

# Democracy, populism and hyperinflation: some evidence from Latin America

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**Abstract** In this paper we test for the populist view of inflation in South America during the eventful period between 1970 and 2007, a period which captures the latest democratic transition in the continent, episodes of hyperinflation and finally macroeconomic stabilisation. The results—based on panel time-series data and analysis—confirm the prediction which suggests that recently elected governments coming into power after periods of political dictatorship, and which are faced with demand for redistribution, end up engaging in populist (or redistributive) policies, which tend to lead to high inflation and overall poor macroeconomic performance. All in all, we suggest that the implementation of democracy as such requires not only the “right political context”—or an appropriately constrained executive—to work well, but it also must come with certain economic institutions (central bank independence and a credible and responsible fiscal authority), institutions that were (coincidentally) absent in South America right after re-democratisation, but which would presumably raise the costs of pursuing populist policies in the first place.

**Keywords** Democracy · Populism · Hyperinflation · Latin America

**JEL Classification** E31 · E65 · N16 · O23 · O54

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## 1 Introduction and motivation

South America has been known for its economic inequality and poor macroeconomic performance (particularly in terms of inflation rates), and also for a particular propensity to flirt between political dictatorships and more democratic regimes. For instance, in the 1980s, after a spell of dictatorships, a number of South American countries re-democratised (Argentina, Bolivia, Brazil and Peru). However, shortly after these processes of political liberalisation had taken place, higher inflation and even severe bursts of hyperinflation happened in those countries. Macroeconomic stabilisation took some time to take root in the region. In fact, in the spirit of [Alesina and Drazen \(1991\)](#), stabilisation came only after a considerable nine-year delay in the 1990s.

No less important to mention at this early stage is the fact that, in the vein of [Przeworski and Limongi \(1997\)](#), the above-mentioned countries, even with all the economic and political instability seen in the 1980s and early 1990s, have not reversed to less democratic regimes, and this is presumably because those countries are more developed now (at least in terms of income per capita) than in the previous democratic transitions that they experienced in the more distant past and which did not survive for long.

Hence, with data for Argentina, Bolivia, Brazil and Peru from 1970 to 2007, periods of political dictatorship, re-democratisation, high inflation, hyperinflation, and then finally macroeconomic stabilisation are captured. We are therefore able to test for the populist view of inflation in South America, which predicts that in countries with high economic inequality that re-democratise (the Gini coefficient in 2008 in the region ranged from .51 in Argentina to .60 in Bolivia), the coalition coming into power will attempt to redistribute income from the rich to the poor. Or to put it another way, as suggested by [Acemoglu et al. \(2011\)](#), particular coalitions coming into power (in this case after right-wing dictatorships), even if not with a left-wing flavour (e.g., Alfonsín in Argentina and Sarney in Brazil, the first civilian presidents after re-democratisation, were not representatives of any left-wing coalition), will attempt to signal to the median voter that they are not right wingers with the implementation of particular (populist) redistributive policies.

The above populist pattern becomes feasible because new democracies sometimes still lack particular institutions (e.g., mature political parties in congress, fiscal responsibility laws and central bank independence, indeed the South American case at the time) and also particularly problematic because this redistribution is usually done through higher and unfunded public spending, or artificial wage and salary increases, and other public transfers, which in turn tend to generate higher inflation and possibly even hyperinflation, and this is known to be detrimental to the welfare of the poor in the first place<sup>1</sup>.

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<sup>1</sup> For instance, [Bittencourt \(2009\)](#) investigates the case of the Brazilian hyperinflation of the 1980s and 1990s, and he suggests that the high rates of inflation seen at the time contributed to increase earnings inequality. Moreover, [Easterly and Fischer \(2001\)](#) suggest that the poor from 38 countries consider inflation to be a more pressing problem than the rich, which suggests that the poor are the ones suffering more with higher inflation.

With the above (eventful) background in mind, and taking advantage of panel time-series analysis, which allows us to empirically model such thin panels of countries, we attempt to further our knowledge on the determinants of macroeconomic performance in the recent history of South America. Essentially, the political and economic characteristics of those countries (inequality, democratic transition, hyperinflation and lack of particular institutions at the point of re-democratisation), combined with the rather novel panel time-series analysis, provides the perfect environment for us to better capture the presence, or not, of the populist view of inflation in the region.

The results show that during the period of political dictatorship inflation was lower, which indicates that the implementation of democracy seen in the 1980s was, in fact, detrimental to macroeconomic performance in the region. It is worth mentioning that, although inflation was lower during the dictatorial period, we are by no means saying that those military regimes achieved stable macroeconomic performance. Nevertheless, in *relative* terms, the evidence allows us to suggest that the then recently elected governments in those countries indeed pursued populist, or all sorts of unfunded redistributive policies, that eventually lead to poor macroeconomic performance through higher rates of inflation and even severe hyperinflationary bursts.

The contribution of this paper to the literature is that, firstly, we focus on understanding the hyperinflationary episodes taking place in South American countries shortly after re-democratisation. This entails a disaggregation of the data to pinpoint more accurately the impact of young democracies on inflation, so that a better historical understanding of the region is achieved and, to the best of our knowledge, this is the first study that attempts to shed some light on those traumatic experiences taking place in South America. Secondly, we construct a composite political index based on principal component analysis, which extracts the unobserved common factors of different political regime variables, and that reduces model uncertainty and therefore gives a proxy for political regime characteristics with more explanatory power.

Thirdly, we make use of panel time-series analysis that deals with relatively thin panels and that tackles interesting empirical issues such as non-stationarity, heterogeneity bias, and between-country dependence in long panels. These empirical issues were (understandably) not always covered by the previous studies which took advantage of large panel data sets and analysis. Consequently, as informative as these previous studies proved to be, they did not explicitly study the South American case. Therefore, such methodological disaggregation allows us to deepen our knowledge of the region.

