Fiscal Policy and the Cycle in Latin America: the Role of Financing Conditions and Fiscal Rules

Enrique Alberola

Iván Kataryniuk

Ángel Melguizo

René Orozco*

Abstract

A stronger macroeconomic position when the financial crisis erupted allowed Latin American economies to mitigate its impact through fiscal expansions, temporarily reversing the characteristic procyclical behaviour of fiscal policy. At the same time, in the last two decades fiscal rules have been extensively adopted in the region. This paper analyses the stabilising role of discretionary fiscal policy over time, and the influence of fiscal financing conditions and of fiscal rules in said behaviour for a sample of eight Latin American economies. The analysis shows three main results: i) fiscal policies became countercyclical during the crisis, but they have turned procyclical again in recent years; ii) financing conditions are the key driver of fiscal procyclicality, while iii) fiscal rules tend to neutralise it.

La Política Fiscal y el Ciclo Económico en América Latina: el papel de las condiciones financieras y las reglas fiscales

Resumen

La crisis financiera fue enfrentada por América Latina con una posición macroeconómica más sólida, lo que permitió mitigar su impacto con una expansión fiscal, en contraste con la tradicional prociclicidad de las políticas fiscales. Asimismo, en las últimas dos décadas ha proliferado el establecimiento de reglas fiscales en la región. Este artículo analiza el papel estabilizador de la política fiscal discrecional, y la influencia de las condiciones financieras y las reglas fiscales en tal comportamiento para ocho países de América Latina. El análisis obtiene tres principales resultados: i) la política fiscal fue contracíclica durante la crisis, y volvió a ser procíclica posteriormente; ii) las condiciones financieras determinan la prociclicidad de la política fiscal, mientras que iii) las reglas fiscales tienden a neutralizarla.

102

FISCAL POLICY AND THE CYCLE IN LATIN AMERICA: THE ROLE OF FINANCING CONDITIONS AND FISCAL RULES
ENRIQUE ALBEROLA, IVÁN KATARYNIUK, ÁNGEL MELGUIZO Y RENÉ OROZCO / 101-116

1. Introduction

The stabilising role of fiscal policy is elusive in Latin America. Empirical studies show that fiscal policy has traditionally been procyclical in the region, as in other emerging economies (e. g. Gavin and Perotti, 1997, Talvi and Vegh, 2005, Cardenas and Perry, 2011). The dependence of Latin American finances on external credit and the recurrence of *sudden stops* may have made the region more prone to this behaviour. Since worsening financing conditions tend to be associated with economic weakness, the dearth of financing led to fiscal constraints (Kaminsky, Reinhart and Vegh, 2004 and Alberola and Montero, 2006). Furthermore, the importance of commodities in exports and revenues in most of the countries analysed is expected to introduce an additional procyclical bias in their fiscal policies (Céspedes and Velasco, 2014 and IMF Fiscal Monitor, 2015).

Things could have changed. On the one hand, the resilience shown to the 2008 financial crisis by most Latin American economies allowed them to mitigate its real impact through monetary and fiscal expansions, as shown by the expansionary fiscal stance. This implied a large fall in the adjusted primary fiscal balance —see figure 1, panel A—, something highlighted by some empirical studies (see Daude, Melguizo and Neut, 2011, Klemm, 2014, Vegh and Vuletin, 2014, and Fernández-Arias and Pérez, 2014). On the other hand, the improvement in macroeconomic management in the last two decades coincided with the progressive adoption of sounder fiscal frameworks, specifically with fiscal rules, as shown in figure 1, panel B. Fiscal rules could facilitate the stabilising role of fiscal policies and ensure debt sustainability in the long run, avoiding expenditure increases in good times, tax hikes in bad times, and allowing the full functioning of the automatic stabilisers.[1]

Has Latin America graduated to a more stabilising fiscal policy? Do more stable financing conditions or the implementation of fiscal rules contribute to an improved behaviour of fiscal policy? We address these questions by analysing the fiscal policy stance and the impact of financing conditions and fiscal rules on fiscal behaviour for the period 1990-2014 in Argentina[2], Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and Uruguay.[3] The

paper contributes to the literature on fiscal policy in Latin America, going beyond the above references to explore the factors lying behind the fiscal stance in the region, and provides a framework of analysis for fiscal policy behaviour in the face of external (financial conditions) and internal (self-imposed fiscal rules) constraints.

We obtain three main results: i) although fiscal policy reacted countercyclically to the financial crisis, this positive development has had no continuity, and fiscal policy continues to be procyclical overall in the region, placing on hold the idea of graduation of fiscal policy to a stabilising behaviour ; ii) financing conditions are confirmed to be the key driver of the fiscal stance in the region, in particular, they explain the procyclicality of fiscal policy; and iii) on the other hand, fiscal rules reduce procyclicality and allow an overall neutral fiscal stance.

Figure 1
Fiscal stance and fiscal rules in Latin America

A. Fiscal impulse, percentage of GDP
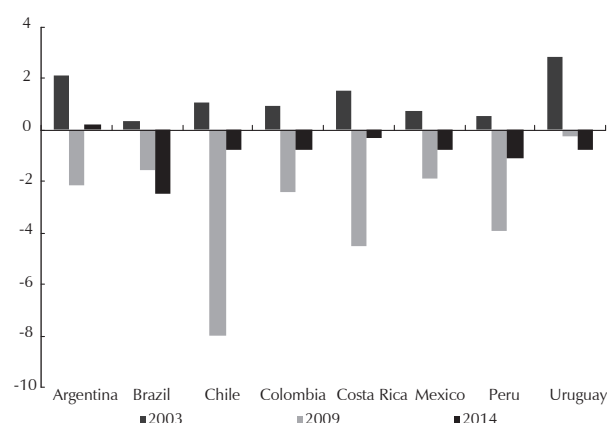
B. Number of countries using fiscal rules
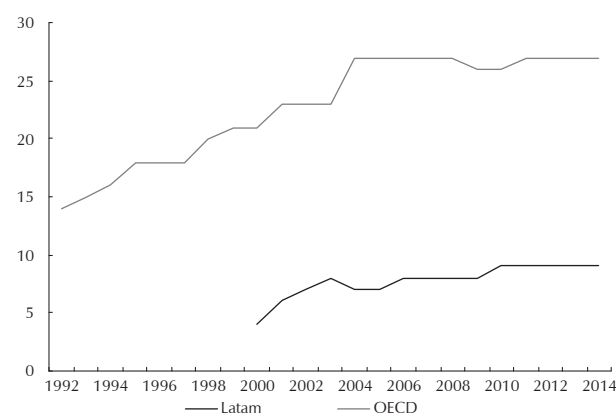
Notes: Fiscal impulse is defined as the change of cyclically adjusted primary balance. A negative number implies an expansionary fiscal stance. Fiscal rules have been established in Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Jamaica, Mexico, Panama and Peru. For further details, see appendix A and B.
Sources: Authors' elaboration, database prepared for this paper (panel A); IMF *Fiscal Rules Dataset* (panel B).

---

1   Fiscal rules might also seek to improve expenditure composition by securing funding space for certain items, frequently investment in infrastructure. See Carranza, Daude and Melguizo (2014) for an analysis in Latin America.

2   On 7 January 2016, Argentina's National Institute of Statistics and Census published an official decree temporarily suspending the publication of certain data in the National Statistics System. https://www.boletinoficial.gob.ar/pdf/linkQR/QlFlS1dmVmpOWXMrdTVReEh2ZkU0dz09. As a consequence, the data for Argentina should be treated with caution.

3   The sample, taken from Daude, Melguizo and Neut (2011), accounts for around 80% of the region's GDP and population, and is based on the availability of estimates of the automatic stabilisers.

The fiscal policy stance is determined by the change in the cyclically adjusted primary balance, but with a twist which is relevant for Latin America. We control for the evolution of commodity prices updating Daude, Melguizo and Neut (2011). The assessment of financing conditions takes into account the costs of financing and the underlying debt situation. When financial conditions tighten, in particular in a deteriorating debt environment, the room for an expanding fiscal policy may become constrained. We thus update and extend Alberola and Montero (2006) methodology, considering as a proxy for financing conditions, the adjusted primary balance that would stabilise debt at any point in time (*threshold balance*), and also taking into account the *debt dynamics*.

On top of this, we explore the impact of fiscal rules on fiscal policy. Fiscal rules do not only entail quantitative, but also qualitative variables, which make their correct tabulation challenging. In order to do so, we rely on the IMF *Fiscal Rule Dataset* (Budina et al., 2012) to construct a *fiscal rule index*. We also test the relevance of some of their key qualitative features, notably rule coverage, enforcement, and flexibility. In spite of this, some caution is still taken in the interpretation of the results. As stated in Berganza (2012), these qualitative variables will only register fiscal rule *de jure,* leaving aside the *de facto* implementation of the recommendations of the rule.

