

# Determinants of Government and External Debt: Evidence from the Young Democracies of South America

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## **Abstract**

I investigate what are the main determinants of government and external debt in the young democracies of South America between 1970 and 2007. The results, based on dynamic panel time-series analysis, suggest that economic growth has significantly reduced the debt ratios in the region. Other candidates suggested by the literature, eg inflation, inequality and constraints on the executive, do not present the expected or clear-cut estimates on government and external debt. Essentially, the results suggest that an economic environment geared towards generating economic activity and prosperity is an important factor in keeping the debt ratios under control in the region.

Keywords: Government and External Debt, Democracy, South America.

JEL Classification: H60, N16, O11, O54.

## I. Introduction and Summary

South America has been known, at least in the last forty years or so, for political transitions from dictatorships to more democratic regimes, macroeconomic instability (some countries experienced debt crises and also episodes of high rates of inflation), delayed stabilisation processes (in the spirit of Alesina and Drazen 1991) and, so far, no come back to less democratic regimes. Moreover, the region has been known for a certain, relatively above the average, degree of economic inequality.

Against this background and also with the current debt crisis affecting some European countries in mind, I investigate what are the main determinants of government and external debt in the South American continent. It is worth mentioning at this stage the importance of both debt variables and how interconnected they actually are with each other, eg Chihi and Normandin (2013) establish positive comovements between external and budget deficits in a sample of developing countries from the 1960s onwards; and also their relation with the debt rescheduling and default crises seen in Latin America, particularly in the 1980s, which coincide with some of the most severe political and economic shocks that the region has suffered in recent times, Sachs (1985).

To conduct the analysis I use data from all nine South American countries which redemocratised in the 1970s, 1980s and 1990s and given data availability I cover the period between 1970 and 2007. The significance of using this sample of young South American democracies is that, given the above-mentioned nature of the continent, it allows me to test different predictions proposed by the literature in an attempt to further our knowledge of the region. For the empirical analysis I make use of dynamic panel time-series data analysis. More specifically, I use the Pooled OLS, one- and two-way Fixed Effects and Fixed Effects with Instrumental Variables estimators so that different empirical issues in the data are taken into consideration.

In terms of results, firstly I find evidence that economic growth is able to significantly reduce the debt ratios in the region. Secondly, I do not find evidence that the rates of inflation have had any effect in increasing debt, which would occur by higher nominal interest rates taking place during periods of high rates of inflation. I do, however, report some evidence which suggests that those governments used inflation as a tool to reduce the debt ratios.

Thirdly, there is no evidence that constraints on the executive, or the better checks and balances which were implemented during the institutional reforms that some of those countries put in place

in the 1990s and early 2000s, have had any effect in reducing debt. Fourthly, I am not able to report conclusive evidence that inequality, which is believed to be prevalent in some of the countries in the region, has played any role in increasing debt, which in the vein of Meltzer and Richard (1991), would take place by some sort of costly redistribution.

All in all, economic growth is, amongst of the most popular candidates suggested by the literature, the variable to have had a robust effect in reducing government and external debt in the region, which is suggestive of the importance of consistent economic activity in keeping debt under control or even in reducing it to lower levels. To put it another way, in times of a renewed wave of populism taking place in some parts of South America, and also with the debt crisis in Europe in mind, an environment which incentivises economic activity is perhaps a better option than the current contempt for property rights taking place in countries like Argentina and Bolivia, and the overall economic uncertainty and instability being experienced in the Giips countries.

The subject has always attracted the attention of the profession and there are always new candidates being proposed to explain government and external debt alike. Initially, Barro (1979) argues that temporary increases in income play a countercyclical role on debt in the US and also that there is an expected positive effect of inflation on debt. Furthermore, Easterly (2001 and 2011) suggest that the growth slowdowns of the 1980s and 1990s are to blame for the government and external debt crises that some developing countries (South America included with its "lost decade") experienced at the time. In similar vein, Hall and Sargent (2010) report that growth reduced the debt to GDP ratio in the US during the post World War II period, however the effect of inflation is less clear-cut, it all depends on how high or low inflation is and on the real returns on government bonds. In the South American context both variables are of particular interest in the sense that the region experienced some growth collapses and also episodes of high inflation during the so-called "lost decade", factors which would have an effect of increasing overall debt.