Hence, in the vein of [Sargent et al. \(2009\)](#), who specifically study the hyperinflationary and stabilisation processes in Argentina, Bolivia, Brazil and Peru—and who suggest that the change, in one way or another, in the fiscal fundamentals not only generated the hyperinflationary bursts, but also played a role in stabilisation—we are able to study and better understand the South American case, with all its idiosyncrasies, instead of treating the region either as a dummy or as an outlier to be removed from the sample, which is usually done in large cross-sectional and panel studies<sup>2</sup>.

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<sup>2</sup> For instance, [Aisen and Veiga \(2006\)](#) make use of GMM estimators, however they are not able to find any significant effect of democracy on inflation when they make use of a sample only of developing countries, which includes South America. In addition [Acemoglu et al. \(2008\)](#) suggest that in countries with intermediate levels of development (represented by a dummy which includes South America)

Or to put it differently, we are able to avoid generalisations about democratisation processes taking place in unequal societies that are not always warranted.

All in all, we can loosely suggest that, although recently the region has had leaders like Lula (the former Brazilian president), Morales in Bolivia and the Kirchners in Argentina—presidents who would fit the bill as the perfect archetype of a South American populist—the region so far has not seen any episode of poor macroeconomic performance like the ones in the 1980s and early 1990s. This is suggestive of the fact that the region nowadays has by far better political and economic institutions, like houses of representatives with less and better consolidated political parties, more independent central banks and fiscal responsibility laws, than at the point of re-democratisation and that those institutions are playing a role in keeping the continent (or the prospective populists more constrained) economically more stable than in the past.

The remainder of this paper is as follows: the next subsection briefly reviews and inserts this paper within the previous literature. Section 2 describes the data and the empirical strategy used, and then reports and discusses the results. Section 3 concludes; it summarises the work, and suggests some policy implications and also future work.

### 1.1 Related literature

The literature on the political determinants of macroeconomic performance has consistently attracted the attention of the profession for some time, and [Paldam \(1987\)](#) presents early descriptive evidence—with a sample of eight Latin American countries covering the period 1946–1984 and that includes the likes of Argentina, Brazil and Peru—and which given the date it was published, does not take into account the hyperinflationary bursts of the 1990s, that suggests that civilian governments tend to generate higher inflation than military ones in Latin America. In similar vein, [Sachs \(1989\)](#), and [Dornbusch and Edwards \(1990\)](#) descriptively highlight the issue of recently elected governments pursuing redistributive populist policies in Latin America particularly in the 1980s wave of democratisation.

In addition, [Alesina and Drazen \(1991\)](#) theoretically suggest that in more “polarised” societies, or in societies with higher income inequality, stabilisations are delayed (stabilisations come only after some “political consolidation” takes place, or after an agreement on which group pays for the stabilisation is reached). This is particularly important for the South American case, not only because it presents high income inequality, but also because, roughly speaking, stabilisation came only after a nine-year delay following the implementation of democracy. In similar vein, [Veiga \(2000\)](#) provides evidence—for the period 1957–1996 and with a sample of ten countries that includes Argentina, Brazil and Peru—that in more fragmented societies, or societies with a large number of political parties in congress, stabilisations tend to be delayed. The latter is also related to the South American experience right after

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Footnote 2 Continued

the implementation of central bank independence has been beneficial to macroeconomic performance. The problem is that most South American countries implemented central bank independence well after their macroeconomic stabilisations, towards the end of the 1990s, which indicates that central bank independence in its own is probably not the sole reason for the stabilisation of the early 1990s in the region.

re-democratisation in which the number of political parties was by far higher than 10 years after re-democratisation, which suggests that a process of political consolidation with less, but more structured political coalitions, has been taking place in the region.

Moreover, [Beetsma and Van Der Ploeg \(1996\)](#) argue—theoretically and empirically (they run cross-country regressions of inflation against inequality for the period 1960–1985)—that in unequal societies, and South America fits the bill again, the government tries to please the median voter, or the poor in this case, via redistribution; and, although not dealing specifically with South America, [Desai et al. \(2003\)](#), use a large panel data set and OLS and Fixed Effects estimators, to suggest that it all depends on how unequal a country is (democratisation taking place in unequal countries lead to populist policies and hence high inflation, a factor that can, again, be related to the South American case)<sup>3</sup>.

Furthermore, [Acemoglu et al. \(2003\)](#) suggest that distortionary macroeconomic policies, which include inflation volatility, that retard economic growth are symptoms of “weak institutions”, or not properly constrained executives; and [Acemoglu et al. \(2008\)](#) estimate panel regressions to suggest that policy reforms, like the implementation of central bank independence, are only successful when the “political context” is right (e.g., Zimbabwe implemented central bank independence in 1995, however it has been plagued with hyperinflation since 2000 when the constraints on the executive were severely curtailed).

Finally, [Acemoglu et al. \(2011\)](#) construct a theoretical model which predicts that even if the democratic coalition coming into power is not necessarily from the left, it will nevertheless attempt to signal to the median voter, via particular redistributive policies, that it is not from the right either. This is also related to the South American experience in the sense that Alfonsín and Sarney were not representatives of any left-wing coalition, however populist policies were pursued during their presidential terms, which lead to higher inflation rates.

Essentially, the literature suggests that the implementation of democracy in developing and unequal countries should be accompanied not only by the right political context, or well-constrained executives, but also by the right economic institutions (e.g., a responsible and independent treasury and central bank respectively), so that the likelihood of economic crisis and delayed stabilisations in young democracies could be minimised.