Finally, we address the issues of endogeneity and reverse causality using instrumental variables. Financing conditions could be driven by the fiscal policy stance, and not the other way round. Similarly, the adoption of fiscal rules may be the culmination of a process of improving fiscal discipline, and not its cause (Elbadawi et al, 2014). Also, our results should be taken with caution, given the limited sample and the difficulties to properly account for the endogeneity of fiscal rules.

The paper is structured as follows. Section 2 describes the methodology to compute the fiscal stance and provides preliminary evidence on the cyclicality of fiscal policy. Section 3 proposes the indicators of fiscal financing conditions, and analyses the link between the fiscal stance and changes in financing conditions. Section 4 adds fiscal rules in order to test their impact on the fiscal policy stance. Section 5 reports several robustness analyses and extensions. Section 6 concludes by summing up the results and assessing the implications for fiscal policy in Latin America going forward.

2. Assessing the fiscal stance in Latin America: data, methodology and results

We define the fiscal stance as the discretionary variation of the primary balance (e.g. net of interest payments on public debt) not explained by the impact of the business and commodity cycles. The data covers

the non-financial public sector (NFPS), including public enterprises, as reported by the IMF.[4] In order to compute the cyclically adjusted primary balance (b^*), we follow the OECD approach (Girouard and André, 2005). The estimation is modified for Latin America by Daude, Melguizo and Neut (2011) so as to include tax and non-tax revenues from commodities (see appendix A). Given the small size of expenditure automatic stabilisers in the region, notably unemployment benefits (in contrast to developed economies), we apply this methodology only to revenues, as is usually the case in emerging countries. The output gap ($GAP=Y/Y^*$), where Y^* is the trend output, is computed using a standard HP filter (lambda = 6.25), with annual projections up to 2020 taken from the IMF *World Economic Outlook Database*.

In order to empirically characterise the cyclicality of fiscal policy, we first regress the changes in the adjusted primary balance (Δb^*) on the estimated output gap

$$\Delta b^*_{it} = \mu_i + \beta GAP_{it} + u_{it} \qquad (1)$$

Table 1 presents the estimated coefficient β, using the fixed effects estimator in order to take into account unobserved heterogeneity.[5]

Table 1
Estimation of the Fiscal Stance in Latin America

(Panel data estimation, fixed effects)
Dependent variable: Δb^* = change in adjusted primary balance

Output Gap	(1)	(2)	(3)
Full sample	-0,222		
	[0.056]***		
1991-2001		-0,259	
		[0.08]***	
2002-2014			-0,177
			[0.08]**
R2	0,08	0,12	0,05
Observations	182	83	99
Number of countries	8	8	8

Robust standard errors in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.
Source: Authors' calculations.

The estimated coefficient is negative and significant (column 1), confirming that fiscal policy has been procyclical in the last two decades in this sample of countries in Latin America. However, this effect has varied over time. Columns 2 and 3 show the estimation

---

[4] We do not control for the heterogeneity of the public sector´s coverage. In Brazil´s, data does not cover the balance of the Brazilian Development Bank (BNDES), so a caveat applies especially to its results.

[5] All STATA codes and data are available upon request.

coefficients, splitting the sample into two periods, 1990-2001 and 2002-2014, confirming the stronger procyclicality in the first period.[6] As an illustrative exercise, given the small sample, we perform a rolling-window estimation, setting a five-year window (figure 2). We find almost constant procyclicality from the 1990s until the crisis. During the crisis and immediately after, the parameters moved towards neutrality (coefficient around 0). Note that the big shift occurs in 2009 and 2010, showing the countercyclical response to the crisis. The improvement stalled thereafter and, in the last years of the window (2010-14), the coefficient sharply fell back again into procyclical territory.[7]

Figure 2
Rolling-window estimation of the fiscal stance in Latin America
(Estimation of beta in equation (1) in 5-year periods)

(+counter-cyclical stance)
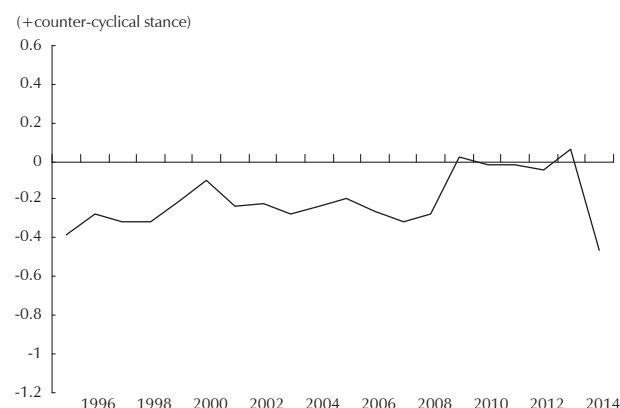
Source: Authors' calculations.

3. Financing conditions and the fiscal stance in Latin America

The previous evidence consistently supports the idea that discretionary fiscal policy has been procyclical in Latin America since 1990, with short exceptions.

---

6   An additional estimation shows that the coefficients in column 2 and 3 are not statistically different. This result can be partially explained by the sample size or by the return to procyclicality in 2013 and 2014. Estimation available upon request.

7   Given the small number of observations, significance bands are not plotted. On a cross-country basis, procyclicality and its evolution are unevenly spread. On a country-by-country basis, with 95% confidence intervals, we find that the procyclicality of fiscal policy has been stronger and significant in Uruguay, Brazil, Argentina, and, to a lesser extent, Mexico. In contrast, the coefficients remain negative, but non-significant, in the other five countries of the sample. We also find an improvement in the policy response for Brazil, Chile, Colombia, Costa Rica and Peru, with some episodes of countercyclical policies. These estimates should be considered with special caution, given the small sample. This finding is consistent with the "graduation" of monetary and fiscal policies (Frankel, Vegh and Vuletin, 2011). However, Argentina and Uruguay have turned more procyclical, a robust finding to the exclusion of the debt crisis period in both countries.

The boom in commodity prices and global liquidity glut before the global financial crisis improved financing conditions and facilitated the access to cheap credit by Latin American governments, loosening the fiscal constraints in an expansionary phase. On the contrary, sudden stops of capital, derived from external or internal circumstances, did not only bring about economic adjustments, but also constrained fiscal policies. The result in both cases would have induced procyclical policies due to the changing financing conditions. Given that the worsening of the financing conditions in 2008-2009 was less persistent than in past episodes, the stabilising role of fiscal policy in the aftermath of the crisis could be explained by the financial resilience of the region.

3.1. Alternative measures of financing conditions

An important question is how to gauge financing conditions and their evolution. A first approximation could be the change in the spreads on external sovereign debt, as they take into account present and future sovereign risk. However, the change in the spreads does not convey the actual change in the overall financing costs, since spreads do not take into account —at least directly— the fiscal burden of the country or how it evolves in response to a change in financing conditions.

An alternative and preferred indicator of how the evolution of financing conditions affects fiscal performance is based on the actual change in the debt service of the country, which conveys the level of debt and its cost. Along this line, we follow Alberola and Montero (2006) in order to measure the financing situation of the public sector, focusing on the actual change in financing costs. A modified version of this indicator can blend market perceptions with actual changes in financing costs.

The indicator is built as follows. We compute the primary balance (b'), which would render the debt stable at a given point in time, and we denote it as threshold balance ($\overline{b}$). A primary balance below (above) that estimate would make the debt grow (decrease). More specifically, given the growth of the economy (g), the stock of debt in the previous period, in terms of GDP (d_{t-1}) and the cost of the debt (r), we compute the *threshold balance* ($\overline{b}$) as:

$$b' \mid \Delta d_t = 0 \Rightarrow \overline{b}_t = \frac{r-g}{1+g} d_{t-1} \tag{2}$$

This threshold balance conveys the evolution of the financing conditions (reflected in r), but it also controls for the fiscal burden that they imply, since the increase in the threshold primary balance is proportional to the size of debt in the previous year. Finally, this expression conveys the impact of economic conditions through g, which alleviates the financing burden in good times and worsens it during economic downturns. The cost of debt

(*r*) is derived, *ex post,* by dividing the interest payments by total debt, to obtain the implied cost of debt.[8]

Another relevant consideration is that fiscal policy constraints may also become more apparent when the fiscal trajectory is worsening. To account for this factor, we control the regressions for the debt dynamics (*dd*) by computing the difference between the threshold and the primary balance in the previous period.

$$dd_t = \bar{b}_{t-1} - b'_{t-1} \tag{3}$$

A positive value of *dd* reflects that the primary balance *b′* falls short of the threshold balance $\bar{b}$, indicating a worsening debt dynamics, and vice versa when the primary balance is higher than the threshold balance.

