

Have Inflation and Money Supply Responded Favorably to Central Bank Independence? Evidence from Latin America

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Abstract

The idea of central bank independence (CBI) has been widely accepted over the last several decades by many countries around the world, both developed and developing. As such, many countries around the world granted autonomy to their central banks during the 1980s and 1990s. The primary tenets of CBI for a particular country have been the stabilization of prices and a greater control of the money supply. However, there is only now sufficient data to empirically determine whether many of these claims are true. This study examines central bank independence in sample countries of Latin America to determine what actual impact an autonomous central bank has had in this region.

Keywords: Latin America, Banks, International Financial Markets

1. Motivation for Autonomy

The term “central bank independence” (or abbreviated, CBI) can be broadly defined as the degree of freedom of the central bank to pursue monetary policy without interference from political considerations (Sirivedhin and Hataiseree, 2000). In other words, independence implies that a nation’s central bank can follow a trajectory outside the political realm and does not have to abide by the government’s request to follow a certain monetary policy, such as printing money to pay for federal deficits (Gruben and Welch, 1993). Since being first written about academically in the late 1980s, many countries have come to adopt this policy and many governments have come to recognize this as standard procedure.

Among both developed and developing countries, there has been significant controversy regarding central bank independence. However, despite this debate, between 1990 and 1995 over 30 countries worldwide (including five from Latin America) granted independence to their respective central banks. This is due to most countries’ central banks and finance ministries understanding and accepting that high inflation is detrimental to growth and that price stability is one of the central banks’ primary functions (Maxfield, 1997). Central bank reforms have been focused in several particular areas. One is the rewriting of legal statutes regarding central banks’ operations and relations with other branches of the government. Another

is the issue of central bank accountability, and the third is the issue of increased central bank transparency (Crowe and Meade, 2008).

Overall, one of the main factors motivating central bank reforms and the granting of autonomy by their respective countries' governments has been the newfound belief that central banks' independence may be an institutional mechanism that leads to price stability, thus increasing the credibility of policymakers' commitments to stable prices (Diana et al, 2004). Furthermore, an independent central bank has the freedom to implement monetary and exchange rate policy in order to achieve its objective. Additionally, a clear definition and prioritization of the objectives of the central bank enhances its credibility both domestically and internationally (Gutiérrez, 2003). However, it should be noted that central bank autonomy is in many cases part of a broader "package" of reforms that many times includes judicial reform, privatization, removal of trade barriers, etc. (Acemoglu et al, 2008).

The idea of granting a nation's central bank autonomy from the government, although a relatively simple one at first glance, is powerful in the sense that if a central bank is independent in its decision making abilities, the government in power at a given time will be unable to turn back monetary decisions that have been made or, in a similar vein, force actions to be undertaken. Thus, in theory, an independent and autonomous central bank should lead to a more stable economic environment in the respective country (Maxfield, 1997). It represents a prominent transformation, because it not only removes a key aspect of economic decision making from political control but has kept many governmental powers from overturning growth-oriented central bank policies (Boylan, 2001).

The primary motive behind the granting of such autonomy was the belief that an independent and sovereign central bank would have more power to diminish inflation and price volatility and thusly, economic growth would be stimulated. According to Cukierman (1994), there is widespread consensus now that central banks should be independent because it helps to achieve price stability. This belief stems not only from monetary theory but also from empirical studies on the subject, both in developed and developing countries. The traditional argument for central bank autonomy is that the power to spend money (the government) should be separate from the power to print money (the central bank). Furthermore, an independent central bank has the freedom to implement monetary and exchange rate policy in order to achieve its objective. Additionally, a clear definition and prioritization of the objectives of the central bank enhances its credibility both domestically and internationally (Gutiérrez, 2003).

Although there has been much study done on the theoretical rationale behind it, few empirical studies, other than those examining the effects of inflation, have been conducted to assess accurately whether central bank independence actually leads to desirable macroeconomic outcomes. This study will examine the effects of an independent Central Bank on several countries of Latin America to determine what monetary benefits (if any) this phenomena has conferred.

