



# Authorities' Fiscal Forecasts in Latin America: Are they Optimistic?

RESEARCH

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## ABSTRACT

Do governments in Latin America tend to be optimistic when preparing budgetary projections? We address this question by constructing a novel dataset of the authorities' fiscal forecasts in six Latin American economies, using data from annual budget documents over the period 2000–2018. We compare such forecasts with the outturns reported in the corresponding budget documents of the following years, to understand the evolution of fiscal forecast errors. Our findings suggest that: (i) there is no general optimistic bias in the forecasts for the fiscal balance-to-GDP ratio; (ii) over time, fiscal forecasts have improved for some countries and worsened for others; (iii) forecast errors for the fiscal balance-to-GDP ratio are positively correlated with GDP growth and terms-of-trade changes, and negatively correlated with GDP deflator surprises; (iv) forecast errors for public debt-to-GDP ratios are negatively associated with surprises to GDP growth; and (v), budget balance rules may help contain fiscal forecast errors.

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## 1. INTRODUCTION

The accuracy of official fiscal forecasts is a key issue with wide-ranging implications for macroeconomic policies, fiscal performance and sustainability, and policy advice. A systematic bias in the authorities' fiscal forecasts generally weakens policy credibility, complicates the policymaking process, and may persistently worsen public finances. Therefore, it is essential to understand the governments' fiscal forecast errors and their underlying drivers, to improve macroeconomic forecasts and strengthen policy guidance. In the context of COVID-19, a better understanding of the official fiscal forecast errors would help sharpen the IMF's advice, given the central role of fiscal policy in response to the pandemic.

This paper investigates the following questions to better understand the authorities' fiscal forecasts and forecast errors in the six largest economies in Latin America (LA6: Argentina, Brazil, Chile, Colombia, Mexico, and Peru). First, have the authorities' fiscal forecasts been over-optimistic? The evidence from empirical papers seems to suggest that governments are frequently unable to reduce their budget deficits as a result of an over or under estimation of fiscal revenues (expenditures). We contribute to this literature by examining the case of Latin America. Second, what are the fundamental factors explaining the official fiscal forecast errors (is there space to improve their efficiency)? Although different variables have been commonly identified as drivers of the authorities' fiscal forecast errors, we center our analysis on those concerning the state of the economy, i.e. official forecast errors of macroeconomic variables.<sup>1</sup> Lastly, have fiscal rules been helpful to reduce the size of forecast errors?

To address these questions, we constructed a novel dataset of the authorities' fiscal forecasts in LA6 by collecting data from annual budget documents over the period 2000–2018. These documents were collected from the Ministry of Finance of each country, correspondingly. Specifically, we construct our dataset using 117 annual budget documents on authorities' fiscal and macroeconomic forecasts. We then compared the fiscal forecasts from the official documents published in year  $t-1$  for the budget of year  $t$  with the outturns reported in the next year's corresponding documents (published in  $t+1$ , thus containing outturns for year  $t$ ).<sup>2</sup> Our analysis aims to: (i) understand the evolution and drivers of the fiscal forecast errors; (ii) describe their evolution over time and across countries; and (iii) assess the impact on fiscal forecast errors from forecast errors for real GDP growth, inflation (GDP deflator changes), and terms of trade (ToT) changes.

## 2. LITERATURE

The empirical literature on fiscal forecast errors suggests that most countries' preliminary official data releases tend to be optimistic when forecasting their fiscal and macroeconomic variables. This literature is limited and has mainly focused on the authorities' fiscal forecasts for advanced economies, in particular European countries.<sup>3</sup>

Indeed, several empirical studies find over-optimism in the authorities' fiscal forecasts of EU economies. Brück and Stephan (2006) used official data on budget deficit forecasts from 15 Eurozone and two non-Eurozone countries, and found substantial evidence of political influence on the budget forecasts since the introduction of the Stability and Growth Pact. Jonung and Larch (2006) examined the accuracy of fiscal projections from four EU economies and concluded that government agencies are systematically optimistic in their growth predictions in the budget-planning phase. Similarly, Beetsma, Giuliadori, and Wiertz (2009) used data on 14 EU economies from the Stability and Convergence Programs and found empirical evidence that planned budget balances differed in an over-optimistic manner from the ex-post budget estimates. Beetsma, Bluhm, and Giuliadori (2011) explored the determinants of deviations of the ex-post budget from

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1 We discuss this further in the literature review.

2 Complemented with WEO or official national sources, when necessary.

3 European countries are generally required to submit their fiscal forecasts, and therefore the data is often more readily available.

first-release outcomes, and found that revision errors were mainly caused by over-optimism on revenues at the first-release stage. In the context of the United States, Croushore and Van Norden (2018) used fiscal policy forecasts prepared for the Federal Open Market Committee to understand and predict changes in fiscal variables. By assembling a new data set on Greenbook fiscal forecasts, their results suggested that improvements in fiscal forecasts are correlated with improvements in forecasting macroeconomic variables, such as the unemployment rate and the output gap. Kliesen and Thornton (2012) studied the properties of forecasts prepared by the Congressional Budget Office (CBO) and found that they perform worse in recessions than in expansions. Similarly, Auerbach (1994) examined the quality of forecasts of the CBO and the Office of Management and Budget (OMB), and showed that both have been overoptimistic.

Part of this literature has also focused on assessing the performance of fiscal forecasts offered by multilateral organizations, pointing towards systematic biases in budgetary forecasts. For instance, Merola and Perez (2013) contrasted the fiscal forecasts prepared by European national governments, the European Commission, and the OECD, and attained evidence that international agencies' forecasts presented an optimistic bias the year prior to elections.

An effort has also been made to expand the literature and include emerging market economies when analyzing the official budget balance projections from national sources. Frankel (2011); Frankel (2013); and Frankel and Schreger (2013), worked with a broader sample that included 33 countries, of which three were emerging market economies (Chile, Mexico, and South Africa). Their results are mainly in line with previous studies on advanced economies (official budget forecasts of advanced economies have an upward bias). For instance, their paper found a significant association between the forecast errors of GDP growth and inflation and those of the budget balance. Avellan and Vuletin (2015) used a broader sample that included 80 developing countries over the 1995–2013 period to reconsider preceding evidence of output forecast errors on fiscal procyclicality. In particular, they showed that over-optimism is neither necessary nor sufficient to decode fiscal procyclicality.<sup>4</sup> The paper also displayed how output forecast errors tended to be over-optimistic over the full sample of countries. Furthermore, when analyzing whether over-optimism is a more pervasive problem in developing countries vs. industrialized ones, they found that this assertion was not supported by the evidence.<sup>5</sup> Our study extends the attention to emerging markets, focusing on Latin American countries, on the basis of a new dataset that we assemble.

### 3. DATA AND METHODOLOGY

#### 3.1 DATASET

The dataset was constructed by collecting the data series on official forecasts and outturns from the budget documents publicly available in each country's Ministry of Finance. Our sample spanned over the period 2000–2018, with the starting date chosen following the availability of the budgetary documents. The forecasts for year  $t$  were retrieved from the documents published in year  $t-1$ , while the outturns for the corresponding variables in year  $t$  were collected from the official documents published in year  $t+1$ . Fiscal variables corresponded to the general government (GG) for Peru, to the central government for (CG) Brazil,<sup>6</sup> Chile, and Colombia, and to the public sector (PS) for Argentina and Mexico.<sup>7</sup> We focused on collecting the following fiscal data series

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<sup>4</sup> We refer the reader to Vegh and Vuletin (2015), Galeano, Izquierdo, Puig, Vegh, and Vuletin (2021), for additional research on how fiscal policy is conducted over the business cycle.

<sup>5</sup> Incidentally, the authors find that, while over-optimism is a phenomenon that affects both developing and industrialized countries, about two-thirds of countries do not show a systematic bias in forecast errors, on an individual basis.

<sup>6</sup> The annual budget bill documents for Brazil only include figures for the primary balance, which are the ones used in this paper.

<sup>7</sup> We tried to maintain the same level of government for all the economies. However, we could only construct a complete dataset of actuals and projections with the levels described above for each country.

(in nominal terms and as percent of GDP): the overall fiscal balance;<sup>8</sup> expenditure; revenues; and public debt.<sup>9</sup> As for the macroeconomic variables, we focused on: nominal GDP; real GDP growth; GDP deflator; CPI inflation; and the exchange rate. The data series on terms-of-trade (forecasts and outturns) came from corresponding WEO vintages.<sup>10</sup>

### 3.2 DATA SOURCES

Our data collection consisted of reviewing 117 budget documents sent to Congress for approval in each year for each of the six countries. These official documents are the most updated set of comprehensive macroeconomic forecasts provided by the Government/Ministry of Finance to the legislative bodies.<sup>11</sup> Nonetheless, in some cases, the approved budget may differ from this set of forecasts. However, pulling together the final comprehensive set of fiscal forecasts from the legal documents would be a significantly more daunting task. We provide an overview of the data sources in Table 1.