Figure 3 shows the evolution of the mean aggregate of the financial variables, together with the adjusted primary balance and the output gap (see appendix A for the evolution of the output gap and adjusted primary balance by country). Financing conditions became tighter after the emerging market crisis of 1998-2002. From 2004 and on, the region entered a period of fast decreasing debt, based on significant primary fiscal surpluses during the expansion period that started in 2003. The global financial crisis shoots up the threshold balance, reflecting an intense tightening of the financing conditions, but this time the fiscal stance moves to expansionary, implying countercyclicality. The rebound in 2010 assured loose financing conditions, but did not come with a procyclical response. In 2011 and 2012, some countries experienced fiscal savings together with decreasing debt and positive output gaps for the first time in our sample (i.e. "countercyclicality also in good times"). But note that in the last two years, 2013 and 2014, the positive output gaps coincide with expansionary fiscal stances; that is, a possible return to procyclicality, in spite of deteriorating financing conditions.

3.2. Explaining the fiscal stance with financing conditions: empirical approach

Our empirical framework to study the influence of financing conditions on the fiscal stance consists in regressing the changes of the adjusted primary balance (Δb^*_{it}) on our proxies for financing conditions:

$$\Delta b^*_{it} = \mu_i + \delta\,\Delta\bar{b}_{it} + \gamma dd_{it} + \beta GAP_{it} + u_{it} \tag{4}$$

A positive δ, the parameter related to the changes in the threshold balance ($\Delta\bar{b}_{it}$), would indicate that governments

Figure 3
A snapshot of financing conditions, output gaps and the fiscal stance in Latin America
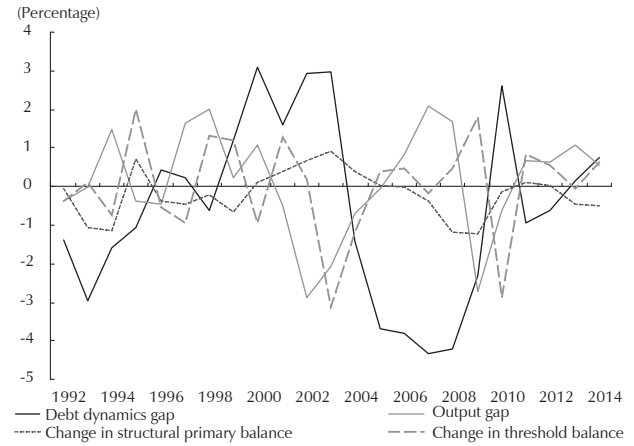
Source: Authors' calculations.

react to a worsening in financing conditions by restraining fiscal policy. The reaction of fiscal policy is also expected to depend on the dynamics of public debt (dd_{it}). When this term is positive, debt dynamics are worsening, possibly restraining the fiscal scope and putting upward pressure on the primary balance. Therefore, we expect γ to be positive. We include the output gap (*GAP*) in the regression to assess the fiscal policy stance after controlling for the financing conditions. If, as we expect, the financing conditions explain the fiscal stance, the coefficient of the output gap should lose relevance.

With regard to the econometrics, we estimate equation (4) using a fixed effects estimator to take into account the possible omitted variable bias coming from the presence of unobserved country heterogeneity. Moreover, there are several sources of endogeneity. In particular, the financing costs included in the model could be affected by the fiscal stance through two channels. First, the real interest rate could be influenced by the announced fiscal policy. Second, the fiscal stance can affect the growth rate, and thus the threshold balances.[9] Against this background, the fixed effects estimator would be consistent, but only under the strict exogeneity of the regressors, which could not be the case. In order to take into account the possible endogeneity between the financial variables and the fiscal impulse, we also use an instrumental variables

---

8   This option may miss some "action" in the markets, which is more readily reflected in the spreads. So, we could also compute a market-based version of expression (5), by using the observed spread plus the real interest on the 10-year US reference bond (nominal rate minus observed US CPI inflation). Market-based interest rates and the implied *ex post* cost of debt are highly correlated but the market-based variable is usually higher and more volatile (See Alberola et al, 2016; appendix C).

9   Moreover, we are in a context in which the number of countries (N) is small relative to T. This feature precludes us from using a GMM estimator. This class of estimators improves efficiency when N is large with respect to T. Against the background presented in this section, the number of instruments will increase as T grows, and it will rapidly catch up with the number of countries, N, resulting in a problem of overfitting the data and loss of power of the standard tests for the validity of the instruments. b^*_{t-1}

(IV) estimator. We chose several instruments, including suitable lags of the independent variables.[10]

3.3. Main results

The results of the estimation of equation (4) using, first, fixed effects, and then instrumental variables are presented in table 2. Column 1 recalls the simple regression between the output gap and the change in the adjusted primary balance in table 1. The next columns include the estimates of the additional variables. The change in the threshold balance ($\Delta \bar{b}_{it}$) is computed here, defining the interest rate r in equation (2) as the *ex post* cost of financing.[11] $\Delta \bar{b}_{it}$ is not significant on its own (column 2), but it becomes strongly so when controlling for the debt dynamics (dd_{it}), which is also highly significant (column 3). Furthermore, the signs are both positive as expected, implying that tighter financing conditions in a context of worsening debt dynamics induce fiscal restraint. Finally, when controlling for these variables, the output gap loses significance, implying that the procyclical behaviour of fiscal policy is fully accounted for by the worsening financing environment (column 4).

Regarding endogeneity issues, note that if there were reverse causation, that is, if the fiscal stance affects the financing conditions, the expected sign would be the opposite: an expansionary or loose fiscal behaviour would be associated with the worsening of financial conditions; so, if anything, this strengthens the results. In any case, for the sake of robustness, columns 5 and 6 in table 2 present the results of the instrumental variables approach. We find that, consistent with previous results, the fiscal stance is neutral if we control for the endogenous impact of financing conditions. Both remain significant and with an effect similar in size to the previous estimation. The behaviour of the instruments is correct as measured by the standard tests. Therefore, we can conclude that the evolution of financing conditions explains the observed procyclicality of fiscal policy in Latin America: worse conditions induce fiscal restraint and vice versa.

---

10   The limited number of countries in our dataset means it is important to be careful with the number of instruments. Too many instruments would overfit the data, with the result being a very similar estimator to the OLS estimator. However, too few instruments will reduce the degrees of freedom of our estimation. In this context, we try to limit the number of instruments while keeping it greater than the number of regressors. Moreover, while the estimates of the instrumental variables approach are asymptotically valid, we should be careful with their small-sample properties. As a result, we include only one lag of each of the right-hand side variables, usually the second, as the first lag will not fulfill the exogeneity conditions of the instrumental variable estimator.

11   The exercise is also performed using the other mentioned proxies to financial conditions: directly, with the spreads and using the spreads -instead of the ex-post cost of financing in the formula for the modified threshold balance. The parameters in these cases are seldom significant under any specification. This is due to the volatility of these measures relative to the *ex post* preferred alternative, see Alberola *et al.* (2016).

4.   The role of fiscal rules

The relative improvement in the stabilisation role of fiscal policy in Latin America has coincided with the proliferation of fiscal rules in the region. This section attempts to properly assess the relation between these rules and the fiscal stance, based on the empirical approach of section 3. Furthermore, assessing the impact of fiscal rules requires not only considering their existence, but also some of their key features, such as their level of coverage, formal enforcements, legal basis and supporting procedures.

4.1. Fiscal rules, financing conditions and fiscal stance: main results

In order to formally assess the role that fiscal rules have had on the fiscal stance, we extend the results from the previous section and consider the following specification:

$$\Delta b^{*}_{it} = \mu_i + \delta \Delta \overline{tb}_{it} + \gamma dd_{it} + \beta GAP_{it} + \eta FR_{it} +$$
$$\vartheta (FR_{it} * GAP_{it}) + u_{it} , \qquad (5)$$

in which we have added to the previous framework the variable FR_{it}, related to the existence of a fiscal rule in country i at time t. The identification of the fiscal rules and their time tabulation is provided in appendix B. This specification is flexible enough so that FR_{it} can represent a fiscal rule dummy, the value of the index or of one of its sub-indexes, as described below. This variable is introduced interacting with the output gap, in order to take into account that most fiscal rules affect fiscal policy as a function of the cyclical position of the economy. The parameter β would capture the impact of the output gap, filtering out fiscal rules and β + ϑ the overall impact of the gap, when fiscal rules are considered. We also include the fiscal rule with no interaction, to test whether the presence of fiscal rules makes countries save more independently of the position in the cycle.

