Banco Central de Chile
Documentos de Trabajo

Central Bank of Chile
Working Papers

N° 343

Diciembre 2005

THE 1990S INSTITUTIONAL REFORM OF MONETARY POLICY IN LATIN AMERICA

Agustín Carstens Luis I. Jácome

BANCO CENTRAL DE CHILE

CENTRAL BANK OF CHILE

La serie Documentos de Trabajo es una publicación del Banco Central de Chile que divulga los trabajos de investigación económica realizados por profesionales de esta institución o encargados por ella a terceros. El objetivo de la serie es aportar al debate temas relevantes y presentar nuevos enfoques en el análisis de los mismos. La difusión de los Documentos de Trabajo sólo intenta facilitar el intercambio de ideas y dar a conocer investigaciones, con carácter preliminar, para su discusión y comentarios.

La publicación de los Documentos de Trabajo no está sujeta a la aprobación previa de los miembros del Consejo del Banco Central de Chile. Tanto el contenido de los Documentos de Trabajo como también los análisis y conclusiones que de ellos se deriven, son de exclusiva responsabilidad de su o sus autores y no reflejan necesariamente la opinión del Banco Central de Chile o de sus Consejeros.

The Working Papers series of the Central Bank of Chile disseminates economic research conducted by Central Bank staff or third parties under the sponsorship of the Bank. The purpose of the series is to contribute to the discussion of relevant issues and develop new analytical or empirical approaches in their analyses. The only aim of the Working Papers is to disseminate preliminary research for its discussion and comments.

Publication of Working Papers is not subject to previous approval by the members of the Board of the Central Bank. The views and conclusions presented in the papers are exclusively those of the author(s) and do not necessarily reflect the position of the Central Bank of Chile or of the Board members.

Documentos de Trabajo del Banco Central de Chile
Working Papers of the Central Bank of Chile
Agustinas 1180
Teléfono: (56-2) 6702475; Fax: (56-2) 6702231

Documento de Trabajo
N° 343

Working Paper
N° 343

THE 1990S INSTITUTIONAL REFORM OF MONETARY POLICY IN LATIN AMERICA

Agustín Carstens
Fondo Monetario Internacional

Luis I. Jácome
Fondo Monetario Internacional

Resumen
El presente estudio analiza las reformas institucionales a la política monetaria en los países de América Latina desde comienzos de la década de 1990. Se plantea que el haber fortalecido la autonomía legal de los bancos centrales junto con la aplicación de políticas macroeconómicas, fue instrumental en la reducción de la inflación, que pasó desde tasas anuales de tres dígitos en los años noventa, a un solo dígito en el 2004. El artículo también revisa los principales desafíos actuales que enfrenta la política monetaria, tales como lograr la estabilidad de precios, recobrar la confianza de los mercados en sus respectivas monedas locales, y mantener la consistencia de las políticas a pesar de los efectos adversos de la volatilidad de los flujos de capitales. Por último, se identifican las crisis recurrentes de la banca y la falta de disciplina fiscal como los principales riesgos que ponen en peligro el éxito de la política monetaria en las economías latinoamericanas.

Abstract
This study takes stock of the institutional reform of monetary policy in Latin America since the early 1990s. It argues that strengthening the legal independence of central banks, together with macroeconomic policies, was instrumental in reducing inflation from three-digit annual rates in the 1990s to single-digit territory in 2004. The paper also discusses the main challenges of monetary policy today, namely, achieving price stability, restoring market confidence in domestic currencies, and sticking to policy consistency despite adverse effects of the volatility of capital flows. Finally, recurrent banking crises and lack of fiscal discipline are identified as the main potential risks for the success of monetary policy in Latin America.

Document presented at the First Monetary Policy Research Workshop in Latin America and the Caribbean on Monetary Policy Response to Supply and Asset Price Shocks, Santiago, Chile, November 17, 2005. The authors wish to thank Alain Ize, Robert Rennhack, and Roberto Steiner for their comments on a previous version of this document, and to Nada Oulidi for providing valuable research assistance.
E-mails: acarstens@imf.org; acome@imf.org.

I. INTRODUCTION

In 1990, average inflation in Latin America reached an unprecedented high of nearly 500 percent. Three of the largest countries in the region (Argentina, Brazil, and Peru) posted quadruple-digit inflation rates, and no country managed to achieve a single-digit rate. In contrast, by that time, industrial countries had already lowered inflation to an average of approximately 4 percent, while Asian countries had brought it down on average to 6 percent. At the same time, 1990 marked the end of a 10-year period in which per capita GDP in Latin America fell on average 0.1 percent annually. With standards of living in decline, the governments in the region faced the need to tackle inflation as a crucial precondition for restoring sustainable economic growth.

Central banks' reform was identified a key component of the new economic agenda in most Latin American countries. The objective of this reform was to restore confidence in monetary policy and thereby wage a successful war on inflation. To ensure the credibility of the reforms, Latin American governments decided to implement the institutional changes in a highly visible way, by passing special laws and, in some cases, by amending the national constitution. Hence, up to now new central bank legislation has been enacted—in some cases more than once—in every country but Brazil. Reforms of the central banks led to significant institutional strengthening and to changes in the design and execution of monetary policy.[2]

As a result of these reforms, Latin American central banks became more independent from their governments—to a greater degree in some countries than in others. The new legislation gave the central banks operational independence and prohibited their financing of the fiscal deficit, or at least severely restricted their ability to do so. With monetary policy independently managed, governments' chances of having potential expansionary policies associated with a country's political-business-cycle were markedly reduced. In exchange for this autonomy, central banks were held accountable with respect to their policy actions and decisions. Within the central banks, the legal reform encouraged changes both at the policy level and in the operational framework for the conduct of monetary policy.

Today, except for Costa Rica and Venezuela, the Latin American countries have brought inflation down to single digits. However, only Chile and Peru, and the dollarized Panama and Ecuador have managed to make their inflation rates converge to the international rate, as measured by the level of inflation in the industrial countries.

[2] Central bank reform was undertaken in Chile (1989), El Salvador (1991), Argentina (1992 and 2002), Colombia (1992), Nicaragua (1992 and 1999), Venezuela (1992, 1999, and 2002), Ecuador (1992 and 1998), Peru (1993), Mexico (1993), Bolivia (1995), Costa Rica (1995), Uruguay (1995), Paraguay (1995), Honduras (1996 and 2004), Guatemala (2001), and the Dominican Republic (2002). Although Brazil did not pass legislation to bring about reforms, it pursued social consensus in favor of the operational independence of the central bank and passed a Fiscal Responsibility Law, which strengthened the central bank's financial autonomy and accountability. Ecuador and El Salvador further reformed their central bank legislation in 2000 and 2001, respectively, but this time to adopt the U.S. dollar as legal tender.

The objective of this paper is twofold. First, to examine the nature of central banks' reform in Latin America since the early 1990s and its policy implications, and second, to identify the main challenges that central banks are still facing today. To this end, section II discusses the key aspects of the legal reform of Latin American central banks and reviews the main policy and operational changes adopted in the wake of the central bank reform. Section III quantifies the degree of legal independence granted to central banks in the region and ascertains its relationship with the downward inflation trend observed during the 1990s. Section IV identifies the key challenges facing Latin America's central banks and pinpoints the main threatens to the success of monetary policy. Section IV sets out the paper's main conclusions.

II. THE REFORM OF CENTRAL BANKS AND ITS AFTERMATH

Latin America's central banks are relatively young institutions. Not only did they come into being more than a century after the countries achieved independence, but they were established much later than their counterparts in Europe and the United States. Most Latin America's central banks were created in the 1920s and 1930s.[3]

In the course of their history, Latin American central banks experienced several reforms. Central banks' ownership evolved from a joint public and private sector participation to one of exclusive state control. The governing structure of central banks mirrored the nature of this ownership, since the initial mixed representation of both public and private sectors—including in the latter representatives of commercial banks and producers' associations—gradually shifted to a greater government involvement. The modality of formulation of monetary policy also changed, as governments started to play a larger role around the 1950s, using central banks to foster economic development. Thus, monetary policy instruments—such as credit regulation by economic activity and interest rates control—were aligned with governments' efforts to spur economic growth. In this environment, central banks rather played the role of development banks, and therefore, did not operate independently from policy-makers to formulate and execute monetary and exchange rate policy, with price stability being, at most, a secondary objective.

[3] The central banks of Chile, Colombia, Ecuador, Mexico, Bolivia, and Guatemala were all founded in the 1920s, whereas the central banks of Peru, Argentina, El Salvador, Costa Rica, and Venezuela were established in the 1930s. The central banks of Brazil and Uruguay as they exist today separated from other government agencies only in the 1960s.

A. The Institutional Reform

Starting with Chile in 1989, Latin America's central bank legislation was extensively amended with the aim of arresting inflation.[4] The reform implied an institutional strengthening of central banks based on four main criteria: (i) a clear mandate that places priority on maintaining price stability; (ii) political independence to design monetary policy; (iii) operational autonomy; and (iv) accountability with respect to the policy mandate.[5] The main features of this reform are discussed below, with applications to all countries in the region, except for the three formally dollarized economies (Ecuador, El Salvador, and Panama).

Central banks' objective

Today, all central bank laws in the region establish that the purpose of the central bank is to ensure price stability or currency stability. This the single mandate in seven countries while in other eight central banks are given other objectives as well, without defining priority, which in some cases potentially create policy conflicts (Table 1). This is the situation in Brazil, where, de jure, the central bank is also responsible for fostering or creating conditions conducive to growth and economic development.[6] When the objective of maintaining price stability is established together—with no indication of priority—with preserving the stability of the financial system (Guatemala, Paraguay, Uruguay), the central bank may also face potential conflicting objectives, in particular during periods of stress in the banking system.[7] A similar situation may arise when the central bank is equally responsible of maintaining the external value of the currency (Costa Rica and Honduras), which will be binding in times of large capital inflows. In any case, having multiple objectives makes more difficult to assess the accountability of central banks.

[4] The theoretical underpinnings of this reform—implemented in industrial and developing countries alike—are derived from the work of Kydland and Prescott (1977) and Barro and Gordon (1983), who showed that, when faced with a choice between higher inflation and lower unemployment, governments generally favored higher inflation. The institutional reform was, in a great extent, inspired in Rogoff's notion (Rogoff, 1985) of turning over monetary policy to a "conservative central banker," with the aim of reducing the so-called "inflation bias."

[5] Jácome (2003) summarizes the main features of central bank legislation in Latin America.

[6] Since the latter is a broad objective, the legal mandate of the central bank may give rise to differing interpretations when it comes to formulate monetary policy. In practice, this potential policy conflict has not been relevant, in particular since the issue of the inflation targeting executive decree in 1999.

[7] Although in countries like Argentina, Brazil, Paraguay, and Uruguay the central bank performs both monetary policy and financial supervision, the conventional wisdom claims that the objective of maintaining the stability of the financial system should be subordinated to that of maintaining price stability like in Argentina.

Table 1. Mandate of the Central Bank

Price stability as the sole or primary objective.	Price stability plus other objectives, with no indication of priority		
	Operation of the payment system.	Stability of the financial system or external stability of the currency.	Growth or economic development.
Argentina, Bolivia, Colombia, Dominican Republic, Mexico, Peru, Venezuela.	Chile, Nicaragua.	Costa Rica, Guatemala, Honduras, Paraguay, Uruguay.	Brazil.

Source: Latin American national constitutions and central bank legislation as of 2004.

Political autonomy

Following the institutional reform, Latin American central banks are more autonomous from governments although there is still room for improvement in a number of countries. In severing the link between the central bank and the executive branch, in some countries the reform expanded central banks' decision-making horizon such that monetary policy is not subordinated anymore to the countries' electoral calendars. As observed in Table 2, today central banks' board of directors are appointed for a tenure that exceeds or overlaps with the country's constitutional term, rarely including private sector representatives or from other public sector entities. What is more important, the law requires in many countries that the Congress confirm these appointments or, in some cases, to appoint them following executive branch nominations.[8] As a key feature of political independence, in a number of countries the new legislation specifies legal grounds for removing the governor and the members of the central bank board of directors and places the final decision in the hands of the legislative or the judicial branch.[9] Yet, in a number of cases, the legislation establishes grounds for removal of central bank governors and members of the board, which relate to policy decisions.

[8] In few countries, the law differentiates procedures for the central bank governor and its executive board, as the former is typically appointed and removed by the executive branch, while the latter is appointed and removed by the legislative branch.

[9] Guatemala is the emblematic case in point, as the Congress has the right to dismiss the governor of the central bank —with a qualified majority—if it considers that his annual appearance before the Legislature to report on the conduct of monetary policy and the achievement of its policy objective is not satisfactory (Article 60 of the Organic Law of the Bank of Guatemala).