The above fits rather well with the South American experience, a re-democratisation process in an unequal region without much political maturity (e.g., [Dornbusch and Edwards 1990](#)), at least in terms of number of political parties in congress (presumably an overlooked factor that works as a constraint on the executive) during and right after democratisation ([Veiga 2000](#)), and also without the necessary economic institutions in place—fiscal rules and central-bank independence came only towards the end of

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<sup>3</sup> In addition, [Al-Marhubi \(1997\)](#) suggests that higher inequality is positively associated with higher inflation rates in a cross-section of countries, [Desai et al. \(2005\)](#) suggest that inequality affects inflation, but conditional on the political structure, and [Dutt and Mitra \(2008\)](#) suggest that excessive inequality leads to political instability, which in turn leads to policy volatility, and therefore lower investment and economic growth.

the 1990s (Acemoglu et al. 2008)—resulted in a long spell of populist policies and consequently poor macroeconomic performance in the region, with all its costs to economic welfare. A counterexample in this case is the fact that the continent has recently seen a renewed wave of what one would argue to be examples of populist politicians (e.g., Lula, Morales and the Kirchners), however so far those countries have not experienced episodes of high rates of inflation, which is an indication of the role of the political consolidation and of the better economic institutions that are now in place in the continent in keeping the region economically stable.

All in all, the theoretical literature provides us with concepts like inequality, democratisation, delayed stabilisations and institutions, concepts which we borrow freely and adapt to the South American case, and which allows us to provide interesting interpretations of the results. Moreover, we build on the empirical literature (which has made use mostly of cross-sectional and large panel analyses) and make use of the relatively novel panel time-series analysis which—without having to rely on large aggregations, nor interaction terms, nor dummy variables—allows us to have a more in-depth view of the continent.

## 2 The empirical analysis

### 2.1 A look at the data

The data set used covers the period between 1970 and 2007, and four South American countries, namely Argentina, Bolivia, Brazil and Peru ( $T = 38$  and  $N = 4$ ). To briefly illustrate the importance of these countries in the regional context, these four countries accounted for roughly 70 % of the total GDP and population in South America in 2009.

The data on inflation (*INFLAT*), we make use the usual log transformation  $\log(1 + (\frac{INFLAT}{100}))$ , come from the Bureau of Census of the four countries. The normalised, and rather popular, political variables that we use to capture the political transitions that these four countries went through in the 1980s come from the Polity IV data set, which is compiled and provided by the Centre for Global Policy, and they are: democracy (*DEMOC*), which ranges from 0 (a more democratic country) to 1 (a less democratic one); constraints on the executive (*XCONST*), which ranges from 0 (a more constrained executive) to 1 (a less constrained one); and political competition (*POLCOMP*), which ranges from 0 (more political competition) to 1 (less political competition).

With the above information we can use principal component analysis to extract from the standardised data matrix the unobserved common factors, or the linear combinations, of these three normalised Polity IV variables, so that we end up with a proxy for political regime characteristics (*POLITY*) which contributes to reduce omitted variable problems and model uncertainty, and which presents more explanatory power. In this particular case, the first principal component—which roughly corresponds to the mean of the series—accounts for 97 % of the variation in these three Polity IV variables. This is significant because in this case we are able to reduce the dimensionality of a set of prospective political variables, and we end up with one variable, *POLITY*, that contains most of the information coming from different candidates for political

regime characteristics<sup>4</sup>. All in all, according to the populist view, we expect negative signs of these proxies on inflation, or that democratisation in unequal countries leads to higher inflation in this case.

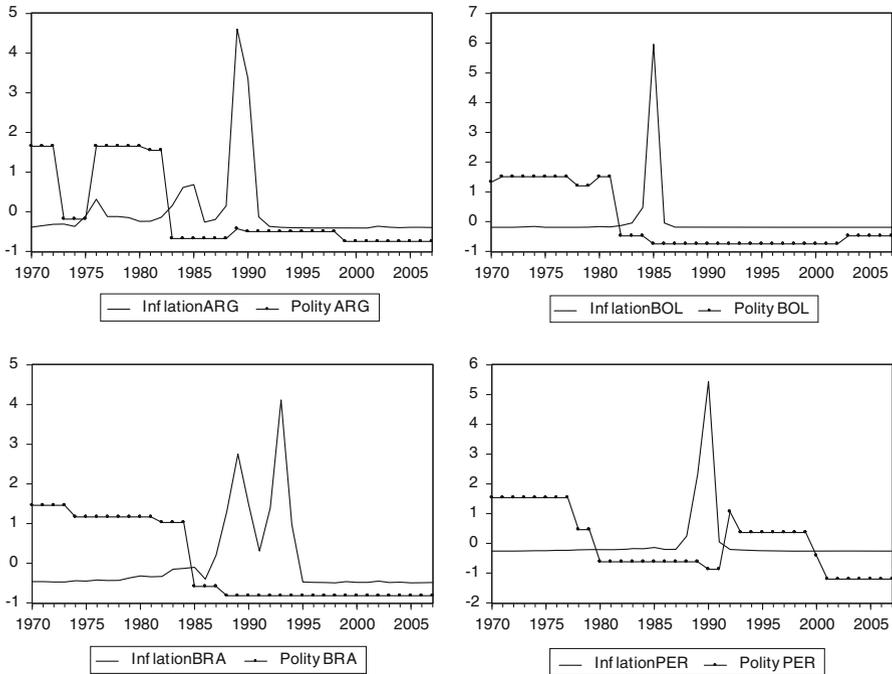
In addition, in accordance with the previous literature, and given data availability, the control variables used include the government's share of the real gross domestic product (*GOV*), a proxy for government size that captures the fact that governments tend to increase in size during political transitions (Brender and Drazen 2007), and it is expected that bigger governments which are not constrained by particular political and economic institutions tend to generate higher deficits and eventually higher inflation as well. Moreover, we use the ratio of exports and imports over the real gross domestic product (*OPEN*), which captures the processes of trade liberalisation taking place in South America in the 1990s and it is expected in this case that more open societies tend to display better macroeconomic performance via higher trade flows (Aisen and Veiga 2006).