In addition, specifically related to Latin America, Gavin and Perotti (1997) make use of a sample of thirteen countries (some of which overlap with my own sample), covering the period between 1968 and 1995, and simple OLS estimation to suggest that the tax-smoothing model does not hold in the region. Their explanation for this result is first that they might be picking up the wrong causality and second the voracity effect. Furthermore, Alesina, Tabellini and Campante (2008) suggest that fiscal procyclicality in developing countries takes place because the electorate

attempts to "starve the Leviathan", or to make sure to extract during booms from the government all resources possible before the coalition in power wastes those resources in more frivolous activities. In similar vein, Ilzetzki and Vegh (2008) make use of a sample of 27 developing countries to report that government consumption moves positively with income. The "starve the Leviathan" story, or the voracity effect, can also be related to those young South American democracies in the sense that those countries took some time to implement better checks and balances on their executives and fiscal responsibility laws after their democratic transitions, factors which would constrain the way those governments managed their *fiscus*.

On a different vein, Berg and Sachs (1988) introduce the role of inequality to study the probability of debt rescheduling in a sample of middle-income countries and they report that high inequality is a good predictor of rescheduling episodes. Furthermore, Woo (2003) makes use of a large panel dataset and finds out that inequality and finance are related to larger public deficits. Because some countries in South America are perceived to be rather unequal (and, according to, eg Gavin and Perotti 1997, procyclical), one would expect inequality to play a positive role on debt (by redistribution taking place during those political transitions).

Political factors enter the literature towards the end of the 1980s. Firstly, Roubini and Sachs (1989) report that after 1973 OECD countries, when politically fragmented, tend to run higher deficits when growth slows down. In similar vein, Edwards and Tabellini (1991) and Roubini (1991) suggest that developing countries, because of political instability and polarisation, tend to run higher deficits as well. Given that the sample includes young democracies with fragmented coalitions at the initial stages of democratisation one would expect higher debt ratios during those democratic transitions<sup>1</sup>.

The value added of this paper to the literature is that I make use of a sample of South American countries (all sharing some developing countries characteristics, but with their own idiosyncrasies), which went through structural political and economic changes in the last thirty years or so. With this sample I can test for different predictions proposed by the literature and also disaggregate and comparatively further our knowledge on what plays a mitigating effect on debt in the region, and consequently avoid unwarranted generalisations.

Furthermore, I use different dynamic panel time-series data estimators which tackle different empirical issues to make sure that the results are robust and informative. Therefore, I am able to

provide evidence to specifically understand the recent history of South America, instead of treating the region either as an outlier to be removed from the sample or as a dummy variable, eg Woo (2003).

## II. Empirical Analysis

### A. *The Data and Methodology*

The dataset covers the period between 1970 and 2007, and all nine South American countries which transitioned from political dictatorship to full democracy in the late 1970s (Ecuador), 1980s (Argentina, Bolivia, Brazil, Chile, Peru and Uruguay), and early 1990s (Guyana and Paraguay). In addition, most of these countries experienced hyperinflationary episodes during the period (the only exception is Paraguay) and growth collapses.

The variable used to measure government debt is the share of general government level public debt to GDP (*DEBT*), from the Historical Public Debt Database compiled by Abbas, Belhocine, ElGanainy and Horton (2010) provided by the IMF and this dataset makes use of a number of datasets, eg the statistical handbooks from the League of Nations and the United Nations. Secondly, the share of external debt stocks to GDP (*XDEBT*), which includes the sum of public, publicly guaranteed and private nonguaranteed long-term debt, use of IMF credit and short-term debt, are from the World Bank. Information on economic growth (*GROWTH*) come from the Penn World Table and in this case it is expected that economies which grow consistently faster tend to present lower debt ratios, Hall and Sargent (2010).

The other explanatory variables used are standard in the literature and they are as follows: a measure for trade openness relative to GDP (*OPEN*) which are provided by the Penn World Table and it is expected that more open economies tend to display lower debt (by higher exports taxes and imports tariffs, Woo 2003). Moreover, the share of the liquid liabilities to GDP (*M2*) come from the World Development Indicators and are provided by the World Bank as well. In this case it is predicted that in economies with better developed financial sectors governments can acquire finance more easily and therefore increase public debt, Woo (2003). The inflation rates (*INFLAT*), which are given by the consumer prices and with its usual log transformation [ $\log(1 + INFLAT/100)$ ], also come from the World Development Indicators and in principle it is

expected that higher inflation, by higher nominal interest rates, leads to higher government debt, Barro (1979).

