Fiscal Policymaking and the Central Bank Institutional Constraint *Una Vez Más*: New Latin American Evidence

Richard C. K. Burdekin* and Leroy O. Laney**

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Abstract

The potential effects of central bank independence on government budget deficits remain surprisingly largely unexplored in the literature. This paper re-examines the relationship between central bank independence and budget deficit for a 14-country sample of Latin American countries over 1990-2012. The empirical findings offer quite strong support for the importance of the central bank institutional constraint extending beyond the industrial countries of Western Europe and North America. This suggests that greater central bank autonomy could indeed help reign in fiscal excesses in a region that has been plagued by inflationary deficit expansion for much of the post-war period.

* Claremont McKenna College
** Hawaii Pacific University

CONTACT: Richard C. K. Burdekin, Jonathan B. Lovelace Professor of Economics, Claremont McKenna College, 500 E. Ninth Street, Claremont, California 91711. Tel (909) 607-2884; Fax (909) 621-8249; Email: rburdekin@cmc.edu.

A central bank that is dominated by the government may be forced to ease policy inappropriately to reduce the financing costs of government debt or to help re-elect incumbents.

(Bernanke, 2005)

[A]djustments in levels and conditional volatilities of monetized deficits seem to have stabilized inflation processes in most of the [South American] hyperinflations …

(Sargent, Williams and Zha, 2009, p. 245)

1. Introduction

The need for fiscal discipline has seldom been more evident than in the face of the Greek debt crisis. Compared to an average central government expenditure per capita of €6754.90 in the European Union as a whole, and €5122.54 for the original 16 Maastricht-treaty countries, Greek expenditure per capita stood at €8072.60 in 2013 (Hanke, 2015). One factor in fiscal discipline concerns the readiness with which the government can turn to the central bank to finance its deficits. If the central bank is not independent this allows the government to fund expenditure increases without having to worry about finding takers for its bond issues. For much of the postwar period Greece featured essentially no central bank independence whatsoever as its monetary policy was determined by a government-run Currency Committee under a set-up that prevailed from 1946 until 1982. Although this institutional arrangement may not account for the underlying pressures for fiscal expansion, the absence of any real financing constraint could only work against the enactment of more disciplined policies.

The subsequent abolishment of the Currency Committee in 1982 and gradual reining in of the Greek central bank's obligation to fund public sector spending was temporarily accompanied by smaller budget deficits (Skoularikis, 2001, pp. 151-152). Central bank independence proved to be no more lasting than the fiscal retrenchment, however. According to Skoularikis (2001, p. 152):

> After the ratification of the Maastricht Treaty in 1992 … a sequence of administrative developments created doubts about the degree of independence of the central bank. Two successive Governors were forced to resign in less than two years, proving that the political independence of the Bank of Greece was almost non-existent.

It is also not clear that placing Greece under the umbrella of the European Central Bank necessarily helped matters. On the contrary, the extraordinary measures adopted by the European Central Bank in purchasing the debt of crisis countries like Greece could only work against any importing of fiscal discipline as a result of European Union membership. Indeed, Masson (2012, p. 24) argues that maintaining the effective independence of the European Central Bank itself might require a "narrower monetary union centered around Germany." There simply does not seem to have been any mechanism within the broader European Union able to compensate for the underlying limitations in Greek domestic institutions.

Although getting one's own house in order is easier said than done, this paper argues that the establishment of an independent domestic monetary authority is key in this regard. Our empirical work focuses upon Central and South America, a region that like Greece has been plagued by fiscal excesses during much of the postwar period. The evidence suggests that reforms establishing more independent central banks can meaningfully boost fiscal discipline even in a region that has experienced amongst the

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worst inflation rates seen in the postwar world. If central bank independence can achieve

this result in Latin America there seems no reason to believe in could not be effective in

countries like Greece. [1] That is, based on the Latin American evidence, we optimistically

conclude that better institutions can potentially lead to better outcomes no matter how

dire the circumstances may have been in the past.