Furthermore, we use the growth rate of the real gross domestic product (*GROW*), proxying for economic cyclicality, and we expect that societies growing faster have lower inflation rates (which is a precondition for growth). Finally, we use the liquid liabilities over the real gross domestic product (*M3*), a baseline measure of financial development, and in this case we expect that societies with better developed financial sectors tend to display lower inflation rates. All these controls are provided by the Penn World Table (PWT) data set mark 6.3 and World Development Indicators (WDI) files respectively. All in all, these control variables are proxies for development and more developed societies usually display sound macroeconomic performance, or lower inflation rates in this case (Desai et al. 2003).

For the sake of clarity, we plot the data on inflation and political regime characteristics in each country separately. Each panel of Fig. 1 illustrates the fact that when those countries re-democratised in the 1980s (Argentina in 1983, Bolivia in 1982, Brazil in 1985 and Peru in 1980), which is illustrated by a reduction in the indices of political regime characteristics, the hyperinflationary episodes happened shortly after (Argentina in 1989, Bolivia in 1985, Brazil in 1989 and again in 1993, and Peru in 1990). Moreover, it is also seen that macroeconomic stabilisation, illustrated by low and stable inflation rates, took roughly 9 years after re-democratisation to take root in the region (Argentina in 1992, Bolivia in 1987, Brazil in 1995 and Peru in 1992).

In addition, in the first panel of Table 1 we present the descriptive statistics and we can initially see the considerable variation that the variables of interest, inflation and the proxies for political regime characteristics, presented at the time, which illustrates the variation not only in macroeconomic performance (e.g., the hyperinflationary bursts), but also in terms of regime characteristics (e.g., the democratic transitions). The second panel presents the correlation matrix, and what can be seen is that all political regime variables used present negative, although not always significant, correlations with inflation. This tentatively suggests that when these countries re-democratised in the 1980s, or when the variables for political regime characteristics decreased in size, macroeconomic performance deteriorated in terms of inflation rates.

<sup>4</sup> Although we report estimates using the baseline *DEMOC* alongside *POLITY*, in the "Appendix", for robustness sake, we also report results using the variable constraints on the executive (*XCONST*).



**Fig. 1** Inflation and Political Regime, 1970–2007. *Sources:* Bureaux of Census, Polity IV and author's own calculations. *Inflation* is the inflation rate and *Polity* is the measure of political regime

The control *GOV* presents the expected positive correlation with inflation, bigger governments (e.g., via larger deficits) tend to be associated with higher inflation, and *OPEN*, *GROW* and *M3* present the expected negative signs against the inflation rates. This is because of the fact that in more economically open societies, and countries that grow consistently faster and which possess a deeper financial sector, tend to be associated with a more stable macroeconomic environment, or lower inflation in this case.

Finally, in Fig. 2 we plot the OLS regression lines between inflation and the political regime variables in the panel, and the relationships are negative, which indicate that during the periods of less democracy, or dictatorship, those countries presented lower inflation rates. Essentially, these regression lines lend some credence to the populist view of inflation in South America.

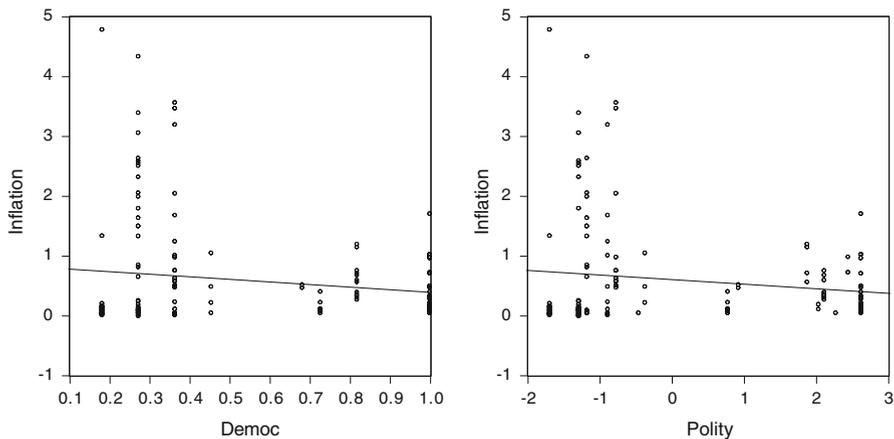
Therefore, this preliminary inspection of the data, with all its caveats, suggests that the processes of political liberalisation taking place in the 1980s were followed by higher rates of inflation in the region, or that democracy took some time to settle down at the time. Or to put it another way, since those democratic transitions were announced well in advance, one would expect that the last dictator would generate higher inflation which would be passed on to the new democratic coalition. However, at this stage the data are not suggesting that. Moreover, stabilisation was clearly delayed, it came only well after the first civilian presidents

**Table 1** Descriptive statistics and the correlation matrix: Argentina, Bolivia, Brazil and Peru, 1970–2007

Variable	Obs	Mean	SD	Min	Max			
INFLAT	152	.606	.915	−.01	4.77			
GOV	152	16.51	3.49	11.98	26.19			
DEMOC	152	.506	.320	.18	1			
POLITY	152	−.000	1.70	−1.69	2.62			
OPEN	152	30.93	14.95	10.32	69.64			
GROW	152	1.18	4.36	−15.82	10.57			
M3	152	24.64	12.62	4.7	58.44			
		INFLAT	GOV	DEMOC	POLITY	OPEN	GROW	M3
INFLAT	1							
GOV	.333*	1						
DEMOC	−.150	.209*	1					
POLITY	−.142	.226*	.995*	1				
OPEN	−.379*	−.633*	−.305*	−.323*	1			
GROW	−.450*	−.166*	.100	.100	.043	1		
M3	−.299*	−.165*	−.426*	−.422*	.368*	.103	1	