Furthermore, the population (*POP*) and urbanisation (*URBAN*) series are from the World Development Indicators, constraints on the executive (*XCONST*) come from the Polity IV dataset, government shares to GDP (*GOV*) are from the Penn World Table and the Gini coefficients for income inequality (*INEQ*) come from the UNU-WIDER data base. What is expected from these variables is that rapid population change and urbanisation in developing countries lead to higher spending in infrastructure, more constrained executives tend to be more restrained in how they generate public debt, higher government participation in the GDP must be funded and it tends to lead to higher debt, and higher inequality leads to higher government debt because of redistribution which usually takes place by the provision of public goods, Woo (2003).

In terms of methodology, since I have a panel of nine young South American democracies ( $N = 9$ ) covering the period between 1970 and 2007 ( $T = 38$ ), I make use of dynamic panel time-series data analysis. Initially, since most variables are either ratios, eg the debt variables, openness and finance, or bounded within closed intervals, eg inequality and constraints on the executive, and consequently stationary by default, I do not pursue the issue of cointegration in panels here. In addition, Bohn (1998) suggests that debt to GDP ratios tend to be mean-reverting, or stationary, because of the positive relationship between primary surpluses and debt which tends to satisfy the government intertemporal budget constraint. Also, Phillips and Moon (1999) suggest that because of the averaging taking place in panel estimation—which reduces the noise—spurious regressions are less of a problem within the panel setting.

Firstly, I use the baseline Pooled OLS (POLS) estimator which assumes homogeneity of intercepts and slopes. Secondly, I make use of the one- and two-way Fixed Effects (FE) estimator with robust standard errors for the correlation of residuals over time, which assumes heterogeneity of intercepts (a reasonable assumption in such a diverse panel of countries), and also time effects which take into account political and economic changes that the continent saw taking place in the 1980s and early 1990s. The FE estimator makes use only of the within  $(\bar{y}_i - \bar{y})$  variation in the data, which purges the correlation between the unobserved heterogeneity and the regressors. Essentially, the FE estimator under  $T \rightarrow \infty$  reduces statistical endogeneity (by the demeaning  $\bar{y}_i - \bar{y}$ ), and also minimises the Nickell bias present in short  $T$  dynamic panels and provides consistent estimates

of the expected values, Smith and Fuertes (2008). In fact, Judson and Owen (1999) suggest that when  $T = 30$  the size of the bias approaches zero.

Secondly, although I attempt to use the most common explanatory variables in the literature, one would argue that omitted variables, measurement error and economic endogeneity might be present. Therefore, I make use of the Fixed Effects with Instrumental Variables (FE-IV) estimator which provides asymptotically consistent and efficient estimates when  $T \rightarrow \infty$ , Arellano (2003), and under the assumption  $E(x_{it-1}v_{it}) = 0$  I use the first lag of economic growth, inflation and government share to GDP as the identifying instruments for contemporaneous  $GROWTH$ ,  $INFLAT$  and  $GOV$ . The rationale for providing these variables with external variation is that firstly the growth literature suggests that government consumption is detrimental to economic growth, Barro (1991). In addition, some would argue that higher debt ratios are behind higher inflation, Fischer (2005). Lastly, it can be argued that the government share to GDP and debt are intrinsically related to each other.

All in all, the above-mentioned dynamic panel time-series estimators take into account the fact that those countries in the sample share particular characteristics and also that such a panel is heterogenous (some of the countries in the sample are more developed than others, or more or less unequal than others). Moreover, these estimators take into consideration the possibility of omitted variables, measurement error biases and endogeneity issues. The estimated two-way FE dynamic equation is as follows,

$$(1) \quad DEBT_{it} = \iota_i + \kappa_t + \alpha GROWTH_{it} + \beta OPEN_{it} + \gamma M2_{it} \\ + \delta INFLAT_{it} + \epsilon URBAN_{it} + \varepsilon XCONST_{it} + \zeta GOV_{it} \\ + \eta POP_{it} + \theta INEQ_{it} + \vartheta GOVERN_{t-1} + v_{it},$$

where  $DEBT$  is government debt to GDP,  $GROWTH$  are the GDP growth rates,  $OPEN$  is a measure for trade openness,  $M2$  are the liquid liabilities to GDP,  $INFLAT$  are the inflation rates,  $URBAN$  is the share of urban population,  $XCONST$  accounts for constraints on the executive,  $GOV$  for the share of government to GDP,  $POP$  for population and  $INEQ$  are the Gini coefficients for income inequality.