The problem of reverse causality is the main caveat of the estimation of fiscal rules´ effect on the fiscal stance. Fiscal rules may not be an instrument to discipline governments´, but rather the result of the government´s (and society´s) preferences for a more robust fiscal environment. Or they might even be a signal to financial markets.[12] In order to address this issue, we also instrument our fiscal rule indicator with institutional variables, mainly the durability of a regime, using the *Polity IV Dataset*, which establishes a chronological record of every political change and regime characteristics for countries covered by the data.[13] The logic behind the use of this instrument is the possibility of capturing the historical pattern of durable

---

12   The model estimated under the traditional OLS framework could be biased given the endogenous nature of the fiscal rules.

13   Data obtained from Polity IV Project (http://www.systemicpeace.org/polity/polity4.htm).

Table 2
Financing conditions' effects on fiscal policy in Latin America
(Panel data estimation)
Dependent variable: Δb^* = change in adjusted primary balance

	Fixed effects estimation				2SLS with Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)
Gap	-0,222			-0,083		-0,029
	[0.056]***			[0.058]		[0.083]
$\Delta \bar{b}$		0,078	0,196	0,178	0,173	0,166
		[0.061]	[0.059]***	[0.060]***	[0.080]**	[0.079]**
dd			0,218	0,193	0,339	0,323
			[0.038]***	[0.041]***	[0.061]***	[0.083]***
R2 $\bar{b}$		0,01	0,181	0,191		
Hansen test (p-value)					0,657	0,557
Observations		171	171	171	163	163
Number of countries		8	8	8	8	8

Robust standard errors in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.

Instrumented with $\bar{b}_{t-2}, dd_{t-2}, GAP_{t-1}$ and b^*_{t-1}
Outliers dropped: Argentina 2002-2006.
Source: Authors' calculations.

institutions in a country.[14] Therefore, the intuition is that durable regimes will influence future fiscal decisions through the implementation of fiscal institutions, namely fiscal rules, to ensure the continuation of stability through balanced fiscal balances. In order to use this, we construct a dummy variable that takes value 1 when a country has a regime durability of 20 years or more, and 0 otherwise. The results are robust to other durability spans.

Table 3 shows the results of the estimation of fiscal rules taking into account only the existence of a fiscal rule in a country at time *t*. In column 1 we report the simple fixed effect estimator of the adjusted primary balance on the gap and the fiscal rules. We find that both effects are significant and with very similar parameter values. Therefore, without fiscal rules the fiscal stance would be procyclical, while it is neutral when fiscal rules are in place. Column 2 reports the within-group fixed effect estimator including the financial variables. We find that financial variables are still significant and with the predicted signs, while the output gap coefficient for a country without fiscal rules is also negative and significant. However, now the presence of fiscal rules is not only significant to explain the different cyclical behaviour of fiscal policy, but the interaction coefficient ,ϑ, is greater than the coefficient of

the output gap, indicating that, when controlling for fiscal rules, fiscal policy is significantly procyclical. In none of the cases is the fiscal rule *per se* significant, rejecting the hypothesis that they incorporate pro-savings behaviour irrespective of the economic cycle.

Columns 3 and 4 report the results using the IV approach. In column 3 we instrument the fiscal rule dummy variable using the years of durability of the regime as instrument,[15] and adding a dummy variable reflecting the durability of governments (to add some degree of non-linearity), while treating the financial variables as controls. The effects of the financing conditions are similar and still significant, as before. However, the effect from fiscal rules is not significant. Moreover, the difference in the size and precision of the estimations of the fiscal rules' coefficients in table 3, should call into question the stability of the parameters. Nevertheless, in column 4, with the introduction of suitable lags in the instrumental variable, we find that the effect of fiscal rules is significant and the change in the threshold balance ($\Delta \bar{b}$) is only significant at the 90% level of confidence. This suggests that the presence of fiscal rules may induce some endogenous behaviour of financial variables, for example, because of their effect on the financing costs of the country.

---

14   This is a common approach in estimating the determinants of growth, for example, in order to calculate the importance of participation in international trade (Rose, 2004). As Acemoglu and Robinson (2006) put it, institutions are often an incremental process: "Rational actors also care about the future. This is where political institutions, which are durable and consequently have the capacity to influence political actions and political equilibria in the future."

15   In order to test the validity of the instrument, we also compute a logit regression with the fiscal rule dummy as a dependent variable and the durability of the regime as regressor. The instrument turns out to be significant at the 1% level. Also, we compute the standard tests for weak identification, the Anderson-Rubin test and the Hansen test for endogeneity. Both lead to rejections of the weak instruments hypothesis and the joint endogeneity of the instruments, respectively.

108

Fiscal Policy and the Cycle in Latin America: the Role of Financing Conditions and Fiscal Rules
Enrique Alberola, Iván Kataryniuk, Ángel Melguizo y René Orozco / 101-116

Table 3
Fiscal rules, financing conditions and fiscal policy in Latin America
(Panel data estimation)
Dependent variable: Δb^* = change in adjusted primary balance

	Fixed effects estimation		2SLS with Fixed Effects	
	(1)	(2)	(3)	(4)
Gap	-0,294	-0,166	-0,280	-0,287
	[0.066]***	[0.066]**	[0.14]**	[0.15]*
$\Delta \bar{b}$		0,189	0,200	0,169
		[0.06]***	[0.065]***	[0.089]*
dd		0,208	0,225	0,319
		[0.041]***	[0.054]***	[0.071]***
Fiscal Rule	0	0,001		
	[0.002]	[0.002]		
Gap*Fiscal Rules	0,245	0,293	0,682	0,757
	[0.121]**	[0.112]**	[0.47]	[0.414]*
R2	0,106	0,228		
Hansen J test (p-value)			0,131	0,343
Kleibergen-Paap underindentification test			0,032	0,031
Observations	182	171	170	162
No. of countries	8	8	8	8

Robust standard errors in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.
Outliers dropped: Argentina 2002-2006.
In (3) instruments are Durability -dummy and Durability -dummy (t-1).
In (4) instruments are Durability -dummyand Durability -dummy (t-1), $\bar{b}_{t-2}$, dd_{t-2}, GAP_{t-1} and b^*_{t-1}.
Source: Authors' calculations.

5. Robustness analysis and extensions

A set of robustness checks of the results is advised, given all the caveats mentioned above: i) using changes to the output gap instead of output gap levels; ii) including past debt levels as an alternative gauge of financing conditions; iii) considering asymmetries in the fiscal response depending on the sign of the output gap; and iv) getting deeper into the effects of different features of the fiscal rules and "second generation" sub-indexes.

In table 4, column 1, we present the response of the fiscal impulse to changes in the output gap. The estimated response is robust to the one presented in section 2. We find a procyclical fiscal policy on average, while the degree of procyclicality has diminished in the last part of the sample. However, the degree of procyclicality under this specification is non-significant in the aggregate. We also test for sustainability concerns in a simpler way, using past debt levels as a regressor (column 2). Under this specification, debt levels are not significant, which reinforces the idea that the dynamics of financing conditions, as captured by the threshold balance $\Delta \bar{b}$ and the debt dynamics dd is the driver of procyclicality in the region, rather than just the level of debt.

In columns 3 and 4, we explore possible asymmetries in the reaction of fiscal policy and the impact of fiscal rules. We include the financing conditions variables in the three regressions. In column 3, we test whether countries have been more procyclical during expansions than during recessions, adding an interaction with a dummy, taking the value of 1 when the output gap is positive. While there is some evidence supporting this idea, and the coefficient of the interaction of the output gap and the cyclical position is negative, it is not significant. In column 4, we show the results of multiplying the dummy variable explained in column 3 with the dummy denoting the presence of fiscal rules, in order to test whether fiscal policies governed by fiscal rules have been more procyclical in booms than in busts. However, this specification assumes that, without fiscal rules, countries behave equally regardless of their cyclical position. We find that fiscal rules are more effective when the output gap is negative, suggesting that they help stabilise in downturns.