Table 2. Political Autonomy

Tenure of the Board of Directors *vis à vis* the President of the Republic's Term of Office 1/			
Longer	Same length, but non-concurrent	Same length, shorter length, or not specified	
Argentina, Chile, Costa Rica, Mexico, Venezuela	Bolivia, Colombia, Guatemala	Brazil, Dominican Republic, Honduras, Nicaragua, Paraguay, Peru, Uruguay	
Structure of the Board			
No representation from the executive branch or the private sector.	The executive branch is represented directly through ministers of State.	In addition to the executive branch, the private sector is also represented.	
Argentina, Bolivia, Brazil, Chile, Honduras, Mexico, Paraguay, Peru, Uruguay.	Colombia, Costa Rica, Dominican Republic, Nicaragua, Venezuela.	Guatemala.	
Who Appoints or Confirms Members of the Board of Directors			
Legislative branch appoints and/or confirms	Executive branch alone	Between the executive and the legislative branch	With the involvement of the private sector
Argentina, Bolivia, Brazil, Chile, Costa Rica, Mexico, Paraguay, Uruguay.	Colombia, Dominican Republic, Honduras.	Peru, Venezuela.	Guatemala, Nicaragua.
Mechanism for Removal			
Strictly on legal grounds		On non-legal grounds or for economic policy reasons	
Argentina, Bolivia, Colombia, Dominican Republic, Mexico, Peru, Venezuela.		Brazil, Chile, Costa Rica, Guatemala, Honduras, Nicaragua, Paraguay, Uruguay.	
Who Decides upon Removal			
Legislative branch.	Executive branch alone.	Judicial branch or the executive board itself.	
Argentina, Chile, Mexico, Paraguay, Peru, Uruguay, Venezuela.	Bolivia, Brazil, Colombia, Costa Rica, Guatemala, Honduras, Nicaragua.	Dominican Republic.	

Source: Latin American national constitutions and central bank legislation as of 2004
1/ In some cases, such as Costa Rica, the governor of the central bank is appointed for the same term as the president, but the other members of the executive board are appointed for a longer term.

Operational independence

The autonomy to formulate and execute monetary policy is probably the most common feature of the central bank reform in Latin America. In particular, the reform assigned operational independence to central banks, which implied freedom to use all monetary instruments to achieve policy targets.[10] To strengthen operational autonomy, central banks

[10] In some countries (Mexico and Venezuela, for instance), the government has retained the power to co-participate in the formulation of exchange rate policy, which has the potential for interfering operational independence. However, this potential restriction is non-binding under flexible exchange rate regimes.

are severely restricted, and in some cases prohibited, of financing public expenditure (see Table 3).[11] The prohibition of monetizing the fiscal deficit reflects the consensus achieved in the region that financing the fiscal deficit has historically been the main root of the chronic inflation that afflicted the region.

Operational independence also implies that central banks are empowered to manage their own interest rates, thereby influencing commercial banks' interest rates, and those of other financial instruments.[12] Nonetheless, operational independence is some times undermined as a result of central banks' losses arising from the discharge of their functions. Given that in most countries in Latin America governments are not required to make up for central bank losses, or there is no statutory requirement for recapitalization if reported capital drops below zero (see Table 3), persistent large losses may undermine the operating independence of central banks and eventually curtail the effectiveness of monetary policy actions.[13, 14] In the event that operating losses become a perennial distortion, like in a number of central banks in the region, markets may cast doubts about central banks' long-term ability to preserve price stability.

There are other situations where central banks' autonomy to conduct monetary policy is restricted. An undesirable situation is that of Guatemala, where the national Congress approves the issue of central bank paper for open-market-operations purposes, a situation that may potentially inhibit the conduct of monetary policy. In addition, there are central banks that do not have financial independence as Congress approves their budget (like in Honduras and Paraguay), which may lead to a lack of the resources needed to accomplish their responsibilities.

[11] Nonetheless, the spirit of this restriction has been violated based on alternative legal grounds. A case in point is Venezuela, where the central bank law requires the central bank to transfer to the government unrealized profits associated to the revaluation of international reserves. Another violation occurs in countries where the annual budget approved by law in Congress requires central banks to make transferences to the government, like in Honduras and Paraguay, for example.

[12] Exactly how interest rates respond to actions taken by the central bank depends essentially on what impact the latter have on inflationary expectations. Changes in interest rates and expectations, in turn, affect aggregate supply and demand, and hence, economic activity and inflation.

[13] The accumulation of central bank losses may limit either their capacity to mop up excess liquidity or their ability to raise interest rates when conducting open-market-operations, as they become an undesirable source of monetization that will require subsequent efforts of sterilization.

[14] To avoid extending a blank check from the government to central bank, the latter should make transparent their operational expenses, including the aggregate wage bill and other administrative outlays.

Table 3. Operational Independence

Credit to the Government by the Central Bank		
No direct or indirect credit, or credit extended on the secondary market with limits.	Credit to cope with seasonal liquidity shortages, or credit extended on the secondary market without limits.	Direct credit approved with special majority.
Argentina, Chile, Costa Rica, Brazil, Dominican Republic, Guatemala, Peru, Uruguay, Venezuela.	Bolivia, Honduras, Mexico, Nicaragua, Paraguay.	Colombia.
Independence in the Use of Monetary Policy Instruments		
Full independence in monetary and exchange rate policy	Restrictions or government influence on the conduct of monetary policy.	Government role in formulating exchange rate policy.
Argentina, Bolivia, Brazil, Chile, Costa Rica, Dominican Republic, Honduras, Nicaragua, Peru, Uruguay.	Guatemala, Paraguay.	Colombia, Mexico, Venezuela.
Financial Independence		
Government is required to maintain central bank's capital.	Government is authorized but is not required to capitalize the central bank, or capitalizes it with nonnegotiable bonds.	No legal basis exists for the government capitalizing the central bank.
Brazil, Colombia, Dominican Republic, Guatemala, Nicaragua, Peru, Venezuela.	Bolivia, Chile, Honduras, Mexico.	Argentina, Costa Rica, Paraguay, Uruguay.
Source: Latin American national constitutions and central bank legislation as of 2004, and Fiscal Responsibility Law in Brazil.		

Accountability

Accountability requirements are an innovating feature of the legislation governing most central banks in Latin America (see Table 4). The purpose of this reform was to hold central banks accountable in exchange for the substantial independence they were granted. Until the reform, central banks in the region typically published an annual report describing the overall economic performance of the countries, which served essentially as an historical record and not as an accountability procedure. Following the reforms of the 1990s, central bank governors in most countries are required to appear before the legislature to report on the conduct of monetary policies and the performance in pursuing their objective of preserving price stability. In addition, central banks publish regularly its monetary program for the foreseeable future, in a number of cases, together with an inflation report that assesses central banks' actions aimed at achieving the inflation targets.

Table 4. Central Bank Accountability

Reporting by the Central Bank		
Formal appearance before the legislature.	Submission of a report to the executive or legislative branch, or publication of a report in the news media.	
Argentina, Brazil, Chile, Colombia, Dominican Republic, Guatemala, Honduras, Mexico, Paraguay, Venezuela.	Bolivia, Costa Rica, Nicaragua, Peru, Uruguay, Mexico.	
Publication and Transparency of Information		
Financial statements certified by external auditors.	Financial statements certified by a public agency separated from the central bank.	Financial statements signed by an auditor appointed by the central bank's executive board.
Argentina, Chile, Guatemala, Mexico, Nicaragua.	Brazil, Colombia, Honduras, Paraguay, Uruguay, Venezuela.	Bolivia, Costa Rica, Dominican Republic, Peru.
Source: Latin American national constitutions and central bank legislation as of 2004, and Fiscal Responsibility Law in Brazil.		

A critical component of central banks' accountability is the transparency of their policy discussions and decisions and the disclosure of financial transactions. The former has rarely been incorporated as a legal requirement, although it is an increasingly popular practice, in particular in countries under inflation targeting. In turn, the transparency of central banks' income statements is already a plus in the legislation of a number of countries in Latin America, although there is room for improvement in some other central banks (Table 4). While practically all central banks disclose their financial statements on a regular basis, best practices advice the certification of an external audit firm, which verifies that central banks' transactions have been properly recorded in accordance with international accounting standards. In fact, a number of central banks in the region do not account properly operational losses and eventually they hide negative capital positions.

In sum, Latin American countries have made significant progress in strengthening central banks institutional foundations but more is needed. The major achievements refer to the augmented operational autonomy that central banks enjoy today and to the accountability requirements that they must observe. However, there is still room for improvement. A number of central banks would benefit from having an unequivocal mandate that requires them to focus their policies in achieving and preserving price stability. Several countries should reduce governments' discretional room for the removal of central bank governors—and members of the board of directors—as this will contribute to bear the fruits of the enhanced independence granted to central banks. Finally, increasing the transparency and dissemination of monetary policy decisions in many central banks in the region will boost their policy effectiveness, whereas requiring a government commitment to maintain central bank's capital integrity—without extending a blank check in favor of central banks—will underpin monetary policy's operational independence.

B. Changes in the Formulation of Monetary Policy

The reform of central bank legislation laid the ground for subsequent changes in the regime of monetary policy and in the modality of policy operation in a number of countries. Central banks in Latin America increasingly migrated from exchange rate pegs towards exchange rate flexibility, although this swing was mostly triggered by financial crises. Instead of adopting a monetary anchor, central banks increasingly adopted—or are in the process of adopting—an inflation targeting (IT) regime as a way of anchoring inflation expectations. In addition, a growing number of central banks shifted to—or are in the process of moving toward—an operational framework that is based on the use of a short-term interest rate as a policy rate, with less emphasis in monitoring monetary aggregates as intermediate targets.

The shift to exchange rate flexibility

At the beginning of the decade, with the region hovering triple-digit inflation, most countries embarked on stabilization strategies based on a nominal exchange rate anchor. This monetary policy arrangement usually involved exchange rate bands that were supported by growing capital inflows into the region. As of 1995, only five of the 18 Latin American countries had a flexible regime (Table 5). All other countries featured a fixed or "super-fixed" exchange regimes, or some intermediate arrangement such as crawling pegs or horizontal and crawling bands—which in terms of expectations worked as if they were fixed pegs. On these grounds, most central banks abdicated, to a great extent, their ability to perform monetary policy.

Table 5. Exchange Rate Regimes in Latin America
(*De facto* classification)

	Fixed exchange rate or "hard peg" [1/]	**Intermediate regimes** [2/]	**Floating exchange rates** [3/]
1990	Dominican Republic, Honduras, Panama.	Bolivia, Chile, Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Uruguay.	Argentina, Brazil, El Salvador, Guatemala, Paraguay, Peru, Venezuela.
1995	Argentina, El Salvador, Panama, Venezuela.	Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Honduras, Nicaragua, Uruguay.	Dominican Republic, Guatemala, Mexico, Paraguay, Peru.
2004	El Salvador, Ecuador, Panama, Venezuela.	Bolivia, Costa Rica, Honduras, Nicaragua.	Argentina, Brazil, Chile, Colombia, Dominican Republic, Guatemala, Mexico, Paraguay, Peru, Uruguay.

Source: Bubula and Ötker-Robe (2002) and "Annual Report of Exchange Arrangements and Exchange Restrictions," International Monetary Fund (2004).

1/ Includes regimes involving formal dollarization, a monetary union, a currency board, or fixed exchange rates pegged to one currency or a basket of currencies.
2/ Includes regimes involving horizontal bands (forward looking and backward looking) crawling pegs, and forward looking and backward looking crawling bands.
3/ Includes managed float and free float regimes.

Today the number of Latin American countries with flexible exchange rates has doubled. However, the transition to more flexibility took place amid financial crises—and in some cases unsustainable fiscal imbalances—that made intermediate exchange rate regimes unsustainable.[15] The number of countries that formally dollarized also increased—to three—reinforcing the bipolar trend in the choice of exchange rate regimes (Fischer, 2001). A small group of countries—mostly in Central America—kept the exchange rate as the nominal anchor given their increasing integration with the U.S. economy.

The transition to exchange rate flexibility was traumatic in most cases as it sparked swift and steep devaluations. Nonetheless, the enhanced autonomy of central banks facilitated the conduct of monetary policy in a flexible exchange rate environment, and hence, most countries reestablished soon the downward trend of inflation. While the affection for exchange rate pegs was not restored, many central banks did not return either to monetary targeting regimes. Central banks discarded exchange rate pegs due to their intrinsic vulnerability to exogenous shocks and because they proved highly vulnerable to speculative attacks due to large fiscal imbalances, all of which eventually resulted in costly currency and banking crises. Monetary targeting was not considered an alternative either as central banks found difficult to predict the course of monetary aggregates in the short-run due to unstable money demand and volatile money multipliers.

With the purpose of reestablishing a nominal anchor, Brazil, Chile, Colombia, Mexico, and Peru instituted IT schemes by the late-1990s and early 2000s.[16] The reform of central banks provided the institutional underpinnings for adopting IT in those countries.[17] Today there is consensus in the profession with respect to the need of having an unequivocal policy mandate of preserving price stability, a strong political and operational independence, and stringent accountability practices, as prerequisites for successfully adopting IT. In turn, the enhanced transparency of central banks' decision-making and the potential for building credibility are also predicated on the institutional strength provided by the reform of central banks.