## B. Results and Discussion

In Table One I regress the variable *DEBT* against all explanatory variables so that I can test for the different predictions suggested by the literature at once. Essentially, all *GROWTH* estimates are negative and statistically significant, which highlights the importance of economic activity in reducing the government debt ratio in the region. For instance, for every percentage point increase in *GROWTH*, government debt would decrease by 0.7% per year in the dynamic FE-IV specification, which is a plausible effect.

The variable *OPEN* presents the predicted negative signs, with most estimates being statistically significant, and *M2* presents the expected positive estimates, however *M2* is not always significant. On the other hand, *INFLAT* has unexpected negative estimates and they are significant in almost all specifications. A plausible economic explanation for these negative estimates is probably because some of those countries implemented nominal interest rate ceilings in the 1980s and others had full indexation in place as a mechanism of protection against high inflation, factors which could have had an effect on the way inflation affects government debt.

The variables *URBAN*, *GOV* and *POP* do not present clear-cut estimates and their significance levels are not always ideal. *XCONST* presents mostly significant positive estimates which points to the chaotic period that some of those countries experienced right after redemocratisation<sup>2</sup>. *INEQ* presents the expected positive estimates, however these estimates are not always statistically significant. Moreover, the lagged dependent variable, *DEBT*<sub>1</sub>, is positive and significant, which suggests that debt is a persistent variable. Lastly, the *t* and *F* tests in the first-stage regressions for growth, inflation and government share are all significant (column four), which minimise the issue of weak instruments in the FE-IV analysis.

Table One: Dynamic POLS, FE and FE-IV Estimates, South America, 1970-2007.

DEBT	POLS (1)	one-way FE (2)	two-way FE (3)	FE-IV (4)
GROWTH	-.029 (-7.91)	-.029 (-6.42)	-.021 (-5.15)	-.070 (-2.81)
OPEN	-.146 (-2.44)	-.345 (-4.01)	-.134 (-0.97)	-.446 (-2.63)
M2	.103 (2.28)	.137 (1.79)	.077 (1.07)	.029 (0.29)
INFLAT	-.069 (-1.86)	-.079 (-3.08)	-.047 (-1.60)	-.249 (-2.39)
URBAN	.150 (1.48)	-.288 (-0.41)	-.467 (-0.56)	-.606 (-0.35)
XCONST	.033 (1.14)	.040 (2.24)	.024 (2.81)	.122 (1.88)
GOV	.162 (1.53)	.209 (2.02)	.244 (1.71)	.353 (1.26)
POP	-.039 (-1.44)	.321 (0.96)	.360 (1.08)	.428 (0.61)
INEQ	.184 (0.98)	.567 (1.57)	.643 (3.40)	.762 (1.96)
DEBT <sub>1</sub>	.942 (30.12)	.951 (29.48)	.917 (31.40)	1.03 (14.81)
F test	122.85	932.19	24.31	40.80
F tests (1 <sup>st</sup> stage)				2.4, 22, 87
t stats (1 <sup>st</sup> stage)				2.4, 9, 15

T-ratios in parentheses. Number of observations:  $NT = 342$ .  $DEBT$  is the government debt to GDP,  $GROWTH$  are the GDP growth rates,  $OPEN$  is a measure for trade openness,  $M2$  are the liquid liabilities to GDP,  $INFLAT$  are the inflation rates,  $URBAN$  is the share of urban population,  $XCONST$  the constraints on the executive,  $GOV$  the government share to GDP,  $POP$  the population and  $INEQ$  are the Gini coefficients for income inequality. POLS is the Pooled OLS, FE is the Fixed Effects and FE-IV is the Fixed Effects with Instrumental Variables estimators.

In Table Two I regress  $XDEBT$  against all explanatory variables. Again, the  $GROWTH$  estimates are all negative and statistically significant and these estimates suggest the importance of sustained economic activity in reducing external debt in the region. For instance, for every percentage point increase in  $GROWTH$ , external debt would decrease by 0.5% per year in the dynamic FE-IV specification.