COUNTRY	SOURCE (BUDGET DOCUMENT)
Argentina	Presupuestos de la Administración Pública Nacional <sup>a</sup> <a href="#">[link]</a>
Brazil	Projeto de Lei Orçamentária Anual <sup>b</sup> <a href="#">[link]</a>
Chile	Informe de Finanzas Públicas del Proyecto de Ley de Presupuestos del Sector Público <sup>c</sup> <a href="#">[link]</a>
Colombia	Marco Fiscal de Mediano Plazo <sup>d</sup> <a href="#">[link]</a>
Mexico	Criterios Generales de Política Económica <sup>e</sup> <a href="#">[link]</a>
Peru	Marco Macroeconómico Multianual <sup>f</sup> <a href="#">[link]</a>

**Table 1** Data Sources of Authorities Forecasts.

**English names:** *a:* Budget of the National Public Administration, *b:* Annual Budget Bill, *c:* Public Finance Report on the Public Sector Bill, *d:* Medium Term Fiscal Framework, *e:* General Criteria of Economic Policy, *f:* Multiannual Macroeconomic Framework.

### 3.3 DATASET EXAMPLE

In Table 2, we illustrate the collected dataset with the example of Chile. The upper panel presents the authorities' forecasts either retrieved from official budget documents (white cells), calculated on the basis of data in these documents (yellow),<sup>12</sup> calculated using special definition for the corresponding variable (orange),<sup>13</sup> retrieved from charts/graphs in official documents (light blue), or collected from another official national source (green). The entries that were not available are marked in dark blue. In general, most entries about the authorities' forecasts were retrieved directly from the official budget documents or using a simple calculation or transformation of the data contained therein. Data on outturns were also collected from the official budget documents, and when not available, outturns series were complemented with official sources, such as national statistical agencies and central banks. The corresponding tables for all LA6 economies are presented in the Appendix.

### 3.4 METHODOLOGY

We defined forecast errors (FE) as the authorities' forecast minus the actual outturn of the corresponding variable. Using this definition, our analysis of forecast errors encompassed three stages: (i) visual analysis of the evolution of fiscal forecast errors across countries and over time; (ii) correlation between fiscal forecast errors and a set of macroeconomic variables; and (iii) formal regression analysis.

<sup>8</sup> It would be interesting to explore the role of possible surprises in primary balances and primary expenditures and highlight the effects of countries with high debt (and a high share of foreign exchange debt). However, it was an unattainable task to assemble a consistent and comprehensive dataset on primary balances.

<sup>9</sup> For Brazil, Colombia, and Mexico, we used the total net debt.

<sup>10</sup> Projections and outturns for the terms of trade were not consistently reported in the official documents.

<sup>11</sup> Although the fiscal forecasts are prepared by the fiscal authorities in each country, it is not always explicitly mentioned which is the source of the underlying macroeconomic assumptions.

<sup>12</sup> For example, in some cases the fiscal balance was not reported explicitly, but it was easily calculated on the basis of total expenditures and total revenues.

<sup>13</sup> For instance, switching from average inflation to end-of-period inflation as that was the only one reported for some years.

Authorities' forecasts																
Units	(million pesos)	%	(million pesos)	%	(million pesos)	%	(million pesos)	%	(million pesos)	%	(million pesos)	%	(pesos/dll average)			
	Fiscal balance	(% of GDP)	Expenditures	(% of GDP)	Revenues	(% of GDP)	Public Debt	(% of GDP)	nominal GDP	real GDP growth	GDP deflator	(% change)	(% average)	Exchange rate		
2000																
2001																
2002																
2003	327.229.00	-0.70	11,373,869.00	23.60	11,046,639.00	22.90			48,216,479.21	4.00			3.40	711.50		
2004	-432,031.00	-0.80	11,916,579.00	22.40	11,484,548.00	21.60			53,184,108.55	4.40	5.05		2.40	660.00		
2005	739,401.00	1.20	12,371,724.00	20.50	11,111,123.00	21.80			60,246,219.03	5.20	7.68		2.50	625.00		
2006	1,568,127.00	2.30	13,866,971.00	20.70	15,435,098.00	22.90			67,158,783.84	5.50	5.08		3.00	540.00		
2007	3,715,730.00	4.40	15,618,443.00	18.70	19,334,173.00	23.10			451,4907.71	5.40	83,609,402.00		17.43	3.50	555.00	
2008	4,239,818.00	4.80	17,780,150.00	18.50	21,969,905.00	23.30			3,897,612.20	4.10	90,605,171.98		5.30	7.98	512.00	
2009	3,599,763.00	3.70	20,673,642.00	21.40	24,273,405.00	25.10			4,156,203.81	4.30	96,656,248.00		4.00	-2.24	430.00	
2010	-1,030,692.00	-1.10	23,381,081.00	24.50	22,350,388.00	23.40			8,306,214.61	8.70	95,473,731.15		5.00	-5.93	2.80	588.00
2011	-973,834.00	-0.80	26,693,480.00	23.80	25,769,646.00	22.70			12,152,429.28	10.47	116,669,049.79		6.10	14.58	3.30	500.00
2012	-510,975.00	-0.40	28,388,389.00	22.70	27,877,154.00	22.50			15,616,464.13	11.81	125,035,127.86		5.00	2.60	2.80	472.00
2013	999,346.00	-0.70	30,631,555.00	22.30	29,632,209.00	21.60			18,679,264.00	13.57	137,273,692.98		4.80	4.76	2.90	496.00
2014	-1,399,763.00	-0.90	32,240,551.00	21.30	30,846,787.00	20.40			21,580,002.00	14.27	151,172,208.82		4.90	5.05	3.00	522.00
2015	-3,094,215.00	-1.90	36,391,119.00	21.30	33,356,904.00	21.30			27,313,000.00	17.46	156,895,121.56		3.60	0.21	3.00	585.00
2016	-5,418,239.00	-3.00	40,277,024.00	24.10	34,858,785.00	20.90			36,793,500.00	22.01	166,956,512.94		3.90	3.80	3.80	700.00
2017	-5,684,420.00	-3.30	42,712,891.00	24.30	36,526,470.00	21.00			45,264,400.00	26.05	173,830,348.00		2.25	1.83	3.00	700.00
2018	-3,721,956.00	-1.90	45,198,536.00	23.60	41,476,580.00	21.70			48,760,400.00	25.49	191,527,766.85		3.00	6.86	2.60	650.00
2019	-3,588,521.00	-1.70	47,742,991.00	22.90	44,154,469.00	21.20					208,380,237.01		3.80	4.93	3.00	650.00
Level	Banco Central Total															
Source:	<a href="http://www.dgces.pob.cl/598/w3-propertyvalue-1129.html">http://www.dgces.pob.cl/598/w3-propertyvalue-1129.html</a>															

Actuals																
Units	(million pesos)	%	(million pesos)	%	(million pesos)	%	(million dollars)	%	(million pesos)	%	(million pesos)	%	(pesos/dll average)			
	Fiscal balance	(% of GDP)	Expenditures	(% of GDP)	Revenues	(% of GDP)	Public Debt	(% of GDP)	nominal GDP	real GDP growth	GDP deflator	(% change)	(% average)	Exchange rate		
2000	750,039.00	0.64	8,263,539.00	17.41	6,096,477.00	10.47			8,677.00	13.20	42,000,184.49		5.23	3.40	528.87	
2001	757,617.00	0.62	9,019,619.00	17.14	6,171,010.00	10.61			939.00	12.51	45,051,601.43		5.28	1.57	524.01	
2002	574,822.00	1.00	10,554,499.00	17.35	6,739,674.00	10.76			102,118.10	15.20	48,044,119.87		5.11	2.36	589.24	
2003	-230,468.00	-0.44	10,804,507.00	20.66	10,574,039.00	20.22			11,095.40	12.70	52,299,888.13		4.09	4.58	2.83	691.54
2004	1,246,468.00	2.06	11,605,173.00	19.19	12,849,605.00	21.25			11,116.30	10.30	60,471,710.76		7.21	7.85	1.87	605.55
2005	3,021,744.00	4.39	12,751,889.00	18.53	15,773,633.00	22.92			9,973.40	7.00	68,831,705.43		5.74	6.64	3.05	559.86
2006	5,998,216.07	7.31	14,070,852.10	17.14	20,069,188.17	24.45			7,866.40	5.00	82,080,219.85		6.32	12.16	3.40	530.26
2007	7,051,177.16	7.77	16,659,167.84	17.71	23,110,355.00	25.46			7,894.00	3.90	90,702,829.88		4.91	4.47	3.20	522.69
2008	1,647,022.09	3.89	19,087,190.91	20.34	22,734,214.00	24.22			7,335.00	6.90	93,654,108.40		5.53	-0.05	8.73	521.79
2009	-4,196,869.09	-4.34	22,565,747.09	23.34	18,388,878.00	19.00			11,095.80	5.80	96,686,156.86		1.56	-4.40	1.40	559.67
2010	-501,448.45	-0.45	24,410,320.95	21.89	23,807,472.49	21.44			20,577.90	8.60	111,508,610.68		5.84	8.96	3.00	513.28
2011	1,559,424.32	1.28	26,062,667.47	21.31	27,562,091.79	22.59			25,927.60	11.10	122,006,090.15		6.11	1.11	3.34	483.36
2012	727,667.16	0.56	28,042,490.91	21.58	28,770,158.07	22.14			32,422.90	11.90	129,947,342.30		5.32	1.13	3.01	486.75
2013	-821,378.67	-0.60	29,794,285.61	21.54	28,880,545.94	20.95			33,534.80	12.70	137,976,219.77		4.06	1.99	1.79	495.28
2014	-3,410,946.23	-1.62	33,051,427.15	22.22	30,604,480.92	20.60			36,986.50	15.00	148,099,433.67		1.77	5.91	4.38	483.36
2015	-4,410,578.36	-2.14	37,001,366.15	23.19	33,990,787.80	21.05			38,963.10	17.30	159,553,348.31		2.30	4.95	4.34	654.25
2016	-4,598,868.62	-2.71	39,842,575.88	23.50	35,145,707.37	20.79			53,365.40	21.00	169,537,287.72		1.71	4.47	3.79	676.85
2017	-4,847,378.74	-2.75	42,643,553.81	23.72	37,695,975.07	20.97			68,836.20	23.60	179,746,125.40		1.18	4.78	2.20	649.35
2018	-3,521,103.31	-1.65	45,184,687.34	23.62	42,031,349.80	21.98			70,427.50	25.60	191,265,952.07		3.95	2.36	2.43	640.29
2019		-2.83	48,152,605.58	24.27	42,531,502.27	21.43			74,991.20	27.90	198,440,706.83		3.09	2.67	2.24	702.69
Level	Banco Central Total															
Source:	<a href="http://www.dgces.pob.cl/598/w3-propertyvalue-15494.html">http://www.dgces.pob.cl/598/w3-propertyvalue-15494.html</a>															

