Public Debt and Economic Growth Nexus in Latin America: A Retrospective Appraisal*

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ABSTRACT

In this paper, we examine the effect of public debt on Gross Domestic Product (GDP) in 15 Latin American economies (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela) for the period 1960-2015. The short-run impact of debt on GDP growth is positive, but it is closer to zero beyond public debt-to-GDP ratios between 64% and 71% (i.e. up to this threshold, additional debt has a stimulating impact on growth). In the long run, the threshold is between 95% and 97%.

Keywords: Macroeconomics, public debt, economic growth, institutions, Latin America.

JEL Classification: E62, H63, O40, O54.

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RESUMEN

La relación entre deuda pública y crecimiento económico en América Latina: una evaluación retrospectiva

En este artículo se examina el efecto de la deuda pública sobre el Producto Interno Bruto (PIB) en 15 economías latinoamericanas (Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, República Dominicana, Honduras, México, Nicaragua, Panamá, Paraguay, Perú, Uruguay and Venezuela) para el período 1960-2015. El impacto a corto plazo de la deuda en el crecimiento del PIB es positivo, pero próximo a cero más allá de la razón de deuda pública/PIB ubicados entre 64% y 71% (es decir, hasta este umbral, la deuda adicional tiene un impacto estimulante en el crecimiento). A largo plazo, el umbral está entre el 95% y el 97%.

Palabras clave: Macroeconomía, deuda pública, crecimiento económico, instituciones, América Latina.

INTRODUCTION

The cornerstone of the relationship between public debt and Gross Domestic Product (GDP) is the conventional opinion that in the shortrun GDP is determined by demand and government debt can effectively exert a positive effect (Elmendorf and Mankiw, 1999). This shortrun effect turns out to be significant when output is far from capacity. However, in the long-run public debt may displace (crowds out) investment and harm growth by raising interest rates (Baldacci and Kumar, 2010).

Not long ago, the empirical literature analyzing whether or not public debt is growth-enhancing have experimented a revival in the euro area (Baum et al., 2013; Dreger and Reimers, 2013; Checherita- Westpal and Rother, 2012). According to Gómez and Sosvilla (2017), this interest has been fueled by the substantial wakening of public finances in different economies as a result of the 2008 financial crisis. The crisis has also revitalized arguments signaling whether or not policymakers should implement expansionary fiscal policies. On the one hand, fiscal austerity may have been the main culprit for the unnecessary recessions experienced by some countries (Berg and Ostry, 2011; DeLong and Summers, 2012). On the other hand, a high level of public sector leverage has a negative effect on economic growth, and fiscal consolidation is fundamental to improve expectations about the future evolution of the economy (Cochrane, 2011; Teles and Mussolini, 2014).

As to Latin America, the issue on debt-growth nexus is particularly relevant. Public debt almost doubled its volume from the 1970s onwards amounting 2.41 trillion US dollar in 2020 but without a clear effect on GDP (CEPAL, 2021). It is important to note that diverse political viewpoints related to the debt burden and sovereign past debt crisis have also stimulated an intense discussion on the effectiveness of fiscal policies as well as the possible adverse consequences of public debt accumulation. Despite the relevance of this debate, however, to our knowledge no effort has yet been made to empirically analyze the effect of debt on economic growth in Latin America as we do.

In this study, we focus on the relationship between gross public debt and GDP for fifty years in a group of 15 Latin American countries, namely Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. We exclusively focus our attention on a regional sample and, unlike previous efforts, we also extend the period of analysis to half a century. Another novelty in our study is the introduction of an institutional variable during the whole period to test the impact of Latin American democratic governments on the relationship in the short and in the long-run. To our knowledge, all these features make a unique contribution to the literature.

The rest of the paper is organized as follows. In section 1 we provide an overview of the literature on the effect of debt on GDP. In section 2 we estimate a direct relationship between gross public debt and growth using a simple approach. In section 3, we conclude.

1. Literature overview

The theoretical basis of the relationship between public debt and GDP is the belief that in the short-run GDP is determined by the demand and the public debt can effectively have a positive effect on the economy.[1] In the Investment-Savings and Liquidity Preference-Money Supply (IS-LM) framework, this expectable short-run effect turns out to be significant when output is far from capacity. If this is case, an increase in the budget deficit raises disposable income. The corresponding

1 For further details on the theoretical literature on debt and growth nexus see Checherita- Westphal and Rother (2012) among other authors.

increase in income boosts the aggregate demand for goods and services thus generating an augment in the GDP.