The variable  $OPEN$  does not present clear-cut estimates and they are not entirely statistically significant, and  $INFLAT$  keeps its unexpected negative sign with most of the estimates being in fact significant. On the other hand,  $M2$  does not present us with entirely convincing estimates

in this instance, possibly because external debt does not depend too much on domestic financial depth to be funded.

The other explanatory variables (*URBAN*, *XCONST* and *POP*) do not present clear estimates in terms of signs, with some of them actually flipping signs, nor in terms of statistical significance. Furthermore, *INEQ* keeps its expected positive signs, however those estimates are not always significant. In addition, the lagged dependent variable is positive and significant, which suggests that external debt is persistent. Lastly, the *t* and *F* tests in the first-stage regressions are statistically significant in the FE-IV analysis, which minimise the issue of weak instruments.

Table Two: Dynamic POLS, FE and FE-IV Estimates, South America, 1970-2007.

XDEBT	POLS (1)	one-way FE (2)	two-way FE (3)	FE-IV (4)
GROWTH	-.024 (-7.46)	-.022 (-9.84)	-.015 (-4.48)	-.051 (-2.80)
OPEN	-.046 (-0.85)	.001 (0.02)	.239 (3.14)	-.098 (-0.74)
M2	-.016 (-0.37)	-.049 (-1.00)	-.095 (-2.28)	-.147 (-1.73)
INFLAT	-.072 (-2.32)	-.064 (-5.22)	-.004 (-0.49)	-.194 (-2.34)
URBAN	.160 (1.44)	-2.42 (-2.02)	-1.78 (-1.45)	-2.43 (-2.09)
XCONST	-.005 (-0.21)	-.041 (-2.55)	-.097 (-2.70)	.017 (0.32)
GOV	.126 (1.33)	.440 (3.06)	.333 (2.21)	.337 (1.54)
POP	-.038 (-1.52)	1.32 (2.14)	.682 (1.13)	1.23 (2.36)
INEQ	.243 (1.32)	.386 (1.08)	.327 (1.13)	.467 (1.51)
XDEBT <sub>1</sub>	.896 (27.33)	.862 (16.59)	.738 (9.36)	.917 (16.22)
F test	99.95	3517.29	20.11	40.87
F test (1 <sup>st</sup> stage)				2.3, 22, 76
t stat (1 <sup>st</sup> stage)				2.7, 8, 14

T-ratios in parentheses. Number of observations:  $NT = 342$ . *XDEBT* is the external debt to GDP, *GROWTH* are the GDP growth rates, *OPEN* is a measure for trade openness, *M2* are the liquid liabilities to GDP, *INFLAT* are the inflation rates, *URBAN* is the share of urban population, *XCONST* the constraints on the executive, *GOV* the government share to GDP, *POP* the population and *INEQ* are the Gini coefficients for income inequality. POLS is the Pooled OLS, FE is the Fixed Effects and FE-IV is the Fixed Effects with Instrumental Variables estimators.

All in all, economic growth is the only explanatory variable which actually follows the predicted

hypothesis, presenting negative and statistically significant estimates against government and external debt in the region. Essentially, these estimates indicate the importance of faster economic activity and prosperity on debt reduction, which, in light of a renewed spell of populism in South America and the severe debt crisis that Europe is experiencing at the moment, is of particular importance, Barro (1979), Easterly (2001 and 2011) and Hall and Sargent (2010).

Moreover, inflation is an important variable which presents unexpected negative estimates. These unexpected estimates are probably because some of those countries engaged in interest rate controls which would artificially reduce the effect of higher nominal interest rates on debt, while others had completely indexed economies during their episodes of hyperinflation. It is plausible that overall both effects are cancelling each other out. Alternatively, it can be said that if interest rate ceilings and inflation were consciously used as instruments to reduce debt, these results about the role of inflation on debt would be more in line with the work by Reinhart and Sbrancia (2011) on financial repression and debt liquidation. Another possibility is suggested by Hall and Sargent (2010) in which returns on government bonds during the high-inflation period would be lower than economic growth rates, which in turn would generate lower debt to GDP ratios. That dynamics would explain the not so clear-cut inflation effect on debt. All in all, at this stage it can be speculated that those governments used inflation as a tool to reduce the debt ratios. No doubt this is an important issue which deserves more attention.