2. Past Evidence on the Importance of Central Bank Independence

Worldwide moves towards greater central bank independence in recent decades

(Crowe and Meade, 2008; Dincer and Eichengreen, 2014) have been accompanied by an

expanding literature focusing on the relationship between such independence and

inflation and other indicators of economic performance. One reason central bank

independence matters is in potentially solving the time-inconsistency problem of

monetary policy. Rogoff (1985) demonstrated that delegation of monetary policy to a

more inflation averse, independent central banker – one who could not be overruled later

by the delegator – should theoretically lead to better inflation outcomes. A more

independent central bank should also help keep interest rates down insofar as investors no

longer demand an extra premium to compensate for the erosion of principal by inflation

over the term of the loan. Indeed, Napoleon Bonaparte had favored establishing a

privately-owned Banque de France because he reasoned that increased investor

confidence would help keep interest rates and borrowing costs low (Elgie and Thompson,

1998, p. 98). In addition to producing less inflationary outcomes, an independent central

bank could also provide for more consistent policy and reduced uncertainty through

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[1] This is not, of course, to deny the importance of public opposition and other country-specific factors – with Kaplanoglou, Rapanos and Bardakas (2015), for example, suggesting that the feasibility of fiscal consolidation can be significantly enhanced by accompanying poverty alleviation measures.

having the same policymaking body span the administrations of different political parties.[2]

Much attention has been paid to the relationship between central bank independence and inflation, with the majority of studies supporting a significant linkage (Klomp and de Haan, 2010). The relationship with economic growth is less clear, however (Alesina and Summers, 1993) and Simmons (1996) argues that central bank independence actually contributed to deflationary bias in the interwar years, for example. Whatever the impact on the economy as a whole, there is no doubt that central bank independence affects the relationship with the central government by denying the fiscal authority automatic money finance of its deficits. Not only is an independent central bank less likely to monetize government budget deficits (cf, Sikken and de Haan, 1998) but also the deficits themselves will be less inflationary insofar as they are not accompanied by actual or expected monetary expansion (Burdekin and Wohar, 1990; Neyapti, 2003). Meanwhile, financing costs rise insofar as government is forced to collect revenues from conventional taxes rather than seigniorage revenue in such a case (Nolivos and Vuletin, 2014). Indeed, if budget deficits must be financed through bond finance rather than money finance, this may not only make deficit finance more costly but also, in the limit, infeasible. Whereas Sargent and Wallace's (1981) "unpleasant monetarist arithmetic" is usually taken to imply that the monetary authority would eventually capitulate in financing otherwise unsustainable budget deficits, Sargent (1985, p. 248) acknowledges that there is also the potential for "reverse causation" whereby

> If the monetary authority could successfully stick to its guns and forever refuse to monetize any government debt, then eventually the arithmetic of

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[2] Central bank independence can naturally be combined with other ways of anchoring policy, such as the increasingly popular device of inflation targeting (cf, Burdekin et al., 2011).

the government's budget constraint would compel the fiscal authority to back down and to swing its budget into balance.

The potential effects of central bank independence on government budget deficits are surprisingly largely unexplored notwithstanding the enormous growth in the literature on central bank independence as a whole. Early estimation by Burdekin and Laney (1988) for a group of 12 industrialized countries during 1960-1983 identified a significant negative effect on budget deficits arising from central bank independence while controlling for monetary base growth, output growth, unemployment, and time effects.[3] In this case central bank independence was defined based on freedom from government override and only the German, Swiss and US central banks were considered independent on these terms (consistent also with the preceding analysis by Parkin and Bade, 1978, and Banaian, Laney and Willett, 1983). Although Grilli, Masciandaro and Tabellini (1991) found no significant effects of central bank independence among their sample of 18 industrialized countries, de Haan and Sturm (1992) suggest that this may have been due to the particular measure of central bank independence employed and find significant results for an independence dummy more closely tied to the original Parkin and Bade (1978) study. Unlike Burdekin and Laney (1988), they do not control for other macroeconomic variables in their regression analysis, however. Subsequent research points towards the importance of including not only macroeconomic control variables but also controlling for the nature of the political structure. Incorporating such institutional variables, Jonsson (1995) finds support for central bank independence reducing budget deficits among the industrialized countries over the 1961-1989 period while Bodea

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[3] Van Aarle, Bovenberg and Raith (1995, p. 138) extend this interaction between monetary and fiscal policy to assess the implications for debt stabilization, concluding that "making the central bank less dependent increases discipline on all fronts in the steady state: money growth, primary fiscal deficits, and debt all decline."