Sources: Bureaux of census, Centre for global policy, PWT, WDI and author’s own calculations

\* Statistical significance at the 5% level



**Fig. 2** OLS Regression Lines between Inflation and Political Regime, Argentina, Bolivia, Brazil and Peru, 1970–2007. Sources: Bureaux of Census, Polity IV and author’s own calculations. *Inflation* is the inflation rate, and *Democ* and *Polity* are the political regime variables

came into office, which coincides with the development of political consolidation and the implementation of certain stabilisation plans and other economic institutions (fiscal responsibility laws and central bank independence) which took place in the continent.

## 2.2 Empirical strategy

In terms of econometric modelling, since we have a  $T > N$  data set, the empirical strategy used is based on panel time-series analysis. This is interesting in itself because, apart from dealing with relevant empirical issues in relatively thin panels—non-stationarity, heterogeneity and endogeneity biases, and cross-section dependence—the panel time-series analysis allows us to conduct a study of South America, which furthers our knowledge of the region. Basically, we are able to specifically study the South American experience, avoiding generalisations and without treating the region either as a dummy or as an outlier to be discarded from the sample as is usually done in large cross-sectional and panel studies.

Firstly, although most of the variables used are either indices or ratios (and therefore stationary by default), for non-stationarity in the country time-series we use the Im, Pesaran and Shin (IPS 2003) test, which allows for heterogeneous parameters and serial correlation in the residuals. The IPS test consists of an augmented Dickey-Fuller (ADF) regression for each variable of each country, and these are then averaged.<sup>5</sup>

Secondly, on the issue of heterogeneity bias in dynamic  $T > N$  panels, which is caused because under wrongly assumed homogeneity of the slopes—the composite disturbance term ends up being serially correlated and therefore the explanatory variables  $x_s$  are not independent of the lagged dependent variable  $y_{t-1}$ —and this bias is non-trivial. This is firstly dealt with by the Fixed Effects (FE) estimator, which provides consistent estimates in dynamic models when  $T \rightarrow \infty$  (which is the case here), but only when the slopes are homogeneous; and then by the Swamy's (1970) Random Coefficients (RC) estimator, which assumes the existence of heterogeneous intercepts and slopes, and it gives consistent estimates of the averages as  $T \rightarrow \infty$ . The RC, which can also be interpreted as a Generalised Least Squares estimator, consists of a weighted average of  $\hat{\alpha}_i$  and  $\hat{\beta}_i$ , and the weight contains a modified variance-covariance matrix of the heterogeneous  $\alpha_i$  and  $\beta_i$ .<sup>6</sup>

Moreover, to some extent we follow Acemoglu et al. (2008) in an attempt to further capture the role of time, democratisation, populism and consolidation, and we include a dummy variable (*DUMMY*) for the first 8 years after democratisation (to account

<sup>5</sup> An alternative to IPS (2003) is the test by Levin et al. (2002). However, this test assumes parameter homogeneity, and therefore does not consider a possible heterogeneity bias present in the data. Moreover, given that these countries shared some macroeconomic characteristics in the 1980s and early 1990s, some would argue that there is between-country dependence present. An alternative that considers the existence of between-country dependence is proposed by Pesaran (2007), the cross-section IPS (CIPS) test. However, CIPS assumes that  $N > 10$  and we have  $N = 4$  in our data set. In addition, one would argue that, given the structure of the data, structural breaks are a possibility. The test proposed by Im et al. (2005) takes that into account. However, this test also assumes large  $N$ , which is not entirely the case here. Basically, the IPS test presents more flexibility in terms of sample size and asymptotics, and is therefore informative and the best alternative available at this stage.

<sup>6</sup> The Mean Group (MG) estimator, proposed by Pesaran and Smith (1995), which is the simple time-series averages of all countries, is also an alternative. However, this estimator is sensitive to outliers, a problem not faced by the RC estimator. Nevertheless, for robustness sake, we report in the "Appendix" the dynamic MG estimates. Moreover, the Random Effects estimator is not needed in this instance because when  $T \rightarrow \infty$  (which is the case here) it is equivalent to the FE estimator (Arellano 2003). In addition, Bond (2002) argues that GMM-type estimators are not an alternative under  $T > N$  because of the overfitting problem.

for two full political terms), in which a positive estimate indicates that those countries indeed presented higher inflation soon after re-democratisation.<sup>7</sup>

All in all, although these countries shared similar poor macroeconomic characteristics in the 1980s and early 1990s, these pooled estimators also account for an important econometric issue in thin  $T > N$  panels—heterogeneity bias—or for the fact that some of these countries do indeed present different levels of economic development (Argentina and Brazil are known to be relatively more developed than Bolivia and Peru).

Furthermore, some would argue that there is reverse causality present (high rates of inflation would actually determine regime change in the region, or the democratic transition in this case). Although our initial look at the data suggests the opposite, Gasiorowski (1995) reports that high inflation played a role in the democratic transition of the 1980s in his sample of 97 developing countries, and since this is an important issue in the political science literature, we take the issue of endogeneity rather seriously in the analysis. We therefore use the Fixed Effects with Instrumental Variables (FE-IV) two-stage Least Squares estimator, and with the assumption  $E(x_{it-1}v_{it}) = 0$  in mind we make use of the first lag of the respective political regime variable as the internal identifying instrument for the contemporaneous political variable being estimated. The estimates provided by the FE-IV estimator are asymptotically consistent and efficient as  $T \rightarrow \infty$ , and it retains the time series consistency even if the instrument set is only predetermined (Arellano 2003).