Innovations to the operational framework

With the aim of fostering the effectiveness of monetary policy, central banks working under flexible exchange arrangements changed their operational framework and procedures. They increasingly migrated from the traditional regime of controlling the money base—or some

[15] México and Venezuela in the mid-1990s and Argentina, Brazil, Colombia, Ecuador, and Uruguay towards the late 1990s and early 2000s are cases in point.

[16] Yet, a number of other countries are in the process of building the blocks for the future adoption of IT.

[17] In Brazil, in the absence of a broad reform of the central bank, the government issued an executive decree to institute the IT regime and included in the Fiscal Responsibility Law some aspects that strengthened central bank' financial independence and transparency

other monetary aggregate—as an intermediate target to an alternative scheme where central banks typically use a short-run interest rate as an operational variable. With the adoption of this operational variable, central banks seek to influence the behavior of longer-term interest rates, including those charged by financial intermediaries, which, in turn, are expected to influence aggregate demand and aggregate supply, and hence, inflation.[18] In this connection, the operational target has become a key factor in affecting the monetary policy transmission mechanism.

Most central banks adopted the overnight interest rate—rather than a quantity variable—as their operational or policy variable (Table 6).[19] To steer interbank interest rates close to the operational variable, these central banks forecast and manage systemic banks liquidity and engage in open-market-operations using overnight repo—and reverse repo—operations. Because the interbank rate may be subject to excessive volatility, central banks are increasingly adopting an interest rate corridor. The floor of the corridor is typically the overnight rate applicable to a deposit facility, instituted to serve financial intermediaries that did not want, or were unable, to place their excess liquidity on the interbank market at the end of the day. In turn, the ceiling of the corridor is usually the rate charged by the central bank to financial intermediaries requesting overnight liquidity assistance.

Table 6. Main Characteristics of Monetary Policy Operating Framework
(Latin American countries with flexible exchange rate regimes. As of end-2004)

	Operational Variable	**Liquidity Projection**	**Interest Rate Corridor**	**Benchmark Rate (Price or Quantity)**
Argentina	Monetary base	Daily	No	None
Brazil	Overnight interest rate	Daily	Yes	Interest rate
Chile	Overnight interest rate	Daily	Yes	Interest rate
Colombia	Overnight interest rate	Daily	Yes	Interest rate
Dominican Repub.	Net domestic assets*	Weekly	Yes	None
Guatemala	7-days interest rate	Weekly	No	Interest rate
Mexico	Bank liquidity	Daily	No	Liquidity
Paraguay	Net domestic assets*	No	No	None
Peru	Overnight interest rate	Daily	Yes	Interest rate
Uruguay	Monetary base (monthly average)	Daily	No	Monetary base

* This is a *de facto* variable in the framework of the economic program these countries have negotiated with the IMF. Strictly speaking, it is more of an intermediate variable, in terms of traditional financial programming, rather than an operational variable.

[18] The impact on the real sector of the economy is a direct function of the development of the financial market, especially the interbank market.

[19] In industrialized countries there is a general trend to use the short-term interest rate as the operational variable. In Latin America, Mexico is an exception as it uses a quantity variable (the *corto*).

In addition, central banks, in particular in IT countries, generally use the policy rate to signal changes in the stance of monetary policy and to boost the effectiveness of policy decisions. For instance, they increase the policy rate in anticipation of inflationary pressures and decrease it light of the opposite scenario. Central banks' monetary policy committees typically adopt these decisions during preannounced meetings and immediately disclose and explain the underlying reasons of the change in the policy stance. In adopting these rules, central banks seek to foster transparency and enhance predictability, thereby encouraging the alignment of the market's inflation expectations with central banks' targets.

III. MEASURING CENTRAL BANK REFORM

The analysis that follows quantifies central bank independence (CBI) in Latin America to gauge the institutional impact of the reform, in particular on inflation. To obtain a more tangible view about the implications of the reform, we first calculate an index of legal CBI for each country applied to the pre and post-reform legislation and then discuss its likely contribution in explaining the sustained downward trend in inflation observed over the 1990s.[20] A simple econometric exercise is found in the appendix of this document.

A. The Independence of Central Banks in Latin America Now—and Then

To measure the independence of central banks, an index of legal CBI is calculated using a slightly modified version of the Cukierman index (Cukierman, 1992), which incorporates additional features such as accountability of central banks.[21] The proposed analysis keeps track of legal CBI during the pre and post reform periods and provides comparative information in a cross section dimension. The index of CBI is applied to the old and new legislation governing central banks, including the relevant parts of the countries' constitutions.[22]

The index of legal CBI is built on the spirit of the Cukierman index. It uses five criteria to capture different aspects that are relevant in measuring legal CBI. After applying different weights for each criterion, the resulting value of the CBI index gives a score that varies in the scale between zero and one. The first criterion measures the political independence of central

[20] Measuring legal CBI is also subject to the usual criticism about the degree of subjectivity that building an index incorporates. Despite its flaws, legal indexes of CBI still convey information about the institutional grounds on which the autonomy of monetary policy is predicated.

[21] The differences between the Cukierman index and the modified index used in this paper are described in Jácome and Vázquez (2005). This paper found a high degree of correlation between this and the Cukierman index.

[22] In the case of Brazil, the legal framework also included the relevant provisions in the Fiscal Responsibility Law approved in 2000, which strengthen financial independence and accountability of the Central Bank of Brazil.

banks by assessing the modality of appointment of central banks' board of directors, the length of their tenure—relative to the term of the executive branch—and the legal provisions for their removal (20 percent). The second criterion refers to the nature of the central bank's mandate, assigning high marks to those central banks that pursue primarily the objective of preserving price stability (15 percent), whereas the third relates to the autonomy of central banks in the formulation of monetary policy (15 percent). The fourth criterion assesses central bank's restrictions in lending provisions to the government and to commercial banks as a lender of last resort, as well as its financial independence (40 percent). The fifth one evaluates central banks' accountability requirements (10 percent).[23] The results of the legal CBI applied to the Latin American economies are posted in Table 7.

Table 7. Legal Central Bank Independence in Latin America
(Based on constitutions and central bank laws as of end-2004)

Group 1	**CBI**	**Group 2**	**CBI**	**Group 3**	**CBI**
Peru-1	0.862	Argentina-1	0.788	Nicaragua-0	0.590
Chile-1	0.846	Venezuela-1	0.750	Guatemala-0	0.565
Bolivia-1	0.825	Nicaragua-1	0.733	Costa Rica-0	0.510
Colombia-1	0.806	Guatemala-1	0.728	Peru-0	0.502
Dominican Republic-1	0.805	Costa Rica-1	0.705	Dominican Republic-0	0.435
Mexico-1	0.805	Paraguay-1	0.702	Uruguay-0	0.435
		Uruguay-1	0.669	Venezuela-0	0.395
		Brazil */	0.641	Mexico-0	0.388
		Honduras-1	0.617	Honduras-0	0.385
				Paraguay-0	0.368
				Bolivia-0	0.326
				Argentina-0	0.314
				Colombia-0	0.289
				Chile-0	0.263
Average Group 1	**0.825**	**Average Group 2**	**0.704**	**Average Group 3**	**0.412**

*/ Incorporates provisions from the Fiscal Responsibility Law (2000) and a Constitutional amendment (2003) that strengthened central bank's independence.
Note: Country–1 refers to the measurement post-reforms, while Country–0 refers to the measurement prior to the reforms.

The numbers show that central banks enjoy today greater legal independence today than they did in 1990, although it varies markedly across countries. Except for Brazil that did not reform its central bank law, in all countries legal independence rose significantly following the reform as measured by the index of CBI—from 0.412 to 0.765. However, current legal independence is not uniform across countries. Table 5 identifies two groups of reformer countries. Group 1 encompasses those countries where central banks became more independent, which have a legal CBI index of 0.80 and more (Peru, Chile, Bolivia,

[23] Jácome and Vázquez (2005) discuss the specifics of this index.

Colombia, Mexico, and the Dominican Republic). The remaining countries, Group 2, have less independent central banks as the legal CBI index is in the range of 0.60 to 0.79, but still more independent than in their pre-reform status (Group 3).

Table 8. Breakdown of Legal CBI into its Five Main Criteria
(Based on constitutions and central bank laws as of end-2004)

	Group 1	Group 2	Group 3
Government of the Central Bank	0.708	0.575	0.301
Central Bank primary objective	0.958	0.556	0.143
Policy formulation	0.762	0.776	0.681
Central Bank lending	0.864	0.773	0.469
Accountability	0.917	0.868	0.402

Progress has not been uniform either in all fronts of the institutional reform (Table 8). Breaking down the legal CBI index into its five key criteria (the first four consistent with the Cukierman index—albeit with slight variations—plus accountability), major differences arise among the reformed legislation in terms of the political autonomy assigned to central banks and, in particular, in relation to the primary objective assigned to central banks. Alternatively, the autonomy to formulate monetary policy is virtually uniform in all countries. On the other hand, the differences are evident in all five criteria with respect to the pre-reform status.

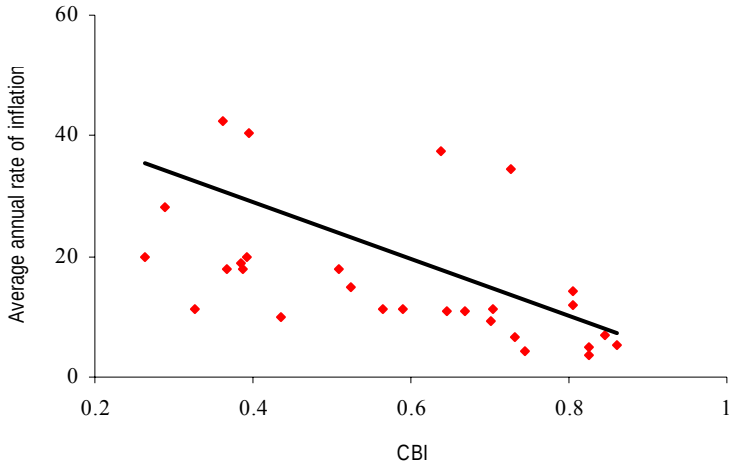
B. CBI and Inflation Performance in Latin America

Given that the reform of central banks was fundamentally conceived to wage a successful war on inflation, it is inevitable to ask whether it indeed contributed to the dramatic fall in inflation of the last 15 years in Latin America. A recent paper by Jácome and Vázquez (2005) finds that the legal CBI, together with other macroeconomic variables and controlling for external inflation, is statistically significant in explaining inflation performance in Latin American and Caribbean between 1990 and 2002.[24] A similar outcome is obtained using the same model and restricting the sample only to the Latin American countries (see the Appendix).[25]

[24] The result holds for two alternative measures of legal CBI, namely the Cukierman index (Cukierman, 1992) and the Grilli, Masciandaro, and Tabellini index (Grilli, Masciandaro, and Tabellini, 1991).

[25] A more rigorous analysis would have required measuring *de facto* CBI and not only *de jure* CBI, but this task exceeds the scope of this paper. The difference between *de jure* and *de facto* independence is relevant, in particular in countries where institutions are weak.

Figure 1: CBI and Inflation in Latin America
(Before and after the reform of central banks)



To have a flavor of this relationship, Figure 1 illustrates the negative relationship between legal CBI and inflation focused only on the Latin American region. The index of legal CBI is calculated for the pre and post-reform periods and paired with average inflation for the same years. The pre-reform period covers the five years prior to the reform of the central bank in each country, including the year in which legal changes materialized, while the time span following the reform covers up to 2003.[26] The statistically significant negative correlation holds despite the noise introduced by the numerous financial crises that hit the region during the last ten years, which temporarily boosted inflation in a number of countries.[27]

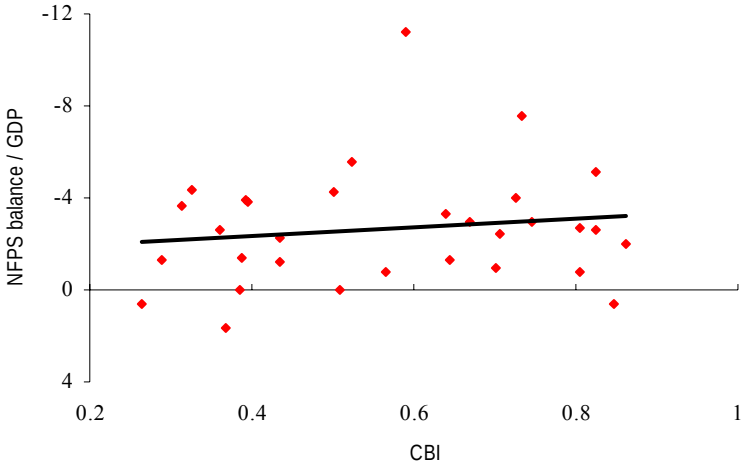
The same relationship does not hold, however, when the fiscal deficit is associated—measured through the non-financial public sector deficit—with inflation (Figure 2).[28] This outcome seems to suggest that restricting central bank from financing the fiscal deficit did not necessarily imposed greater fiscal discipline, and rather that governments replaced this money with other sources of financing, mainly public debt (see Section IV). In addition, while the reform of central banks contributed to reduce inflation, there is no empirical evidence of causality as reported in Jácome and Vazquez (2005), suggesting that many central banks in Latin America adopted central bank reforms when inflation was already falling. Thus, the institutional reform of monetary policy served mostly to consolidate the regional downward trend rather than to trigger a fall of inflation.