2. Empirical Studies-- Inflation and the Money Supply

Most of the 20th Century was characterized by positive inflation rates in most countries of the world. The most common rationale for this phenomenon is the interaction between policymakers and a rational public within the context of the Phillips curve. This concept is based on the idea that monetary policymakers are concerned with both employment and price levels, but that their preferred level of employment is above the natural level. This is most likely due to the political pressures of maintaining relatively high

employment and the shorter term perspective that this would prompt, which tends to cause an inflation bias (Cukierman and Gerlach, 2003).

Some scholars, therefore, have argued that governments and central banks are more tempted to impart an inflationary bias to the economy, thus sacrificing long-term economic benefit to short-term political gain. However, this bias can be overcome by establishing an autonomous central bank that does not respond to myopic political pressures (Eijffinger et al, 1996). Additionally, the more authority a central bank has in setting interest rates and money supply growth, the less likely it will be for politicians to be able to use these mechanisms for their own means and not of the overall goal of achieving price stability. The central bank, as the fiscal agent for the federal government, has the varying ability (depending on its independence) to impose fiscal restraint on the government (through its ability to make/refuse to make unsecured loans from its reserves and print/refuse to print currency notes). The extent of independence of the central bank has its greatest impact on its ability to control the money supply, and thereby limit the rise of inflation. In other words, it is difficult to control the money supply if the government makes excessive demands on the central bank to print money that the bank feels it cannot reject. Thus, the argument is that an independent central bank would have more power and be more secure in its ability to refuse these types of actions (Maxfield, 1997).

Moreover, the theoretical literature has emphasized three primary arguments to explain why the delegation of monetary authority to an autonomous central bank would assist in lowering inflation, *ceteris paribus*. The first argument is that an independent central bank will be able to resist government pressure to relax monetary conditions. The second is that an independent central bank will not as easily yield to government pressure to finance government deficits by printing money and will most likely urge the government to actually reduce the deficit. The third argument is that an independent central bank will be more likely to take a longer term view of the economy compared to the government (Gutiérrez, 2003). Additionally, more central bankers now realize that surprise inflation can have, at best, a temporary positive effect on output and employment, and at worst, can lock the country into an inflation spiral along with greater macroeconomic instability (Rogoff, 2003). In sum, central bank autonomy acts as a constraint of the fiscal authority's behavior (Carlstrom and Fuerst, 2006).

There were several earlier empirical studies, such as Bade and Parkin (1985) and Alesina (1988, 1989) that successfully linked central bank independence with lower levels of inflation. However, Bade and Parkin (1988) later examined central bank independence and inflation levels for ten countries but found no relationship. Cukierman et al (1992) and Cukierman et al (1993), however, did find a negative relationship between central bank independence and inflation and inflation volatility in developed countries but not in developing ones. The common rationale for this is that the rule of law is traditionally not respected to as great a degree in developing countries. However, Gutiérrez (2003) proposes that the constitution of a country is more likely to be respected than ordinary statutes governing central bank independence. Some countries not only granted autonomy to their central banks but also went so far as to entrench it in the constitution. The study concludes that those countries that have central bank independence entrenched in their respective constitutions (as do many in Latin America) have better inflation performance than those that do not.

More recently, Kuttner and Posen (2001) and de Souza (2002) measure the impact of central bank autonomy on inflation and exchange rates and determine that autonomy is associated with lower inflation. Jácome and Vasquez (2005) note that higher central bank independence is related to lower inflation in

Latin American and Caribbean countries. Hicks (2004) confirms that central bank independence is associated with lower levels of inflation, at least in developed countries. In Ahsan et al (2007), the authors use an index of central bank independence and governance and find there is a strong relationship between inflation and central bank independence in the Asia Pacific region.

Although many empirical studies from the past few years have found a statistically significant correlation between CBI and inflation, proving causality (i.e. that CBI actually causes a decrease in inflation and/or inflation volatility) is much more difficult. To illustrate, Jácome and Vazquez (2005), using panel regressions, find a negative relationship between legal central bank independence and inflation. The results hold even after controlling for international inflation, banking crises, and exchange rate regimes. However, the authors are unable to find a causal relationship running from CBI to inflation. Furthermore, the effects of central bank reform on inflation may not be immediate, since the implementation of a new institutional environment usually requires the enactment of more specific regulations and time for the newly reformed central bank to develop a reputation with market participants (Jácome and Vazquez, 2005). Lastly, central bank independence seems to perform better as a safeguard against recurring inflation rather than as a tool to control initial high inflation. According to Cukierman (1994), experience has shown that in high-inflation economies, the taming of the inflation level can only be achieved by the involvement of the entire political establishment. However, once inflation has been conquered, central bank authority can function as a preventive device against future episodes of high inflation.