Finally, in column 5 of table 4, we go beyond the mere existence of fiscal rules including the "fiscal rule index" (see construction details in appendix B). Since the implementation and use of fiscal rules is not homogeneous across countries and their characteristics may vary, we include the "overall fiscal index" to address the

Table 4
Fiscal rules, financing conditions and fiscal policy in Latin America –sensitivity tests
(Panel data estimation, fixed effects)
Dependent variable: Δb^* = change in adjusted primary balance

	(1)	(2)	(3)	(4)	(5)
Gap		-0,218	-0,07	-0,015	-0,132
		[0.058]***	[0.080]	[0.060]	[0.064]**
$\Delta \overline{b}$			0,177	0,205	0,186
			[0.060]***	[0.058]***	[0.06]***
dd			0,193	0,21	0,197
			[0.042]***	[0.041]***	[0.041]***
Δ Gap	-0,063				
	[0.048]				
Debt (t-1)		0,003			
		[0.009]			
Gap*Positive Gap			-0,034		
			[0.136]		
Gap*Positive Gap*Fiscal Rules				0,117	
				[0.160]	
Gap*Negative Gap*Fiscal Rules				0,332	
				[0.099]***	
Overall FR Index					0,00
					[0.001]
Gap*Overall FR Index					0,065
					[0.038]*
R2	0,010	0,082	0,020	0,034	0,207
Observations	182	179	171	171	171
Number of countries	8	8	8	8	8

Robust standard errors in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.
Outliers dropped: Argentina 2002-2006.
Source: Authors' calculations.

heterogeneity of fiscal rules in the region. The interaction coefficient is significant and has a positive sign with the inclusion of financing conditions. As the previous results, the output gap and the financing conditions show the expected signs and are significant. The interaction coefficient of the overall index is smaller than the output gap when the value of the index is lower than 3 (which is the case in the majority of the countries), which would account for a more neutral discretionary fiscal policy, rather than a countercyclical fiscal policy. Again, the overall index without interactions is not significant.

In Table 5 we test whether different types of rules have different impacts on the fiscal stance of the government. We introduce the different types of rules as independent variables in the fixed effects estimator studied before, controlling for the impact of financing conditions. We find that budget balance rules and structural rules are correlated with a more countercyclical fiscal stance. Expenditure rules and debt rules appear irrelevant. Moreover, we find that none of the different types of rules taken in isolation affect the fiscal stance, as shown by the non-significance of the effect of the dummy variable.[16]

Finally, Table 6 shows the effects of the different fiscal rule sub-indexes that capture an array of different characteristics (see appendix B for more details). The

16   See Bova, Carcenac and Guerguil, 2014 for similar results for a wider sample of emerging economies.

Table 5
Types of fiscal rules, financing conditions and fiscal policy in Latin America

(Panel data estimation, fixed effects)
Dependent variable: Δb* = change in adjusted primary balance

	Expenditure rule	Budget balance rule	Debt rule	Structural rule
Gap	-0,107	-0,154	-0,080	-0,103
	[0.061]	[0.062]**	[0.059]	[0.057]*
Gap*Fiscal Rules	0,205	0,316	-0,134	0,466
	[0.149]	[0.119]***	[0.278]	[0.217]**
Fiscal Rule	0,002	0,001	-0,003	0,003
	[0.003]	[0.002]	[0.008]	[0.004]
R2	0,205	0,229	0,185	0,219
Observations	171	171	161	171
Number of countries	8	8	8	8

Robust standard errors in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.
Outliers dropped: Argentina 2002-2006.
Financing conditions included in all regressions.
Source: Authors' calculations.

Table 6
Fiscal rule sub-indexes, financing conditions and fiscal policy in Latin America

(Panel data estimation, fixed effects)
Dependent variable: Δb* = change in adjusted primary balance

	Supporting procedures	Formal enforcement	Coverage	Legal basis
GAP	-0,141	-0,097	-0,126	-0,149
	[0.063]**	[0.062]	[0.063]**	[0.065]**
$\Delta \overline{b}$	0,186	0,180	0,186	0,188
	[0.060]***	[0.061]***	[0.061]***	[0.060]***
dd	0,202	0,192	0,195	0,199
	[0.041]***	[0.041]***	[0.041]***	[0.041]***
Gap*Fiscal Rules	0,114	0,034	0,098	0,138
	[0.05]**	[0.055]	[0.058]*	[0.061]**
R2	0,216	0,193	0,206	0,215
Observations	171	171	171	161
No. of countries	8	8	8	8

Robust standard errors in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.
Outliers dropped: Argentina 2002-2006.
Financing conditions included in all regressions.
Source: Authors' calculations.

only sub-index that is non-significant is the formal enforcement of the rule. In other words, surprisingly enough, the existence of formal enforcement procedures (measured as in the IMF *Fiscal Rules Dataset*) plays no role as an explanatory variable of the countercyclicality of the countries' fiscal policy. On the contrary, the coverage enforcement, legal basis and supporting procedures sub-index do seem to play a role. In the case of coverage enforcement, countries with a fiscal rule with a wider coverage (general government vs central government) tend to behave more countercyclically. Similarly, the supporting procedures sub-index shows that having an independent body monitoring implementation (or suggesting the proper assumptions) will behave similarly to the coverage enforcement sub-index (as in Bova, Carcenac and Guerguil, 2014). The most important aspects of a rule to prevent countries from behaving procyclically are the stronger legal basis of a rule and the supporting procedures. However, again, these results should be taken with caution. For the majority of the economies under study, the legal basis for the fiscal rules is statutory (and not constitutional, a legal treaty or a political agreement) and has not varied since 2000 (with the exception of Chile). As a result, most of the variation of the index comes from the introduction of a new fiscal rule rather than a change in the legal basis, reflecting a similar influence as the case where we only take into account the existence of a fiscal rule.[17]

17   In almost all of the cases, the countries under study show a similar legal basis, i.e. statutory law. Chile is the only country that has experienced a change in the legal basis, when it went from a political commitment to a statutory law in 2006.

6.   Conclusions

This paper has reviewed the fiscal policy stance in Latin America and two possible determinants, financing conditions and fiscal rules.

Fiscal policy, traditionally procyclical in Latin America, became less so in the aftermath of the crisis. The mitigation of procyclicality in the last period is heavily influenced by the strong countercyclical behaviour during the crisis in the year 2009. However, the progress towards more stabilising fiscal policy has reversed in recent years. Indeed, positive output gaps have been accompanied by fiscal expansions in the last few years, and, even more recently, fiscal consolidation is being implemented at a time of faltering growth.

Overall, financing conditions, when considered with the dynamics of debt, turn out to be a key determinant of the fiscal policy stance. Worsening financing conditions, which tend to coincide with difficult economic times, constrain fiscal policy. Favourable financing conditions, more prominent in good times, favour fiscal profligacy. The outcome, quite robust empirically, is that fiscal procyclicality is explained by changing financing conditions.

On the *institutional* front, most countries in Latin America have strengthened their fiscal frameworks,

notably through the use of fiscal rules. Our results are robust in showing that countries with fiscal rules have behaved less procyclically during the last two decades. Furthermore, for certain fiscal rule specifications the estimations cannot reject that they have enabled the implementation of countercyclical fiscal policies during certain periods, specifically as a reaction to the financial crisis. Also after the crisis, countries with fiscal rules show relatively better performance than countries without rules. Among these countries, and very tentatively, countries with fiscal rules with a wider coverage (general government vs central government), and with supporting procedures (e.g. an independent body which monitors implementation or suggests the appropriate set of assumptions) outperform the others in terms of stabilisation. Similarly, budget balance rules and structural rules are correlated with a more countercyclical fiscal stance.

All empirical work of this kind has to be taken with caution. While endogeneity or reverse causation is not an issue in the case of financing conditions determining the fiscal stance, the adoption of fiscal rules may be a consequence rather than a cause of more fiscal good practices and discipline.

What should we expect from the fiscal stance in Latin America going forward? Lower commodity prices and weak growth prospects constrain fiscal policy in much of Latin America. Lower commodity prices reduce tax revenues. Output gaps are into negative territory and financing conditions tightened due to the start of the anticipated lift-off, the weaker prospects for growth in the region and the reduced appetite for risk. The significant increase in average yield on government bonds combined with lower growth has impacted negatively on debt dynamics. Under such circumstances, fiscal positions will need to be improved even during the downturn, thus entrenching their procyclical bias in the current environment.

All in all, more research and evidence are needed to conclude that fiscal policy has "graduated" in Latin America – at least for some countries – as recently expressed by the IDB (Powell, 2015) and the IMF (Celasun et al., 2015). Yes, some progress was observed around the crisis, but the most recent behaviour grants caution before reaching a final verdict. As a matter of fact, our results cool down such optimistic conclusion.

References

Acemoglu, D. (2006), *Economic origins of dictatorship and democracy*, Cambridge University Press.

Acemoglu, D., and J.A. Robinson (2006), "Persistence of Power, Elites and Institutions" NBER *Working Papers* 12108.

Alberola, E. I. Kataryniuk, A. Melguizo and R. Orozco (2016), "Fiscal policy and the cycle in Latin America: the role of financing conditions and fiscal rules", BIS Working Papers No 543

Alberola, E., and J. M. Montero (2006), "Debt Sustainability and Procyclical Fiscal Policies in Latin America*", Economia Journal of The Latin American and Caribbean Economic Association* vol. Volume 7 Number 1, issue Fall 2006, 157-193 .

