary nature of various aspects of economic reform.

Taking into account the possible endogeneity of central bank reform, however, the results fail to support the existence of a causal relationship running from legal CBI to inflation. This suggests that the extraordinary reduction in inflation achieved in the region during the 1990s is probably due to a combination of policies and cannot be attributed to legal central bank reforms, which warns against excessive optimism on the effects of legal central bank independence on inflationary performance. On the other hand, an important caveat remains, since the indexes of CBI used in this paper are, at best, imperfect measures of effective CBI.

Structure of the Cukierman and the "*Modified Cukierman*" Indexes

Cukierman Index Criteria (weights)	Values	"Modified Cukierman" Index Criteria (weights)	Values
Central Bank CEO (0.20)		**Central Bank Board (0.20)**	
1. Term of office of CEO (0.25)		*1. Term of office of Governor(0.20)*	
- Equal or more than 8 years	1	- More than presidential period	1
- 6 years or more but less than 8 years	0.75	- The period does not coincide	0.67
- Equal to 5 years	0.50	- Same period as the executive branch	0.33
- Equal to 4 years	0.25	- Less than executive branch or not	0
- Less than 4 years	0	specified in the law	
2. Who appoints the CEO (0.25)		*2. Who appoints the Governor (0.20)*	
- The Central Bank Board	1	- Double process (Executive/Legislative),	1
- Council composed by executive and	0.75	or through the Central Bank Board if also	
legislative branch and Central Bank Board		appointed in a double process, or for longer	
- By legislative branch	0.50	or overlapped periods with respect to the	
- By executive branch	0.25	executive branch	
- By one or two members of executive	0	- The executive branch directly or through	0
branch		the Central Bank Board, when this is	
		directly appointed by the executive branch	
3. Provisions for dismissal of CEO (0.25)			
- No provision	1	*3. Appointment and term of office rest of*	
- Only for non-policy reasons (e.g., incapa-	0.83	*the Board (0.20)*	
bility, or violation of law)		- More than presidential period or for a	1
- At a discretion of Central Bank Board	0.67	non-defined period	
- For policy reasons at legislative branch's	0.50	- For the same period as the President of the	0.75
discretion		Republic with overlap	
- At legislative branch's discretion	0.33	- Double process for the same period	0.50
- For policy reasons at executive branch's	0.17	- Executive and private sector appoint the	0.25
discretion		majority of directors for same period or less	
- At executive branch's discretion	0	- Executive branch appoints the majority	0
		for the same period or less	
4. CEO allowed to hold another office in			
government (0.25)		*4. Dismissal of Board members (0.30)*	
- Prohibited by law	1	- Double process approved by the Senate or	1
- Not allowed unless authorized by executive	0.5	by a qualified majority and for violations	
branch		codified in legislation	
- No prohibition for holding another office	0	- By an independent Central Bank Board	0.75
		- Double process with simple majority,	0.50
		based on policy decisions or due to	
		subjective reasons	
		- By executive branch or subordinated	0.25
		Central Bank Board due to legal reasons	
		- By executive branch or subordinated	0
		Central Bank Board due to policy or	
		subjective reasons, or no legal provision	
		5. CEO allowed to hold another office in	
		government (0.10)	
		- Prohibited by law	1
		- Not allowed unless authorized by	0.5

	executive branch
	- No prohibition for holding another office 0

Central Bank objectives (0.15)

5. Central Bank objectives
- Price stability is the only or major goal, and in case of conflict with government, the Central Bank has final authority   1
- Price stability is the only goal   0.8
- Price stability along with other objectives that do not seem to conflict with the former   0.6
- Price stability along with other objectives of potentially conflicting goals (e.g., full employment)   0.4
- Central Bank charter does not contain any objective   0.2
-Some goals appear in the charter but price stability is not one of them   0

Policy formulation (0.15)

6. Who formulates monetary policy (0.25)
- Central Bank has the legal authority   1
- Central Bank participates together with government   0.67
- Central Bank in an advisory capacity   0.33
- Government alone formulates monetary policy   0

7. Government directives and resolution of conflicts (0.50)
- Central Bank given final authority over issues defined in the law as objectives   1
- Government has final authority over issues not clearly defined as Central Bank goals   0.8
- Final decision up to a council whose members are from the Central Bank, executive branch, and legislative branch   0.6
- Legislative branch has final authority   0.4
- Executive branch has final authority, but subject to due process and possible protest by Central Bank   0.2
- Executive branch has unconditional authority over policy   0

8. Central Bank given active role in formulation of government's budget (0.25)
- Yes   1
- No   0

Central Bank objectives (0.15)

6. Fundamental objective (1.00)
- Price stability is the single or primary objective   1
- Price stability together with non-conflicting objectives but without priority   0.75
- Price stability plus others goals including stability of financial system that may conflict with the former, without priority   0.50
- Price stability together with objective of economic growth / economic development with no priority   0.25
- Objectives do not include price stability   0