Table 2 Dataset Example (Chile).

**Color legends.** White: Official budget report. Yellow: Calculation/Transformation. Orange: Special definition. Blue: Taken from a graph (visually). Navy: Not available. Green: Official national source.

For the latter, we employed the following two regression specifications:

$$FE Y_{it} = \beta_0 + \beta_1 FE \Delta Real GDP_{it} + \beta_2 FE \Delta GDPdef_{it} + \varepsilon_{it} \quad (1)$$

$$FE Y_{it} = \beta_0 + \beta_1 FE \Delta Real GDP_{it} + \beta_2 FE \Delta GDPdef_{it} + \beta_3 FE \Delta ToT_{it} + \varepsilon_{it} \quad (2)$$

Where  $Y_{it}$  is a fiscal variable for country  $i$  at time  $t$  (fiscal balance, total expenditure, total revenue, or public debt), expressed as a share of GDP;  $FE Y_{it}$  is the forecast error for the corresponding fiscal variable,  $FE \Delta Real GDP_{it}$  stands for the forecast error of the growth rate for real GDP,  $FE \Delta GDPdef_{it}$  stands for the forecast error of the change in the GDP deflator, and  $FE \Delta ToT_{it}$  is the forecast error in the change of the WEO Terms of Trade.<sup>14</sup>

We ran panel data regressions on Equations 1–2, allowing for country-specific fixed effects (F.E.) and random effects (R.E.). We also ran Hausman specification tests to check which of the two methods (F.E. and R.E.) was the preferred one in each specification.<sup>15</sup>

#### 4. VISUALIZING THE FORECAST BIAS

Figures 1–4 describe the evolution of the forecast errors for fiscal balance, revenues, expenditure, and public debt in LA6 over the period 2000–2018.<sup>16</sup> These figures present the authorities' forecasts, the actual outturns, and the forecast errors (defined as forecasts minus outturns). In addition, we display the introduction of fiscal rules horizontal lines, mainly to detect if these rules have resulted in changes regarding the accuracy of the fiscal forecasts.<sup>17</sup>

Figure 1 shows that the authorities' forecasts for the fiscal balance-to-GDP ratios have been optimistic (positive forecast errors) for Argentina and Brazil,<sup>18</sup> especially during 2012–2016, but not for the other economies in general. In fact, the authorities' forecasts for the fiscal balance in

14 We include the Terms of Trade in our analysis as our sample encompasses commodity exporter economies. Terms of Trade are expected to improve fiscal accounts through higher revenues when this variable increases.

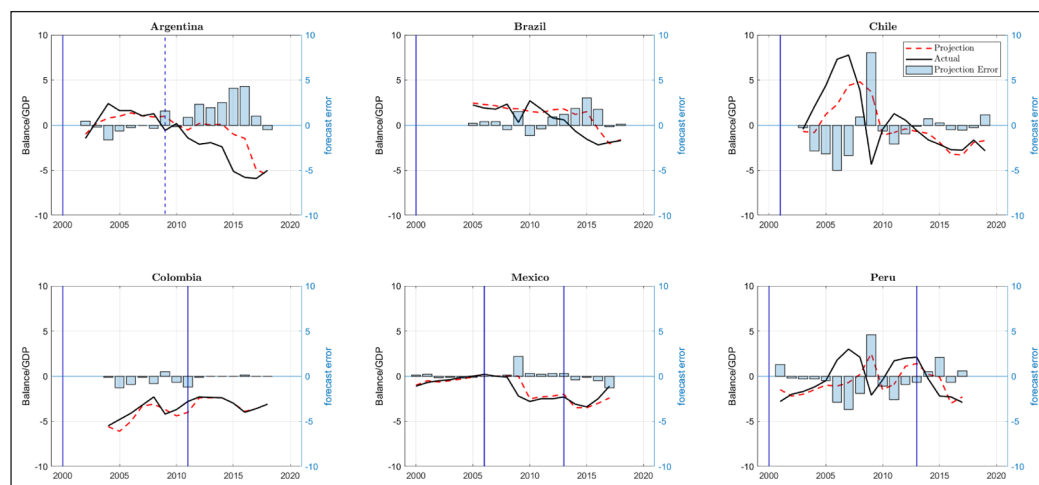
15 In alternative specifications, we also added the forecast error for the exchange rate as a regressor, but the regression coefficients turned out not to be significant.

16 For a more comprehensive and extensive discussion on the fiscal policy history of the countries in our sample, we refer the reader to Kehoe, Nicolini, and Sargent (2020).

17 Illustrated as a reduction of the forecast errors bars.

18 One possible explanation of the persistently overestimated fiscal balances in Argentina and Brazil could be related to possible spending rigidities (i.e., mandatory provincial transfers, wage, pension spending).

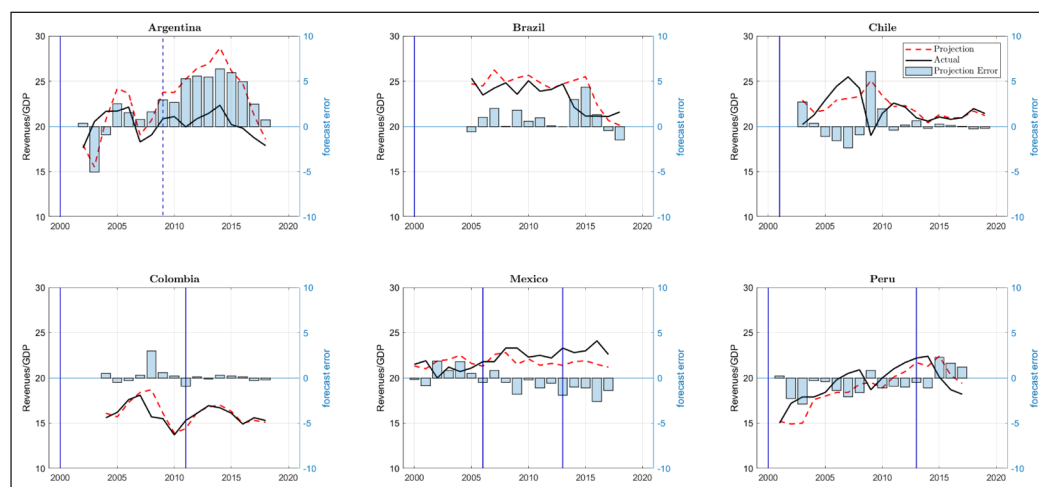
Chile and Colombia have improved over time, especially in the past decade, while those for Mexico have been quite accurate for most years. In Peru, there wasn't an evident consistent pattern in the forecasts errors for the fiscal balance.