We therefore estimate static and dynamic models with different pooled estimators (the benchmark Pooled Ordinary Least Squares (POLS), FE, RC and FE-IV), and in the vein of Desai et al. (2003), the estimated heterogeneous dynamic equation is as follows

$$\begin{aligned} INFLAT_{it} = & \alpha_i + \beta_i POLITY_{it} + \gamma_i GOV_{it} + \delta_i OPEN_{it} \\ & + \epsilon_i GROW_{it} + \zeta_i M3_{it} + \varepsilon_i INFLAT_{it-1} + v_{it}, \end{aligned} \quad (1)$$

in which  $INFLAT$  are the inflation rates,  $POLITY$  is the composite political regime index which consists of the unobserved common factors of  $DEMOC$ ,  $XCONST$  and  $POLCOMP$ ,  $GOV$  is the share of government in the gross domestic product,  $OPEN$  is a measure of economic openness,  $GROW$  are the growth rates of the gross domestic products, and  $M3$  is a measure of financial development.

In addition, given some similar poor macroeconomic characteristics in the 1980s and early 1990s, and even a certain coincidence in terms of transition to democracy in the 1980s, we deal with between-country dependence, which usually happens through the disturbances being  $E(u_{it}u_{jt}) \neq 0$ . We therefore make use of Zellner's (1962) Seemingly Unrelated Regressions (SUR) estimator, which presents greater efficiency, the greater the correlation amongst the disturbances. The SUR estimates different country time series, which are then weighted by the covariance matrix of the disturbances. Moreover, this estimator provides insightful estimates because it disaggregates

<sup>7</sup> In addition, we make use of a variable that counts the number of years after democratisation and its square term to account for the fact that perhaps democratic maturity comes in the long run. We report those alternative estimates in the "Appendix".

the analysis further than the pooled analysis, so that we can have a more in-depth view of the hyperinflationary processes in each country at the time.<sup>8 9</sup> Equation Two illustrates the equation estimated for each country,

$$\begin{aligned} INFLAT_t = & \alpha_t + \beta POLITY_t + \gamma GOV_t + \delta OPEN_t \\ & + \epsilon GROW_t + \zeta M3_t + \nu_t. \end{aligned} \quad (2)$$

Finally, as done before, to capture the role of time after democratisation, populism, inflation and consolidation, we include a dummy (*DUMMY*) for the first 8 years after democratisation in which a positive estimate indicates that those countries indeed presented higher inflation or pursued populist policies soon after re-democratisation (or before political and economic consolidation took place).

### 2.3 Results

In terms of results, firstly, we report the IPS statistics—*INFLAT* is  $-2.87$ , *GOV* is  $-2.63$ , *POLITY* is  $-2.35$ , *DEMOC* is  $-2.31$ , *OPEN* is  $-2.51$ , *GROW* is  $-3.48$  and *M3* is  $-3.61$ —and these statistics suggest that we can reject the null hypothesis of unit roots and accept in favour of the alternative that at least one variable of each country is, in fact, stationary. This implies that no further data transformations are needed, and also that panel-cointegration analysis cannot be pursued in this case.

Secondly, in Tables 2 and 3 we report the static and dynamic estimates of the baseline *DEMOC* and then *POLITY* on inflation using the POLS, FE and RC estimators respectively. In columns 1 and 2 we make use of the *DEMOC* variable and it presents negative and statistically significant effects on inflation, as well as *POLITY* in columns 3 and 4. This suggests that less democracy—represented by an increase in *DEMOC* and *POLITY*—is, in fact, associated with lower inflation. In addition, in columns 5 and 6 we report the estimates of the dummy variable (*DUMMY*) for the first 8 years after re-democratisation, and the estimates are positive and statistically significant, which indicate that inflation was indeed higher for the first two terms right after democratisation. Essentially, these static and dynamic estimates are in accordance with the literature on populism and inflation (e.g., Sachs 1989; Dornbusch and Edwards 1990), which articulates the idea that in young democracies that are faced with demand for redistribution, populist policies are likely to be pursued in an attempt to please the median voter (Beetsma and Van Der Ploeg 1996, and Desai et al. 2003).

The three cyclical control variables present for most of the time the expected signs and are mostly statistically significant (*OPEN*, *GROW* and *M3* are negatively associated with the inflation rates), which somehow confirms the view that more open and developed societies tend to display lower inflation rates. Moreover, the *GOV* estimates present the expected sign as well, mostly positive, however not always statistically

<sup>8</sup> An alternative to SUR is the Common Effects Estimator proposed by Pesaran (2006). However,  $N$  is assumed to be large and in our data set  $N = 4$ . Furthermore, Kapoor et al. (2007) propose an estimator that also works best under the  $N \rightarrow \infty$  assumption.

<sup>9</sup> For a more thorough discussion about panel time-series analysis in general, see Smith and Fuentes (2008).