Policy formulation (0.15)

7. Who formulates monetary policy (0.50)
- Central Bank has the legal authority   1
- Executive branch holds the final decision on exchange rate policy   0.67
- Central Bank participates on monetary policy formulation in an advisory capacity or faces legal limitations on monetary instruments or interest rates   0.33
- Government formulates monetary policy alone   0

8. *Government directives and resolution of conflicts (0.30)*
- Central Bank given final authority over issues defined in the law as objectives   1
- Government has final authority over issues not clearly defined as Central Bank goals   0.8
- Final decision up to a council whose members are from the Central Bank, executive branch, and legislative branch   0.6
- Legislative branch has final authority   0.4
- Executive branch has final authority, but subject to due process and possible protest by Central Bank   0.2
- Executive branch has unconditional authority over policy   0

9. Central Bank involvement in debt approval (0.20)
- Approves government debt   1

		- Legally required to provide opinion on technical aspects	0.5
		- No involvement at all	0

Central Bank lending (0.50)

9. Limitations on advances (0.30)

- Advances to government prohibited	1
- Permitted but subject to limits in terms of absolute cash amounts or relative limits (government revenues)	0.67
- Permitted subject to relatively accommodative limits (more than 15 percent of government revenues)	0.33
- No legal limitations on advances. Subject to negotiations with government	0

10. Limitations on securitized lending (0.20)
- The same as in 9

11. Who decides control of terms of lending to government (0.20)

- Central bank controls terms and conditions	1
- Terms of lending specified in law, or Central Bank given legal authority to set conditions	0.67
- Law leaves decision to negotiations between the Central Bank and government	0.33
- Executive branch alone decides and imposes to the Central Bank	0

12. Beneficiaries of Central Bank lending (0.10)

- Only central government	1
- Central and state governments, as well as further political subdivisions	0.67
- Also public enterprises can borrow	0.33
- Central Bank can lend to all of the above and to the private sector	0

13. Type of limits when they exist (0.05)

- As an absolute cash amount	1
- As a percentage of Central Bank capital or other liabilities	0.67
- As a percentage of government revenues	0.33
- As a percentage of government expenditure	0

14. Maturity of loans (0.05)

- Limited to a maximum of 6 months	1
- Limited to a maximum of 1 year	0.67
- Limited to a maximum of more than one year	0.33
- No legal upper bounds	0

Central Bank lending (0.40)

10. Limitations on advances (0.15)

- Advances to government prohibited	1
- Limited by small percentage of government revenues or by monetary program	0.67
- Allowed under lax limits (more than 15 percent of government revenues	0.33
- Allowed without limits	0

11. Lending to Government (0.30)

- Not allowed	1
- In the secondary market with restricted limits	0.75
- In the secondary market with lax or without limits	0.50
- In the primary market with limits or approved by Central Bank Board with a qualified majority	0.25
- In the primary market without limits	0

12. Who decides financing conditions to government (0.10)

- Central Bank defines terms and conditions	1
- Defined by law	0.67
- The law allows negotiations between government and Central Bank	0.33
- Executive decides independently	0

13. Beneficiaries of Central Bank financing (0.10)

- Only the government	1
- Government plus local governments	0.67
- All of the above plus public enterprises	0.33
- All of the above and to the private sector	0

14. Interest rates in advances or lending (0.10)

- At market rates	1
- Interest rates not specified in law	0.5
- At below market rates	0

15. LOLR (0.15)

- For liquidity purposes with limitations (up to 180 days or up to banks' equity), or no legal provision for emergency lending.	1
- For liquidity at conditions defined by the central bank	0.75
- Provisions for constructive ambiguity or	0.50

15.Restrictions on interest rates (0.05)
- Must be at market rate — 1
- On loans to government can not be lower than a certain floor — 0.75
- Interest rate on Central Bank loans can not exceed a certain ceiling — 0.50
- No explicit legal provisions regarding interest rate in Central Bank loans — 0.25
- No interest rate charge on government's borrowing from Central Bank — 0

16. Prohibition on Central Bank lending in primary market to Government (0.05)
- Prohibition from buying government securities in primary market — 1
- No prohibition — 0

rediscount of commercial bank loans
- Open assistance to cope with solvency problems — 0.25
- To finance bank restructuring and/or paying deposit insurance — 0

16. Financial autonomy (0.10)
- Government should maintain central capital integrity — 1
- Government is legally allowed to capitalize the central bank — 0.67
- The law does not allow the government to capitalize the central bank — 0.33
- The Central Bank conducts quasi-fiscal operations. — 0

Accountability (0.10)