**Figure 1** Forecasts, Actuals, and Forecasts Errors: Fiscal Balance.

Note: In Argentina, fiscal rules were introduced from 2000 and de facto suspended in 2009. In Brazil, the debt rule and the expenditure rule were introduced in 2000. In Chile, the (structural) budget balance rule was introduced in 2001. In Colombia, the expenditure rule was introduced in 2000, and the budget balance rule in 2011. In Mexico, the budget balance rule started in 2006 and the expenditure rule in 2013. In Peru, the budget balance and expenditure rules were introduced in 2000, and the debt rule in 2013. Fiscal rule data is from Lledo, Yoon, Fang, Mbaye, and Kim (2017).

Figure 2 provides a similar picture but for the revenues-to-GDP ratios. Specifically, it points out that the optimistic forecasts for revenue have been large in Argentina the past decade,<sup>19</sup> declined over time (in absolute value) in Chile and Colombia, and reversed into an underestimation for Mexico roughly after 2009. For Brazil, the overestimation has recently reversed, while Peru has seen the opposite pattern with underestimation of revenues that have turned into an overestimation in recent years.



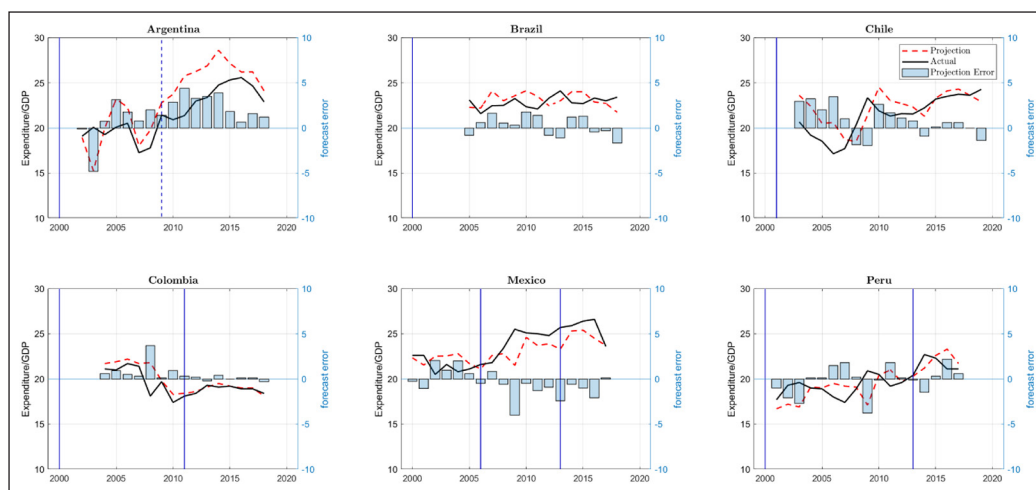
**Figure 2** Forecasts, Actuals, and Forecasts Errors: Revenues.

Note: Same as in Figure 1.

The pattern of forecast errors for the expenditure-to-GDP ratio is presented in Figure 3. The charts show similarities with the patterns for revenue-to-GDP ratio shown in Figure 2. For instance, the overestimation of expenditure has been large in Argentina, roughly over the same period in which Figure 2 showed overestimation for revenues. Similar to the case of revenues, the overestimation of expenditure has declined in Chile and Colombia, while it has reversed into an underestimation in Mexico. For Brazil and Peru, there are no clear signs of bias, although the forecasts for the expenditure-to-GDP ratios seem to be linked to the upturns in the previous years.

<sup>19</sup> To some extent, a possible explanation of the overestimation of revenues in countries like Argentina could be due to a disappointing recovery in trade volumes since the Global Financial Crisis (well below GDP growth), or overoptimism on the terms of trade and exchange rate fronts.

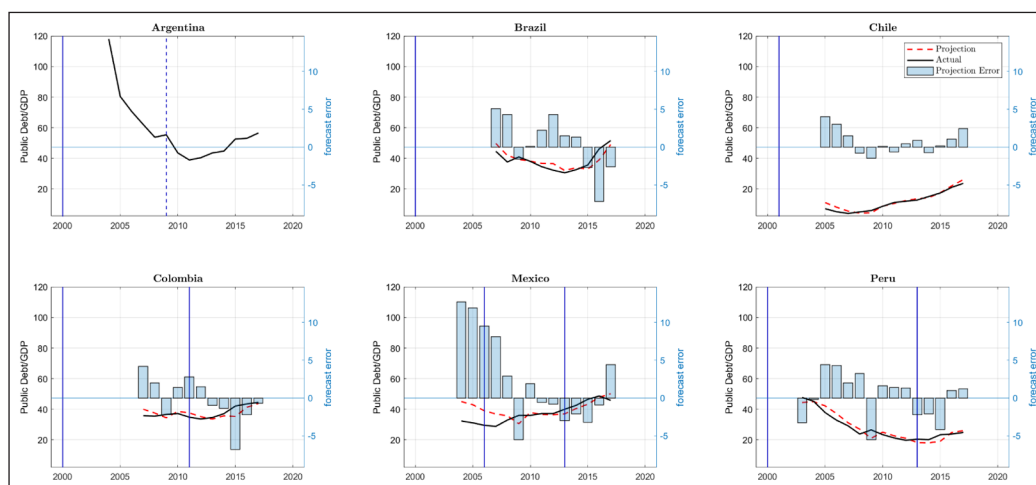




**Figure 3** Forecasts, Actuals, and Forecasts Errors: Expenditure.

Note: Same as in Figure 1.

Figure 4 presents the evolution of the authorities' forecasts, outturns, and forecast errors for the public debt-to-GDP ratio. The figure shows that forecasts started pessimistic (positive forecast errors for debt-to-GDP ratio) in all countries, then started turning optimistic in the 2010s, and are reversing in recent years.<sup>20</sup>



**Figure 4** Forecasts, Actuals, and Forecasts Errors: Public Debt.

Note: Same as in Figure 1.

Overall, Figures 1–4 provided several valuable insights in the evolution of fiscal variable forecasts. For instance, the visual evidence does not suggest a general (optimistic) bias in the authorities' fiscal forecasts for most countries. In fact, the optimistic forecasts for the fiscal balance mainly applied to Argentina and Brazil in the 2010s, but not to the other economies. In Argentina, the overestimation of revenues has been larger than the overestimation of expenditure, leading to optimistic forecasts for the fiscal balance, especially in recent years. For Mexico, both expenditure and revenues seem overestimated pre-GFC, and underestimated post-GFC by a similar magnitude, resulting in quite accurate overall balance forecasts; this seems to suggest an expenditure control that is anchored to revenue outcomes, which would be a sign of fiscal discipline. Indeed, by comparing the forecast errors of revenues with those of expenditure (both in nominal terms and as GDP ratios), it becomes apparent that any surprises in revenues are offset via expenditure accommodation.<sup>21</sup> Meanwhile, in Chile and Colombia, all forecasts improved significantly in the post-GFC period, while in Peru—and, to a lesser extent, in Brazil—, revenue and expenditure forecasts seem backward-looking, linked to the outturns from previous years. Turning to stock variables, the forecasts for the public debt-to-GDP ratio started pessimistic in all economies, i.e. authorities were

<sup>20</sup> No official forecasts for public debt are provided consistently in Argentina.

<sup>21</sup> To some degree, this also seems to be true for Argentina and Colombia. The corresponding figures are displayed in the Appendix.

anticipating a higher public debt than the outcome (with positive forecast errors, possibly due to the scars from the previous decades of debt problems), but then turned more optimistic (negative forecast errors, i.e. a debt forecast below the outcome) over time, albeit this trend is reversing in most recent years.

We also considered previous evidence on the association of fiscal rules with the levels of debt and fiscal deficits (a topic discussed for example in Debrun, Moulin, Turrini, Ayuso-i Casals, and Kumar (2008), IMF (2009), Eyraud et al. (2018), and Cardenas, Ricci, Roldos, and Werner (2021)). In particular, Celasun et al. (2015) reported that rules/institutions have shaped the pattern of deviations of fiscal forecasts from outcomes, albeit this effect has varied across countries. We investigated the impact of fiscal rules on fiscal forecast errors in our sample, using simple regression specifications that we present in the Appendix, where fiscal rule data is from the IMF dataset prepared by Lledo et al. (2017). A graphical representation of the introduction of these rules can also be found in Figures 1–4, via vertical lines.<sup>22</sup> In general, the results suggest that budget balance rules seem to be effective at containing the size of fiscal forecast errors, potentially as they can be associated with better information sets and forecasting techniques, improved data quality, and reduced uncertainty.

#### 4.1 TESTING FOR UNBIASEDNESS

In this section, we examine whether the fiscal forecasts are biased, by performing the Mincer and Zarnowitz (1969) test. Under the null, forecasts are unbiased (i.e., forecast errors have a zero mean) and efficient (consistently underestimating high values and overestimating low values). Specifically, we regress the actual data ( $Y$ ) on the authorities' forecasts ( $Y^F$ ) for each fiscal variable and test the joint null hypothesis that the constant term is null ( $\alpha = 0$ ) and the slope coefficient is equal to one ( $\beta = 1$ ):

$$Y_{i,t} = \alpha + \beta Y_{i,t}^F + e_{i,t} \quad (3)$$

The results are summarized in Table 3.<sup>23</sup> Altogether, at a 10 percent significance level, the joint p-value indicates that the null is rejected for the GDP ratios of expenditure, revenues, and debt in some specifications, suggesting that such forecasts are biased. Interestingly, the forecasts for the fiscal balance appear to be unbiased, implying that, on average, systematic biases in forecasts for expenditure and revenue ratios may tend to offset each other, resulting in more precise forecasts for the fiscal balance than for its components.