In sum, many central bank independence studies in the 1990s and early 2000s involving both developing and developed countries showed a negative relationship between inflation and central bank independence to varying degrees, and some studies also confirmed this relationship with the variance of inflation as well as other macroeconomic benefits (a topic which will be studied in the following section). For developing countries, however, there still remains some controversy regarding the basic correlation between central bank independence and inflation (Cukierman, 1994).

2.1 Latin America

Latin America has been in the midst of a very complex historical transition. Countries in this region are overcoming deeply rooted authoritarian legacies in route to more liberal, competitive and participatory democracies (Smith et al, 1994). In 1950, Latin America was the most developed region outside of the industrialized world, with an average GDP per capita more than two and a half times that of East Asia, and about one-fourth that of the U.S. However, three factors can account for much of Latin America's lagging economic performance during the second half of last century: its problems with macroeconomic instability, its low level of integration with the global economy and the poor quality of its public institutions (Elson, 2006). Beginning in the mid-1960s the majority of the Latin American governments began to encourage inward-looking growth and underestimate the importance of macroeconomic stability, as opposed to East Asian economies which implemented and encouraged policies that promoted exports and preserved macroeconomic stability (Edwards, 1995).

Recurrent banking crises and lack of fiscal discipline have traditionally been, and still are, the primary risks for the success of monetary policy in Latin America. Many Latin American countries experienced hyperinflation and economic recession during the 1980s and first part of the 1990s due in part to expansionary monetary policies. In 1990 average inflation in Latin America reached 500%, with three of the countries in the region (Argentina, Peru and Brazil) posting quadruple-digit inflation rates.

As has been stated throughout, dependent central banks are commonly at the whim or mercy of specialized agencies in charge of the country's overall financial activities. Independent central banks, on the other hand, have much more freedom to carry out monetary policy (Edwards, 1995). Until the 1990s, Latin American central banks lacked independence from policymakers and thusly the independence to formulate and execute monetary and exchange rate policy. Therefore, for many years, price stability was at most a secondary objective (Carstens and Jácome, 2005).

As a result of these inflation numbers and the economic havoc that was brought about as a result, various governments in the region made central bank reform a key component of the new economic agenda. With monetary policy independently managed, governments' chances of potential expansionary policies associated with a country's political and business cycles were drastically reduced (Carstens and Jácome, 2005). Since the late 1980s and early 1990s, many Latin American countries have implemented major financial reforms, of which granting independence to their central banks is a part, aimed at increasing the degree of financial intermediation and raising the efficiency of investment (Edwards, 1995). Inflation began to improve when many countries in the region began to reform their constitutions and included a chapter devoted explicitly to central bank restructuring and independence (Gutiérrez, 2003). For example, Chile was one of the first countries in the region to grant autonomy to its central bank. According to its web site, the Central Bank of Chile is "an autonomous entity of technical nature, created in accordance with constitutional provisions, has full legal capacity, possesses its own assets and has an indefinite duration" (www.bcentral.cl/eng/index.htm).

The goals of financial deregulation and central bank autonomy in most Latin American countries have been to stabilize prices and remove government from directly participating in the allocation of credit and setting of interest rates. At the time the reforms were implemented, the feeling among Latin American leaders was that direct government involvement had failed badly and that the Latin American countries needed to move toward a very different model. The debt crisis of 1982 and the failure of early policies in the region to deal with it also played an important role in reshaping policy views in Latin America (Edwards, 1995). Moreover, the external shocks of the debt crises of the early 1980s and again in the mid-to late 1990s led to the implementation of policies with strong common elements--trade liberalization and the promotion of foreign investment, deregulation of markets, fiscal reforms and macroeconomic equilibrium (Smith et al, 1994).