[26] Exceptionally, the post-reform period considered for Ecuador goes up only to 1999 and for El Salvador only to 2000, when those two countries adopted the U.S. dollar as legal tender.

[27] See Jácome (2005) for a characterization of banking crises in Latin America during the last 15 years.

[28] The series on the non-financial public sector deficit are built on information obtained from the country reports elaborated regularly by the IMF staff.

Figure 2: CBI and Fiscal Deficit in Latin America
(Before and after the reform of central banks)



Source: the Non financial public sector is obtained from IMF's staff reports.

IV. CHALLENGES FACING LATIN AMERICA'S CENTRAL BANKS

Despite the success in reducing inflation, central banks in Latin America still face important challenges in the perspective of conquering inflation and preserving price stability in the long-run.[29] First, inflation in most Latin American countries has yet to converge to price stability. Second, a number of them need to restore confidence in the domestic currency, not only as a mean of transaction, but also as a store of value. An third, central banks needs to cope with capital inflows without sacrificing the objective of attaining and preserving price stability. Overcoming these difficulties, however, is not only a central bank duty since governments also bear some responsibilities, in particular, preserving the stability of the financial system and maintaining fiscal deficits on check.

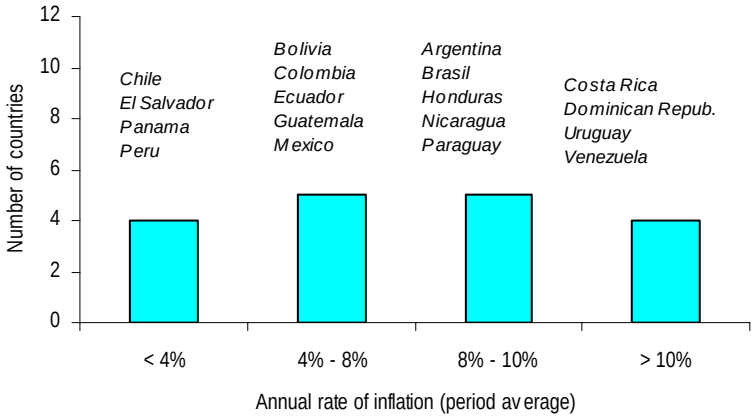
While this document provides general recommendations to cope with today's main central bank challenges, more specific proposals are needed. They should be widely analyzed in years to come as part of the research agenda of central banks in the region and, to some extent, of the multilateral financial institutions.

[29] We refer as price stability to a situation that features low and stable inflation, in the range of one to four percent on an annual basis.

A. Achieving Price Stability

While inflation in Latin America has already declined in average to single digits, in the vast majority of countries it has not yet converged to the world inflation. When measuring inflation for the period 2003-2005, only four countries in the region reached a rate below 4 percent, with two of them having been formally dollarized. Likewise, more than one half of all countries—including the dollarized economies—featured a rate that exceeded 8 percent in average in the same period (see Figure 3), which is approximately the threshold identified in the empirical literature as carrying costs in terms of economic growth.[30] In 2005, the number of countries with inflation rates in the two-digit territory has increased given the recent upward trend—albeit moderate—resulting from the impact of the persistent oil shock.

Figure 3. Average Inflation in Latin America 2003-2005



Source: International Financial Statistics, IMF, and data up to October 2005.

Further reducing inflation should be a key goal of central banks in Latin America. However, this may be an increasingly difficult endeavor because of its potential adverse effects in short-term output.[31] While in the 1990s governments in the region seemed to unconditionally support anti-inflation policies as a vital social objective, today this emphasis has lost momentum, and rather, governments are prioritizing efforts to spur economic growth—after three years of negative growth in per-capita GDP and three decades of very modest

[30] See Sarel (1996), which places the threshold at 8 percent, and the more recent work by Khan and Senhadji (2000) which, for developing countries only, places the threshold in the range of 7 to 11 percent.

[31] In the last ten years there has been increased attention in the industrial countries to the analysis of the negative effects on output stemming from disinflation efforts, in particular following the institutional reform that strengthened central banks independence. In this connection, Fischer (1995), Fischer (1996), and Gartner (1997) found empirical evidence of a positive correlation between central bank independence and the "sacrifice ratio." Furthermore, Andersen and Wascher (1999) claim that the "trade-off" between inflation and growth—in industrial countries—intensifies when inflation is below 8 per cent.

improvement. Under these conditions, central banks may face a political environment opposed to tight monetary policies.

Nonetheless, central banks must persevere on seeking the objective of price stability as a primary goal although simultaneously minimizing the potential adverse effects on output. To this end, the key ingredient is to keep along the path of strengthening central banks' reputation and credibility.[32] The more solid is central banks' reputation and credibility, the lower are real interest rates required to maintain simultaneously price stability and a stable path of output growth. Achieving this goal, however, depends on the combination of policy and institutional factors.

Implementing a more efficient monetary policy hinges not only on central banks' ability to conduct monetary policy, but also on making central banks' policy more transparent and predictable.[33] While central banks in the region, especially IT central banks, have already enhanced accountability and transparency standards following their institutional reform, there is still room for improvement. Based on the international standards adopted to measure the transparency of monetary policy,[34] in average, Latin America ranks behind Europe, Asia, and Middle East and Central Asia in monetary policy transparency. As illustrated in Figure 4, the percentage of criteria of the code of transparency of monetary policy that are "fully observed" or "broadly observed" is 76 percent in Latin America against more than 90 percent, both in Asia and Europe, and 80 percent in Middle East and Central Asia.[35] On the other hand, if central banks react consistently when faced with exogenous and policy-induced shocks and explain their policies for fighting inflation, the market will be able to anticipate central bank reactions. In this environment, market participants will face less uncertainty, which will make them more inclined to align inflation expectations with central bank targets, thereby improving the short-run trade-off between inflation and economic growth.

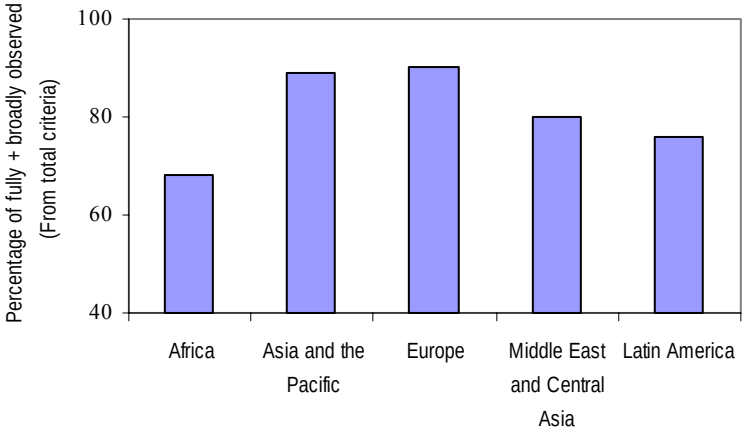
[32] The difference between these two policy features is subtle and difficult to separate. One form of separating these two concepts is to associate reputation with the stock of monetary policy successes—the accumulated past achievements in terms of inflation—and to link credibility with the public's assessment of current monetary policy (Siklos, 2002).

[33] The link between more transparency and less inflation has not received much attention in the literature, but it is subject of increasing interest by academics and practitioners. Chortareas and others (2002) provide empirical support in industrial countries.

[34] See the IMF's Transparency Code for Good Practices in Monetary and Financial Policies: Declaration of Principles (1999). The assessment of transparency practices is conducted on a qualitative basis using five categories: observed, broadly observed, partially observed, non-observed, and not applicable.

[35] Not all countries in the region are included in the sample as they have not been yet evaluated. Specifically, the assessment does not include important players such as Argentina, Uruguay, and Venezuela.

Figure 4. Transparency of Monetary Policy
(Latin America versus other regions)



Source: Standards and Codes Gateway (Monetary and Financial Systems Department, IMF).

In addition to what central banks can do to fulfill their mandate of arresting inflation, their autonomy should receive the support of governments and societies. At present, the record of instability of central bank governors in their posts raise concerns about whether central banks are autonomous in practice. Using the turnover rate of central bank governors as a proxy for effective central bank independence, and assuming that the higher the turnover rate the lower is the independence of central banks,[36] we found that the average rate in Latin America is approximately 0.4 during the post reform period.[37] Thus, in average, a central bank governor remains in office for about two and a half years.[38] This period, however, is clearly smaller than the term of appointment of central bank governors in the region—typically between four and six years. In addition, it is well below the effective term of central bank governors in industrial countries.[39] By country, Bolivia, Colombia, and Mexico seem to have the most stable central bank authorities, whereas Brazil and Ecuador feature the least stable (Figure

[36] A similar indicator has been used previously in the literature (see Cukierman, 1992 and more recently, De Haan and Kooi, 2000), although it has also been criticized under the argument that it may also imply a lack of political autonomy, as docile central bank governors will have better chances of remaining in their posts.

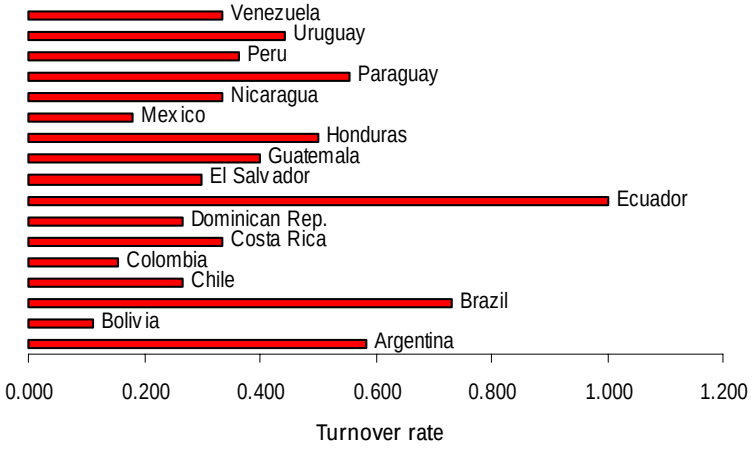
[37] The turnover rate of central bank governors was obtained by dividing the number of central bank governors by the number of years following the enactment of the new law that instituted central banks' autonomy in each country—until 2004. Thus, the lower is this rate, the more stable have been central banks authorities, and presumably, more independent they have been from a political perspective.

[38] This outcome does not experience any major change when the sample is restricted by excluding the non-reforming countries during most of the period of analysis (Brazil, the Dominican Republic, Guatemala).

[39] For the sake of comparison, the Chairman of the Board of Governors of the U.S. Federal Reserve remains in post since 1987, whereas in the Bank of Canada and the Bank of England governors typically complete their period of appointment—7 and 10 years, respectively.

5).[40] The high rate of turnover of central bank governors in some Latin American countries suggests that monetary authorities remain vulnerable to periods of political instability.