(2013) finds evidence of such an effect for a 1990-2002 sample of European post-Communist countries.[4]

Bodea's (2013) analysis suggests that the reverse causation initially identified for the industrialized countries in Burdekin and Laney (1988) may extend to less advanced economies. Such economies are often thought to be more at risk of fiscal dominance, under which the outstanding public debt is only partially backed by current and future primary budget surpluses implying prospective reliance upon seigniorage revenue to make ends meet.. De Resende (2007), for example, finds that the actual degree of fiscal dominance is low for almost all OECD countries but is much more of a concern amongst developing economies. Fiscal dominance threatens not only effective central bank independence but also the scope for achieving inflation targets insofar as the central bank loses control over the size of its own balance sheet (Freedman and Ötker-Robe, 2010). Walsh (2011, p. 19) further states: "Without fiscal acceptance of the goals of low and stable inflation, the central bank will ultimately fail, regardless of its supposed degree of operational independence."

It is of particular interest, therefore, to determine if reverse causality running from monetary to fiscal policy extends beyond the industrialized countries alone. The results below suggest that the relationships seen for the industrialized countries in Burdekin and Laney (1988) do indeed carry over to a more recent sample of developing economies. As with Bodea (2013), we include the Freedom House democracy index to control for the nature of the political regime. We consider three alternative indexes of central bank

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[4] Although Sikken and de Haan (1998) suggest that central bank independence affected only monetization rates and not the size of the budget deficit itself, this finding relies upon a single alternative measure of central bank independence based upon Cukierman, Webb and Neyapti (1992) and does not incorporate any of the control variables featured in the other studies.

independence for our sample of 14 Central and South American countries over the 1990-2012 period. In addition to an index derived specifically for this region by Gutiérrez (2004) we incorporate an updated version of the Cukierman, Webb and Neyapti (1992) index and a new index compiled by Dincer and Eichengreen (2014). We find support for budget deficits being smaller when the central bank is more independent, which, together with Bodea (2013), suggests that this is much more than just an industrialized country phenomenon. The extension of central bank independence outside the industrialized group can exert significant effects not just upon the overall inflation rate but upon the conduct of fiscal policy, therefore.

3. Measuring Central Bank Independence in Practice

According to Parkin and Bade (1978), the most independent central banks should enjoy final authority over monetary policymaking, have no government official on their governing board, and have some board appointments that were independent of government. Only the German Bundesbank and the Swiss National Bank met all these standards at the time of their original study. Later analyses of central bank independence added on more institutional features, with the Grilli, Masciandaro, and Tabellini (1991) index, for example, based on a summation of eight features, each equally weighted. Their approach highlighted disagreement in interpretation of central bank laws and how some criteria were written (see also Banaian, Burdekin and Willett, 1995). Cukierman, Webb, and Neyapti (1992) broadened the array of possible institutional arrangements to

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as many as seventeen different legal attributes (see also Cukierman, 1992),[5] forming the

basis for Cukierman, Miller, and Neyapti's (2002) coding for the transition economies as

well as the Latin American and Caribbean analysis by Carstens and Jácome (2005) and

Jácome and Vázquez's (2008).[6] This approach is not without its critics, however, with

Banaian, Burdekin and Willett (1998) and Banaian and Luksetich (2001) showing that

only certain elements of the wide array of attributes contribute useful explanatory power.