Berganza, J.C. (2012), "Fiscal Rules in Latin America: A Survey", *Documentos Ocasionales* No. 1208, Banco de España

Bova, E., N. Carcenac and M.guerguil (2014), "Fiscal Rules and the Procyclicality of Fiscal Policy in the Developing World", IMF *Working Paper* No. 14/122, International Monetary Fund, Washington DC.

Budina, N.T., A. Schaechter, A. Weber and T. Kinda (2012), "Fiscal Rules in Response to the Crisis-toward the Next-generation Rules: A New Dataset", IMF *Working Paper* No. 12/187, International Monetary Fund, Washington DC.

Cardenas, M., and G. Perry (2011), "Fiscal Policy in Latin America", *The Oxford handbook of Latin American economics*, Oxford: Oxford University Press.

Carranza, L., C. Daude and A. Melguizo (2014), "Public Investment and Fiscal Sustainability in Latin America: Incompatible goals?", *Journal of Economic Studies*, 41(1), 29-50.

Celasun, O., Grigoli, F., Honjo, K., Kapsoli, J., Klemm, A., Lissovolik, B., Luksic, J., Moreno-Badia, M., Pereira, J., Poplawski-Ribeiro, M., Shang, B. and Ustyugova, Y (2015), "Fiscal Policy in Latin America: Lessons and Legacies of the Global Financial Crisis", IMF *Staff Discussion* Note SDN/15/06, International Monetary Fund, Washington DC.

Céspedes, L. F., and A. Velasco (2014), "Was this Time Different? Fiscal Policy in Commodity Republics", NBER Working Paper No. 19748.

Daude, C., A. Melguizo and A. Neut (2011), "Fiscal Policy in Latin America: Counter-cyclical and Sustainable?", *Economics: The Open-Access, Open-Assessment E-Journal*, 5, 2011-14.

De Mello, L., and D. Moccero (2006) , "Brazil Fiscal Stance During 1995-2005: The Effect of Indebtedness on Fiscal Policy over the Business Cycle", OECD Economic Department *Working Papers* 485, OECD, Paris.

Elbadawi, I., K. Schmidt-Hebbel, Soto, R. and R. Vergara (2014), Why do Countries have Fiscal Rules?, UC Economics Institute Working Paper No. 452.

Fatas, A. and I.mihov (2001), "Government Size and Automatic Stabilizers: International and Intranational evidence", *Journal of International Economics,* 55(1), pp.3-28.

Fernández-Arias, E., and J.e.p. Pérez (2014), "Grading Fiscal Policy in Latin America in the Last Decade", *Policy Brief* No. IDB-PB-216, Inter-American Development Bank.

Frankel, J. A., C.a Vegh and G. Vuletin (2011), "On Graduation from Fiscal Procyclicality", NBER Working Paper No. 17619.

Gali, J. (1994), "Government Size and Macroeconomic Stability", *European Economic Review*, 1994, vol. 38, issue 1, 117-132

Gavin, M. and R. Perotti (1997), "Fiscal Policy in Latin America", *NBER Macroeconomics Annual* 12, pp. 11-72, National Bureau of Economic Research.

Girouard, N. and André, C. (2005), "Measuring Cyclically-adjusted Budget Balances for OECD Countries", OECD Economic Department *Working Papers* 434, OECD, Paris.

IMF Fiscal Monitor (2015). "The Commodities Roller Coaster: A Fiscal Framework for Uncertain Times, chapter 1, October

Kaminsky, G. L., C.M. Reinhart and C.A. Végh (2004), "When it Rains, it Pours: Procyclical Capital Flows and Macroeconomic Policies", NBER Working Paper No. 10780.

Klemm, M. A. (2014), "Fiscal Policy in Latin America Over the Cycle" IMF Working Paper No. 14/59, International Monetary Fund, Washington DC.

Lozano, I., and J. Toro (2007), "Fiscal Policy Throughout the Business Cycle: the Colombian Experience", Ensayos sobre Política Económica, 25(55), pp. 12-39.

Marcel, M., M. Tokman, R. Valdés and P. Benavides (2001), "Balance Estructural del Gobierno Central: Metodología y Estimaciones para Chile: 1987 – 2000", *Estudios de Finanza Públicas*, Ministerio de Hacienda, Gobierno de Chile, Santiago.

Marshall, M. G., and K. Jaggers (2002) *Political Regime Characteristics and Transitions, 1800-2002*, Polity IV Project, University of Maryland.

OECD/IADB (2014), *Government at a Glance: Latin America and the Caribbean 2014: Towards Innovative Public Financial Management*, OECD Publishing.

OECD/CIAT/ECLAC/IDB (2014), *Revenue Statistics in Latin America and the Caribbean 1990-2013*. OECD Publishing.

Powell, A (2015) (ed.) 2015 Latin American and Caribbean Macroeconomic Report "The Labyrinth: How Can Latin America and the Caribbean Navigate the Global Economy". IDB, Washington DC.

Rose, A.K. (2004), "Do We Really Know that the WTO Increases Trade?", *American Economic Review,* 94(1),98-114.

Talvi, E., and C.A. Vegh (2005), Tax Base Variability and Procyclical Fiscal Policy in Developing Countries, *Journal of Development Economics*, 78(1), pp.156-190.

Vegh, C. A., and G. Vuletin, G. (2014), "The Road to Redemption: Policy Response to Crises in Latin America*"*, NBER Working Paper No. 20675.

Vladkova-Hollar, I., and J. Zettelmeyer (2008), "Fiscal Positions in Latin America: Have they Really Improved?" IMF *Working Papers* WP/08/137, International Monetary Fund, Washington DC.

Appendix A

Calculating the adjusted balance b*

Based on the OECD methodology based on Girouard and André (2005) and Daude, Melguizo and Neut (2011) we derive the adjusted balance b^* as presented in expression A1.1

$$b^* = \frac{\left(\sum_{i=1}^{4} T_i \left(\frac{Y^*}{Y}\right)^{\varepsilon_{i,y}}\right) - G + X}{Y^*} + R_c^s \qquad (A1.1)$$

Where T_i are the cyclically-adjusted receipts from the four families of taxes[18], G is the current primary government expenditure, X are non-tax revenues minus capital and net interest spending, Y^* is the level of trend output derived from applying a Hodrick-Prescott with lambda=6.5 to the output series. R_C^S are the structural

revenues related to commodities as a percentage of GDP and $\varepsilon_{ti,y}$ is the elasticity of taxes to the economic cycle. We excluded the taxes (indirect and corporate taxes) related to commodity production from T_i.

Taxes and the economic cycle

The response from the different types of taxes [i] to the economic cycle $\varepsilon_{ti,y}$ is calculated as the product of the elasticity of tax receipts to the tax base ($\varepsilon_{ti,tbi}$ and the elasticity of the tax base to the economic cycle ($\varepsilon_{tbi,y}$), as presented in expression A1.2.

$$\varepsilon_{ti,y} = \varepsilon_{ti,tbi} * \varepsilon_{tbi,y} \qquad (A1.2)$$

Four types of taxes are considered personal income tax (*PIT*,), social security contributions (*SSC*), corporate income tax (*CIT*) and indirect taxes (*IT*). As a result*,* the cyclical budget response from taxes (as a share of GDP) can be expressed as the weighted sum of the four different tax revenue elasticities, shown in figure A.1. The estimates of the automatic stabilisers used in the paper imply that the business cycle has quite a diverse impact on the expenditure and the overall primary balance: a one percentage point change in the output gap would result in

---

[18] Data obtained from see OECD/CIAT/ECLAC/IDB (2014) *Revenue Statistics in Latin America and the Caribbean 1990-2013*. Elasticities come from Daude, Melguizo and Neut (2011).