However, things seem to be different in the long-run where more debt-financed government budget may displace private investment and harm growth by raising the interest rates. In fact, higher long-term interest rates can crowd-out private investment, thus dampening potential output growth (Baldacci and Kumar, 2010). In this case, a reduction in public savings (due to a higher budget deficit) is not compensated by an increase in private ones, so national savings will decline and total investment will inevitably fall (Modigliani, 1961; Diamond, 1965).[2] Additionally, under these circumstances, net exports may fall due to a significant appreciation of the exchange rate. Moreover, if government debt is associated with higher inflation, this may also act as a drag on growth, as various Latin American economies have demonstrated. Cochrane (2011) argues that the negative effect of a higher public debt level on growth can be relatively important if higher debt enhances uncertainty and expectations of a higher inflation.

Supporters of the opposite position (i.e. that there is always a positive relationship between the public deficit and economic growth) argue that an increase in government spending inevitably raises future debt, but not by an equal amount. Higher spending raises GDP and it leads to higher revenue, which offsets a significant fraction of the initial outlay (Krugman, 2009). Besides, in a world dominated by expectations, the main determinant of private investment is the state of the economy. As a consequence, anything that improves that state (fiscal stimulus included in this case) leads to more investment and hence raises the economy's future potential without a role for a crowding-out effect.

A third interesting viewpoint is that the public debt and economic growth nexus is neutral since the acquired level of government debt is repaid through future taxes (Barro, 1989). Under this theory, an individual would be more attracted to save at the present by purchasing government issued stocks and sacrifice consumption in order to pay for future taxes.

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[2] Apart from this direct crowding-out effect, Modigliani also points out to that "if the government operation is of sizable proportions it may significantly drive up (long-term) interest rates since the reduction of private capital will tend to increase its marginal product" (Modigliani, 1961; p. 739). As to Diamond (1965; p. 1126), he indicates that, through the impact of taxes that are necessary to finance the interest payments, public debt reduces the available lifetime consumption of taxpayers as well as their saving, and thus the capital stock.

As probably inferred by the reader, in theoretical literature, there is a variety of positions regarding this phenomenon. Some views assume a negative relationship between debt and economic growth, while other opinions show that debt has a positive or null impact on growth.

As to this point, an idea that has strongly guided the literature is that there can be thresholds in the public-debt-to-GDP ratio beyond which growth is substantially reduced. While this literature is relative scarce, it has gained significance over the years.

Despite the shortage of studies, however, two important issues must be highlighted. The first one is that the existing literature mainly focuses on the direct effect of debt on growth, rather than on the channels of this effect. The second one is that the results are far from being convincing, as we shall briefly summarize.

In a seminal study, Reinhart and Rogoff (2010) show that public debt as a share of GDP may have a detrimental effect on the rate of growth. They find that the relationship between public debt and growth can be represented by an inverted U-shaped pattern (i.e. whilst low levels of public debt positively affect economic growth, high levels have a negative impact). They use a dataset of 44 countries over 200 years and suggest a weak relationship for public debt ratios below 90% of GDP, but the growth rates decrease substantially above this threshold.[3]

As to the 90% ratio, Herndon *et al*. (2013) identify some methodological mistakes in the work of Reinhart and Rogoff. We are not going into details regarding their drawbacks here.[4] However, it may be noted without straying too far afield from our major focus that after correcting for errors the debt-to-GDP ratio threshold seems to be above 120% (i.e. much higher than the 90% determined by Reinhart and Rogoff). In words of those authors, "the full extent of those errors transforms the reality of modestly diminished average GDP growth rates for countries carrying high levels of public debt into a false image that high public debt ratios inevitably entail sharp declines in GDP growth" (Herndon, *et al*., p.14).

Despite the mistakes, Reinhart and Rogoff's paper has been important and stood the test of time. This is probably due to the fact that

[3] In a previous attempt, Schclarek (2005) does not find any support for an inverted U-shape relationship between debt and growth for industrial economies. As to developing countries, he finds that lower total external debt levels are associated with higher rates of growth.

[4] See Herndon, Ash and Pollin (2013) for further details.

the study was available in the middle of a debate trying to determine whether fiscal expansion or consolidation was the best policy response to global the financial crisis. In this direction, their findings have seemed to serve as an academic safeguard in support of austerity policies.