Other complications arise from the distinction between *de facto* and *de jure* aspects of

independence (Siklos, 2008) and possible co-determination of central bank independence

and inflation performance (Brumm, 2011).[7]

Whereas Cukierman (1992) and Cukierman, Webb and Neyapti (1992) suggest

that legal independence may matter only for industrialized countries, Gutiérrez (2004)

finds that Latin American inflation rates are significantly influenced by central bank

independence when this independence is enshrined in the constitution. Such

constitutional provisions make it more difficult for governments to interfere with central

bank autonomy after the fact, thereby making it much more likely that *de jure*

independence will be associated with greater *de facto* independence as well. In focusing

upon the Latin American economies, we consider the possible implications for fiscal

policy of the constitutional central bank independence series for South American and

Caribbean countries compiled by Gutiérrez (2004). Gutiérrez (2004) considers five broad

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[5] Cukierman, Webb and Neyapti (1992) offer an additional measure focusing on the turnover of the central bank governor and offer evidence that higher rates of turnover are correlated with higher rates of inflation amongst developing economies..

[6] See also Arnone et al. (2009) for a broad-based empirical analysis applied to 163 central banks updated through the end of 2003.

[7] In addition to central bank independence, there is also an expanding literature devoted to the impact of rising central bank transparency (see, for example, Dincer and Eichengreen, 2014). Meanwhile, Hayo and Hefeker (2010) review the potential role played by such factors as varying national inflation cultures, political interest groups, and divergent legal and political systems.

criteria covering the objectives of the central bank (price stability should be the primary objective), its responsibilities regarding monetary and exchange policy, its degree of political autonomy of the central bank (for example, the presence of government representatives with voting rights on the central bank board diminishes the political independence of the bank), its degree of economic autonomy (capacity to control its own balance sheet and to affect liquidity levels and interest rates), and its accountability.[8]

   We focus upon 14 for countries for which we can obtain consistent macroeconomic data covering the 1990-2012 period and our sample comprises Argentina, Bahamas, Barbados, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru and Uruguay. In order to avoid possible distortions arising from hyperinflation observations, the start date is delayed until 1992 for Argentina, Nicaragua and Peru and data availability limits us to a 1997 start date for Brazil. In light of the changes in central bank laws since the compilation of the Cukierman, Webb and Neyapti (1992) index, we compare the Gutiérrez (2004) constitutional independence index with an updated version of the Cukierman index that takes into account post-1990 developments (Carstens and Jácome, 2005). This modified index takes account of gains in central bank independence through the end of 2003 and the relatively stronger positions enjoyed in countries like Bolivia, Chile, Colombia, the Dominican Republic and Mexico. It does not, however, include values for Bahamas, Barbados, El Salvador or Panama, which therefore leaves a ten-country sample with this index.

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[8] If the constitutional provisions explicitly undermine the autonomy of the central bank, the value of the index is negative.

There are substantial differences between the constitutional-based approach and the Cukierman-based approach that is based upon the letter of the central banks laws alone. Under the constitutional approach, the central banks of Chile, Mexico and Peru receive the highest scores for independence whereas, in contrast to the modified Cukierman index of Carstens and Jácome (2005), the central banks of Bolivia, Colombia, and the Dominican Republic are ranked relatively low ranked in the absence of constitutional guarantees supporting their seemingly enhanced legal independence. In addition to comparing the empirical significance of these alternative measures of central bank independence, we consider a third measure compiled by Dincer and Eichengreen (2014). This last index builds upon the Cukierman approach but adds measures on reappointment limits for the central bank head and other members of the policy board, restrictions on government representation, and government intervention in exchange rate policy. Unfortunately, it is available only for eight of our countries and just for 1998-2010, limiting us to a total of 101 observations in this case compared with 275 for the constitutional index and 196 for the Cukierman-based dummy. Although the observations are rather minimal for regression analysis we do also consider its correlation with the other two indexes and the macroeconomic variables.