17. Accountability of Central Banks (0.75)
- Reports to executive branch and informs at least annually to Congress — 1
- Reports to the executive once a year and submits an annual report to Congress — 0.75
- Annual report to the executive. Informs to the executive branch whenever fundamental disequilibria emerge, or reports through the media without specific periodicity — 0.50
- Issues annual report at specific time — 0.25
- Distributes an annual report without establishing particular period of time for it — 0

18. Central Bank transparency (0.25)
- Discloses detailed financial statements at least once a year with a certification of an independent auditor — 1
- Discloses consolidated financial statements at least once a year with seal of the Banking Superintendent or other public sector authority — 0.75
- Discloses financial statements at least once a year, certified by an internal auditor — 0.50
- Publishes partial financial statements — 0.25
- Does not publish financial statements or the law authorizes the central bank to deviate from international accounting standards — 0

GMT Index and the Independence of Central Banks
(Latin America and the Caribbean)

	Arg-0	Arg-1	Bah	Bar	Bel	Bol-0	Bol-1	Bra	Chi	Col-0	Col-1	CR-0	CR-1
Index of Political Independence	**0**	**8**	**4**	**3**	**3**	**2**	**7**	**5**	**7**	**4**	**4**	**4**	**6**
Government does not appoint Governor	0	1	0	0	0	0	1	1	1	1	1	1	0
Governor in office > 5 years	0	1	0	0	0	0	1	1	0	0	0	0	0
Government does not appoint Board	0	1	0	0	0	0	1	1	1	0	0	0	1
Board in office > 5 years	0	1	0	0	0	0	0	1	1	0	0	0	1
Government participation in Board	0	1	1	1	1	0	1	0	1	0	0	0	1
Government does not approve mon. policy	0	1	1	1	1	1	1	0	1	1	1	1	1
Legal Mandate mon.stability	0	1	1	1	1	0	1	1	1	1	1	1	1
Conflict Resolution	0	1	1	0	0	1	1	0	1	1	1	1	1
Index of Economic Independence	**6**	**5**	**4**	**4**	**4**	**5**	**6**	**5**	**7**	**4**	**6**	**5**	**5**
Direct credit not automatic	1	0	0	0	0	0	0	0	1	1	1	1	0
Market interest rates	0	1	0	1	1	0	1	1	1	0	1	1	1
Temporary	1	1	1	1	1	1	1	1	1	1	1	1	1
Limited amount	1	1	1	0	1	1	1	1	1	0	0	0	1
Primary market participation	1	1	0	0	0	1	1	0	1	1	1	1	1
Discount rate set by Cent. Bank	1	1	1	1	1	1	1	1	1	1	1	1	1
Banking supervison reponsibility	1	0	1	1	0	1	1	1	1	0	1	1	0
Total GMT	**6**	**13**	**8**	**7**	**7**	**7**	**13**	**10**	**14**	**8**	**10**	**9**	**11**

GMT Index and the Independence of Central Banks (Continued)
(Latin America and the Caribbean)

	DR	Ecu-0	Ecu-1	ES-0	ES-1	Gua	Guy-0	Guy-1	Hon-0	Hon-1	Jam	Mex-0	Mex-1
Index of Political Independence	4	3	4	5	4	3	4	4	4	4	3	3	8
Government does not appoint Governor	0	1	1	0	0	0	0	0	0	0	0	0	1
Governor in office > 5 years	1	0	0	0	0	0	0	0	1	0	0	1	1
Government does not appoint Board	0	0	0	1	1	1	0	0	1	0	0	0	1
Board in office > 5 years	1	0	0	0	0	0	0	0	0	0	0	0	1
Government participation in Board	0	0	0	1	0	0	1	1	0	1	0	0	1
Government does not approve mon. policy	1	1	1	1	1	1	1	1	1	1	1	0	1
Legal Mandate mon.stability	0	0	1	1	1	0	1	1	0	1	1	1	1
Conflict Resolution	1	1	1	1	1	1	1	1	1	1	1	1	1
Index of Economic Independence	4	5	7	2	7	5	4	5	4	6	3	3	5
Direct credit not automatic	0	0	1	0	1	1	0	1	0	0	0	0	0
Market interest rates	1	0	1	0	1	1	0	1	1	1	0	0	1
Temporary	0	1	1	1	1	1	1	1	1	1	1	0	1
Limited amount	1	1	1	0	1	1	1	1	1	1	1	1	1
Primary market participation	0	1	1	0	1	0	0	0	0	1	0	0	0
Discount rate set by Cent. Bank	1	1	1	1	1	1	1	1	1	1	1	1	1
Banking supervison reponsibility	1	1	1	0	1	0	1	0	0	1	0	1	1
Total GMT	8	8	11	7	11	8	8	9	8	10	6	6	13

GMT Index and the Independence of Central Banks (Concluded)
(Latin America and the Caribbean)