Figure 5. Turover Rate of Central bank Governors
(Post reform period up to 2004)

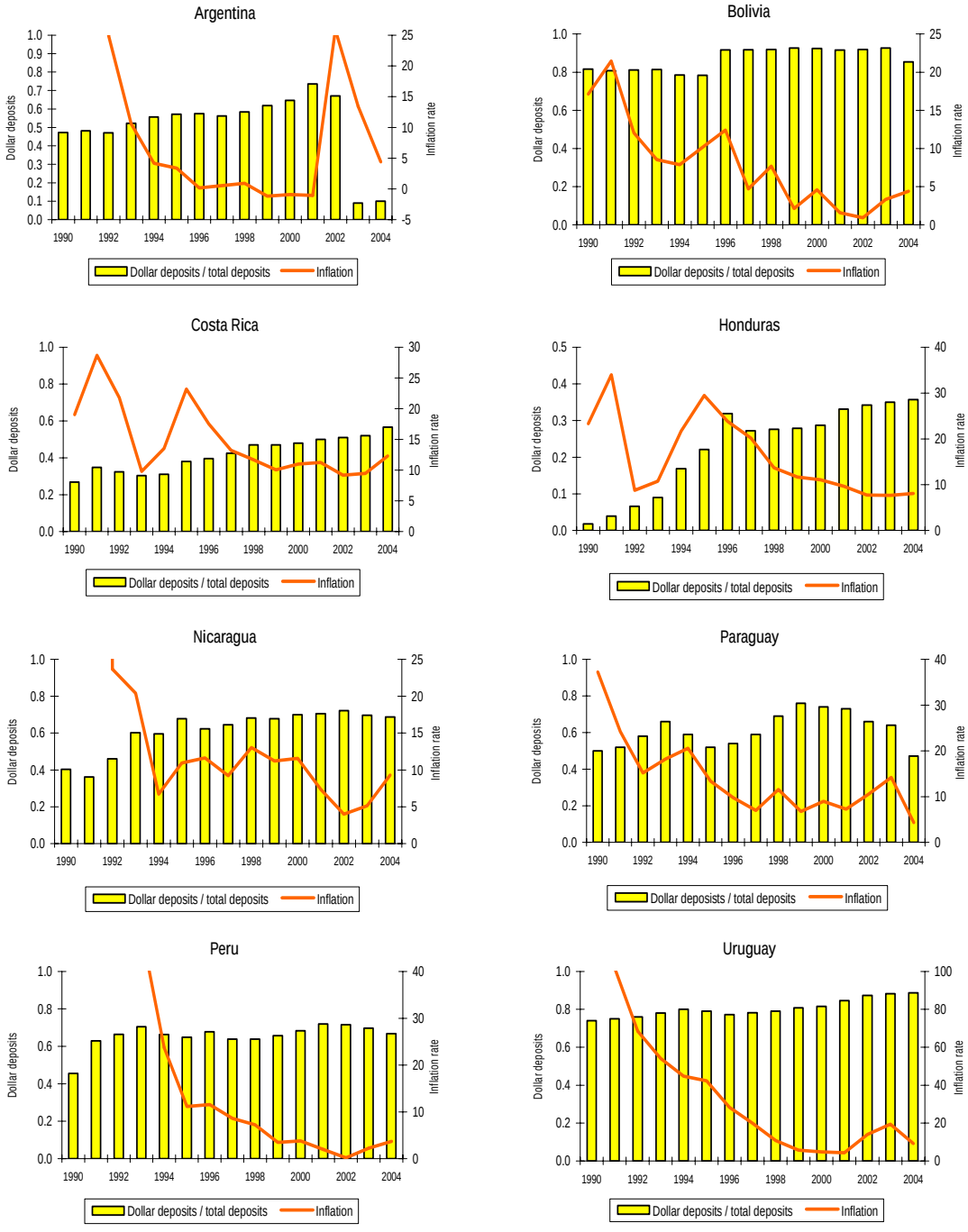


B. Pesos rather than Dollars

A second key challenge facing most central banks in Latin America is to restore markets' confidence in domestic currencies. High dollarization is in general a legacy of periods of high inflation, although recurrent periods of financial instability and full-fledged banking crises have also encouraged dollarization. The demand for foreign currency has also gradually increased in countries that decided to sacrifice their monetary "independence" by tying their currency—to one degree or another—to the U.S. dollar in order to reduce inflation or to preserve external competitiveness of tradable activities. Thus, despite the regional downward trend in inflation, dollarization has remained high in several countries (Figure 6).

[40] For Ecuador, the rate corresponds to the period 1992-1999 and for El Salvador 1991-2000, when the central bank reform was adopted and before dollarization was formally instituted in each country. For Brazil, the Dominican Republic, and Guatemala, the whole period 1990-2003 was applied.

Figure 6. Financial Dollarization and Inflation in Selected Latin American Countries



Source: International Financial Statistics, IMF.

While financial dollarization entails some benefits, there is growing consensus about the limitations it imposes for the conduct of monetary policy and the restrictions it entails for managing banking crises.[41] After periods of high inflation, financial dollarization provides a deposits' base, which would not have been possible to preserve should they be denominated in domestic currency, thereby encouraging financial intermediation and financial sector growth. However, as money base in domestic currency shrunk, central banks have only a small room for maneuver and, in practice, they focus mainly on achieving high levels of international reserves and on preserving exchange rate stability, which in the end becomes the nominal anchor. Moreover, in the event of banking crises, financial dollarization restricts central bank's capacity as lender of last resort and limits the scope for the provision of additional credible financial safety nets, given central banks' inability of issuing foreign currency.

The legacy of past periods of high inflation

A number of central banks in Latin America succeeded in reducing inflation but failed to restore confidence in the domestic currencies. After several years—and even decades—of high inflation in a number of countries, markets have not recover confidence in the domestic currency, in particular in terms of its role as a store of value. As a result, financial distortions endure, particularly a high level of dollarization and, in a number of cases, the so-called "peso problem."

Financial dollarization rocketed during the 1990s despite the decline in inflation, reaching in some cases more than 80 percent—like in Bolivia and Uruguay. Against this background, central banks developed the syndrome of "fear of floating" the exchange rate and are compelled to maintain sizeable volumes of international reserves as a buffer to tackle potential speculative attacks and banks' instability featuring large deposit withdrawals.[42] "Fear of floating" has also set in motion a vicious circle where the lack of exchange rate flexibility leads market participants to take further foreign currency risks, which in turn enhances dollarization, thereby strengthening central banks' "fear of a floating" and reinforcing exchange rate inflexibility. In turn, the "peso problem" is typically manifested by high real interest rates in domestic currency. It represents the markets' perception of a potential risk, albeit minimum, of a sudden depreciation of the domestic currency. Strictly speaking, high real interest rates also capture "country risk" and "banking crises risk," and hence, they have emerged following periods of fiscal fragility and/or financial instability. High real interest rates are observed in a number of countries in the region but are a particularly distorting feature in Brazil.[43]

[41] An assessment of the risks and benefits of financial dollarization is out of the scope of this document. This analysis is conducted in De Nicolo, Honohan, and Ize (2005).

[42] See Calvo and Reinhart (2002), where they coined the term "fear of floating."

[43] High interest rates in Brazil may also capture other distortions such as an appropriate legal framework that institutionalize the independence of the central bank.

Correcting these distortions—high financial dollarization and the “peso problem”—will take a considerable length of time and will require the support of government policies. The institutional strengthening envisaged in the legal reform of central banks has been a major step in the right direction, complemented with the modernization of the design and execution of monetary policy and the implementation of policies aimed at building institutional capacity. However, central banks need to persevere in consolidating their reputation by meeting their inflation targets, on the basis of maintaining operational independence within long-term decision-making horizons, and enhancing accountability and transparency.

In terms of government policies, strengthening prudential regulations applicable to foreign exchange transactions is crucial to reestablish an independent monetary policy. While a set of good practices is still nonexistent, a number of measures may be adopted with the aim of encouraging the use of local currency vis à vis the U.S. dollar or other foreign currency. For instance, rising capital requirements in light of increases in foreign currency loans will take its toll on bank shareholders and will discourage borrowing in foreign currency. Establishing differentiated insurance premiums—within deposit insurance systems—to penalize foreign currency deposits will also act as an incentive for de-dollarizing financial systems. Nevertheless, these measures could work provided they are adopted in an environment of strong macroeconomic fundamentals. Other than these, de-dollarization efforts should be part of a broad strategy based on national consensus about economic, political, and social foundations for long-term stability and economic growth, which also seems to be necessary to restore confidence in domestic currencies.

Targeting the exchange rate and its aftermath

In other countries in the region, mostly in Central America, dollarization has also taken its roots as they are small and very open economies with close commercial ties to the United States. These countries increasingly adopted the U.S. dollar as a means of payment; meanwhile, given that exchange rate fluctuations exert a significant influence on price formation, central banks have decided to use the exchange rate as a nominal anchor to guide inflation expectations. In this environment, dollarization of liabilities became increasingly high, to the point where real depreciations could inflict a marked negative impact on the financial obligations of individuals, companies, and the government, and hence, "fear of floating" also became an issue.

Without question, the use of an exchange rate anchor helped bringing down inflation in these countries, although it also borne costs and vulnerabilities. The main drawback is the lack of a rapid and low-cost exit strategy from the exchange rate peg, which is critical in light of recurrent real and financial shocks that hit most countries in the region. In addition, the use of an exchange rate peg precluded central banks from conducting monetary policy, and hence, developing the skills necessary to formulate and manage monetary policy and building credibility was not really necessary. The latter turned into a costly shortcoming when the countries were forced to exit the peg, for example in the midst of a financial crisis.

Looking ahead, central banks in this group of countries need to assess whether it is wise to continue with the current monetary regime or to shift to an alternative scheme. This means weighing the benefits of keeping the exchange rate anchor—once inflation has been brought down to single-digit levels but still without lowering it to the international level—against the potential costs embedded in such a regime. If the decision is to stay with the peg, central banks will need to maintain a higher level of international reserves than would be necessary under a flexible regime, to assure the markets that the exchange rate will be held stable, even in the face of exogenous and policy-induced shocks. In addition, although fiscal discipline and the soundness of the financial system are necessary conditions for the proper functioning of any monetary regime, they are especially important under fixed or quasi-fixed exchange rate regimes because of the devastating macroeconomic consequences of a disorderly exit from the peg stemming from loose fiscal and financial polices. This is the lesson of several recent episodes, in which exchange rate anchors were abandoned in the midst of fiscal and/or financial crises and exerted very high macroeconomic costs (Argentina, Brazil, Ecuador, and Mexico are valid cases in point).

Should the decision to migrate to a flexible exchange rate regime is adopted, the transition should be gradual. This strategy will give central banks time to learn how to conduct monetary policy and improve their understanding of its transmission mechanism. Simultaneously, central banks would have to invest in building reputation and gaining credibility, based on their ability to meet monetary targets and reduce inflation, an objective that can only be achieved over time.

Under a flexible exchange regime, a relevant question is whether central banks should pursue a monetary targeting strategy or if they should adopt an IT regime. This query relates to the debate about whether IT regimes demand pre-requirements for its implementation. There is no consensus on this issue. Some consider that certain prerequisites are desirable but not essential, since the adoption of an IT regime brings about an endogenous learning process over time (see Truman, 2003, for example). Our view is that, before announcing a commitment to an IT scheme, central banks must put in place some fundamental conditions to assure the proper functioning of the new regime and minimize the risk of initial failures, which may undermine the success of the IT regime. The following four conditions should be included at the very least: (i) having an appropriate legal framework which identifies price stability as central bank's primary objective, empowers the central bank with political and operational independence to achieve such objective, and establishes rigorous accountability and transparency mechanisms; (ii) eliminating for practical purposes any other primary goal, whether explicit or implicit, including the stability of the exchange rate; (iii) eliminating fiscal dominance, if it exists; and (iv) strengthening the financial system.[44] On the other hand, having in place basic institutional capacities may also be crucial to run a policy regime that relies on more sophisticated expertise. On the other hand, countries featuring low developed

[44] Carare *et al.* (2002) contains a detailed discussion of the initial conditions that need to be established in order to support an IT regime.

financial markets and a stable money demand, may find more effective and easier to handle a monetary targeting regime.

If countries irreversibly abandon their currency, thereby giving up their right to make monetary policy, the question is whether there is any reason for the existence of a central bank. So far, none of the recently dollarized economies in Latin America—Ecuador and El Salvador—has tackled this question formally, and so their central banks continue to exist, performing tasks of secondary importance vis à vis central bank's basic functions of issuing money and conducting monetary policy.[45] Operating these institutions, however, bears costs that society has to pay. An alternative to maintaining the costly status quo or to closing down central banks would be to give them the fundamental responsibility of financial supervision, by taking over or merging them with the public institutions in charge of these duties—and perhaps having them continue performing other secondary functions as they do now.

C. Coping with Capital Inflows While Maintaining Policy Consistency

Monetary policy consistency is instrumental to underpin credibility, a key pre-requisite to achieve long-run price stability. If markets are unable to anticipate and understand the decisions of central banks, and if central banks lack a consistent policy reaction function, monetary policy will be less effective in reducing inflation and the existence of an inflation bias will perpetuate. In this environment, monetary policy efforts directed to reduce inflation will demand higher interest rates than otherwise, which will imply a higher "sacrifice ratio."

Following the institutional reform of central banks, policy inconsistency decreased significantly in Latin America as political influence on central bank decisions was mostly eradicated. Nonetheless, while policy surprises associated to sudden monetary expansion became less important, inconsistencies remained in a few central banks, this time as a result of using the exchange rate as nominal anchor to reduce inflation. Thus, central banks targeting the real exchange rate generally devoted their energies to defend the exchange rate peg, which at times were in conflict with the objective of achieving price stability.

The recent surge of capital inflows has put additional pressure on the consistency of monetary policy in the Latin American economies. As capital inflows soared, domestic currencies faced pressures for an exchange rate appreciation, leading central banks to the dilemma of whether or not to intervene in the exchange rate market to avoid a real appreciation. The 2004–2005 oil supply shock has further complicated central banks' policy response to capital inflows as it triggered a slight rebound in inflation in most countries. To keep inflation pressures—even if they are only moderate—from contaminating wage negotiations and other contracts, in many cases central banks have increased interest rates.