4. Empirical Analysis

Each of our alternative measures of central bank independence is entered in budget deficit regressions alongside Freedom House's political freedom index, which provides ratings on 195 countries in the world based on a comparative assessment of global political rights and civil liberties. The freedom rating is on a scale of 1-7, with 1 being

completely free and 7 being the most undemocratic.[9] We also allow the budget deficit to

react to money growth and real GDP growth rates and to its own lagged values. Faster

money growth would make deficits easier to finance without resorting to increased bond

issuance and so we would expect a positive sign on this variable. Faster output growth

would make expansionary policy less necessary for stabilization purposes, with automatic

stabilizers also making for an expected fall in the deficit as growth rates increase. Our

deficit equation has the following general form:

$$DEF_t = \alpha + \beta MONEY_t + \gamma GDP_t + \delta DEF_{t-1} + \theta FREE + \lambda D_i + \varepsilon_t \qquad (1)$$

where

DEF is the ratio of the budget deficit to nominal GDP,[10]

MONEY is the growth rate of the money stock,[11]

GDP is the growth rate of real GDP,[12]

FREE is the value of the Freedom House index,

D_i is the central bank independence dummy, and

ε is an error term

The simple correlations between these variables over our sample are laid out in

Table 1. As expected, the budget deficit evinces a negative correlation with each of the

independence dummies as well as real GDP growth. There are only very small

correlations with money growth and the freedom index. The negative correlation with

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[9] The 2010 ratings for each country were used for our study. A complete list of data sources can be found in the Appendix.

[10] The specific series employed is the cash surplus divided by nominal GDP and then multiplied by minus one. The primary data source is the World Bank supplemented by IMF data series and national central bank data in cases where the World Bank coverage was not complete (as detailed in the Appendix).

[11] This is based on the World Bank series on the growth rate of money and quasi money. The more limited available of monetary base data (from both the World Bank and IMF databases) required us to focus solely on the broader monetary aggregates for the countries in our sample.

[12] This is GDP growth based on constant 2005 US dollars as drawn from the IMF database.

money growth is contrary to the expected relationship while the (barely) positive

correlation of the deficit with the freedom index suggests that freer political regimes have

a slight tendency towards smaller deficits. With regard to the alternative central bank

independence indices themselves, there is a 0.3221 correlation between the constitution-

based index from Gutiérrez (2004) and the Dincer-Eichengreen index. By contrast, there

is a much smaller correlation between the constitution-based index and the modified

Cukierman index of 0.1053 and a negative correlation between the modified Cukierman

index and the Dincer-Eichengreen index. This suggests greater commonality between the

constitution-based index and Dincer-Cukierman than between either of these indices and

the Cukierman-based approach. Finally, there are positive correlations between two of

the central bank independence indices and the freedom index, perhaps rather disturbingly

suggesting that higher levels of central bank independence could go hand-in-hand with

less democratic political structures across our sample.

Regression results for equation (1) are presented in Table 2. It is estimated as a

pooled cross-section regression using two-stage least squares (2SLS) to take account of

the likely endogeneity of the money supply. Lagged real GDP growth and the second

lags of the deficit, money growth and inflation rates are employed as instruments. We

utilize robust standard errors that are heteroskedasticity-consistent. Columns (1) and (2)

present results for the Cukierman-based index and the constitutional-based index using

the full available samples of 10 and 14 countries, respectively, for which each index is

available (see Appendix for full details). In line with the correlations seen above, there is

a consistent significant negative response of the deficit to real GDP growth. There are no

significant effects arising from money growth or the freedom index, which is not

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surprising in light of the low correlations between the deficit and these variables. Besides a significant positive reaction to its own past value (in column (2)), the deficit evinces a significant negative response to each alternative measure of central bank independence. This is in line with the Burdekin and Laney (1988) finding for the industrialized countries that more independent central banks tend to be associated with smaller government budget deficits.

Columns (3) of Table 2 shows the results of re-estimating the equation to examine the performance of the constitution-based dummy when the sample is restricted to the same 10 countries covered by the Cukierman-based index. In this case the coefficient on the constitutional dummy remains similar in size with a negative sign but the rise in the standard error renders it insignificant at conventional levels (dropping to approximately the 16% significance level). This suggest that the additional countries included in the full 14-country sample (namely Bahamas, Barbados, El Salvador and Panama) were crucial to its significance in column (2). All four of these countries received low scores for constitutional independence from Gutiérrez (2004, p. 278), with El Salvador even garnering a negative value. It is also worth noting that the overall range of values for the constitutional-based index is relatively tight, perhaps simply necessitating a larger sample in order to capture sufficient cross-country variation.