	Nic-0	Nic-1	Par-0	Par-1	Per-0	Per-1	Sur	T&T	Uru-0	Uru-1	Ven-0	Ven-1
Index of Political Independence	3	3	4	6	5	6	2	4	4	5	3	6
Government does not appoint Governor	0	0	0	1	1	1	0	0	1	1	0	1
Governor in office > 5 years	0	0	0	0	0	0	0	0	0	0	0	1
Government does not appoint Board	0	0	0	1	1	1	0	0	1	1	0	0
Board in office > 5 years	0	0	0	0	0	0	0	0	0	0	0	1
Government participation in Board	0	0	1	1	1	1	0	1	1	1	0	0
Government does not approve mon. policy	1	1	1	1	1	1	0	1	1	1	1	1
Legal Mandate mon.stability	1	1	1	1	0	1	1	1	0	1	1	1
Conflict Resolution	1	1	1	1	1	1	1	1	0	0	1	1
Index of Economic Independence	6	6	3	5	5	7	4	4	3	5	4	6
Direct credit not automatic	0	0	0	0	0	1	0	0	0	1	0	1
Market interest rates	1	1	0	1	0	1	0	0	0	1	0	1
Temporary	1	1	1	1	1	1	1	1	1	1	1	1
Limited amount	1	1	1	1	1	1	1	1	1	1	1	1
Primary market participation	1	1	0	1	1	1	0	0	0	0	0	0
Discount rate set by Cent. Bank	1	1	1	1	1	1	1	1	1	1	1	1
Banking supervison reponsibility	1	1	0	0	1	1	1	1	0	0	1	1
Total GMT	9	9	7	11	10	13	6	8	7	10	7	12

Cukierman Index and the Independence of Central Banks
(Latin America and the Caribbean)

	Arg-0	Arg-1	Bah	Bar	Bel	Bol-0	Bol-1	Bra	Chi	Col-0	Col-1	CR-0	CR-1
Central Bank Governor	0.625	0.770	0.583	0.418	0.480	0.625	0.688	0.563	0.708	0.355	0.770	0.730	0.333
Term of office	0.25	0.75	0.5	0.5	0.5	0.25	0.75	0.75	0.5	0	0.25	0.25	0.25
Who appoints	0.25	0.5	0	0	0.25	0.25	0.5	0.5	0.5	0.75	1	1	0.25
Dismissal	1	0.83	0.83	0.17	0.17	1	0.5		0.83	0.67	0.83	0.67	0.83
Other responsibilities	1	1	1	1	1	1	1	0	1	0	1	1	0
Central Bank primary objective	**0.4**	**1**	**0.6**	**0.6**	**0.4**	**0**	**0.8**	**0**	**0.6**	**0.2**	**1**	**0.4**	**0.6**
Price stability	0.4	1	0.6	0.6	0.4	0	0.8	0	0.6	0.2	1	0.4	0.6
Policy Formulation	**0.083**	**0.750**	**0.550**	**0.550**	**0.268**	**0.750**	**0.750**	**0.368**	**0.750**	**0.750**	**0.750**	**0.668**	**0.750**
Who formulates monetary policy	0.33	1	1	1	0.67	1	1	0.67	1	1	1	0.67	1
Conflict resolution	0	1	0.6	0.6	0.2	1	1	0.4	1	1	1	1	1
Central Bank role governm. Budget	0	0	0	0	0	0	0	0	0	0	0	0	0
Central Bank lending	**0.440**	**0.784**	**0.480**	**0.563**	**0.631**	**0.479**	**0.868**	**0.596**	**1.000**	**0.467**	**0.735**	**0.814**	**0.839**
Limits in advances to governm.	0.33	1	0.67	0.67	0.67	0.67	0.67	0.67	1	0.67	0.67	1	1
Limits in loans to government	0.33	0.33	0.67	0.33	0.67	0.33	1	0.33	1	0.33	0.67	0.67	0.67
Who decides terms of lending	0.67	0.67	0.33	1	1	0.33	1	1	N/A	0.67	1	0.67	0.67
Beneficiaries	0.33	1	0.33	0.33	0.33	1	1	0.33	N/A	0.33	1	1	1
Type of limits	0.33	0.67	0.67	0.67	0.67	0.67	0.67	0.33	N/A	0.67	0	0.67	0.67
Maturity of loans	0.67	N/A	0	0.33	0.33	0	0.67	0.33	N/A	0.67	N/A	N/A	N/A
Restrictions on interest rates	0.5	1	0.25	0.25	0.25	0.25	1	0.25	N/A	0.5	1	0.25	0.75
Prohibition lending to government	1	1	0	0	0	0	1	1	1	0	0	1	1
Cukierman weighted	**0.417**	**0.808**	**0.529**	**0.537**	**0.511**	**0.477**	**0.804**	**0.465**	**0.844**	**0.447**	**0.784**	**0.713**	**0.689**
Political Independence	**1.025**	**1.770**	**1.183**	**1.018**	**0.880**	**0.625**	**1.488**	**0.563**	**1.308**	**0.555**	**1.770**	**1.130**	**0.933**
Economic Independence	**0.523**	**1.534**	**1.030**	**1.113**	**0.898**	**1.229**	**1.618**	**0.963**	**1.750**	**1.217**	**1.485**	**1.482**	**1.589**