#### 4.2 FORECAST ERRORS OF KEY MACROECONOMIC VARIABLES

After providing an overview of the authorities' fiscal forecasts errors, we now turn our focus to the authorities' forecast errors for the main macroeconomic variables, such as real GDP growth, inflation, GDP deflator changes, and exchange rates. The objective of this exercise is to help provide insights about the (dis)similarities in the pattern of the two sets of forecast errors, and show preliminary evidence about possible interdependence.

Figure 5 plots the collected data on real GDP growth rates. In particular, the figure displays that actual growth rates for Argentina have been much more volatile than the forecasts, which have been generally optimistic over the last decade. Moreover, the growth forecast errors for Argentina have been larger than in other LA6 economies. The figure also shows that there has been a tendency to overestimate growth in Brazil post-GFC,<sup>24</sup> while Chile, Colombia, Mexico, and Peru tend to have somewhat smaller (or less persistent) forecast errors.

<sup>22</sup> It is important to recognize that a different degree of implementation of fiscal rule across countries may play a role.

<sup>23</sup> We also performed the tests separately to explore potential insights in terms of bias vs. efficiency. However, the individual tests turned out to be consistent with those for the joint hypothesis and are therefore presented only in the Appendix.

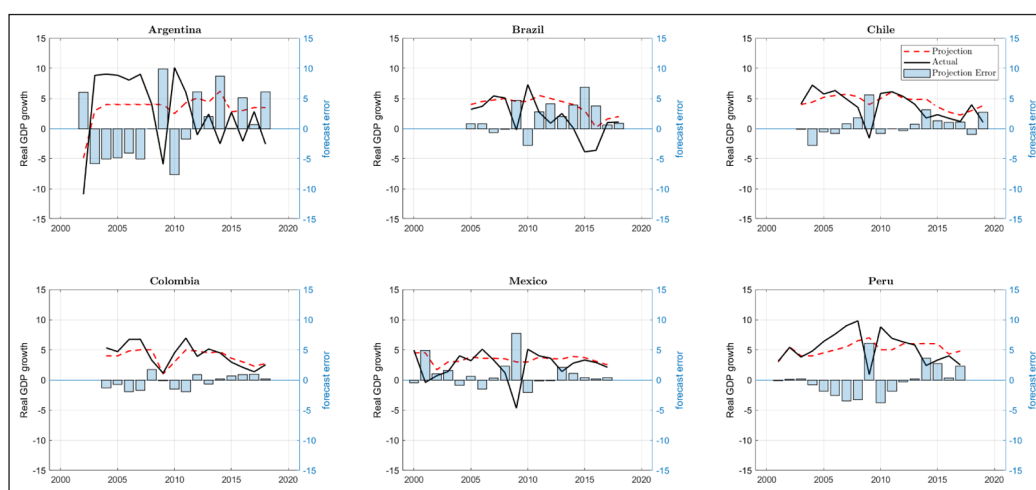
<sup>24</sup> It is worth mentioning that Brazil underwent one of its deepest recessions during 2015–2016, comparable in size to the Covid-19 shock.



BALANCE-TO-GDP RATIO											
POOLED ESTIMATION				FIXED EFFECTS				RANDOM EFFECTS			
$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val
-0.188 (0.222)	0.875 (0.101)	0.495	0.410†	-0.187 (0.087)	0.899 (0.129)	0.406	0.503†	-0.190 (0.295)	0.882 (0.109)	0.495	0.517†
EXPENDITURE-TO-GDP RATIO											
POOLED ESTIMATION				FIXED EFFECTS				RANDOM EFFECTS			
$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val
4.533 (1.531)	0.770 (0.069)	0.621	0.000	5.722 (1.738)	0.716 (0.079)	0.537	0.000	5.454 (1.704)	0.728 (0.075)	0.621	0.001
REVENUES-TO-GDP RATIO											
POOLED ESTIMATION				FIXED EFFECTS				RANDOM EFFECTS			
$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val
7.299 (1.372)	0.629 (0.063)	0.564	0.000	12.417 (1.812)	0.388 (0.085)	0.227	0.000	11.299 (1.795)	0.440 (0.079)	0.564	0.000
DEBT-TO-GDP RATIO											
POOLED ESTIMATION				FIXED EFFECTS				RANDOM EFFECTS			
$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val	$\alpha$	$\beta$	$R^2$	p-val
0.847 (1.276)	0.947 (0.038)	0.908	0.096	3.616 (2.270)	0.861 (0.072)	0.709	0.000	1.059 (1.413)	0.941 (0.042)	0.908	0.133†

**Table 3** Test of forecast unbiasedness.

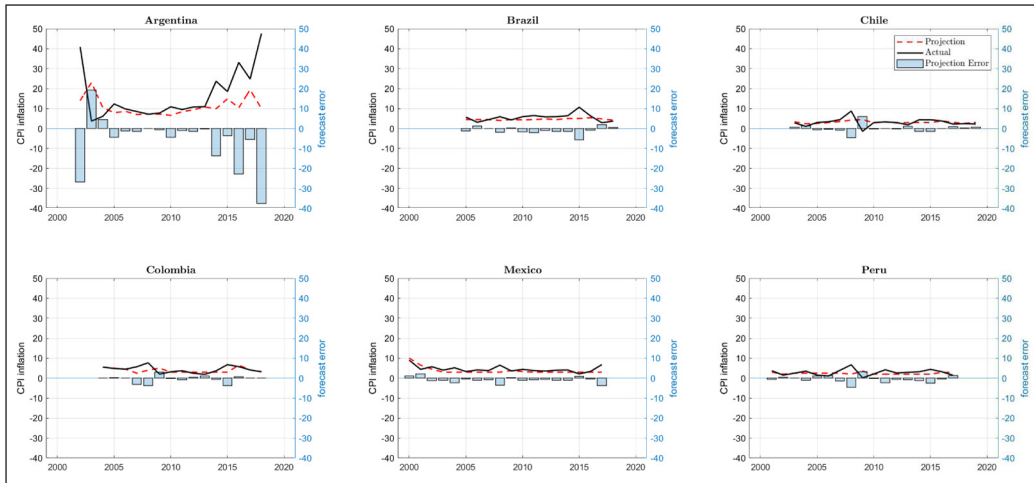
Notes: The table shows the coefficient estimates of Equation 3. The p-values refer to the test of the null hypothesis that the forecast is unbiased ( $\alpha = 0, \beta = 1$ ), where † denotes the rejection of the null at 10% significance level. Standard errors are denoted in parenthesis. For Fixed Effects, the test is performed using the average constant term.



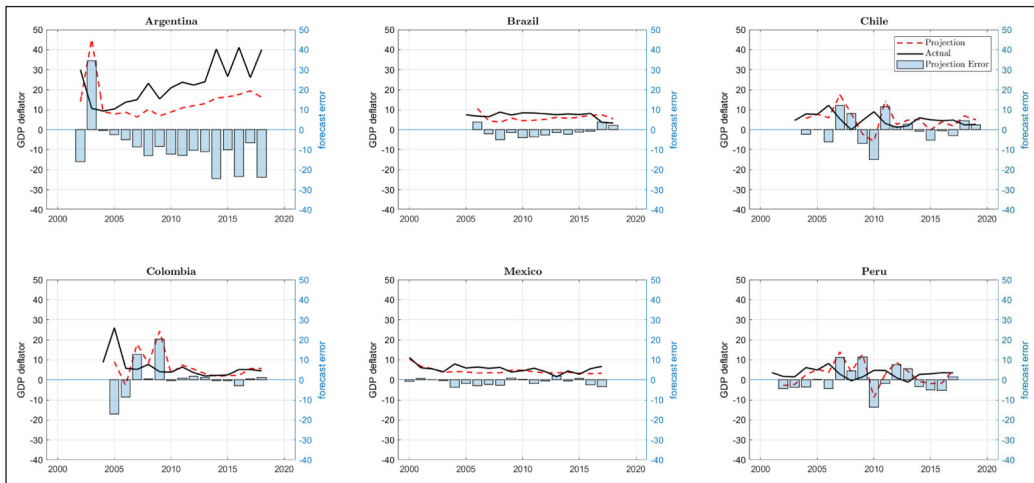
**Figure 5** Forecasts, Actuals, and Forecast Errors: Real GDP Growth.

The authorities' forecasts and forecast errors for inflation are presented in Figure 6. The main finding in the figure refers to Argentina, where actual CPI inflation has consistently exceeded the authorities' forecasts since 2014. On the other hand, inflation forecast errors do not show similar bias in any of the other LA6 economies.