Thus, it became increasingly apparent that relying heavily on the state to run the economy did not generate the expected results. Instead of protecting the public from major external shocks, the state greatly weakened the ability of the respective country's economy to react to foreign disturbances. By the end of the 1980s, many political leaders of the region were looking to market based policies to turn their respective economies around. Part of the process of fiscal and macroeconomic reform has been the granting of independence to many central banks in the region. Unfortunately, however, accountability of central banks in some Latin American countries has improved but transparency is still weak (Edwards, 1995).

Although common motives have been a need for economic retooling for export-led growth and a need for international creditworthiness as a result of a history of financial mismanagement, countries in the region have also had their own unique rationales for seeking CBI. For example, in Chile, independence was granted in order to limit the consequences of poor judgment of future administrations. In Argentina, a conditional IMF loan agreement prompted central bank independence. In Venezuela, although the central

bank was granted a great deal of legal monetary policy authority, the country's vast oil wealth decreased the importance that many politicians placed on independence; as a result, operational CBI has been severely stymied. In Brazil, more inclusive objectives have been assigned to the semi-independent central bank, such as the advancement of social progress. Lastly, for Mexico, international creditworthiness was a major consideration in granting autonomy to the central bank due to this country's desire to continue to attract foreign capital (Maxfield, 1997).

Although the macroeconomic results have not fully met the expectations that were raised at the time the reforms were instituted, there has indeed been an improvement over the previous decade. This is especially true when the tremendous consequences of persistent hyperinflation, macroeconomic instability and the regional financial shocks that took place during the 1990s are taken into consideration. The decline of inflation rates in Latin America was astonishing, from an average of 500% at the beginning of the 1990s to single digits by the early 2000s (Carstens and Jácome, 2005).

In sum, the history of Latin America abounds with incidents where fiscal balance was lost and inflation took over due to political pressures. Some countries in the region have tried to deal with these problems by implementing reforms that lessen the extent to which the central bank is influenced by short-term politics, arguably the most important of which has been making their central banks independent from the executive branch, a policy which was widely adopted during the 1990s. However, it is important to realize that although autonomous central banks, with the responsibility of achieving monetary stability, can have a great deal of influence in reducing macroeconomic imbalances, independent central banks are in no way substitutes for prudent and consistent monetary and fiscal policy (Edwards, 1995). Additionally, the tremendous reduction of inflation in these countries was due to an entire group of reforms, although undoubtedly central bank independence played an important role (Jácome and Vazquez, 2005).

2.1.1 Brazil

The Central Bank of Brazil was created in 1964 and is considered an autonomous federal institution. However, from that time until the mid-1980s, monetary authority was shared between the Central Bank, the Bank of Brazil (which acted in a sort of government bank capacity) and the National Treasury. In 1985, financial reorganization of the government was undertaken and continued on until 1988, at which time the functions of monetary authority were completely transferred to the Central Bank from other monetary authorities in the country (such as the Bank of Brazil). The 1988 Constitution establishes the Central Bank's responsibilities, such as the issuance of money, the nomination of Central Bank governors, and the prohibition of loans to the National Treasury ("Banco Central History").

However, despite worsening macroeconomic conditions in the country during the 1980s, including the massive rise of external government debt as well as several episodes of hyperinflation, the issue of legal central bank independence remained a low priority for the once again civilian government (which had been under military rule since the mid-1960s). This was most likely due to the easy money available during that time period through different sources (such as private bankers) in the international markets as well as a massive growth in exports. Unfortunately, although talks pursuing renewed interest in central bank autonomy rose again in 1993-94, they were quickly buried among scandals of political corruption (Carstens and Jácome, 2005). Therefore, at this point it seems that there is a tacit agreement of some degree of operational independence between the Central Bank of Brazil and the government (with

responsibilities established by the Constitution), but no formal central bank independence has been declared in the Constitution or in any other legal statute.

2.1.2 Mexico

The concept of central bank autonomy in Mexico has evolved through three distinct stages. During the first stage, known as Statutory Autonomy (1925-1938), rules were established which governed the ceilings on growth of key operative variables. In the second stage, known as Charismatic Autonomy (1955-1970), sound public finances were emphasized and defended by important political figures. During the most recent stage, known as Institutional Autonomy (1994 to present), the central bank's autonomy has been based on a constitutional mandate that determines the bank's functions, provides for a self-governing directive body, and administrative and budgetary independence (Turrent y Diaz, 2007). When Mexico's Central Bank was granted legal (vs. simply some degree of operational) independence in 1994, the treasury secretary explained that the changes were designed to ensure that the bank would gain control over the country's anti-inflation policies, which were tied directly to the central bank's lending practices ("Presidency Introduces Legislation Seeking Autonomy for Central Bank").