[45] In those countries central banks perform the role of fiscal agency, regulate and coordinate the payment system, invest international reserves, carry out macroeconomic studies, and recover portfolio assets which were pledged as collateral in exchange for the loans granted during previous episodes of banking crises

However, higher interest rates have attracted additional capital inflows, thereby exacerbating appreciation pressures on the domestic currencies. Similar issues have arisen in oil exporting countries in the region, given the significant increase in oil revenues as a result of the spike in crude prices.

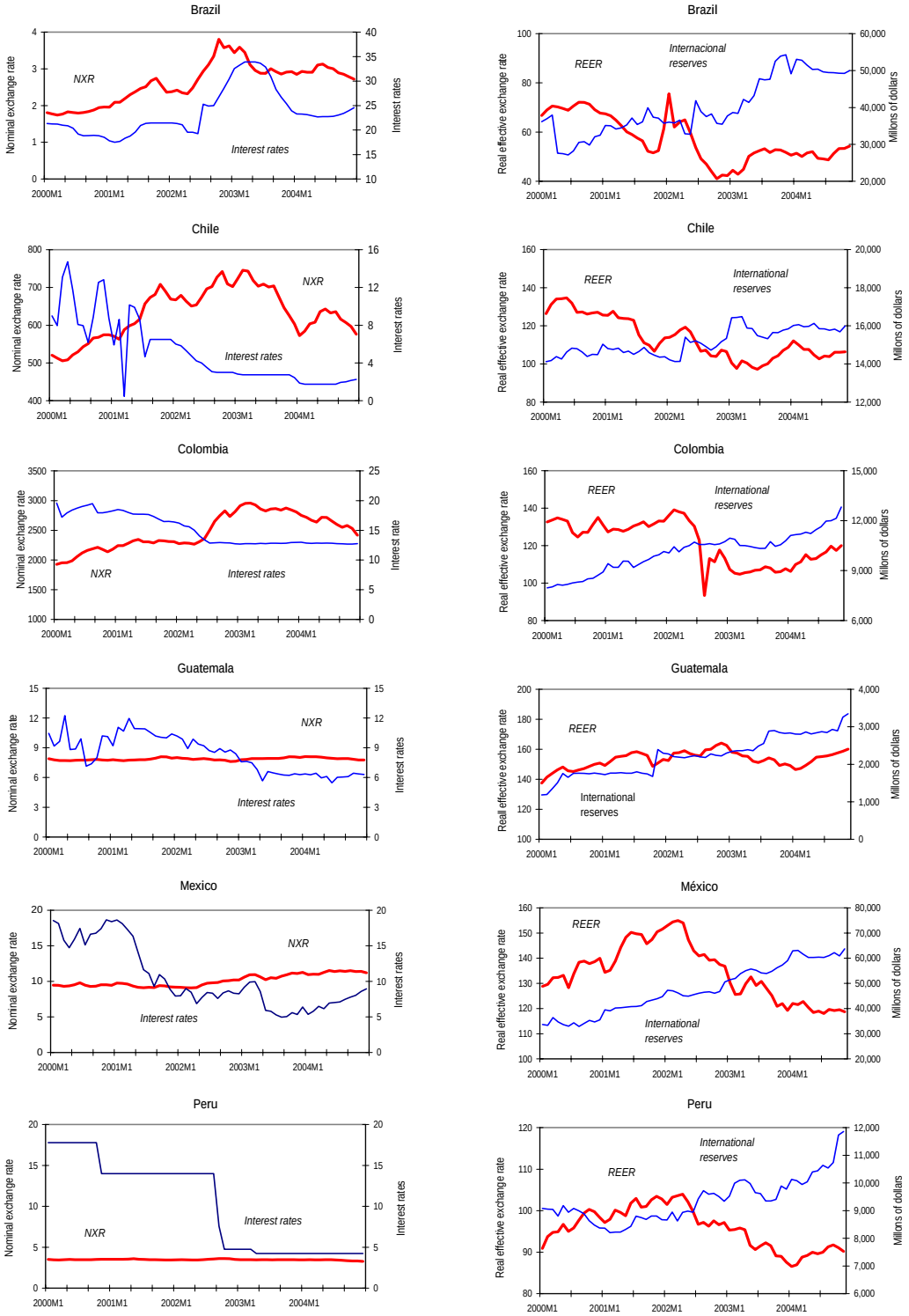
As oppose to the recent past, today the real appreciation of domestic currencies is not welcome any more. In 2004, most central banks in the region, including some of the IT countries, intervened intensively in the exchange market to mitigate real appreciation pressures.[46] At least two factors help to explain the opposition to accept today's appreciation trend. The first is that inflation in the region is not perceived any more as a problem, and hence, the appreciation of the domestic currencies appears generating only costs but no benefits. The second factor is the loss of competitiveness of exports as today they face a fierce foreign competition, especially from Asia, which puts at risk investment and employment.

As illustrated in Figure 7, a number of central banks—Colombia, Guatemala, and Peru are some examples in the region—have followed the course of exchange rate intervention, although they did not always succeeded in deterring real exchange rate appreciation. As a positive externality, international reserves held by the central bank increased, although at the cost of increasing sterilization, which led to a negative impact on central banks' income statements. In turn, a few central banks in the region decided not to intervene, or they did it but not on regular basis, like Brazil, Chile, and Mexico.

None of these two policy alternatives is costless, but probably central banks' intervention is more costly in a long-term perspective. While foreign exchange interventions are not abnormal, even in IT emerging markets, the problem is really the reason underlying interventions. A frequent and/or abundant intervention may signal the purpose of preserving external competitiveness, and not simply, for instance, the desire of mitigating short-term episodes of exchange rate volatility. The nature of this intervention raises concerns about central banks caring about the competitiveness of exports—an objective not envisaged in central banks' charter—which at times may be in contradiction with the objective of price stability. Moreover, one can question the *de facto* independence of monetary policy because central banks intervention may well respond to external pressures indirectly exerted—through the government—by market participants, which lose with the appreciation of the domestic currency.

[46] Intervention has taken place not only by outright sales of international reserves, but also using financial instruments such as options and swaps.

Figure 7. Response to Capital Inflows in Selected Latin American Countries

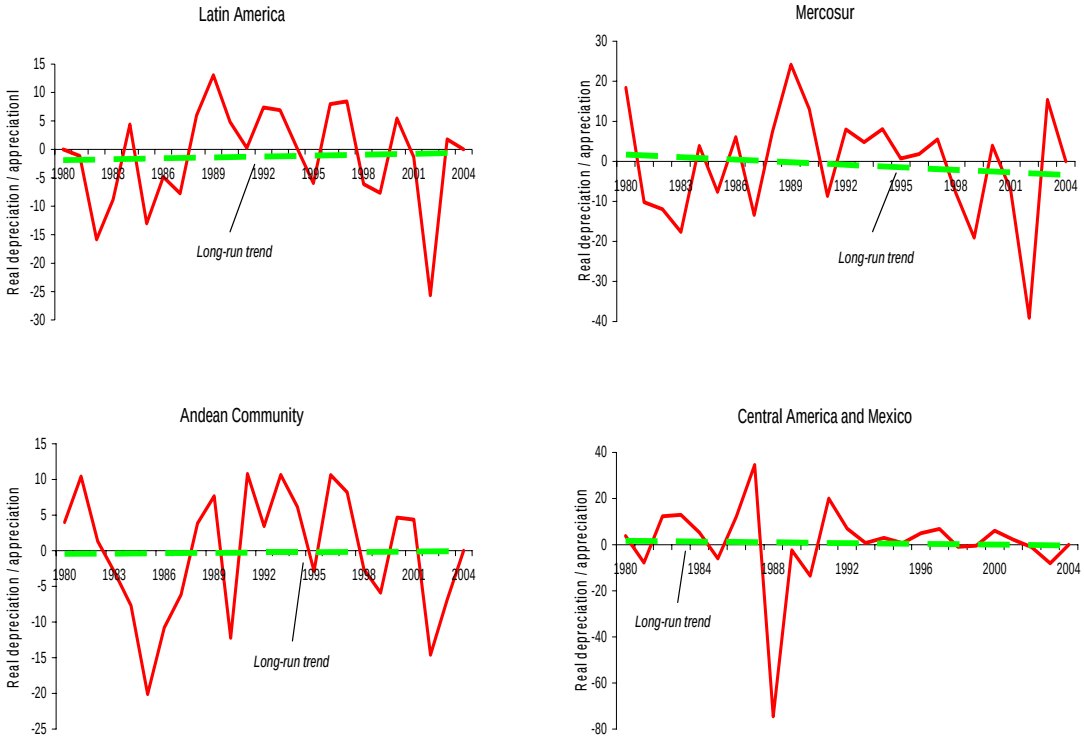


Source: International Financial Statistics, IMF.

Furthermore, central banks' intervention may be damaging from an institutional standpoint, in particular for IT central banks. Given that IT central banks in the region have publicly committed with price stability as their fundamental objective, switching to a policy of avoiding exchange rate appreciation may revive concerns about policy conflicts, as the appreciation would help to curb inflation pressures. Furthermore, switching short-term policy emphasis to focus on exchange rate stability will damage central banks' predictability, a key feature in which central banks have made a valuable and sustained investment.

On the other hand, when central banks do not intervene in the foreign currency market, the appreciation trend will eventually disappear, provided domestic interest rates adjust downward to eliminate differentials vis-à-vis the world interest rate. In the event that a real appreciation materializes, this may help to moderate inflation pressures stemming from the oil shock in the current juncture. To cope with the cost on tradable activities, domestic producers may have to absorb losses. In the long-run, central banks may not be very effective in containing the real appreciation because the real exchange rate is an endogenous variable. Thus, the appropriate way to mitigate the effects of the real appreciation is having tradable activities increase productivity.

Figure 8. Real Exchange Rate in Latin America and Subregions



Source: Western Hemisphere Department, IMF.

Current exogenous shocks stress the need of additional structural changes in Latin America, in particular in the labor market. Making the economies more flexible will allow them to better adjust to moderate the adverse effects of exogenous shocks. It may also allow to soften the cyclical pattern of the real exchange rate, which tend to evolve in the long-run through an equilibrium path (Figure 8).

D. The Perils of Financial System Weaknesses and the Lack of Fiscal Discipline

While the objective of price stability is clearly a central bank responsibility, it may not be attainable and, in particular, may not be sustainable in the long-run, without the support of other conditions that are out of the scope of central banks. Two key threatens to the objective of price stability are potential financial system weaknesses and a deteriorating fiscal stance.[47] These two distortions can place an upward pressure to interest rates and eventually may trigger a rebound in inflation.

The need to preserve sound financial systems

Banking crises have been a common and recurrent event in Latin America with disastrous macroeconomic and social effects (Carstens et al., 2004). In particular, since 1990, banking crises have been the main cause of inflation reversals and economic contraction in many countries (see Figure 9). From a microeconomic perspective, in a number of episodes the management of systemic crises left a legacy of market discipline relaxation as a result of the provision of blanket guarantees and widespread debt restructuring plans, while depositors' confidence suffered a long-term damage because of breaches of contracts such as freezing and reprogramming of deposits.