Cukierman Index and the Independence of Central Banks (Continued)
(Latin America and the Caribbean)

	DR	Ecu-0	Ecu-1	ES-0	ES-1	Gua	Guy-0	Guy-1	Hon-0	Hon-1	Jam	Mex-0	Mex-1
Central Bank Governor	0.708	0.668	0.730	0.395	0.418	0.355	0.480	0.645	0.645	0.520	0.500	0.500	0.813
Term of office	1	0	0.25	0.5	0.5	0.25	0.5	0.5	0.75	0.25	0.5	0.75	0.75
Who appoints	0	1	1	0.25	0	0	0.25	0.25	0	0	0	0.25	0.5
Dismissal	0.83	0.67	0.67	0.83	0.17	0.17	0.17	0.83	0.83	0.83	1	1	1
Other responsibilities	1	1	1	0	1	1	1	1	1	1	0.5	0	1
Central Bank primary objective	**0**	**0**	**0.6**	**0.6**	**0.8**	**0**	**0.4**	**0.4**	**0**	**0.6**	**0.4**	**0.4**	**0.8**
Price stability	0	0	0.6	0.6	0.8	0	0.4	0.4	0	0.6	0.4	0.4	0.8
Policy Formulation	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.583	0.750
Who formulates monetary policy	1	1	1	1	1	1	1	1	1	1	1	0.33	1
Conflict resolution	1	1	1	1	1	1	1	1	1	1	1	1	1
Central Bank role governm. Budget	0	0	0	0	0	0	0	0	0	0	0	0	0
Central Bank lending	0.361	0.513	1.000	0.096	1.000	1.000	0.521	0.783	0.294	0.735	0.277	0.377	0.719
Limits in advances to governm.	0.33	0.67	1	0	1	1	0.67	1	0.33	0.67	0.33	0.33	0.67
Limits in loans to government	0.33	0.33	1	0	1	1	0.33	0.33	0.33	0.67	0.33	0.33	0.67
Who decides terms of lending	0.67	1	N/A	0	N/A	N/A	0.33	1	0.33	1	0.33	0.33	1
Beneficiaries	0.33	0	N/A	0.33	N/A	N/A	1	1	0	0.33	0	0.67	1
Type of limits	0.33	0.33	N/A	0.33	N/A	N/A	0.33	0.67	0.33	0.33	0.33	0.33	0.67
Maturity of loans	0	0.33	N/A	0.67	N/A	N/A	0.67	0.67	0.67	1	0.33	0	
Restrictions on interest rates	0.25	0.25	N/A	0.25	N/A	N/A	0.75	1	0.25	1	0.25	0.25	1
Prohibition lending to government	0	0	1	0	1	1	0	0	0	1	0	1	0
Cukierman weighted	0.435	0.502	0.849	0.329	0.816	0.684	0.529	0.693	0.388	0.674	0.411	0.436	0.754
Political Independence	0.708	0.668	1.330	0.995	1.218	0.355	0.880	1.045	0.645	1.120	0.900	0.900	1.613
Economic Independence	1.111	1.263	1.750	0.846	1.750	1.750	1.271	1.533	1.044	1.485	1.027	0.960	1.469

Cukierman Index and the Independence of Central Banks (Concluded)
(Latin America and the Caribbean)