Since Reinhart and Rogoff's influential paper there have been several empirical studies trying to identify and to explain the negative nonlinear relationship between public debt and growth for a group of countries. Most of these studies tends to confirm a turning point beyond which economic growth slows down.

In fact, covering a mix of advanced and emerging market economies for almost four decades, Kumar and Woo (2010) finds a turning point at 90% of debt-to-GDP ratio. Their empirical results suggest an inverse relationship between initial debt and subsequent growth after controlling for other determinants. On average, a 10-percentage point increase in the initial debt-to-GDP ratio is associated with a slowdown in annual real per capita GDP growth of around 0.2 percentage points per year (with the impact being somewhat smaller in advanced economies).

Along this line, Cecchetti *et al*. (2011) estimate a threshold of 85 percent of debt-to-GDP ratio for a panel of 18 OECD countries beyond which government debt is harmful for growth, while Checherita- Westphal and Rother (2012) report analogous results for a set of euro area countries over a period of 40 years. Likewise, Baum *et al*. (2013) focus on 12-euro area countries for the period 1990-2010 and detect a similar threshold by employing a dynamic approach (the short-run impact of debt on per capita GDP growth is positive but it decreases to zero beyond ratios of 67%, and for ratios above 95% additional debt has a negative impact).

However, Caner *et al*. (2010) and Elmeskov and Sutherland (2012) show that the turning point is probably lower (77% for a set of 77 countries and 66% for a dozen of OECD countries respectively). Similarly, Panizza and Presbitero (2013) argue that a negative correlation between debt and growth does not imply causality, as lower growth can result in a higher public debt to GDP ratio. Nevertheless, the results are consistent with the existing literature that has found a negative correlation between debt and growth.

In an additional effort to improve previous studies, Dreger and Reimers (2013) base their analysis on the distinction between sustainable and non-sustainable debt periods. Their thresholds are theory-based

and depend on the macroeconomic framework. They conduct the analysis using annual data for 12-euro area members and find that the negative impact of the debt-to-GDP ratio on growth is limited to periods of non-sustainable public debt.

In an interesting study that only covers the period 1970-2010, Calderón and Fuentes (2013) test whether public debt hinders growth and explore if economic policy ameliorates this effect. Their results reveal a negative and robust effect of public debt on growth. Among other findings, an enhanced policy environment and its interaction with public debt has helped to explain the improved growth performance of industrial and developing countries for the years 2001–05 compared to the years 1991–95.

These preceding studies are somewhat unified and extended by Antonakakis (2014) who explores the role of theory-driven (non-) sustainable debt-ratios in combination with debt-ratio thresholds on economic growth. Based on both dynamic and non-dynamic panel data analyses in the 12-euro area countries over the period 1970-2013, he finds that non-sustainable debt-ratios above the 60% threshold have a detrimental effect on short-run economic growth, while sustainable debt ratios below the 90% threshold exert a positive influence on short-run economic growth. In the long-run, both non-sustainable and sustainable debt-ratios above the 90% threshold as well as non-sustainable debt-ratios below the 60% compromise economic growth.

However, no single threshold seems to be right for all countries or at all times. Using total public debt data from 118 developing, emerging and advanced economies over the period 1960 to 2012, Eberhardt and Presbitero (2015) argue that there is no evidence for a common debt threshold for all countries over time. They find that long-run debt coefficients differ across countries and provide evidence that countries with higher average debt-to-GDP ratios are more likely to see a negative effect on their long-run growth performance.

Moreover, Égert (2015) also presents evidence suggesting that 90% is not a magic number because the threshold may be lower and the nonlinearity may change across different samples and specifications. The author shows that finding a negative nonlinear relationship between the public debt-to-GDP ratio and economic growth is extremely difficult and sensitive to modelling choices and data coverage. In the very rare cases when nonlinearity *á la* Reinhart and Rogoff can be detected the

negative correlation kicks in at very low levels of public debt (between 20% and 60% of GDP).

To our knowledge, the latest analysis on debt-to-growth relationship for the EU is the study of Gómez and Sosvilla (2017), who examine the causal effect between debt and growth in a sample of eleven European countries. The authors find that public debt has a negative effect on growth from an endogenously detected breakpoint and above a threshold varying between 56% and 103% according to the country.