Figure A.1
Automatic stabilisers in selected Latin American and OECD economies
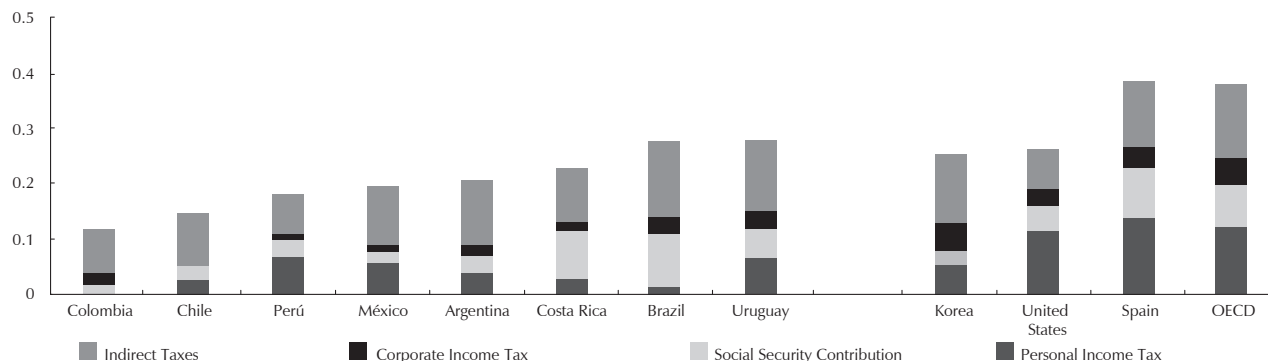
(Tax semi-elasticities of non-commodity taxes to output, p.p. of GDP)

Source: Update of Daude, Melguizo and Neut (2011).

an increase of around 0.12 precentage points (p.p.) in the overall primary balance for Colombia, or 0.15 for Chile, while it could be as high as 0.25 for Uruguay or 0.28 for Brazil . In line with the literature (Gali, 1994 and Fatas and Mihov, 2001), the size of revenue automatic stabilisers is significantly lower (driven by lower *PIT* and *SSC*) than that observed in most OECD countries.

This methodology is extended to take into account the relevance of public revenues from various commodities (fuels, food and minerals) in Latin American fiscal accounts, either through the share of taxation linked to rents in natural resource extractions or through the utilities of state-owned enterprises in these sectors (see OECD/CIAT/ECLAC/IDB, 2014). These commodity dependent revenues are affected by the high volatility in prices, which could call into question fiscal sustainability in the medium or long term and the fiscal stance in the short term. This adjustment is done for Argentina, Chile, Colombia, México and Peru, updating and expanding Daude, Melguizo and Neut (2011), using the methodology proposed in Marcel et al. (2001) and Vladkova-Hollar and Zettelmeyer (2008).

In particular, we separate revenues into commodity revenues and non-commodity revenues. Non-commodity revenues are adjusted for the cycle as previously mentioned, and commodity revenues are adjusted for the volatility in commodity prices following the expression A1.3:

$$R_{s,t}^c = R_t^c \left(\frac{p_t^*}{p_t} \right)^{\gamma} \qquad \text{(A1.3)}$$
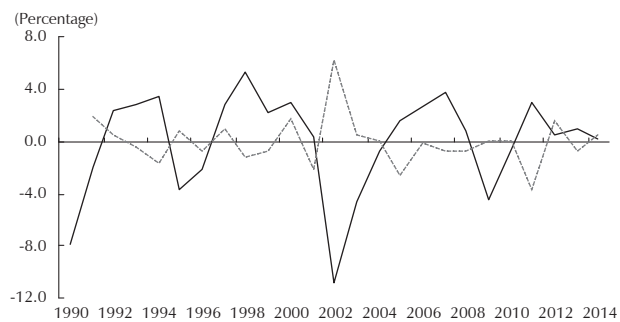
in which $R_{s,t}^C$ is the price-adjusted commodity (structural) revenues, which result from the product of R_t^C (the commodity revenues) and the ratio between p_t^* (the equilibrium commodity price, calculated as a 10-year moving average or from experts' panels) and the current commodity price p_t, elevated to the power γ . We assume that the revenues from commodities are proportional to their prices and set $\gamma = 1$ (unitary elasticity).

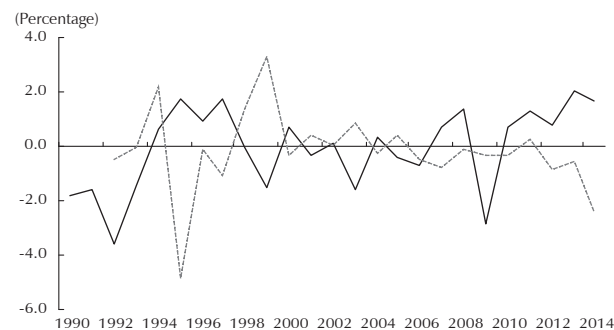*Data source for non-commodity revenues and commodity revenues*

Data for non-commodity revenue for Argentina comes from the *Ministerio de Economía y Finanzas Públicas* (Ministry of Economy and Public Finance, www.mecon. gov.ar); for Chile, it is obtained from the *Dirección de Presupuesto* (Budget Directorate, www.dipres.gob.cl); for Colombia, the data is obtained from the *Ministerio de Hacienda y Crédito Público* (Ministry of the Treasury and Public Credit, www.minhacienda.gov.co). For Mexico, the data comes from the *Secretaría de Hacienda y Crédito Público* (Secretary of the Treasury and Public Credit, www.apartados.hacienda.gob.mx). In the case of Peru, we used information from the *Superintendencia Nacional de Aduanas y de Administración Tributaria* (National Superintendence of Tax Administration and Customs, www.sunat.gob.pe).

In terms of commodities categories, in the case of Argentina, we consider the export taxes on agricultural goods introduced in 2002, and then using a combination of the food price index and the fuel (energy) index taken from the IMF Commodity Price Database, and weighted according to their importance in exports (weights are calculated using World Integrated Trade Solution data from 1993 to 2012). For Chile, commodity revenues are defined as the corporate income tax paid by the public copper company (CODELCO), the transfers made to the central government by CODELCO and royalties paid by private mining firms. The price adjustment is done using refined copper prices (USD cents/lb.) from the Chilean commission for Copper COCHILCO (based on the London Metal Exchange). In the case of Colombia, we control for the dividends transferred by the national oil company Ecopetrol to the central government. In Mexico, net income from the public oil firm (PEMEX), the royalties paid by private firms in the petrol sector, special tax on petrol-related income and the specific net excise taxes are defined as commodity revenue. Both
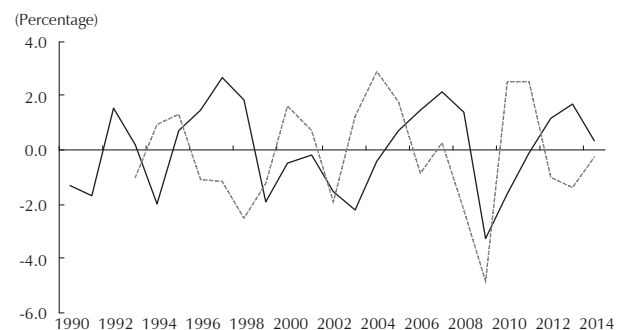
114

Fiscal Policy and the Cycle in Latin America: the Role of Financing Conditions and Fiscal Rules
Enrique Alberola, Iván Kataryniuk, Ángel Melguizo y René Orozco / 101-116

Figure A.2
Fiscal stance and output gap by country

A. Argentina

B. Brazil

C. Chile

D. Colombia
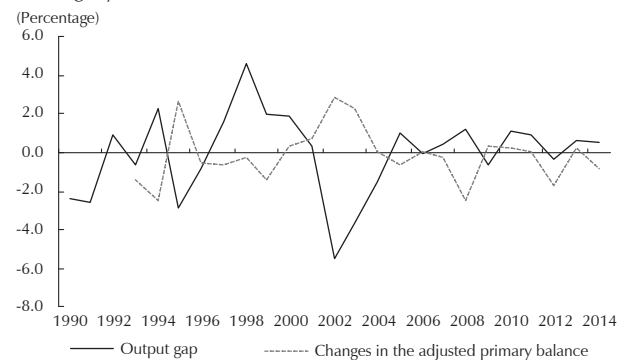

E. México

F. Perú

G. Uruguay

——— Output gap   ------- Changes in the adjusted primary balance
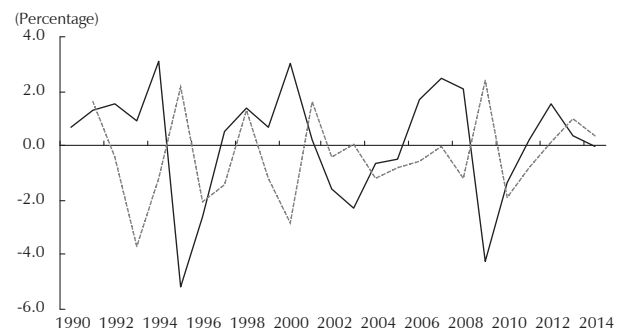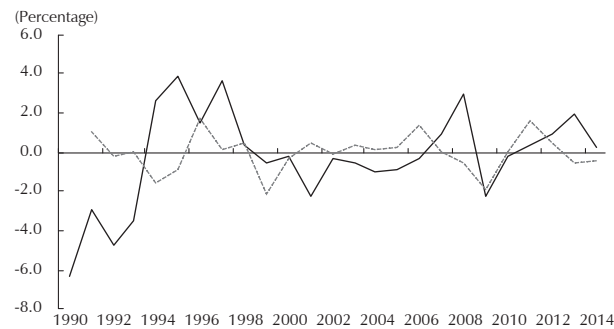
Source: Authors' calculations.

in Mexico and in Colombia this revenue is adjusted for price volatility using the crude oil (petroleum) price index from the IMF Commodity Price Database from 1990 to 2013. Finally, in the case of Peru, revenues from royalties and the income taxes paid by the mining and fishing industries are considered. Prices are adjusted using IMF Commodity Price Database on copper (USD per metric ton), fishmeal (USD per metric ton), oil (crude oil price index) and the World Bank commodity price data for gold (annual prices, USD per troy ounce), weighted by importance of sectors in revenue.