Finally, column (4) of Table 2 provides exploratory results for the Dincer-Eichengreen dummy over the limited 8 country, 1998-2010 sample for which it is available. It is, in fact, negative and significant at the 95% confidence level offering some further support for the negative relationship between budget deficits and central bank independence prevailing across a variety of independence measures.

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5. Conclusions and Implications

Our empirical work suggests that reforms establishing more independent central banks can meaningfully boost fiscal discipline even in a region that has had quite abysmal inflation performance in the past. Although there are certainly important differences between the alternative measures of central bank independence considered in this study, all three measures evince significant negative relationships with Latin American budget deficits. There is quite strong overall support for the importance of the central bank institutional constraint extending from the western industrial countries (Burdekin and Laney, 1988) and the emerging economies of central and eastern Europe (Bodea, 2013) to the South American and Caribbean economies considered here. Moreover, if central bank independence can play an effective role in reigning in fiscal excesses in Latin America, there is cause to be optimistic that it could be effective in other crisis countries like Greece. The apparent scope for securing fiscal discipline through institutional change has emerged in Latin America even amidst a backdrop littered with past failures and inflationary deficit expansion for much of the post-war period.

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Table 1: Correlation Matrix for Central Bank Independence and Budget Deficits in Latin America, 1990-2012

	Budget Deficit	Money Growth	Real GDP Growth	Cukierman-based Independence Dummy	Constitution-based Independence Dummy	Dincer-Eichengreen Dummy	Freedom Index
Budget Deficit	1						
Money Growth	-0.1484	1					
Real GDP Growth	-0.3965	0.1636	1				
Cukierman-based Independence Dummy	-0.2917	-0.0157	0.1285	1			
Constitution-based Independence Dummy	-0.1868	0.1156	0.1095	0.1053	1		
Dincer-Eichengreen Dummy	-0.3566	-0.0920	0.1409	-0.0159	0.3221	1	
Freedom Index	0.0193	0.0329	0.0255	-0.0042	0.2422	0.1795	1

Table 2: 2SLS Pooled Time Series Budget Deficit Regressions for up to 14 Latin American Countries, 1990-2012

	Dependent Variable: Budget Deficit as a Share of GDP			
	(1)	(2)	(3)	(4)
Money Growth	0.006	0.010	0.011	0.017
	(0.025)	(0.017)	(0.023)	(0.108)
Real GDP Growth	-0.215***	-0.204***	-0.220***	-0.365***
	(0.037)	(0.033)	(0.040)	(0.124)
Lagged Budget Deficit	0.269	0.340**	0.294	0.154
	(0.215)	(0.153)	(0.206)	(0.189)
Cukierman-based Dummy	-6.515**			
	(2.734)			
Constitutional Dummy		-0.248**	-0.299	
		(0.124)	(0.214)	
Dincer-Eichengreen Dummy				-4.093**
				(2.040)
Freedom Index	0.141	0.110	0.188	0.512
	(0.131)	(0.144)	(0.162)	(0.492)
Constant	6.139**	1.381***	1.337**	2.866**
	(2.458)	(0.444)	(0.668)	(1.263)
Observations	196 (10 countries)	275 (14 countries)	196 (10 countries)	101 (8 countries)
R-squared	0.279	0.267	0.252	0.305)

where ***, and ** denote significance at the 99%, and 95% levels, respectively, and robust standard errors are in parentheses

APPENDIX: Sources and Data Range

Budget Deficit Series:

- Argentina: 1992-2001 IMF http://elibrary-data.imf.org/; 2002-2004 World Bank http://data.worldbank.org/indicator/GC.BAL.CASH.GD.ZS/countries; 2005-2008 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1898355; 2009-2012 http://www.indec.gov.ar/nivel4_default.asp?id_tema_1=3&id_tema_2=10&id_tema_3=101