Furthermore, our variable  $XCONST$ , a proxy which accounts for redemocratisation and also for checks and balances on the executive, is not playing a role in reducing government debt in the region. The reason for these unclear estimates is perhaps because fiscal responsibility laws and central bank independence were only implemented in some countries towards the end of the 1990s, Santiso (2006), and it is plausible to assume that because of this the data are still not picking those institutional changes up, which tend to restrain the way governments behave and spend. Alternatively, it can be suggested that in some countries macroeconomic stabilisation was achieved before these institutional reforms were actually implemented, eg Brazil, and in others the reforms were implemented before redemocratisation, eg Chile, factors which would possibly play down the importance of constraints on the executive, or institutional quality, on debt.

An old determinant of redistribution, which in procyclical countries would lead to bigger government and external debt alike, inequality, does not play a clear-cut role in the region either,

which somehow contrasts with Berg and Sachs (1988). This rather foggy role of inequality on debt is perhaps because, although South America is known for being relatively unequal, in fact not all those countries are actually that unequal, eg Argentina, Chile and Uruguay, to mention a few, do not present high Gini coefficients of their own and Brazil has presented decreasing inequality since the stabilisation of the 1990s, Bittencourt (2011).

Alternatively, some would argue that new democratic coalitions coming into power, even when supposedly from the left, will try to disguise themselves and avoid engaging in leftist redistribution, Acemoglu, Egorov and Sonin (2012), which might be a mitigating factor of the effect of inequality on debt. In this vein, it could also be argued instead that since those outgoing dictatorships presented a right-wing flavour, the first democratic coalitions coming into power would be of a more left-wing nature and with particular redistributive tendencies. However, this is an unwarranted generalisation, eg Alfonsín and Sarney (the first Argentinean and Brazilian civilian Presidents) were not representatives of any left-wing coalition (Alfonsín's coalition was not related to the Peronist party, and Sarney's coalition excluded the main Brazilian leftist parties). Nevertheless, both coalitions engaged in redistributive policies. All in all, the link between inequality and debt, at least in South America, does not seem to be entirely clear, and therefore deserves more attention as well.

In a nutshell, I have tested for different hypothesis on what determines government and external debt in the young democracies of South America, a sample which offers enough variation, not to mention interesting structural changes, in an attempt to further our knowledge about the continent's recent history. More importantly, we have been able to learn firstly that economic activity plays an important role on the debt ratios in the region; secondly that inflation, in conjunction with interest ceilings, is probably being used as an instrument for debt liquidation; thirdly that the effect of the institutional reforms implemented mostly after redemocratisation are still not being picked up by the analysis conducted here; and finally that inequality is not really affecting the size of government and external debt in the region. All the same, with those results we deepen what we know about the region (the roles played by economic activity and inflation on debt), and also avoid unwarranted generalisations about the continent<sup>3</sup>.

### *C. Final Observations*

In this paper I have investigated the determinants of government and external debt in the young democracies of South America. The results, based on a sample of countries that have gone through particular political (redemocratisation) and economic (growth collapses, hyperinflationary episodes and macroeconomic stabilisation) structural changes in the last thirty years or so indicate that faster and consistent economic activity is the variable that robustly has been able to reduce government and external debt in the region.

The importance of this study is that with panel time-series data and analysis we have been able to specifically study the South American case, with all its idiosyncrasies, without having to incur in generalisations which are not always warranted (in particular about the roles of growth, inflation, constraints on the executive and inequality on debt), nor to treat the region either as a dummy or as an outlier to be removed from the sample. With that we have been able to comparatively further our understanding of the recent history of the continent in terms of government and external debt during an eventful period of its history, which might also be of use to understand the importance that an environment conducive to faster economic growth can play on the current debt crisis that some Mediterranean European countries are experiencing at the moment.

About future research, in addition to more studies about the role of inflation and inequality on the debt ratios, future research can be extended to the role of growth on fiscal deficits and surpluses so that we can better understand whether the region is counter or procyclical, eg Gavin and Perotti (1997).

Essentially, perhaps the main lessons from the above analysis is firstly the importance of avoiding particular generalisations, and secondly the need for a return to the basics in terms of understanding government and external debt, and the role and relevance of economic activity and prosperity in keeping debt under control. The latter is interesting in itself, since the lesson, or the main policy implication, coming from the analysis is about promoting an environment conducive to economic activity, which somehow contrasts with some of the interventions and policies being recently implemented in countries like Argentina and Bolivia, and Europe to tackle the crisis, which are more along the lines of not generating faster economic activity.