The authorities' GDP deflator forecasts in Figure 7 convey a similar story to the one for CPI inflation. In fact, the authorities have consistently underestimated the GDP deflator in Argentina over the past decade and a half, and these forecast errors have widened over time. In the other LA6 economies, the forecast errors were either very small (Brazil and Mexico), or did not show any persistent pattern (Chile, Colombia, and Peru).

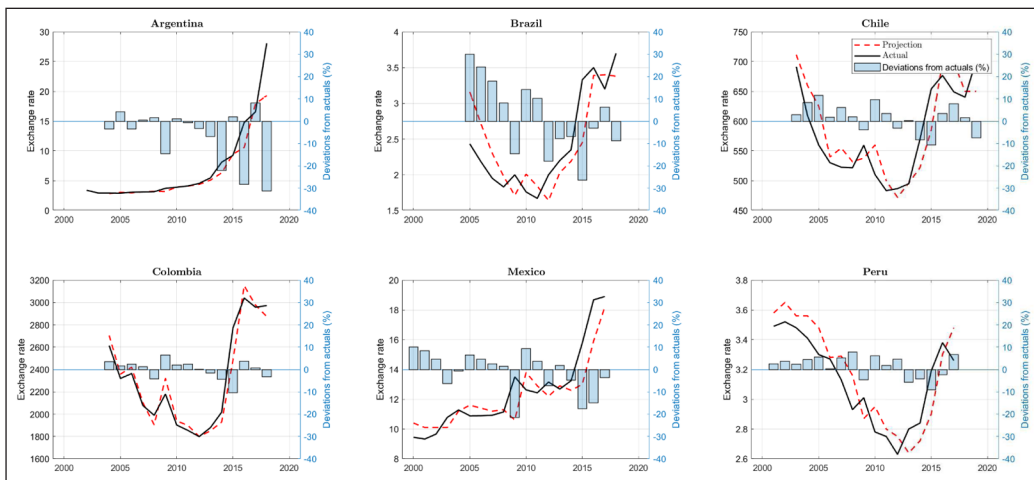


**Figure 6** Forecasts, Actuals, and Forecasts Errors: CPI Inflation.



**Figure 7** Forecasts, Actuals, and Forecasts Errors: GDP Deflator.

Figure 8 provides a visual inspection of the authorities' exchange rate forecasts. Overall, the charts show that the rate of depreciation tended to be underestimated post-GFC in Argentina and Brazil, with the magnitude of the forecast errors increasing in some recent years in Argentina. To a lesser extent, the depreciation rate also tended to be underestimated in Mexico in most recent years. On the other hand, the forecast errors have been substantially smaller and without a visible pattern for Chile, Colombia, and Peru.



**Figure 8** Forecasts, Actuals, and Forecasts Errors: Exchange Rate.

Having provided visual evidence of the evolution of the authorities' forecasts and forecast errors over time, in this section we focus our analysis on explaining the underlying drivers of fiscal forecast errors. We proceeded in two steps: first, we provide descriptive evidence of the correlations between forecast errors of fiscal and macroeconomic variables;<sup>25</sup> and then, we used panel data regressions to formally assess these relationships.

5.1 BIVARIATE RELATIONS

The bivariate relationships between forecast errors for fiscal variables and the forecast errors for real GDP growth rates are presented in Figure 9. The top panel shows the relationship for the overall sample, while the bottom panel shows the country-specific relationships. The charts in the top panel suggest that optimistic GDP growth forecasts (positive forecast errors) are associated with overestimated fiscal balance-to-GDP and revenues-to-GDP ratios, as shown by the positive correlation in the first and the third chart. Conversely, they are associated with underestimated expenditure and public debt ratios, as shown by the negative correlations in the second and the fourth chart. The charts in the bottom panel show that most country-specific relationships are in line with these general correlations, with a few limited exceptions.

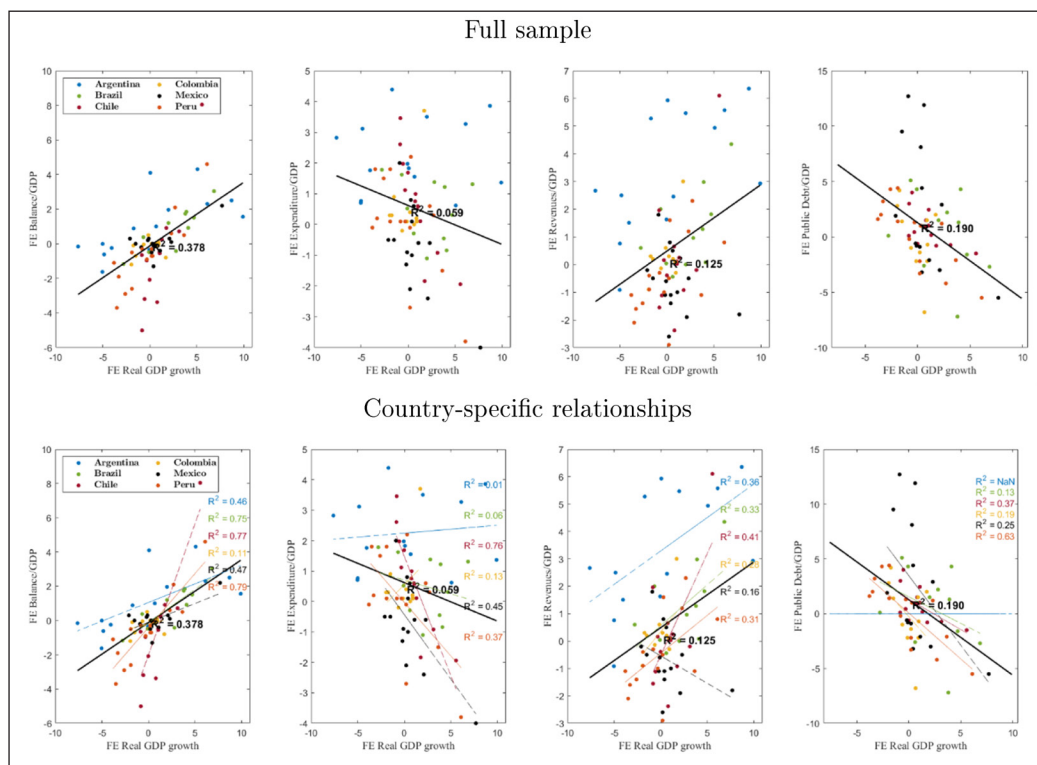
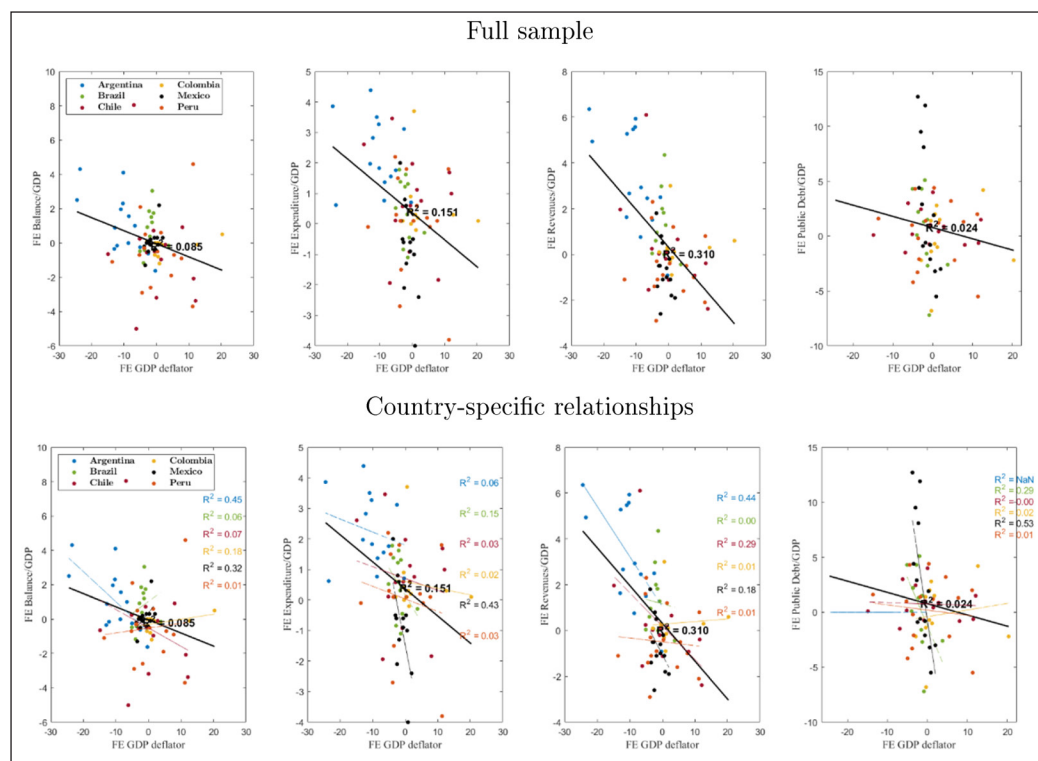


Figure 9 Correlations between Forecast Errors of Fiscal Variables and Forecast Errors of Real GDP growth.