	Nic-0	Nic-1	Par-0	Par-1	Per-0	Per-1	Sur	T&T	Uru-0	Uru-1	Ven-0	Ven-1
Central Bank Governor	0.375	0.375	0.418	0.583	0.375	0.708	0.480	0.583	0.563	0.625	0.645	0.708
Term of office	0.5	0.5	0.25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Who appoints	0	0	0.25	0.5	0.5	0.5	0.25	0	0.25	0.5	0.25	0.5
Dismissal	0	0	0.17	0.33	0.5	0.83	0.67	0.83	0.5	0.5	0.83	0.83
Other responsibilities	1	1	1	1	0	1	0.5	1	1	1	1	1
Central Bank primary objective	0.4	0.6	0.4	0.6	0.4	1	0.4	0.4	0.2	0.6	0.4	0.6
Price stability	0.4	0.6	0.4	0.6	0.4	1	0.4	0.4	0.2	0.6	0.4	0.6
Policy Formulation	0.750	0.750	0.468	0.668	0.750	0.750	0.268	0.750	0.450	0.450	0.750	0.750
Who formulates monetary policy	1	1	0.67	0.67	1	1	0.67	1	1	1	1	1
Conflict resolution	1	1	0.6	1	1	1	0.2	1	0.4	0.4	1	1
Central Bank role governm. Budget	0	0	0	0	0	0	0	0	0	0	0	0
Central Bank lending	0.685	0.753	0.298	0.773	0.530	0.918	0.447	0.413	0.596	0.667	0.547	0.918
Limits in advances to governm.	0.67	0.67	0.33	0.67	0.67	1	0.67	0.67	1	1	0.67	1
Limits in loans to government	0.67	0.67	0	1	0	0.67	0.67	0.33	0.67	0.67	0.67	0.67
Who decides terms of lending	0.33	0.67	0.33	0.67	1	1	0.33	0.33	0.33	0.33	0.33	1
Beneficiaries	1	1	0.33	1	0.33	1	0	0	0.67	0.67	0.33	1
Type of limits	1	1	0.67	0.33	0.33	0.67	0.67	0.67	0.33	0.33	0.33	0.67
Maturity of loans	0.67	0.67	0.33	0.67	1	N/A	1	0.67	0	0.67	0.67	N/A
Restrictions on interest rates	1	1	0	0.75	0.25	1	0.25	0.25	0.25	1	0.25	1
Prohibition lending to government	1	1	1	1	1	1	0	0	0	0	1	1
Cukierman weighted	0.590	0.654	0.363	0.693	0.512	0.863	0.420	0.495	0.508	0.616	0.575	0.803
Political Independence	0.775	0.975	0.818	1.183	0.775	1.708	0.880	0.983	0.763	1.225	1.045	1.308
Economic Independence	1.435	1.503	0.766	1.440	1.280	1.668	0.715	1.163	1.046	1.117	1.297	1.668

"Modified Cukierman" Index and the Independence of Central Banks
(Latin America and the Caribbean)

	Arg–0	Arg–1	Bah	Bar	Bel	Bol–0	Bol–1	Bra	Chi	Col–0	Col–1	CR–0	CR–1
Government of the Central Bank	**0.416**	**1**	**0.241**	**0.166**	**0.384**	**0.166**	**0.8**	**0.6**	**0.934**	**0.05**	**0.884**	**0.241**	**0.341**
Term of office Governor	0.33	1	0.33	0.33	0.67	0.33	1	1	0.67	0	0.67	0.33	0.33
Who appoints the Governor	1	1	0	0	0	0	1	1	1	0	1	0	0
Appointment and term of Board	0.25	1	0	0	0.75	0	0.75	1	1	0.25	0.75	0	1
Dismissal of Governor and Board	0	1	0.25	0	0	0	0.5	0	1	0	1	0.25	0.25
Responsibilities of governor	1	1	1	1	1	1	0	0	1	0	1	1	0
Central Bank primary objective	**0.25**	**1**	**0.5**	**0.5**	**0.25**	**0**	**1**	**0.25**	**0.75**	**0**	**1**	**0.25**	**1**
Price stability	0.25	1	0.5	0.5	0.25	0	1	0.25	0.75	0	1	0.25	1
Policy formulation	**0.17**	**0.80**	**0.68**	**0.68**	**0.56**	**0.80**	**0.80**	**0.46**	**0.80**	**0.80**	**0.64**	**0.84**	**1**
Who formulates monetary policy	0.33	1	1	1	1	1	1	0.67	1	1	0.67	0.67	1
Conflict resolution	0	1	0.6	0.6	0.2	1	1	0.4	1	1	1	1	1
Central Bank and public debt	0	0	0	0	0	0	0	0	0	0	0	1	1
Central Bank lending	**0.37**	**0.64**	**0.62**	**0.51**	**0.61**	**0.40**	**0.77**	**0.50**	**0.82**	**0.35**	**0.76**	**0.70**	**0.79**
Advances to government	0.33	1	0.67	0.67	0.67	0.67	0.67	0.67	1	0.67	0.67	1	1
Loans to government	0.5	0.25	0.75	0.5	0.25	0.25	1	0.5	1	0.25	0.5	0.75	0.75
Beneficiaries of financing	0.33	1	0.33	0.33	0.33	0.33	1	0.33	N/A	0.33	1	1	1
Who decides terms of lending	0.67	0.67	0.33	1	1	0.67	1	1	N/A	0.67	1	0.67	0.67
Interest rates	0	1	0.5	0.5	0.5	0.5	1	0.5	N/A	0	1	0.5	1
LOLR	0.5	0.75	0.5	0.5	1	0.5	0	0.25	0	0.5	0.75	0.5	0.75
Financial autonomy Central Bank	0	0.33	1	0	1	0	0.67	0.33	0.67	0		0.33	0.33
Accountability	**0.1875**	**1**	**0.8125**	**0.8125**	**0.8125**	**0.125**	**0.88**	**0.69**	**1**	**0.1875**	**1**	**0.19**	**0.56**
Accountability norms	0	1	0.75	0.75	0.75	0	1	0.75	1	0	1	0.25	0.75
Transparency	0.75	1	1	1	1	0.5	0.5	0.5	1	0.75	1	0	0
Total Modified Cukierman	**0.314**	**0.825**	**0.553**	**0.495**	**0.523**	**0.326**	**0.825**	**0.496**	**0.846**	**0.289**	**0.827**	**0.510**	**0.739**
Political Independence	**0.121**	**0.350**	**0.123**	**0.108**	**0.114**	**0.033**	**0.310**	**0.158**	**0.299**	**0.010**	**0.327**	**0.086**	**0.218**
Economic Independence	**0.175**	**0.375**	**0.349**	**0.305**	**0.327**	**0.280**	**0.427**	**0.270**	**0.447**	**0.260**	**0.400**	**0.405**	**0.465**
Accountability	**0.019**	**0.100**	**0.081**	**0.081**	**0.081**	**0.013**	**0.088**	**0.069**	**0.100**	**0.019**	**0.100**	**0.019**	**0.056**