**Table 2** Static estimates of DEMOC, POLITY and DUMMY on inflation, 1970–2007

INFLAT	Static models					
	POLS (1)	FE (2)	POLS (3)	FE (4)	POLS (5)	FE (6)
GOV	.029 (1.40)	.003 (.12)	-.030 (1.44)	.002 (.09)	.003 (.14)	-.029 (-.90)
DEMOC	-1.003 (-4.98)	-1.137 (-5.53)				
POLITY						
DUMMY						
OPEN						
GROW						
M3						
Constant	1.77 (3.66)	2.87 (3.77)	1.25 (2.68)	2.33 (3.12)	1.16 (2.42)	2.00 (2.56)
F test (p)	23.64 (0.00)	24.56 (0.00)	23.51 (0.00)	24.67 (0.00)	20.43 (0.00)	19.38 (0.00)
F test* (p)		2.76 (0.04)		3.00 (0.03)		.80 (0.49)
R <sup>2</sup>	.44	.40	.44	.40	.41	.39

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is  $INFLAT_{it} = \alpha + \beta POLITY_{it} + \gamma GOV_{it} + \delta OPEN_{it} + \epsilon GROW_{it} + \zeta M3_{it} + v_{it}$ , in which  $INFLAT$  is the inflation rates,  $DEMOC$  and  $POLITY$  are the political regime variables,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP,  $M3$  is a measure of financial development, and  $DUMMY$  takes the value one for the first 8 years after re-democratisation. POLS is the Pooled Ordinary Least Squares and FE is the Fixed Effects estimators

**Table 3** Dynamic estimates of DEMOC, POLITY and DUMMY on inflation, 1970–2007

INFLAT	Dynamic models					
	FE (1)	RC (2)	FE (3)	RC (4)	FE (5)	RC (6)
GOV	.004 (.19)	.133 (3.33)	.004 (.18)	.132 (3.39)	-.007 (-.31)	.109 (2.11)
DEMOC	-.377 (-2.14)	-.659 (-2.86)				
POLITY			-.070 (-2.13)	-.118 (-2.90)		
DUMMY					.420 (1.97)	.266 (2.06)
OPEN	-.026 (-2.74)	-.037 (-.62)	-.026 (-2.75)	-.037 (-.62)	-.021 (-2.27)	-.029 (-.63)
GROW	-.049 (-4.56)	-.039 (-2.87)	-.049 (-4.57)	-.039 (-2.93)	-.051 (-4.77)	-.040 (-3.02)
M3	.001 (.33)	.007 (-.24)	.001 (.33)	-.007 (-.23)	.006 (1.26)	-.000 (-.02)
INFLAT <sub>(-1)</sub>	.584 (9.93)	.432 (5.49)	.583 (9.90)	.436 (5.66)	.611 (11.10)	.489 (6.35)
Constant	1.20 (1.97)	-1.20 (-1.66)	1.02 (1.73)	-1.51 (-2.09)	.875 (1.49)	-1.42 (-1.41)
F test (p)	50.77 (0.00)		50.75 (0.00)		50.58 (0.00)	
F test* (p)	1.71 (0.16)		1.73 (0.16)		.81 (0.48)	
Wald test (p)		227.60 (0.00)		231.82 (0.00)		158.04 (0.00)
LR test (p)		61.53 (0.00)		61.55 (0.00)		40.93 (0.00)
R <sup>2</sup>	.64		.63		.66	

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is  $INFLAT_{it} = \alpha_i + \beta POLITY_{it} + \gamma GOV_{it} + \delta OPEN_{it} + \epsilon GROW_{it} + \zeta M3_{it} + \varepsilon INFLAT_{it-1} + v_{it}$ , in which  $INFLAT$  is the inflation rates,  $DEMOC$  and  $POLITY$  are the political regime variables,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP,  $M3$  is a measure of financial development, and  $DUMMY$  takes the value one for the first 8 years after re-democratisation. FE is the Fixed Effects and RC the Random Coefficients estimators

**Table 4** Second-stage estimates of DEMOC and POLITY on inequality, 1970–2007

INFLAT	FE-IV			
	(1)	(2)	(3)	(4)
GOV	.005 (.18)	.004 (.20)	.004 (.15)	.004 (.19)
DEMOC	−1.29 (−5.06)	−.396 (−1.73)		
POLITY			−.245 (−5.11)	−.075 (−1.75)
OPEN	−.043 (−3.44)	−.026 (−2.72)	−.044 (−3.51)	−.027 (−2.74)
GROW	−.064 (−4.60)	−.049 (−4.52)	−.064 (−4.60)	−.049 (−4.52)
M3	−.017 (−2.44)	.001 (.29)	−.017 (−2.46)	.001 (.28)
INFLAT(−1)		.581 (9.32)		.580 (9.28)
Constant	3.02 (3.89)	1.22 (1.94)	2.40 (3.20)	1.04 (1.74)
Hausman	1.16	−0.34	1.17	−0.30
F test* (p)	3.02 (0.02)	1.68 (0.17)	3.27 (0.02)	1.70 (0.17)
Wald test (p)	238.40 (0.00)	507.26 (0.00)	239.18 (0.00)	507.15 (0.00)
R <sup>2</sup>	.39	.63	.39	.63
Instrument	<i>DEMOC</i> <sub>−1</sub>	<i>DEMOC</i> <sub>−1</sub>	<i>POLITY</i> <sub>−1</sub>	<i>POLITY</i> <sub>−1</sub>

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is:  $INFLAT_{it} = \alpha_i + \beta POLITY_{it} + \gamma GOV_{it} + \delta OPEN_{it} + \epsilon GROW_{it} + \zeta M3_{it} + \varepsilon INFLAT_{it-1} + v_{it}$ , in which  $INFLAT$  is the inflation rates,  $DEMOC$  and  $POLITY$  are the political regime variables,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP, and  $M3$  is a measure of financial development. The identifying instrument is the first lag of the political regime variable being estimated. FE-IV is the Fixed-Effects with Instrumental Variables estimator

significant. These  $GOV$  estimates (if we take into account our preferred dynamic RC estimates in Table 3) weakly confirm the fact that bigger governments tend to generate higher deficits which are likely to be funded via higher inflation.