## A Appendix

In this Appendix I report estimates from the Generalised Method of Moments (GMM) estimator. Firstly, controlling for the number of instruments and for what is instrumented to avoid overfitting, Judson and Owen (1999), Bond (2002) and Roodman (2009), I carefully make use firstly of the "restricted" GMM estimator proposed by Arellano and Bond (1991) First-Difference GMM (DIF-GMM) which is based on the idea proposed by Anderson and Hsiao (1981) of using lags in levels ( $y_{it-2}, \dots, y_{i1}$ ) as instruments for the first-differenced model. Moreover, I take into account the fact that persistent series might lead to weak instruments and to a non-negligible small sample bias and make use of the GMM estimator that combines the usual moment conditions for the DIF-GMM model with those extra conditions for the model in levels ( $\Delta y_{it-1}$ ), SYSTEM (SYS), or the SYS-GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998).

Within the GMM framework I instrument for the lagged dependent variable with levels dated  $t - 3$  and earlier, and then again for *GROWTH*, *INFLAT* and *GOV*. I therefore carefully use these two "restricted" GMM estimators, collapsing the lag range with robust standard errors and the small-sample correction provided by Windmeijer (2005) to avoid "too good to be true" standard errors.

Table Three reports the results. In columns one and two government debt is the dependent variable and in columns 3 and 4 external debt is the explanatory variable. The estimates are in line with the ones reported above, particularly in terms of the role of economic growth on debt. Moreover, the Arellano and Bond *m2* test for second-order serial correlation suggests that I can not reject the null hypothesis and the Sargan test does not indicate that the DIF-GMM and SYS-GMM instrument sets are invalid.

Table Three: Dynamic GMM Estimates, South America, 1970-2007.

	DIF-GMM (1)	SYS-GMM (2)	DIF-GMM (3)	SYS-GMM (4)
GROWTH	-.009 (-1.43)	-.023 (-5.44)	-.006 (-1.50)	-.022 (-4.62)
OPEN	-1.43 (-1.96)	-.144 (-1.59)	-.526 (-1.58)	-.034 (-0.49)
M2	.298 (3.00)	.125 (1.94)	-.113 (-1.74)	-.057 (-1.52)
INFLAT	.176 (2.14)	-.071 (-1.75)	.041 (-1.23)	-.030 (-1.32)
URBAN	-9.00 (-2.00)	.139 (2.28)	-1.05 (-0.81)	.204 (1.20)
XCONST	-.106 (-1.76)	.001 (0.06)	-.263 (-3.62)	-.065 (-1.13)
GOV	1.28 (1.55)	.195 (0.90)	1.06 (2.68)	.092 (0.92)
POP	-.624 (-0.17)	-.018 (-0.38)	-4.66 (-3.09)	-.056 (-2.22)
INEQ	.789 (2.50)	-.020 (-0.12)	.711 (2.12)	.242 (1.26)
DEBT1	.608 (7.46)	.949 (20.74)	.443 (4.57)	.856 (11.09)
m2 (p)	0.56	0.69	0.42	0.26
Sargan	1.00	1.00	1.00	1.00

T-ratios in parentheses. Number of observations:  $NT = 342$ . *GROWTH* are the GDP growth rates, *OPEN* is a measure for trade openness, *M2* are the liquid liabilities to GDP, *INFLAT* are the inflation rates, *URBAN* is the share of urban population, *XCONST* the constraints on the executive, *GOV* the government share to GDP, *POP* the population and *INEQ* are the Gini coefficients for income inequality. DIF-GMM and SYS-GMM are the First Difference and System Generalised Method of Moments estimators.

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## Notes

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<sup>1</sup>A parallel literature dealing with political budget cycles is also of some interest for the South American case, however I do not deal explicitly with those issues in this paper. In any case, see Brender and Drazen (2005) and Shi and Svensson (2006) for more on this literature.

<sup>2</sup>For instance, Bittencourt (2012) suggests that some of those young South American democracies experienced hyperinflation right after redemocratisation in the 1980s and early 1990s.

<sup>3</sup>In addition, I ran regressions using the Bruno (2005) correction, and with the inflation tax, lagged democracy, fiscal unbalance, lagged growth, lagged urbanisation and inequality and with the principal components of government and external debt on the RHS and all estimates are consistent with the ones reported above. Available on request. Furthermore, I report in the Appendix the GMM estimates which are also consistent with the ones reported.