"Modified Cukierman" Index and the Independence of Central Banks (Continued)
(Latin America and the Caribbean)

	DR	Ecu-0	Ecu-1	ES-0	ES-1	Gua	Guy-0	Guy-1	Hon-0	Hon-1	Jam	Mex-0	Mex-1
Government of the Central Bank	0.6	0.3	0.216	0.141	0.291	0.291	0.234	0.459	0.65	0.466	0.416	0.066	0.866
Term of office Governor	1	1	0.33	0.33	0.33	0.33	0.67	0.67	1	0.33	0.33	0.33	0.33
Who appoints the Governor	0	0	0	0	0	0	0	0	0	0	0	0	1
Appointment and term of Board	0	0	0.25	0	0.25	0.25	0	0.75	0.25	0	0	0	1
Dismissal of Governor and Board	1	0	0	0.25	0.25	0.25	0	0.25	1	1	1	0	1
Responsibilities of governor	1	1	1	0	1	1	1	1	1	1	0.5	0	1
Central Bank primary objective	**0**	**0**	**0.75**	**0.75**	**1**	**0**	**0.25**	**0.5**	**0**	**0.75**	**0.25**	**0.25**	**1**
Price stability	0	0	0.75	0.75	1	0	0.25	0.5	0	0.75	0.25	0.25	1
Policy formulation	**0.80**	**0.84**	**0.84**	**0.90**	**0.8**	**1**	**0.8**	**0.635**	**0.835**	**1**	**0.635**	**0.465**	**0.64**
Who formulates monetary policy	1	0.67	0.67	1	1	1	1	0.67	0.67	1	0.67	0.33	0.67
Conflict resolution	1	1	1	1	1	1	1		1	1	1	1	1
Central Bank and public debt	0	1	1	0.5	0	1	0	0	1	1	0	0	0
Central Bank lending	**0.42**	**0.36**	**0.82**	**0.15**	**0.85**	**0.78**	**0.61**	**0.73**	**0.28**	**0.63**	**0.42**	**0.42**	**0.72**
Advances to government	0.33	0.67	1	0	1	1	0.67	0.67	0.33	0.67	0.33	0.33	0.67
Loans to government	0.5	0.25	1	0	1	1	0.25	0.5	0.25	0.75	0.25	0.5	0.75
Beneficiaries of financing	0.33	0	N/A	0.33	N/A	N/A	1	1	0	0.33	0	0.67	1
Who decides terms of lending	0.67	1	N/A	0	N/A	N/A	0.33	1	0.33	1	0.33	0.33	1
Interest rates	0.5	0.5	N/A	0.5	N/A	N/A	0.5	1	0.5	1	0.5	0.5	0.5
LOLR	0.5	0.25	0	0.25	0.25	0	1	0.5	0.25	0.25	1	0.25	0.5
Financial autonomy Central Bank	0	0	0.67	0.33	0.67	0.33	1	1	0.33	0.33	0.67	0.33	0.67
Accountability	**0.25**	**0.31**	**0.31**	**0.56**	**0.75**	**0.44**	**0.63**	**0.81**	**0.19**	**0.75**	**0.75**	**1.00**	**1**
Accountability norms	0.25	0.25	0.25	0.75	0.75	0.5	0.5	0.75	0	0.75	0.75	1	1
Transparency	0.25	0.5	0.5	0	0.75	0.25	1	1	0.75	0.75	0.75	1	1
Total Modified Cukierman	**0.435**	**0.362**	**0.639**	**0.393**	**0.745**	**0.565**	**0.510**	**0.634**	**0.385**	**0.682**	**0.461**	**0.388**	**0.805**
Political Independence	**0.120**	**0.060**	**0.156**	**0.141**	**0.208**	**0.058**	**0.084**	**0.167**	**0.130**	**0.206**	**0.121**	**0.051**	**0.323**
Economic Independence	**0.290**	**0.270**	**0.452**	**0.196**	**0.462**	**0.463**	**0.363**	**0.385**	**0.236**	**0.402**	**0.265**	**0.238**	**0.382**
Accountability	**0.025**	**0.031**	**0.031**	**0.056**	**0.075**	**0.044**	**0.063**	**0.081**	**0.019**	**0.075**	**0.075**	**0.100**	**0.100**