- Bahamas: 1990-2010 World Bank

- Barbados: 1990-1995 https://books.google.com/books?id=hq0aGc8pOEUC&pg=PA123&lpg=PA123&dq=barbados+deficit+1990&source=bl&ots=JeWXpYXFFH&sig=1PPvMZsVmTyUSEI0de9m3-w5GaI&hl=en&sa=X&ved=0CB4Q6AEwAGoVChMIhJPl5dyIxgIVyhKSCh1WvwDv#v=onepage&q=barbados%20deficit%201990&f=false p.123; 1996 https://books.google.com/books?id=o9ODxqsr-dIC&pg=PA122&lpg=PA122&dq=barbados+deficit+1996&source=bl&ots=KvA2EpDGZ-&sig=zVipmjbcVM-AU0mNN_EMgPHEBMc&hl=en&sa=X&ved=0CB0Q6AEwADgKahUKEwjll5_-14jGAhWMnYgKHa6-CVw#v=onepage&q=barbados%20deficit%201996&f=false p.122;1997-1999 http://www.imf.org/external/pubs/ft/scr/2000/cr00158.pdf p.22 2000-2001 http://www.imf.org/external/np/sec/pn/2003/pn0316.htm; 2002 http://www.imf.org/external/np/sec/pn/2004/pn0456.htm; 2003-2006 IMF; 2007-2010 World Bank; 2011-2012 Ministry of Finance http://www.economicaffairs.gov.bb/archive-detail.php?id=325 (2012 and 2013 proposals respectively)

- Brazil: 1997-2012 World Bank

- Chile: 1990-2001 http://bibliotecadigital.dipres.gob.cl/bitstream/handle/123456789/1760/2001_Structural%20budget%20balance%20Methodology%20Estimation%201987_2001.pdf?sequence=1&isAllowed=y; 2000-2001 IMF; 2002-2012 World Bank

- Colombia: 1990-2011 IMF; 2012 World Bank

- Costa Rica: 1990-2007 IMF; 2008-2012 World Bank

- El Salvador: 1990-2001 IMF; 2002-2012 World Bank

- Guatemala: 1990-2012 World Bank

- Mexico: 1990-2000 World Bank; 2001-2012 Ministry of Finance
  http://www.shcp.gob.mx/English/Timely_Public_Finances/Paginas/unica.aspx
  (Public sector financial position)

- Nicaragua: 1992-2012 World Bank

- Panama: 1990-2001 World Bank; 2002-2003 IMF Staff Report https://www.imf.org/external/pubs/ft/scr/2006/cr0607.pdf p.31;
  2004-2012 Ministry of Finance http://www.mef.gob.pa/es/informes/Paginas/informes.aspx

- Peru: 1992-2012 World Bank

- Uruguay: 1990-2012 World Bank

Real GDP growth: The World Bank http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG

Money Growth: The World Bank http://data.worldbank.org/indicator/FM.LBL.MQMY.ZG

Consumer Price Inflation: Argentina (all years), Nicaragua (1992-1999) and Chile (all years) from the IMF database- International Financial Statistics; other countries from the World Bank

Cukierman-based Dummy: Carstens and Jacome (2005)

Constitutional Dummy: Gutierrez (2004)

Dincer-Eichengreen Dummy: Dincer and Eichengreen (2014)

Freedom Index: Freedom House freedom score (2010) https://freedomhouse.org/report/freedom-press/freedom-press-2015#.VXsjb1xVikq

Countries and Data Range Included Under the Different Central Bank Independence Dummies

	Cukierman-based Dummy	*Constitutional Dummy*	*Dincer-Eichengreen Dummy*
Argentina	1992-2012	1992-2012	1998-2010
Bahamas	N/A	1990-2010	2000-2010
Barbados	N/A	1990-2012	1998-2010
Brazil	1997-2012	1997-2012	N/A
Chile	1990-2012	1990-2012	1998-2010
Colombia	1990-2012	1990-2012	1998-2012
Costa Rica	1990-2012	1990-2012	N/A
El Salvador	N/A	1990-2012	1998-2010
Guatemala	1990-2012	1990-2012	N/A
Mexico	1990-2012	1990-2012	1998-2010
Nicaragua	1992-2012	1992-2012	N/A
Panama	N/A	1992-2012	N/A
Peru	1992-2012	1992-2012	1998-2010
Uruguay	1990-2012	1990-2012	N/A
Availability summary	10/14 countries	14/14 countries	8/14 countries