Appendix B

Fiscal rules in Latin America

Fiscal rules have become a frequently used policy tool in Latin America in the last two decades (in the 1990's, only OECD economies applied them). This proliferation was led by Argentina (until 2009), Brazil, Colombia and Peru in 2000, Chile and Costa Rica in 2001, and Mexico in 2006. After the 2009 crisis, more economies from the region started using fiscal rules: Panama (which had already implemented them for two years between 2002 and 2003), Jamaica and Ecuador. The economies from the region that have applied these rules have largely preferred those that entail budget balance (all except Brazil), and in most cases have complemented them with a second rule, normally an expenditure or a debt rule. A particular case is Ecuador, which has used three different fiscal rules in the last 20 years, although currently it uses only one, the expenditure rule. Along with Ecuador, Chile currently uses a single rule, the budget balance rule. In the majority of the cases there are clear mechanisms in case of non-compliance with the rule. For example, according to the OECD/IADB (2014)[19] if Chile, Colombia or Peru fails to follow the budget balance rule, they must present a proposal to the legislative power with corrective measures. In the case of the expenditure rule for Brazil or Colombia, if the rule is not followed, it is up to the authorities to undertake measures.

For the classification of the fiscal rules, we follow the work done by Budina et al. (2012), who categorise them into four categories: expenditure rules, revenue rules, budget balance rules and debt rules.

Debt rules: set a clear limit or target for public debt in percent of GDP. For example, in the case of Panama, complemented with a budget balance rule, the target was to reduce the debt-to-GDP ratio to 40% by 2014.

19   In general, the results are quite similar except for the case of Argentina, which according to the report uses an expenditure rule and a budget balance rule. Similarly, Chile and Ecuador use an expenditure rule and a debt rule, respectively. Finally, in the case of Brazil, the data presented in the report is the same as that used in the empirical analysis, with the exception of the legal basis. According to this source, the Brazil rule is written in the constitution, in contrast to the IMF *Fiscal Rules Dataset*, where it is only a statutory law.

Table B.1
Countries using fiscal rule

Fiscal rule Country	Expenditure rule	Revenue rule	Budget balance rule	Debt rule
Argentina	2000-2008		2000-2008	
Brazil	2000-2014			2000-2014
Chile			2001-2014	
Colombia	2000-2014		2011-2014	
Costa Rica			2001-2014	
Ecuador	2010-2014		2003-2009	2003-2009
Jamaica			2010-2014	2010-2014
Mexico	2013-2014		2006-2014	
Panama			2002-2003, 2009-2014	2002-2003, 2009-2014
Peru	2000-2014		2000-2014	

Source: IMF *Fiscal Rules Dataset* 2013.

Budget balance rules: require the government to balance revenue and expenditure. In some cases, the rule can refer to overall balance, structural balance or balance over the cycle. For example, Colombia uses a budget balance rule that is focused on reducing structural deficits for the central government. The objective is to reduce structural deficits to 2.3% of GDP in 2014 and to less than 1% from 2022 onwards. In the medium term, an independent advisory commission will set the correspondent targets. The rule establishes possible action (fiscal expansion) in the case of economic downturn and an escape clause in case of extraordinary events.

Expenditure rules: set limits on total, primary or current spending. For example, for Argentina, (2000-2008) primary expenditure could grow more than nominal GDP or at most stay constant in periods of negative nominal GDP growth.

Revenue rules: floors on revenues. At the moment, no Latin American economy applies this fiscal rule. Nevertheless, it is still used by some OECD economies. For example, in Belgium, the growth of real primary expenditure for the central government must be 0 or less.

Overall fiscal rule index and sub-indexes in Latin America

We construct a fiscal index based on the rules' key characteristics, using the methodology proposed by Budina et al (2012) and the IMF *Fiscal Rules Dataset* (1985-2013). The fiscal index consists of the unweighted sum (standardised to vary from 0 to 5) of four sub-indexes that describe key characteristics: coverage, formal enforcements, legal basis and supporting procedures (also varying from 0 to 5) (figure B.1).

Each sub-index consists of the sum of several key indicators (that range from 1 if the indicator exists to 0 if it does not). For instance, the sub-index for supporting procedures is the sum of three indicators that account for the existence of multiyear expenditure ceilings, fiscal responsibility laws and independent fiscal bodies. The formal enforcement sub-index is a sum of the existence of formal enforcement procedures and the monitoring of compliance outside government. In the case of the legal basis sub-index, a sum is performed (values are standardised to range from 0 to 1) to take into account if the rule is based on a political commitment, a coalition agreement, a statutory law or the constitution. For the coverage sub-index, a similar methodology is performed, taking into account if the rule covers only the central government or the general government (figure B.2)

Figure B.1
Fiscal Rules Index in Latin America

(Index ranging from zero to five)
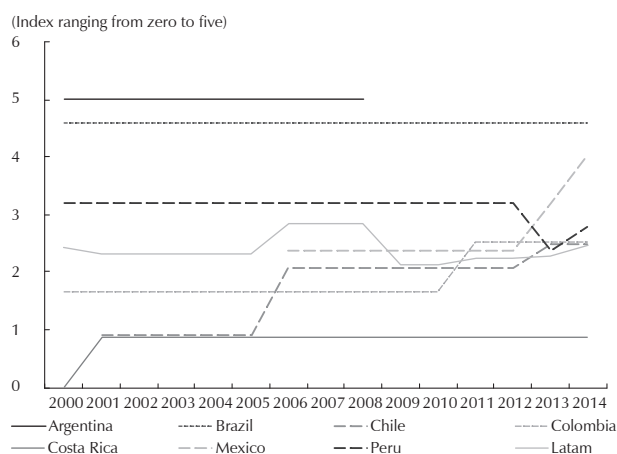
Note: The index for Latin America (LATAM) is the result of a simple average of Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador and Mexico.
Source: Authors' calculations based on IMF *Fiscal Rules Dataset* 2013.
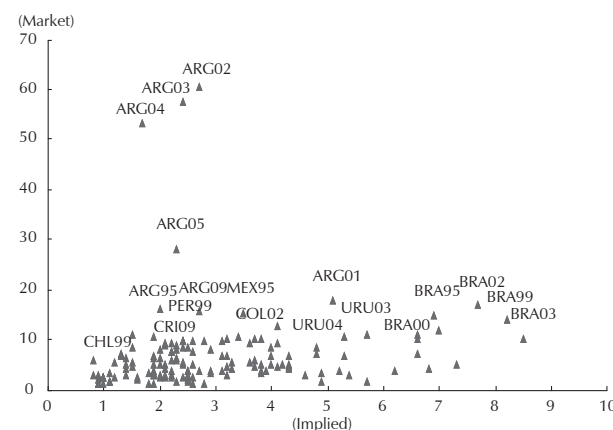
Figure B.2
Fiscal rule sub-indexes in Latin America

(Index ranging from zero to five)
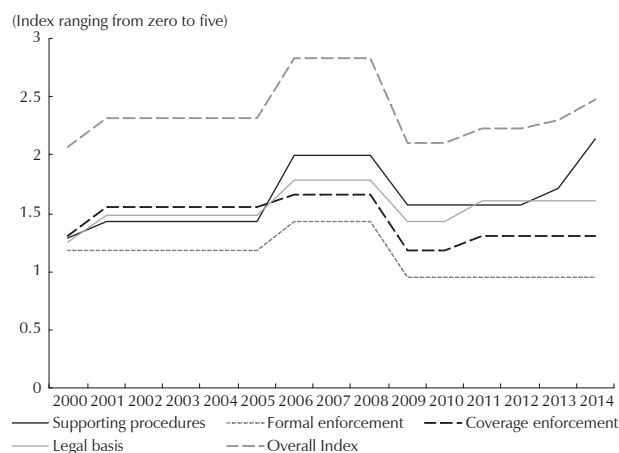
Source: Authors' calculations based on IMF *Fiscal Rules Dataset* 2013.

Appendix C

Figure C.1
Market and implied interest rates in selected economies in Latin America, 1990-2014

Source: Authors' calculations.