The 1994 statute essentially made three changes. The stabilization of the peso's purchasing power was stipulated as the central bank's primary goal. The statute also prohibited the extension of central bank credit to the government and provided for appointment terms and conditions of the central bank governor and directors as those "that would be conducive to exercising autonomy." However, the peso crisis of 1994-1995 demonstrated how little impact legal independence can sometimes have. However, the example of Mexico strongly suggests how legal independence can arise from operational independence (although sometimes with a considerable lag). It also helps to lend credence to the intuitively sound thought that markets shape ideology more than ideology shapes markets (Grier, 2004).

3. Hypotheses

Given the related theory and evidence provided in the previous sections, the following hypotheses are put forth. For simplicity, they are written in the form of alternative hypotheses, with the null being that of no correlation.

H1- Central Bank Independence is negatively related to Inflation.

H2- Central Bank Independence is negatively correlated to Money Supply growth.

4. Methodology and Data

The following macroeconomic variables will be used as dependent variables to measure the impact of central bank independence and outside phenomena on a country's growth and stability and are measured on a quarterly basis. For econometric reasons, the first iteration (i.e. "first difference") of each variable will be used. Macroeconomic data from Q1:1960 to Q1:2011 will be taken entirely from the International Monetary Fund (considered a highly regarded, neutral, global financial institution) in order to maintain consistency of measurements, data collection processes and to avoid biases of individual country central banks or national data collection agencies. Source: International Monetary Fund.

1. Inflation (as measured through changes in the Consumer Price Index)

2. Money (M1) Supply

The following independent variables will be used to examine the impact of the nuances (political and economic) of central bank independence and related phenomena on the previously mentioned dependent variables. Dummy variables are used frequently to classify data into mutually exclusive categories (Gujarati, 2003) and will be used in the following equations to represent, among other things, the effects of country development, foreign exchange rate regimes, the occurrence of financial crises, the degree of international inflation, and the presence of legal CBI.

1. **Central Bank Independence (Legal Date)**. This is a dummy variable designed to distinguish between years in which no central bank independence was in place and years in which legal central bank independence was in existence.
2. **Modified Cukierman Index**. This is a composite CBI index measuring various facets of independence.
3. **Grilli Masciandaro Tabellini (GMT) Index**. This is a composite index measuring political and economic independence in various areas.
4. **CB Governor Turnover**. This has traditionally been used in the CBI literature as a proxy for independence, with the idea being that if there is a high ratio of turnover (as measured on a yearly basis), this is an indicator that the central bank is actually under the firm control of the executive branch and that the central bank governor will be dismissed if he or she does not comply with the government's demands.
5. **Development Dummy Variable (from 0 to 1 in .1 increments)**. This measures the economic development of the respective sample country in terms of Gross Domestic Product, with each .1 increment representing \$3,000 of GDP in constant dollars Source: The World Economy: Historical Statistics, OECD Development Center, 2003.
6. **Foreign Exchange Rate Regime Dummy Variable**. This is designed to capture the effects of a particular type of exchange rate system on a country's economy. It takes a value of 0 for pure fixed and 1 for pure floating in .1 increments. Sources: Crowe and Meade (2008), Musa et al (2000), Baig (2002), Bubula and Otker-Robe (2003), and IMF (2003).
7. **Financial Crisis Dummy Variable**. This is designed to capture the effects of financial crises on a country. It takes a value of 0 for years in which no crisis was experienced and 1 otherwise. Sources: Carstens and Jácome (2005) and author's own calculations.
8. **International Inflation Dummy Variable**. This is designed to control for the effects of international inflation on a country, with the idea being that many countries (including developed ones) are susceptible to outside economic forces. It takes a value from 0 to 1 in .1 increments. Sources: Jácome and Vázquez (2005) and IMF Database.
9. **Inflation Targeting Regime Dummy**. This is devised to capture the effects of Inflation Targeting as either a primary or secondary objective for a nation's central bank.
10. **Government Consumption as a Percentage of GDP**. This will be used as a proxy measure of government spending or government expenditure in order to measure the effects of fiscal policy on the dependent variables already described.
11. **Total Tax Revenue as a Percentage of GDP**. This will also be a proxy measure of fiscal policy, representing the respective government's policy toward and ability to collect taxes relative to the size of the economy.