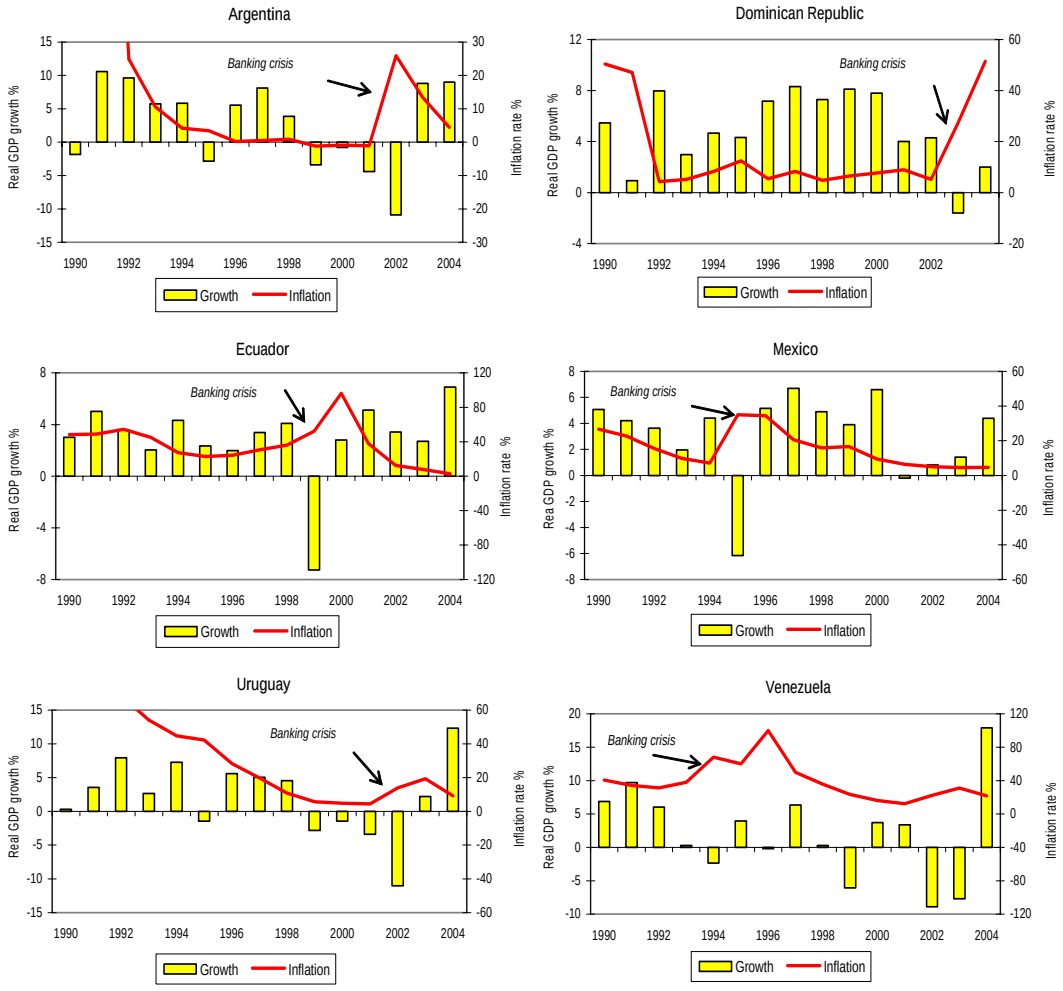
Central banks in Latin America have been intensively involved in the management of banking crises and resolution, whether or not the crisis posed a systemic threat—which in theory would have justified such intervention. The resulting monetization was not costless. On the contrary, it exacerbated macroeconomic instability, including in a number of cases a simultaneous banking and currency crisis. Central banks' participation in bank resolution also damaged their financial position as a result of the purchase of assets—received in exchange for liquidity and solvency loans provided in the midst of the crises—which has proven to be difficult to recover overtime.

Most countries in the region have made progress in establishing an appropriate framework for preventing and managing banking crises, but more needs to be done. The new reforms must emphasize precautionary regulations because the experience shows that once a crisis erupts the costs are inexorably high. The countries should focus on improving early warning mechanisms and, more important, on empowering bank regulators to act effectively at an

[47] In this paper we are assuming that financial systems' surveillance is not a central bank responsibility, like in the majority of countries in Latin America.

early stage to deal with incipient banks liquidity and solvency problems.[48] In addition, the legal framework for bank restructuring and resolution must be improved to allow countries to manage and resolve banking crises in an effective way. Major reforms and new procedures should facilitate and make more effective the conduct of "purchase and assumption" operations as the main instrument of bank resolution. The costs of the crisis should be absorbed by financial institutions' shareholders and by large depositors, whereas any residual cost should be borne by the government and not by the central bank.

Figure 9. Effects of Banking Crises on Growth and Inflation in Latin America



Source: International Financial Statistics, IMF.

[48] The experience of recent banking crises in Latin America shows that bank regulators tend to act when liquidity and solvency problems were already irreversible.

As part of this reform, the role of central banks in the prevention and management of banking crises should be clearly established in law. Leaving open the door for the monetization of banking crises may threaten central banks' objective of price stability and may pose moral hazard risks. Central banks may be under pressure to provide easy money to finance banking crises, in particular in countries that feature weak institutions, thereby amplifying macroeconomic instability. Having generous access to central bank resources is equivalent to providing leeway to bankers and depositors to take excessive risks. In turn, governments may feel encouraged to postpone banking resolution decisions as they count at any time on low cost funds from the central bank, without measuring properly the potential costs of delaying decisions aimed at adopting lasting bank resolution decisions.

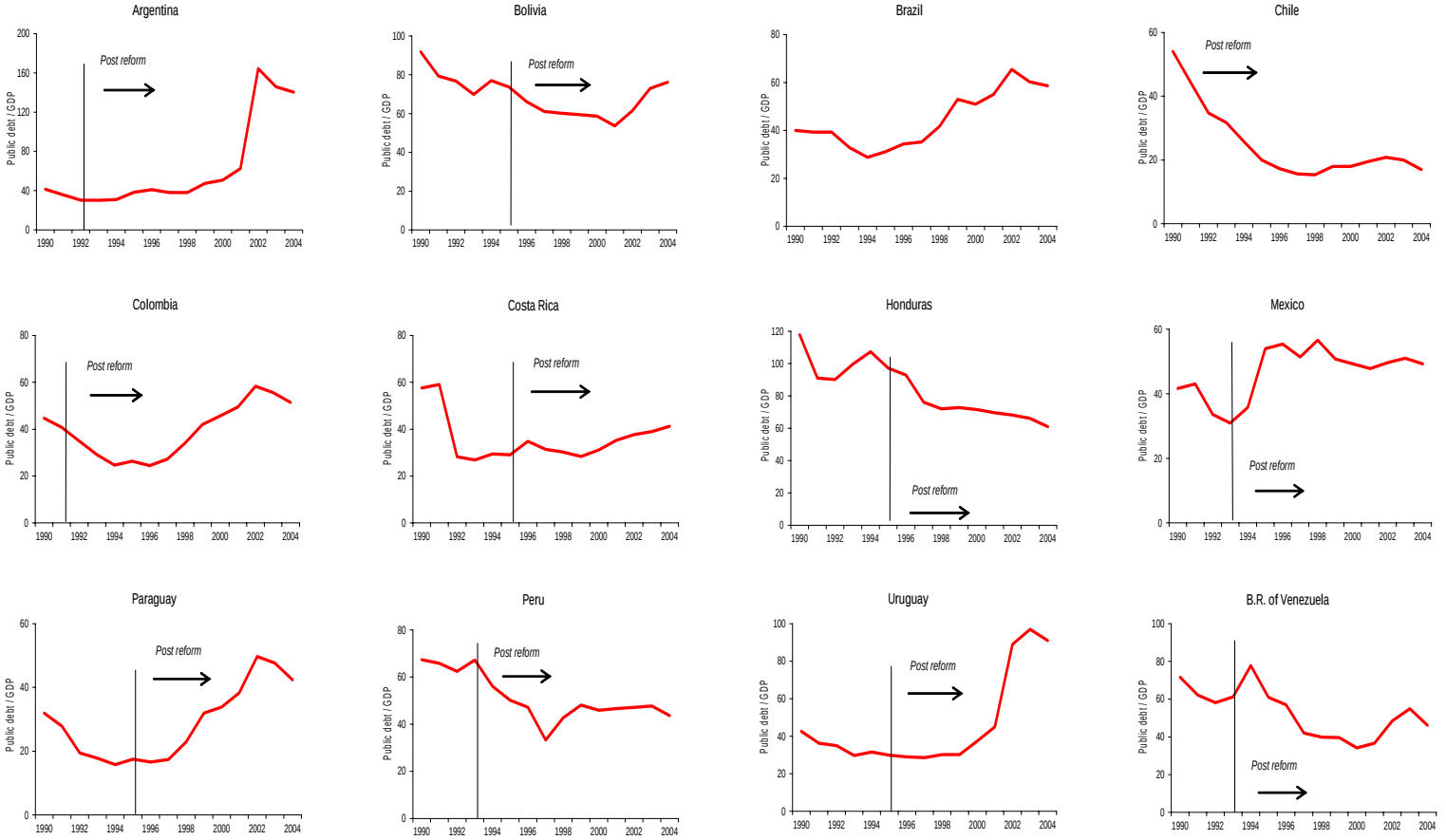
However, the regulatory framework to restrict central banks' involvement in banking crises must be an integral part of the legal reform aimed at preventing and managing banking crises. Furthermore, the legal provisions that limit the monetization of banking crises should enter into effect only once the regulations to manage banking crises and resolution are in place—based on the use of private sector and fiscal resources. Regarding lender-of-last-resort assistance, these provisions should be bounded to short-term loans directed to illiquid but solvent banks.

The importance of having strong public finances

A second key potential source of vulnerability to the objective of price stability in Latin America is the reemergence of fiscal deficits. After an initial period of fiscal consolidation during the early 1990s in most countries in the region, fiscal deficits have increased again in a number of countries, in some cases reflecting the burden associated to the legacy of previous banking crises. While public expenditure financing from central banks is already restricted following the institutional reform of central banks, increasing fiscal deficits are conducive to a rise in public debt as the only remaining source of government financing as observed in most countries in the region (see Figure 10).

The effect of a lack of fiscal discipline and an increasing debt burden is that countries may feature high real interest rates and a surge in "country risk" indicators. A tight monetary policy combined with a loose fiscal stance produces an inconsistent policy mix, which leads to an upward trend in interest rates as central banks multiply efforts to preserve markets' confidence on inflation targets. In an environment of high interest rates, the room of maneuver of monetary policy is limited and conducive to an enhanced "sacrifice ratio." In the limit, the deteriorating fiscal stance may turn unsustainable, thereby leading to a currency crisis, like in Brazil in 1999, or to a banking-currency-sovereign debt crisis, like in Argentina en 2002.

Figure 10. Public Debt in Latin American Countries (1990-2004)



Source: Western Hemisphere Department, IMF.

In light of a potential additional deterioration of public finances, a number of Latin American governments have the responsibility of reestablishing fiscal discipline to underpin central bank efforts to abate inflation. Central banks can do little to curb inflation expectations associated to large fiscal deficits and an unsustainable public debt, except rising interest rates—which may not be sustainable in the current juncture—as a way of alerting the markets about the perils of lax fiscal policies in relation to their medium and long-run objective of achieving price stability. An alternative course of action could be that governments approve "fiscal responsibility laws," like Brazil did, which seems to be providing encouraging results.

V. CONCLUDING REMARKS

Recent major developments in monetary policy in Latin America are of an institutional nature. A major central bank reform was adopted in almost all countries in the region, which, in general, focused their mandate on seeking and preserving price stability, enhanced central banks' autonomy, in particular in the use of monetary instruments, and held them accountable with respect to the actions adopted to attain their policy mandate. Despite this achievement, progress is uneven across countries, with political independence and transparency of policy decisions being fertile areas for further reform.

Under the new institutional framework, monetary policy acquired a protagonist role in most countries of the region. They abandoned exchange rate pegs in the wake of financial crises, but increasingly built confidence in their ability to formulate and execute monetary policy and eventually arrest inflation. This has been a remarkable achievement in those countries that implemented inflation targeting regimes. The operational framework of monetary policy has also evolved such that today more central banks are using a short-run interest rate as a policy rate and to signal the stance of monetary policy.

The results of the institutional reform of monetary policy are encouraging. In line with the main objective of the reform, inflation has dropped to single-digit rates in a majority of countries of the region. Empirical evidence indicates that the legal CBI, in conjunction with other macroeconomic policies, contributed to the fall of inflation, although causality has not been established. The latter is not surprising since most legal reforms were approved when the declining trend of inflation had already started. On these grounds, one can say that while granting independence to central banks did not cause lower inflation in Latin America, it did served to consolidate its downward trend by laying the ground for a monetary policy that effectively anchors inflation expectations.

Despite the tremendous success in abating inflation, there is no room for complacency. Today, central banks still need to address three important challenges. First, to drive inflation to international levels, as a measure of price stability, minimizing at the same time the "sacrifice ratio" associated with the disinflation process. Second, to foster confidence in the domestic currencies, not only as a means of payment, but also as a store of value, to reduce the vulnerabilities stemming from dollarization and to enhance monetary policy's room of

maneuver. And third, to maintain the consistency of monetary policy in the wake of the new wave of capital inflows, which is fueled by a propitious international environment and attracted by improved stability conditions and favorable regional prospects.

While an enhanced reputation and credibility will be key to successfully overcoming the first challenge—at least from the part of central banks—this may not be sufficient to restore confidence in the domestic currencies in a number of countries in the region. De-dollarization is expected to take place gradually as a result of maintaining solid macroeconomic fundamentals and the adoption of microeconomic regulations aimed at discouraging transactions in foreign currency. Likewise, measures to weather distortions created by capital inflows also require a strategy that exceeds central bank responsibilities. As a matter of principle, central banks should stick to price stability as their primary objective, and exchange rate interventions should be limited to curtailing excessive volatility in the foreign exchange market. To cope with the cost on tradable activities associated with the exchange rate appreciation, domestic producers should seek to improve productivity. Meanwhile, governments should deepen structural reforms to make their economies more flexible (including the labor market) and better able to withstand exogenous shocks.

In general, central banks will not succeed in their endeavors unless governments ensure global macroeconomic and financial stability. In particular, central banks' success also hinges on governments' abilities to preserve the soundness and stability of the financial systems and to keep fiscal deficits in check. Finally, governments should make sure that actions speak louder than words in supporting the autonomy of central banks, demanding in exchange rigorous accountability and transparency procedures from monetary policy.

REFERENCES

Andersen, P., and W. Wascher, 1999, "Sacrifice Ratios and the Conduct of Monetary Policy in Conditions of Low Inflation," BIS Working Papers, No. 82 (Basel: Bank for Internaitonal Settlements).