Finally, as to Latin America, hardly any empirical studies have examined the topic for the region solely. Most of the studies on debt-to-growth nexus include some Latin American countries in a heterogeneous set of economies and they frequently do so for a short period of time. The exception to this rule is the work of Jacobo and Jalile (2017) who explore the impact of government debt on GDP for Latin American economies over a period of fifty years. The short-run impact of debt on GDP growth is positive, but decreases to zero beyond public debt-to-GDP ratios of 67% (i.e. up to this threshold, additional debt has a stimulating impact on growth). However, the analysis is not extended for the long-run as we shall do in this study.

2. Estimations and results

Following Baum *et al*. (2013) and Checherita-Westphal and Rother (2012), we firstly analyze the impact of one-year lagged debt-to-GDP ratios on annual real GDP per capita growth rates and we obtain a near of the short-term debt effect. Hence, a positive impact of debt on growth could be interpreted as a stimulating effect of additional debt. Secondly, we consider the long-term effects of debt on the GDP. Our empirical growth model is based on a conditional convergence equation that relates the GDP per capita growth rate to the initial level of income per capita, the investment/saving-to-GDP rate and the population growth rate. The model is augmented to include the level of gross government debt (as a share of GDP).

Our set of countries covers Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. This is a less heterogeneous sample in the sense that we only consider developing economies from Latin America, but we do not pretend the countries to

be alike. As in most of the studies, our selection does not solve problems derived from things that can be different from each other.[5]

We use a quadratic equation in debt since we are interested in checking whether there exists a non-linear impact of government debt on growth. Other control variables include: (i) variables measuring the economic openness; (ii) a variable signaling the existence of democratic governments; and (iii) policy environment variables.

For the economics openness variables (i) we use the real exchange rate and the sum of export and import shares in GDP to expand the model beyond a closed-economy form. As to the democratic government indicator (ii), we test the impact of the presence of democratic governments on growth.[6] We turn to the common claim that the lack of democracy becomes a particularly powerful constraint on economic growth for countries with low levels of development (Aghion *et al*., 2008). The last group of variables (iii) involves price stability and we measured it as inflation rate.[7]

The basic equation for our estimation is as follows:

$$g_{i,t} = \alpha + \beta_1 debt_{i,t-1} + \beta_2 debt_{i,t-1}^2 + \varphi gdppc_{i,t-1} + \gamma gfk_{i,t-1} + \delta pop_{i,t-1} + \kappa\,(other\_controls) + \mu_t + \upsilon_t + \varepsilon_{i,t} \qquad (1)$$

where $g_{i,t}$ is the growth rate of GDP per capita; $debt_{i,t}$ is gross government debt as a share of GDP; $gdppc_{i,t}$ is the initial level of GDP per capita; $gfk_{i,t}$ is investment rate (proxied as gross fixed capital formation) as a share to GDP; $pop_{i,t}$ is population growth rate; other_controls include real exchange rate, economic openness, democratic government indicator and inflation rate; μ_t is country fixed effects; υ_t is time fixed effects; and $\varepsilon_{i,t}$ is the error term.

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5 In fact, Brazil has a long history of domestic public borrowing (Summerhill, 2015), while small Central American nations lack a sizable domestic financial sector. Argentina defaulted its debt several times, while Colombia did not. The fiscal capacity of each country (the ratio between tax and GDP) is much higher in Brazil and Argentina than in oil-dependent countries such as Venezuela and Mexico. The list of dissimilarities among countries could go on. However, in the literature, the authors regularly disregard this kind of differences within countries selected for their studies and some problems derived from heterogeneity may arise. As usual, the availability and reliability of the data constitute two important restrictions in order to overcome the differences.

6 We follow Loayza *et al*. (2005).

7 We also consider country-fixed effects to control for the country-specific characteristics. The country dummies capture economic and social features for each country that remain unchanged over time. In addition, we also include year dummies to control for common shocks across countries.

The series for our estimation comes from the World Development Indicators and the International Financial Statistics databases and cover the period 1960-2015.[8] As to democratic government indicator, there is no fully satisfactory measure of the regime type (Munck and Verkuilen, 2002), and the options are considerably reduced when one requires a measure for a large sample of countries over a long period of time. A measure with broad historical coverage is the "Polity2" variable from the Polity IV Dataset (Marshall and Jaggers, 2000). This variable measures the extent to which democratic or authoritarian government ("authority patterns") are institutionalized in a given country. It considers how the executive is selected, the degree of checks on executive power, and the form of political competition.