12. Budget Surplus/Deficit as a Percentage of GDP (limited availability). This will be a comprehensive proxy for fiscal stance and policy. It is often thought that a large budget deficit can be an exogenous source of inflation. To maintain a similar basis for comparison for the long time period in question, again the variable “as a % of GDP” will be utilized. Source: International Monetary Fund IFS.

The basic individual regression in this study will take the following form:

(Formula 1)

The specific regressions given the above dependent and independent variables will be the following:
(Formulae 2 & 3)

This study will first use Ordinary Least Squares multivariate regression to test for correlation and relationships among the variables in question. Regressions will be done in a time series fashion over the time period under consideration (quarterly data for over 50 years, to equal more than 200 observations for most time series). The “goodness of fit” ratio, or R^2 will be used to gauge how well each dependent variable is explained by the independent variables. The Durbin-Watson Test will also be used for autocorrelation. A comparison of the R^2 and Durbin-Watson test will be used as verification that the regression is not spurious (as mentioned above, if the Durbin-Watson results are quantitatively higher than the R^2 , this is a sign that the regression is not spurious, or non-sensical). Only results that are at least at the 10% statistical significance level will be listed throughout the results section and all will be listed with coefficients.

5. Results and Interpretations

H1- Central Bank Independence is negatively related to Inflation.

(Table 1)

It is difficult to make any broad generalizations regarding Latin America, as this region unfortunately experienced extreme financial turmoil such as hyperinflation during much of the time period under question. Operational and legal CBI appears to have mixed results. However, the tendency for country development to be negatively related to inflation is encouraging.

Now, the pre- vs. post-CBI periods will be examined to pinpoint any gains achieved from the legal and/or operational rise in central bank autonomy. (Table 2 & 3)

Several instances of operational CBI effectiveness in the pre-CBI period can be seen in Argentina and Mexico.

Interpretation-- Overall, there is moderate to strong support for the negative relationship between CBI and Inflation. Moreover, the effectiveness of operational independence in lowering Inflation increased post-CBI. However, legal CBI does not appear to be quite as effective.

H2- Central Bank Independence is negatively correlated to Money Supply growth.

Next, the effects of inflation will be examined from the supply side in terms of (M1) Money Supply (currency circulation plus checking accounts). As was noted earlier, one of the key benefits of an independent central bank is that it does not have to acquiesce to the government’s demands to print money. Therefore, the supply of money could perhaps grant some insight into the effectiveness of an autonomous central bank.

(Table 4, 5 & 6)

It is difficult to make any new distinctions regarding money supply in the pre- vs. post-CBI periods. There does, however, appear to be a positive correlation between central bank governor turnover and money supply in several instances, and a negative correlation between the surplus/deficit and money supply growth.

Interpretation-- Perhaps Central Bank Independence, when working properly, is able to stem the creation of money (as the literature suggests), thereby indirectly stemming inflation growth due to an independent, non-politically motivated or influenced central bank.

6. Conclusion

There seems to be a general indication that central bank independence, although a relatively powerful tool, is not a panacea. Even after the passing of laws creating an independent central bank in a given country, it by no means will serve to cure all monetary and fiscal ills of that country. Although CBI by itself may have a limited effect on many macroeconomic outcomes, it is probable that CBI is part of a wider range of reforms, all seeking to stabilize and modernize the economy of the respective country. Perhaps in this way, successful CBI may serve as a key part (although only a part) of a package of reforms or, in a similar way, may “pave the way” for reforms to come.