Figure 10 shows correlations between the forecast errors for the same set of fiscal variables and the forecast errors for the GDP deflator. The negative relationships in the upper-panel charts suggest that optimistic forecasts for the GDP deflator (positive forecast errors) are associated with underestimated fiscal ratios (negative forecast errors). Nonetheless, the bottom-panel charts show heterogeneity across economies, with some of them displaying country-specific correlations that are opposite to the general one.

<sup>25</sup> Although this paper mainly assumes that the fundamental factors that explain the forecast errors of fiscal variables are the surprises in variables such as growth and inflation, it is also important to highlight that fiscal forecast errors could also be explained by uncertainty in the models or elasticities used by the authorities (e.g., by how much revenue increases with GDP).



**Figure 10** Correlations between Forecast Errors of Fiscal Variables and Forecast Errors of GDP deflator.

The negative relationships in Figure 10—which suggest that overestimation of the GDP deflator is associated with an underestimation of the fiscal balance or revenues—may seem counterintuitive at first. However, it is worth underlying that all fiscal variables here are expressed as ratios to GDP. Hence, the negative relationship is explained by the smaller (and therefore not enough to compensate for) positive effect that the GDP deflator holds on the nominal fiscal values (in the numerator) vs. the direct positive effect on GDP (in the denominator).

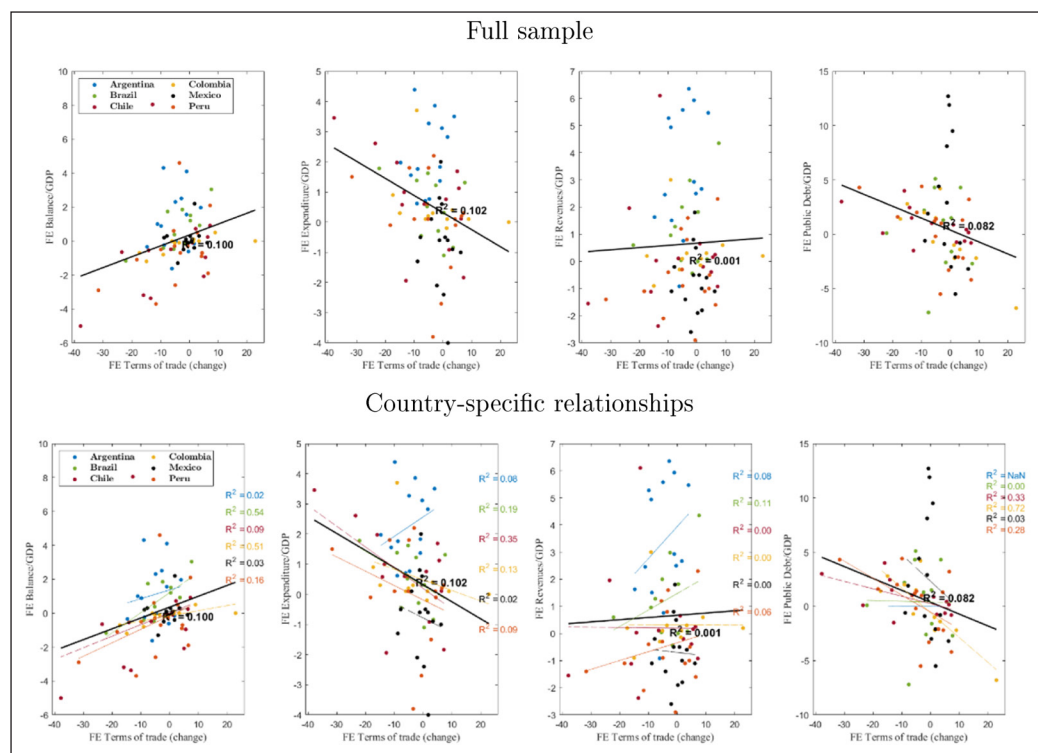
Figure 11 displays the correlations between the forecast errors of fiscal variables and those of the terms of trade percentage changes. The top panel shows that positive surprises to the ToT percentage changes are associated with positive surprises in the fiscal balance-to-GDP ratios. It is worth noting that such a result reflects the combination of an increase in revenues that is somewhat stronger than the increase in GDP (as depicted by the slightly positive slope of the third chart), and an increase in expenditure that is smaller than the increase in GDP (as shown by the negative slope in the second chart). In line with the effect on the fiscal balance-to-GDP ratio, positive ToT surprises are associated with smaller debt-to-GDP ratios (as shown in the fourth chart).

## 5.2 REGRESSION RESULTS

The results from the formal panel regression analysis are presented in Tables 4–7. These tables aim to explain the forecast errors of the different fiscal variables. For each specification, we present results from FE and RE panel regression estimations, along with the corresponding results from the Hausman specification tests.<sup>26</sup>

In particular, Table 4 shows that the forecast errors for the fiscal balance-to-GDP ratio are positively associated with positive forecast errors (negative outcome surprises, i.e., actuals turning out to be higher than the projections) for GDP growth and ToT percentage changes, and negatively associated with positive forecast errors for the GDP deflator changes. Put differently, higher forecasts for growth and ToT changes as well as lower forecasts for GDP deflator inflation are positively related to optimistic forecasts for the fiscal balance-to-GDP ratio.

<sup>26</sup> We show cross-country differences of fixed effects in the Appendix.



**Figure 11** Correlations between Forecast Errors of Fiscal Variables and Forecast Errors of Terms of Trade (changes).

DEPENDENT VARIABLE FE BAL/GDP	(1)	(2)	(3)	(4)
	F.E.	R.E.	F.E.	R.E.
FE $\Delta$ Real GDP	0.366* (0.054) [0.000]	0.352* (0.053) [0.000]	0.322* (0.055) [0.000]	0.306* (0.052) [0.000]
FE $\Delta$ GDPdef	-0.021 (0.028) [0.470]	-0.054* (0.023) [0.021]	-0.047 (0.029) [0.113]	-0.079* (0.023) [0.001]
FE $\Delta$ ToT	-	-	0.048* (0.019) [0.015]	0.057* (0.018) [0.002]
Constant	-0.168* (0.058) [0.005]	-0.224 (0.180) [0.214]	-0.001 (0.088) [0.994]	-0.021 (0.176) [0.904]
Observations	78	78	78	78
Countries	6	6	6	6
R-squared	0.414	0.424	0.462	0.491
Adjusted R-squared	0.355	0.409	0.400	0.470
Hausman's test				
H-stat		4.358		3.080
p-value		[0.113]		[0.379]

**Table 4** Regression Results: Explaining Forecast Errors for the Fiscal Balance (GDP ratio).

Note: Standard errors in parenthesis ( ). p-values in brackets. \* Denotes significance at the 10% level.

The findings in Table 4 about the factors that explain the forecast errors for the fiscal balance-to-GDP ratios are underpinned by the set of results for the expenditure-to-GDP and revenue-to-GDP ratios presented in Tables 5 and 6, respectively.

The results in Table 5 imply a negative relationship between the forecast errors for the expenditure-to-GDP ratio and those for GDP growth, and the GDP deflator (the latter being insignificant when ToT are included in the specification). In turn, Table 6 presents results from specifications that

DEPENDENT VARIABLE FE EXP/GDP	(1)	(2)	(3)	(4)
	F.E.	R.E.	F.E.	R.E.
FE Δ Real GDP	-0.148* (0.049) [0.004]	-0.150* (0.049) [0.002]	-0.123* (0.052) [0.020]	-0.126* (0.051) [0.013]
FE ΔGDPdef	-0.060* (0.026) [0.024]	-0.069* (0.025) [0.006]	-0.045 (0.028) [0.109]	-0.053* (0.026) [0.042]
FE ΔToT	-	-	-0.028 (0.018) [0.131]	-0.027 (0.018) [0.126]
Constant	0.539* (0.054) [0.000]	0.520 (0.360) [0.149]	0.442* (0.083) [0.000]	0.427 (0.385) [0.268]
Observations	78	78	78	78
Countries	6	6	6	6
R-squared	0.151	0.230	0.179	0.248
Adjusted R-squared	0.066	0.210	0.084	0.217
Hausman's test				
H-stat		1.026		1.169
p-value		[0.599]		[0.761]

**Table 5** Regression Results: Explaining Forecast Errors for the Expenditure (GDP ratio).

Note: Standard errors in parenthesis ( ). p-values in brackets [ ]. \* Denotes significance at the 10% level.