In our baseline model, we evaluate the short-term effects of public indebtedness on economic growth, so the dependent variable is the growth rate of the GDP per capita of the same year. In our subsequent models, to analyze the impact of long-term effects of public indebtedness we have considered as dependent variable the 5-year cumulative overlapping growth rate.

The basic estimation technique is panel fixed-effects corrected for heteroskedasticity and autocorrelation. The results across various models are presented in Table 1. We consider the strong potential for endogeneity of the debt variable, especially reverse causation (low or negative growth rates of per-capita GDP are likely to induce higher debt burdens).[9]

As stated in Hiebert *et al*. (2002), in a panel context many studies on growth regressions have made use of the instrumental variable (IV) approach to deal with the issue of simultaneity bias. We use the General Methods of Moment (GMM) estimators. With the GMM estimators we also correct for the possible heteroskedasticity and autocorrelation in the error structure by using the consistent estimator. The two-step GMM provides some efficiency gains over the traditional IV/2-SLS estimator derived from the use of the optimal weighting matrix, the overidentifying restrictions of the model, and the relaxation of the independent and identical distribution (i.i.d.) assumption (see Baum *et al*., 2013).

[8] The availability and reliability of some variables for different countries restrict our analysis to 2015.

[9] Data on correlation among control variables as well as robustness check tests can be requested to the authors.

TABLE 1
PUBLIC DEBT AND ECONOMIC GROWTH: PANEL FIXED EFFECTS REGRESSION MODELS

	Annual growth rates				Cumulative 5-year overlapping growth rate			
	Model	Model	Model	Model	Model	Model	Model	Model
Variables	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)
ln(gdppc)	-5.884***	-6.463***	-5.148***	-5.703***	-42.65***	-44.22***	-42.68***	-43.89***
	(1.747)	-1.819	(1.771)	-1.838	(4.514)	(4.544)	(4.597)	(4.598)
debt	0.115***	0.117***	0.116***	0.124***	0.187**	0.216**	0.190**	0.218**
	(0.0351)	-0.0369	(0.0348)	-0.037	(0.0882)	(0.0921)	(0.0873)	(0.0915)
$debt^2$	-0.000811***	-0.0008203***	-0.000828***	-0.000865***	-0.000980**	-0.00111**	-0.000996**	-0.00113**
	(0.000196)	-0.000205	(0.000196)	-0.0002061	(0.000480)	(0.000497)	(0.000477)	(0.000497)
openness	-0.0103	-0.0088	-0.0120	-0.0134	-0.0393	-0.0457	-0.0388	-0.0479
	(0.0147)	-0.01495	(0.0146)	-0.0149	(0.0359)	(0.0359)	(0.0360)	(0.0360)
gfkf	-0.262***	-0.2408***	-0.259***	-0.237***	-0.701***	-0.696***	-0.702***	-0.693***
	(0.0544)	-0.0555	(0.0541)	-0.0553	(0.128)	(0.128)	(0.128)	(0.128)
Pop	-0.927	-0.796	-1.175	-1.101	0.999	1.187	0.983	1.092
	(0.842)	-0.8534	(0.850)	-0.864	(2.040)	(2.033)	(2.057)	(2.050)
inflation	-0.0469**	-0.0454**	-0.0368*	-0.0337*	-0.231***	-0.241***	-0.233***	-0.235***
	(0.0214)	-0.0222	(0.0215)	-0.0223	(0.0518)	(0.0523)	(0.0526)	(0.0527)
polity2			0.102**	0.130**			-0.00794	0.0635
			(0.0451)	-0.049			(0.109)	(0.115)
real exchange rate		-0.00019		-0.00033**		-0.000902**		-0.000965**
		0.00017		0.00017		(0.000424)		(0.000446)
Cons	64.37***	64.37***	56.59***	60.46***	419.9***	433.9***	420.3***	430.2***
	(15.89)	(15.89)	(16.20)	(16.77)	(40.75)	(41.03)	(41.74)	(41.73)
Observations	*463*	*463*	*448*	*448*	*425*	*425*	*425*	*425*
Debt TP	*70.900*	*71.315*	*70.048*	*71.676*	*95.408*	*97.297*	*95.382*	*96.460*
Country FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: World Development Indicators, International Financial Statistics and Polity IV Dataset

We have also estimated the confidence intervals for each model turning point. Since the turning point is a non-linear combination (the ratio) of two estimated coefficients (debt and debt squared) the normal distribution 95% confidence intervals (CI) estimated for each coefficient cannot be used to compute the CI for the turning point. Consequently, we use the delta method to assess the statistical uncertainty surrounding the turning point estimates. This method is commonly applied to compute the standard error of non-linear functions for which it is difficult to analytically compute the variance (Vance, 2006).