Again, the practical implications of these results for both academics and policymakers is that the concept of Central Bank Independence has continued to evolve and is still a very relevant issue for the economy of the first decade of the 21st century and beyond. Its benefits can be moved beyond simply a potential measure to counteract Inflation, but to perhaps influence the entire spectrum of a nation’s economy. Although its benefits are not seen “overnight”, it is an unambiguous and distinct measure for a nation to take to improve the long term prospects of an economy and its population. Through the broader set of macroeconomic variables chosen here, as well as the more narrow set focused on in later hypotheses, it is clear that the gains from Central Bank Independence can be felt by a nation’s residents (through more stable prices, greater economic growth and less unemployment) and be a definite step for improving the country’s overall level of welfare.

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FORMULAE AND TABLES

$$y = \alpha + \beta_1 CBI_1 + \beta_2 CBI_2 + \beta_3 CBI_3 + \dots + \varepsilon \tag{1}$$

Inflation Rate = $\alpha - \beta_1$ Development Dummy - β_2 Modified Cukierman Index - β_3 GMT Index - β_4 Foreign Exchange Rate Regime Dummy + β_5 Financial Crisis Dummy + β_6 International Inflation Dummy - β_7 Legal Central Bank Independence Dummy + β_8 Central Bank Governor Turnover - β_9 IT Dummy + β_{10} Cons - β_{11} TaxRev + ε

(2)

Money Supply = $\alpha - \beta_1$ Development Dummy - β_2 Modified Cukierman Index - β_3 GMT Index - β_4 Foreign Exchange Rate Regime Dummy + β_5 Financial Crisis Dummy + β_6 International Inflation Dummy - β_7 Legal Central Bank Independence Dummy + β_8 Central Bank Governor Turnover - β_9 IT Dummy + β_{10} Cons - β_{11} TaxRev + ε

(3)

Country	R ²	DW	Significant Variables (Coefficients)	Chi-Square
Argentina	.63	1.23	FCD (1.04), FXD (3.99), GMT (-10.05), LCBI (64.70), TaxRev (6.17)	124.11
Argentina (GARCH)	.51	.98	CBGov (.00), DD (-.01), FCD (.00), GMT (-10.26), Cons (.00), II (.73), LCBI (62.06), MCI (8.06), TaxRev (6.11)	
Brazil	.46	1.06	GMT (2.36), II (9.11)	90.62
Mexico	.74	1.50	DD (-5.36), FCD (.61), FXD (3.34), GMT (.96), II (.64), LCBI (-5.93), TaxRev (-.29)	145.04
Mexico (GARCH)	.66	1.16	CBGov (-.01), DD (-3.63), II (.06)	

Table 1-- Inflation Results: Latin America

Country	R ²	DW	Significant Variables (Coefficients)
Argentina	.73	.87	CBGov (-2.93), DD (-9.08), GMT (-.91), II (4.84), TaxRev (1.72)
Brazil			Unavailable
Mexico	.62	.99	DD (-3.58), GMT (-6.70), II (.55), Surplus (-.15)

Table 2-- Inflation Results: Latin America (Pre)

Country	R ²	DW	Significant Variables (Coefficients)
Argentina	.21	1.93	FXD (8.87), TaxRev (-6.03)
Brazil	.42	1.05	GMT (2.25), II (13.14)
Mexico	.62	2.41	FXD (9.49), II (3.65)

Table 3-- Inflation Results: Latin America (Post)

Country	R ²	DW	Significant Variables (Coefficients)	Chi-Square
Argentina	.32	1.40	None	63.04
Brazil	.56	1.47	FXD (132.45), II (129.95), LCBI (-2390.45), Surplus (-19.12)	110.32
Mexico	.38	2.60	DD (356.12), Surplus (-9.26), Cons (-4.56)	74.86

Table 4—Money Supply Results: Latin America

Country	R ²	DW	Significant Variables (Coefficients)
Argentina	.23	1.85	CBGov (1119.30), II (315.11), TaxRev (-136.30)
Brazil			Unavailable
Mexico			Unavailable

Table 5—Money Supply Results: Latin America (Pre)

Country	R ²	DW	Significant Variables (Coefficients)
Argentina	.21	2.85	CBGov (102.15), FXD (15.40)
Brazil	.59	1.42	FXD (135.48), II (160.20), Surplus (-18.35)
Mexico	.50	2.43	Surplus (-9.62)

Table 6—Money Supply Results: Latin America (Post)