DEPENDENT VARIABLE FE REV/GDP	(1)	(2)	(3)	(4)
	F.E.	R.E.	F.E.	R.E.
FE Δ Real GDP	0.217* (0.053) [0.000]	0.213* (0.053) [0.000]	0.198* (0.056) [0.001]	0.194* (0.055) [0.000]
FE ΔGDPdef	-0.081* (0.028) [0.005]	-0.095* (0.027) [0.000]	-0.093* (0.030) [0.003]	-0.103* (0.029) [0.000]
FE ΔToT	-	-	0.021 (0.020) [0.278]	0.023 (0.019) [0.237]
Constant	0.364* (0.057) [0.000]	0.338 (0.428) [0.430]	0.438* (0.089) [0.000]	0.426 (0.516) [0.409]
Observations	78	78	78	78
Countries	6	6	6	6
R-squared	0.298	0.369	0.310	0.383
Adjusted R-squared	0.228	0.353	0.230	0.358
Hausman's test				
H-stat		4.291		1.706
p-value		[0.117]		[0.636]

**Table 6** Regression Results: Explaining Forecast Errors for the Revenues (GDP ratio).

Note: Standard errors in parenthesis ( ). p-values in brackets [ ]. \* Denotes significance at the 10% level.

aim to explain the forecast errors for the revenue-to-GDP ratio. These results suggest a positive relationship between the forecast errors for the revenue-to-GDP ratio and the GDP growth and ToT (albeit the latter not significant), and a negative relationship between the forecast errors for the revenue-to-GDP ratio and the GDP deflator. Hence, positive surprises to GDP growth are associated with lower expenditure and higher revenue forecasts than the respective outcome, which explain the optimistic fiscal balance forecast. Positive surprises to GDP deflator are associated with both



lower expenditure and revenue forecasts than the outcome, the latter effect being dominant and driving a negative fiscal balance forecast error.

Finally, in Table 7 we present the results that refer to the only stock fiscal variable in our analysis—the public debt-to-GDP ratio. In line with our priors and the description findings presented earlier, negative surprises to GDP growth forecasts (positive forecast errors) are associated with negative forecast errors for the public debt-to-GDP ratio. Hence, overestimating GDP growth implies underestimating public debt-to-GDP ratios, mainly through a denominator effect (higher GDP), but also through the numerator (better fiscal balance). The other factors included in Table 7—the forecast errors for the GDP deflator and the ToT changes—are insignificant.

DEPENDENT VARIABLE FE DEBT/GDP	(1)	(2)	(3)	(4)
	F.E.	R.E.	F.E.	R.E.
FE Δ Real GDP	-0.813* (0.187) [0.000]	-0.719* (0.179) [0.000]	-0.727* (0.201) [0.001]	-0.672* (0.193) [0.000]
FE ΔGDPdef	-0.056 (0.075) [0.465]	-0.092 (0.074) [0.216]	-0.024 (0.080) [0.770]	-0.052 (0.079) [0.509]
FE ΔToT	- - -	- - -	-0.057 (0.050) [0.263]	-0.051 (0.049) [0.296]
Constant	1.349* (0.141) [0.000]	1.283* (0.514) [0.013]	1.078* (0.278) [0.000]	1.061 (0.652) [0.104]
Observations	64	64	64	64
Countries	5	5	5	5
R-squared	0.261	0.214	0.278	0.223
Adjusted R-squared	0.183	0.189	0.187	0.184
Hausman's test				
H-stat		2.521		3.232
p-value		[0.283]		[0.357]

We also investigated the role of the authorities' forecast errors for the exchange rate as a possible explanatory factor, but the coefficients turned out to be insignificant for most fiscal variables. They are significant with the expected sign only for the public debt-to-GDP (larger-than-projected depreciation are associated with larger-than-projected increase in public debt, presumably due to a foreign currency debt effect in the numerator), albeit not robust to the inclusion of ToT in the same specification. These regressions are presented in the Appendix.

## 6. CONCLUDING REMARKS

By constructing a novel dataset on official fiscal forecasts in Latin America, this paper provides both descriptive insights into the evolution of the authorities' fiscal forecast errors and formal analysis using panel data regressions regarding the importance of the various factors that explain these forecast errors for the LA6 economies.

In our descriptive analysis we compared the set of official forecasts to actual outturns and observed the following patterns. Optimistic forecasts for the fiscal balance seem to apply mainly to Argentina and Brazil, but not to other countries in LA6. For Argentina, this finding is due to the overestimation of revenues being larger than the overestimation of expenditure. For Mexico, both expenditure and revenues seem overestimated pre-GFC and underestimated post-GFC by a similar magnitude, resulting in quite accurate overall balance forecasts. Meanwhile, in Chile and

**Table 7** Regression Results: Explaining Forecast Errors for the Public Debt (GDP ratio).

Note: errors in parenthesis ( ). p-values in brackets [ ].  
\* Denotes significance at the 10% level.

Colombia, all forecasts improved significantly in the post-GFC period, while they seem backward-looking in Peru (and, to a lesser extent, in Brazil). We offer preliminary evidence that the presence of budget balance rules may help contain the size of the fiscal forecast errors, but a proper assessment will require a larger sample of countries as fiscal rules do not change much over time.

A more formal test of forecast unbiasedness indicates that the fiscal balance forecasts were generally unbiased for our sample of countries, even though the forecasts for revenues and expenditure appear biased, thereby suggesting that the biases in the two components of the fiscal balance tend to offset each other. This could be due to an either explicit or implicit fiscal targeting, whereby the authorities aim to reach the fiscal balance target set at the budgetary stage: in this case, for example, the authorities would tend to offset, with expenditure adjustments, any deviation in actual revenues from forecasts (over time, as the year progresses).

An interesting extension to our work could consider comparing authorities' fiscal forecasts against Consensus Forecast and investigating the possible fiscal (and macroeconomic) optimism or lack thereof across other forecasters.

The formal regression analysis helped shed light on key factors explaining the authorities' fiscal forecast errors. For instance, the fiscal balance forecast errors were found to be positively associated with negative surprises to GDP growth and ToT, and positively associated with GDP deflator surprises. In turn, we showed that this reflects the combination of: (i) the negative relationships between the forecast errors for expenditure and GDP growth and GDP deflator; and (ii) the positive relationships between revenue errors and those to GDP growth and ToT (albeit not significant), and the negative relationship of revenues with the GDP deflator (the latter being stronger than for expenditure). In other words, these findings imply that optimistic forecasts for growth or ToT changes drive optimistic forecasts for the fiscal balance-to-GDP ratio, both via optimistic or overestimated revenues ratios (too high) and underestimated expenditure ratios (too low). Furthermore, the negative surprises to GDP growth were found to be associated with negative forecast errors for public debt-to-GDP, while the effect of GDP deflator and ToT were insignificant. It could be worthwhile for future studies to expand our analysis to employing forecast errors in nominal terms (rather than as ratios of GDP), which could help disentangle the dominator effect.

In conclusion, it is important to underline the policy relevance of our analysis as well as point to some limitations. This analysis helps highlight the scope for improvement to the extent that the fiscal forecast errors are persistent and are strongly associated with the performance of macroeconomic forecasts. We primarily provide a positive analysis of the fiscal forecast gaps and do not address the important issue of whether they change due to exogenous reasons or endogenous policy reactions. However, the analysis of the drivers of the forecast error gaps offers some hints about the exogenous component and policy response in line with the existing fiscal rules. The fact that we did not find a general systematic over-optimism in the fiscal balance to GDP ratios may be initially shocking, especially given our understanding of the conduct of fiscal policy in emerging and developing countries (Frankel Vegh, & Vuletin 2013). Indeed, revenues-to-GDP projections are expected to be primarily driven by external factors other than the government's economic activity. Yet, the same is not true for fiscal expenditure, especially in emerging economies where the discretionary component of spending is larger than in the industrial counterparts. One possible explanation is that positive news about fiscal revenues quickly translates into larger fiscal spending to target previously identified fiscal balance ratios, thus potentially generating voracity effects. As such, the absence of fiscal balance biases, in the presence of correlated forecast errors in revenues and expenditure, could reflect a very high voracity response. For example, the Mexican case is perfectly consistent with a strong commitment to reaching the announced fiscal balance, so that any forecast error in revenues is then deliberately offset (i.e. via policy) by an adjustment in expenditure. Further, it would be interesting to extend the current analysis to explore the possible repercussions of biased expenditure forecasts around election cycles (similar to Merola and Perez 2013), or explore possible asymmetric loss functions (comparable to Elliott, Komunjer, and Timmermann 2008) by the fiscal authorities (e.g., larger losses in reputation due to the actual fiscal deficit exceeding what was forecasted in comparison to the actual resulting below the forecast), but such studies go beyond the scope of the current paper and are left for future research.

The additional file for this article can be found as follows:

- **Appendix.** Dataset, descriptive findings, and other econometric exercises. DOI: <https://doi.org/10.31389/eco.416.s1>

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## COMPETING INTERESTS


The authors have no competing interests to declare.

## AUTHOR INFORMATION


The views expressed in this paper are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

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