"Modified Cukierman" Index and the Independence of Central Banks (Concluded)
(Latin America and the Caribbean)

	Nic-0	Nic-1	Par-0	Par-1	Per-0	Per-1	Sur	T&T	Uru-0	Uru-1	Ven-0	Ven-1
Government of the Central Bank	**0.1**	**0.316**	**0.391**	**0.666**	**0.516**	**0.766**	**0.184**	**0.241**	**0.516**	**0.616**	**0.166**	**0.641**
Term of office Governor	0	0.33	0.33	0.33	0.33	0.33	0.67	0.33	0.33	0.33	0.33	0.33
Who appoints the Governor	0	0	0	1	1	1	0	0	1	1	0	1
Appointment and term of Board	0	0.75	0.75	0.75	0.5	0.5	0	0	0.5	0.5	0	1
Dismissal of Governor and Board	0	0	0.25	0.5	0.5	1	0	0.25	0.5	0.5	0	0.25
Responsibilities of governor	1	1	1	1	0	1	0.5	1	0	1	1	1
Central Bank primary objective	**0.5**	**0.75**	**0.25**	**0.5**	**0.25**	**1**	**0.25**	**0.25**	**0**	**0.5**	**0.25**	**0.5**
Price stability	0.5	0.75	0.25	0.5	0.25	1	0.25	0.25	0	0.5	0.25	0.5
Policy formulation	**0.80**	**0.80**	**0.88**	**0.74**	**0.80**	**0.80**	**0.40**	**0.90**	**0.46**	**0.72**	**0.74**	**0.74**
Who formulates monetary policy	1	1	1	0.67	1	1	0.67	1	0.67	1	0.67	0.67
Conflict resolution	1	1	0.6	1	1	1	0.2	1	0.4	0.4	1	1
Central Bank and public debt	0	0	1	0.5	0	0	0	0.5	0	0.5	0.5	0.5
Central Bank lending	**0.73**	**0.84**	**0.21**	**0.77**	**0.51**	**0.93**	**0.37**	**0.54**	**0.47**	**0.72**	**0.44**	**0.81**
Advances to government	0.67	0.67	0.33	0.67	0.67	1	0.67	0.67	1	1	0.67	1
Loans to government	0.5	0.75	0	1	0.5	0.75	0.25	0.5	0.5	0.75	0.5	0.5
Beneficiaries of financing	1	1	0	1	0.33	1	0.33	0.33	0.67	0.67	0.33	1
Who decides terms of lending	0.33	0.67	0.33	1	1	1	0	0.67	0.33	0.33	0.33	1
Interest rates	1	1	0.5	1	0.5	1	0.5	0.5	0	1	0.5	1
LOLR	1	1	0.5	0.25	0.5	1	0.5	0.5	0.25	0.75	0.5	0.75
Financial autonomy Central Bank	1	1	0	0.33	0	1	0.33	0.67	0.33	0.33	0	1
Accountability	**0.81**	**1.00**	**0.38**	**0.75**	**0.38**	**0.69**	**1.00**	**0.81**	**0.75**	**0.75**	**0.38**	**0.88**
Accountability norms	0.75	1	0.25	1	0.5	0.75	1	0.75	0.75	0.75	0.25	1
Transparency	1	1	0.75	0	0	0.5	1	1	0.75	0.75	0.75	0.5
Total Modified Cukierman	**0.590**	**0.733**	**0.368**	**0.702**	**0.502**	**0.862**	**0.380**	**0.519**	**0.435**	**0.669**	**0.395**	**0.726**
Political Independence	0.095	0.176	0.116	0.208	0.141	0.303	0.074	0.086	0.103	0.198	0.071	0.203
Economic Independence	0.413	0.457	0.215	0.419	0.323	0.490	0.206	0.352	0.256	0.396	0.287	0.435
Accountability	0.081	0.100	0.038	0.075	0.038	0.069	0.100	0.081	0.075	0.075	0.038	0.088

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