Barro, R., and D. Gordon, 1983, "A Positive Theory of Monetary Policy in a Natural Rate Model," *Journal of Political Economy*, Vol. 91, pp. 589–610.

Brumm, H., 2000, "Inflation and Central Bank Independence: Conventional Wisdom Redux," *Journal of Money, Credit, and Banking*, Vol. 32, pp. 807–19 (November).

Bubula, A., and I. Ötker-Robe, 2002, "The Evolution of Exchange Rate Regimes since 1990: Evidence from De Facto Policies," IMF Working Paper 02/155 (Washington: International Monetary Fund).

Carare, A., A. Schaechter, M. Stone, and M. Zelmer, 2002, "Establishing Initial Conditions in Support of Inflation Targeting," IMF Working Paper 02/102 (Washington: International Monetary Fund).

Carstens, A., D. Hardy, and C. Pazarbaşioğlu, 2004, "Banking Crises in Latin America and the Political Economy of Financial Sector Policy." Document presented at the seminar *Gobiernos y Bancos: Responsabilidades y Límites.* Inter-American Development Bank, Annual Meetings, Lima, Peru (March).

Chortareas, G., D. Stasavage, and G. Sterne, 2002, "Monetary Policy Transparency, Inflation, and the Sacrifice Ratio," *International Journal of Finance and Economics*, Vol. 7, pp. 141–155.

Cukierman, A., 1992, *Central Bank Strategy, Credibility, and Independence: Theory and Evidence* (Cambridge, Massachussetts: The MIT Press).

———, P. Miller, and B. Neyapti, 2002, "Central Bank Reform, Liberalization, and Inflation in Transition Economies – An International Perspective," *Journal of Monetary Economics*, Vol. 49, pp. 237–64.

De Haan, J., and W. Kooi, 2000, "Does Central Bank Independence Really Matter? New Evidence for Developing Countries Using a New Indicator," *Journal of Banking and Finance*, Vol. 24, pp. 643-64.

De Nicoló. G., P. Honohan and A. Ize, 2005, "Dollarization of Bank Deposits: Causes and Consequences," *Journal of Banking and Finance*, Vol. 29, pp. 1697-1727.

Eijffinger, S., and E. Schaling, 1993, "Central Bank Independence in Twelve Industrial Countries," *Banca Nazionale de Lavoro Quarterly Review*, No. 184 (March),

pp. 49–89.

———, E. Schaling, and M. Hoeberichts, 1998, "Central Bank Independence: A Sensitivity Analysis," *European Journal of Political Economy*, Vol. 14, pp. 73–88.

Fischer, S., 2001, "Exchange Rate Regimes: Is the Bipolar View Correct?" *Journal of Economic Perspectives*, Vol. 15, No. 2 (Spring).

_____, 1995, Modern Central Banking. En Capie, F., et.al. Eds. *The Future of Central Banking* (Cambridge: Cambridge University Press).

Fischer, A.M., 1996, "Central Bank Independence and Sacrifice Ratios," *Open Economies Review*, Vol. 7, pp. 5–18.

Fuhrer, J., 1997, "Central Bank Independence and Inflation Targeting: Monetary Policy Paradigms for the Next Millennium?" *New England Economic Review,* pp. 19–36 (January/February).

Grilli, V., D. Masciandaro, and G. Tabellini, 1991, "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy: A European Forum*, Vol. 6, pp. 342–91 (October).

Gartner, M., 1997, "Central Bank Independence and the Sacrifice Ratio: The Dark Side of the Force," *Schweizerische Zeitschrift fur Wolkswirtschaft und Statistik*, No. 133, pp. 513–38 (September).

Jácome, 2003, "Independencia Legal de la Banca Central en la América Latina e Inflación," *El Trimestre Económico*, Vol. LXX(4), pp. 673–719, Mexico, D.F (October-December).

———, and F. Vázquez, 2005, "Any Link Between Legal Central Bank Independence and Inflation? Evidence from Latin America and the Caribbean" IMF Working Paper 05/75, (Washington: International Monetary Fund).

Kydland, F., and E. Prescott, 1977, "Rules Rather than Discretion: The Inconsistency of the Optimal Plans," *Journal of Political Economy*, 85, pp. 473–491.

Lora, E., 2001, "Structural Reforms in Latin America: What Has Been Reformed and How to Measure It," Research Department Working Paper No. 466, (Washington: Inter-American Development Bank).

Loungani, P., and N. Sheets, 1997, "Central Bank Independence, Inflation, and Growth in Transition Economies," *Journal of Money, Credit, and Banking*, Vol. 29, No. 3, pp. 381–99 (August).

Rogoff, K., 1985, "The Optimal Degree of Commitment to an Intermediate Monetary Target," *Quarterly Journal of Economics*, pp. 1169–1190 (November).

Sarel, M., 1996, "Nonlinear Effects of Inflation on Economic Growth," *Staff Papers, International Monetary Fund*, Vol. 43, pp. 199–215 (March).

Siklos, P., 2002, *The Changing Face of Central Banking: Evolutionary Trends Since World War II* (Cambridge: Cambridge University Press).

Truman, E., 2003, *Inflation Targeting in the World Economy*, Institute for International Economics, Washington, D.C.

APPENDIX

LEGAL CBI AND INFLATION: EMPIRICAL RESULTS

This appendix highlights some empirical regularities of the association between enhanced legal CBI and inflation in Latin America—albeit without establishing causality from one to the other. As opposed to other regions, the contribution of legal CBI towards reducing inflation in Latin America has received little attention in the literature.[49]

Using panel regressions, Table A1 shows that legal CBI contributes to explain the downward trend in inflation during the period 1990-2002.[50] Legal CBI is measured through the "modified Cukierman index" referred in section II of this paper and is applied to the pre and post reform period. The result is 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.[51] The regression also includes two dummy variables to control for other potential influences in price formation and to limit the adverse statistical effect of a missing variables problem. The first dummy variable seeks to isolate the effect on inflation of systemic banking crises.[52] In turn, the second is intended to capture the influence on disinflation from fixed and hard-peg exchange rate regimes—measured on the basis of a *de facto* criterion, according to the IMF's classification of countries' exchange rate regimes. In addition, the analysis controls for world inflation (measured in terms of the average inflation in the G-7 countries) to take into account the potential influence of external inflation in the disinflation process in Latin America.

---

[49] For studies that look at developed countries, see for example the seminal work by Grilli, Masciandaro, and Tabellini (1991) and those by Eijffinger and Schaling (1993), Eijffinger, Schaling, and Hoeberichts (1998), and Brumm (2000). The transition economies have also received some attention (see for example Loungani and Sheets, 1997 and Cukierman, Miller, and Neyapti, 2002). While the influential study by Cukierman (1992) included some Latin American countries as part of a large sample of industrial and developing countries, it covers a time span prior to the 1990s in which the legal reform took place in the region.

[50] The specifics of the methodology used in this statistical exercise are similar to those discussed in Jácome and Vázquez (2005) for a sample that also includes the Caribbean countries.

[51] This variable takes a value in the range of 0 to 1, with higher variables reflecting deeper structural reforms. The data is obtained from the structural reform index calculated for Latin America by the Inter-American Development Bank. The index incorporates reforms in the trade, tax, financial, and labor spheres, and also includes privatization (see Lora, 2001).

[52] For this dummy variable, a value of 1 is assigned in the years when a systemic banking crisis occurred and 0 elsewhere.

Table A1. Legal Central Bank Independence and Inflation in Latin America
(Panel regressions of inflation on lagged CBI data)

Dependent variable: inflation scaled as $\pi/(1+\pi)$

Explanatory variables	**Lagged 1 Period**	**Lagged 2 Periods**	**Lagged 3 Periods**	**Lagged 4 Periods**
Dummy variable for banking crises	0.041** (0.017)	0.044** (0.019)	0.041** (0.020)	0.041*** (0.021)
Dummy variable for exchange rate regime	–0.052** (0.021)	–0.049*** (0.018)	-0.058*** (.009)	-0.068*** (0.009)
World inflation	0.037*** (0.007)	0.027*** (0.009)	0.024*** (0.008)	0.025*** (0.009)
Structural reform index	–0.392*** (0.117)	–0.284*** (0.109)	-0.364*** (0.089)	-0.449*** (0.083)
CBI index (modified Cukierman index)	–0.020 (0.029)	–0.037 (0.028)	- 0.065*** (0.021)	-0.042** (0.020)
Number of observations	158	147	133	117
Number of countries	17	17	17	17
Rho	0.56	0.50	0.40	0.33

Standard errors in parentheses.
* Significant at 10 percent, ** Significant at 5 percent, *** Significant at 1 percent.
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. Dummy Banking Crises equals 1 during years with banking crises and 0 elsewhere. Dummy Exchange Rate Regime equals 1 during periods of fixed exchange regimes and 0 elsewhere. World inflation is measured by the average inflation of industrial countries (IFS series 110), and the index of structural reforms varies in the interval [0, 1] with higher values indicating deeper economic reforms.

The analysis is conducted lagging the CBI index with respect to the year of approval of the institutional reform of monetary policy in each country. The purpose of lagging this variable is to capture a learning process associated to the new institutional framework and the development of the expertise required to operate under the new setting. In addition, the lags make room for a process of building credibility, which increases central bank chances of reducing inflation.

As reported in Table A1, the coefficients of all variables have the expected sign and are statistically significant at least at 5 percent. In particular, the level of significance of the coefficient of the variable CBI improves as the lag increases to three periods, which is consistent with the idea that central banks gain ability to defeat inflation as they build credibility and achieve expertise in the conduct of monetary policy.

Documentos de Trabajo
Banco Central de Chile

Working Papers
Central Bank of Chile

NÚMEROS ANTERIORES

PAST ISSUES

La serie de Documentos de Trabajo en versión PDF puede obtenerse gratis en la dirección electrónica: www.bcentral.cl/esp/estpub/estudios/dtbc. Existe la posibilidad de solicitar una copia impresa con un costo de $500 si es dentro de Chile y US$12 si es para fuera de Chile. Las solicitudes se pueden hacer por fax: (56-2) 6702231 o a través de correo electrónico: bcch@bcentral.cl.

Working Papers in PDF format can be downloaded free of charge from: www.bcentral.cl/eng/stdpub/studies/workingpaper. Printed versions can be ordered individually for US$12 per copy (for orders inside Chile the charge is Ch$500.) Orders can be placed by fax: (56-2) 6702231 or e-mail: bcch@bcentral.cl.

DTBC-342 Diciembre 2005
Bank Concentration and Credit Volatility
Alejandro Micco y Ugo Panizza

DTBC-341 Diciembre 2005
Large Term Structure Movements in a Factor Model Framework
Marcelo Reyes

DTBC-340 Diciembre 2005
Fiscal and Monetary Policy Rules: the Recent Chilean Experience
Macarena García, Pablo García y Bernardita Piedrabuena

DTBC-339 Diciembre 2005
Emerging Market Spreads at the Turn of the Century: a Roller Coaster
Sergio Godoy

DTBC-338 Diciembre 2005
Managing the Capital Account
Sebastián Edwards

DTBC-337 Diciembre 2005
Una Cuantificación del Efecto Causal de las Metas de Inflación
Jorge Lorca

DTBC-336 Noviembre 2005
Well Diversified Efficient Portfolios
Alejandro Corvalán

DTBC-335 Noviembre 2005
Monetary Policy and Long-Term Interest Rates in Chile
Mauricio Larraín

DTBC-334 Noviembre 2005
Brechas de Ingreso entre Hombres y Mujeres: ¿Perpetuadas o Exacerbadas en la Vejez?
Solange Berstein y Andrea Tokman

DTBC-333 Noviembre 2005
Sovereign Spread in Emerging Markets: A Principal Component Analysis
Mónica Fuentes y Sergio Godoy

DTBC-332 Septiembre 2005
***Spreads* Soberanos: ¿Diferencian los Inversionistas Internacionales entre Economías Emergentes?**
Valentín Délano y Felipe Jaque

DTBC-331 Septiembre 2005
Business Cycle Dynamics and Shock Resilience in Chile
Helmut Franken, Guillermo Le Fort, y Eric Parrado

DTBC-330 Septiembre 2005
Sovereign Debt, Volatility and Insurance
Kenneth Kletzer

DTBC-329 Septiembre 2005
Contingent Reserves Management: an Applied Framework
Ricardo Caballero y Stavros Panageas

DTBC-328 Septiembre 2005
Why are Capital Flows so much more Volatile in Emerging than In Developed Countries?
Fernando A. Broner y Roberto Rigobon

DTBC-327 Septiembre 2005
Probability Of Insolvency
Marcelo Reyes y Eugenio Saavedra

DTBC-326 Agosto 2005
Exchange Rate Interventions and Insurance: is "Fear of Floating" a Cause for Concern?
Francisco Gallego y Geraint Jones