The delta method basically expands a function of random variables (e.gr. the ratio) about its mean using (usually a one-step) Taylor approximation, and then computes the variance. Its accuracy depends on the degree of linearity of the derivative function at the evaluation point (Vance, 2006), i.e., it is a good Taylor approximation when the random variable has a high probability of being close enough to its mean. Therefore, the delta method assumes that the coefficients in the model are normally distributed, being influenced by the sample size (Hole, 2007).

The results across all models show a highly statistically significant non-linear relationship between the government debt ratio and the per-capita GDP growth rate for Latin American countries in the sample.[10] The debt-to-GDP turning point of this concave relationship (inverted U-shape) is roughly between 64% and 71% for the sample across all models in the short-run. In the case of the long-run specification we have found a higher debt threshold between 95% and 97%.

As to openness indicators, we do not find any relevant influence of the real exchange rate in the debt-to-growth relationship. This result is consistent with our expectations.

Regarding to the open economy variables, the evidence in the literature is quite favorable to the short-run contractionary devaluations hypothesis. The evidence also suggests that in the long-run real devaluations will have no effect on output (Edwards, 1985).[11] Thus, in

[10] As to the non- significance of the investment coefficient, recall that changes in factor accumulation do not closely track changes in economics growth. Much of the large variations of growth over time is not necessarily explained by much of the smaller variation in physical (and human) capital (Easterly and Levine, 2001, p. 196).

[11] This is not surprisingly because there are several theoretical reasons why a devaluation can produce a decline in real activity. See also Krugman and Taylor (1978) and Diaz-Alejandro (1965).

a region with a long history of sudden and large currency devaluations, we expect a negative effect of real exchange rate in the short-run disregarding its value and a nearly null one in the long-run.

Additionally, the relationship between openness and economic growth has long been a subject of much interest and controversy in the international trade literature. Chang, *et al*. (2005) point out that openness promotes the efficient allocation of resources and growth through comparative advantage, allows the dissemination of knowledge and technological progress and encourages competition in domestic and international markets.[12] However, some economists take the opposite position and argue that the effect of openness on growth is doubtful (Krugman, 1994; Rodrik and Rodríguez, 2001). These controversial theoretical findings also appear in the empirical literature. For example, Yanikkaya (2003) goes as far as to show that openness may actually not be good for growth. This author shows that trade barriers are positively and significantly associated with growth, especially for developing countries. We assume that if a country depends on economic conditions existing in other countries, its economic situation will be highly exposed to external shocks both in the short and in the long-run. This situation possibly leads to an erratic behavior of GDP in the country in question. Likewise, a high dependence on imports is likely to lead to a high degree of exposure to economic conditions in the rest of the world. Besides, protectionism has been a classical feature in Latin American countries since their independence with a doubtful effect on growth. Under these assumptions, we do not expect any sign in the coefficient.

Finally, the institutional variable is also statistically significant and it tends to highlight importance of democratic governments on economic growth rates in the short-run. However, in the long-run it is not the nature of a country's political system what determines the course of its economic growth.

CONCLUDING REMARKS

We investigate the impact of government debt on GDP in 15 Latin American economies, namely Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Honduras, Mexico,

[12] See also Winters (2004), and Easterly and Kraay (2000) among others authors.

Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela for a period of fifty years.

Our study finds a highly statistically significant non-linear relationship between the government debt ratio and the per-capita GDP growth rate for Latin American countries. The debt-to-GDP turning point of this concave relationship (inverted U-shape) is roughly between 64 and 71% on average in the short-run and across all models. This means that, on the average, government debt to-GDP ratios above this threshold would have a negative effect on economic growth (i.e. up to this threshold, additional debt has a stimulating impact on growth). In the long-run, this threshold is between 95% and 97%.

As to openness indicators, we do not find any relevant influence of the real exchange rate in the debt-to-growth relationship. With regards to the institutional variable we have selected, it shows the expected sign and countries with democratic governments tend to exhibit higher growth rates in the short-run relationship between debt and growth. However, it seems not to be the nature of a country's political system what determines the course of this relationship in the long-run.

Last but not least, more research is needed to understand whether (and if so, how) public debt is related to growth. This will surely occur as soon as newly available and reliable data help us to accurately perform an updated assessment.

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