The F test\* statistics suggest the presence of country fixed effects in the static models (columns 1–4), which indicates that the FE estimator is the most appropriate one in these static instances. It is worth mentioning as well that the F\* test statistic does not indicate the presence of fixed effects in columns 5–6, however Zellner (1969) suggests that in static models, as long as the regressors are exogenous, POLS and FE estimators provide unbiased and consistent estimates of the expected values. Finally, in Table 3 the Likelihood Ratio (LR) test suggests heterogeneity of intercepts and slopes, which indicates that the RC estimator, since it allows for heterogeneity of intercepts and slopes, is the one delivering the best estimates in the dynamic instances.

Fourthly, in Table 4 we report the estimates of  $DEMOC$  and  $POLITY$  on inflation using the FE-IV estimator. Although the regression-based Hausman test indicates that we can accept the null hypothesis of (statistical) exogeneity, we take the thorough study by Gasiorowski (1995), who suggests that economic crisis trigger the democratic transitions, rather seriously in this analysis. Basically, in columns 1 and 2 we regress  $DEMOC$  against inflation in static and dynamic specifications, and it presents negative and statistically significant effects on inflation, as well as  $POLITY$  in columns 3 and 4, which confirm once again that, at least in South America, less democracy tends to be associated with lower inflation. In some respect these instrumented estimates

**Table 5** SUR estimates of DEMOC, POLITY and DUMMY on inflation, 1970–2007

INFLAT	SUR			
	ARGENTINA	BOLIVIA	BRAZIL	PERU
GOV	.116 (3.83)	.204 (2.22)	.332 (4.22)	-.292 (-4.35)
DEMOC	-.591 (-2.31)	-1.06 (-3.15)	-2.06 (-4.98)	-1.08 (-4.76)
OPEN	.038 (2.50)	.035 (1.50)	-.238 (-9.91)	-.054 (-2.79)
GROW	-.035 (-2.27)	-.082 (-1.73)	-.026 (-1.35)	-.064 (-5.32)
M3	-.097 (-6.15)	-.032 (-3.12)	.057 (5.31)	-.051 (-2.89)
LM test	14.26			
GOV	.118 (3.94)	.205 (2.22)	.324 (4.08)	-.290 (-4.37)
POLITY	-.108 (-2.24)	-.208 (-3.12)	-.349 (-5.03)	-.212 (-4.83)
OPEN	.040 (2.61)	.034 (1.44)	-.236 (-9.85)	-.054 (-2.80)
GROW	-.034 (-2.25)	-.077 (-1.60)	-.032 (-1.70)	-.064 (-5.41)
M3	-.098 (-6.20)	-.032 (-3.06)	.056 (5.22)	-.053 (-3.05)
LM test	15.02			
GOV	.091 (2.76)	.079 (.77)	.429 (4.94)	-.410 (-4.09)
DUMMY	.191 (.99)	.773 (2.05)	.721 (3.13)	.644 (2.51)
OPEN	.040 (2.50)	.029 (1.15)	-.170 (-6.14)	-.014 (-.67)
GROW	-.030 (-1.95)	-.098 (-1.83)	-.054 (-2.55)	-.085 (-5.58)
M3	-.100 (-5.88)	-.016 (-1.58)	.070 (5.86)	-.064 (-3.09)
LM test	15.98			

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is  $INFLAT_t = \alpha_t + \beta POLITY_t + \gamma GOV_t + \delta OPEN_t + \epsilon GROW_t + \zeta M3_t + v_t$ , in which  $INFLAT$  is the inflation rates,  $DEMOC$  and  $POLITY$  are the political regime variables,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP,  $M3$  is a measure of financial development, and  $DUMMY$  takes the value one for the first 8 years after re-democratisation. SUR is the Seemingly Unrelated Regressions estimator

are not necessarily in line with Gasiorowski (1995), essentially the estimates confirm the populist view of re-democratisation, inequality, redistribution and poor macroeconomic performance, or that high inflation was a consequence of the democratic transition in South America.

The cyclical controls  $OPEN$ ,  $GROW$  and  $M3$  present negative effects and are mostly significant, confirming that more open and developed societies tend to display better macroeconomic performance. The control  $GOV$  presents positive effects on inflation, however the estimates are not significantly different from zero, therefore difficult to draw solid conclusions about its role on inflation in this instance.

Furthermore, in the first-stage regressions the F test for overall significance is statistically different from zero (the F test statistics are 141.08, 116.95, 140.21, 116.30 respectively) and the identifying instruments—the lags of the respective political regime variables—are significant as well (the  $t$  test statistics are 21.94, 19.22, 21.59 and 18.92 respectively), which minimise the possibility of weak instruments. Finally, the F\* tests indicate the presence of country fixed effects in the static specifications.

Finally, when we disaggregate the analysis further and make use of the SUR estimator, the story the data are telling about the role of democracy (or youngish democracies)

**Table 6** Estimates of YEARS and YEARS<sup>2</sup> on inflation, 1970–2007

INFLAT	Static and dynamic models			
	POLS (1)	FE (2)	FE (3)	RC (4)
GOV	.041 (1.74)	.011 (0.34)	-.004 (-0.17)	.118 (3.47)
YEARS	.084 (3.54)	.093 (3.89)	.007 (0.36)	.065 (2.39)
YEARS <sup>2</sup>	-.003 (-3.13)	-.002 (-2.00)	.000 (0.61)	-.000 (-0.36)
OPEN	-.014 (-2.52)	-.054 (-3.16)	-.037 (-2.84)	-.065 (-1.21)
GROW	-.075 (-5.29)	-.073 (-5.04)	-.053 (-4.85)	-.035 (-2.46)
M3	-.015 (-2.46)	-.019 (-2.59)	.001 (0.21)	-.017 (-0.46)
INFLAT <sub>(-1)</sub>			.621 (10.53)	.424 (5.41)
Constant	.575 (1.13)	2.16 (2.39)	1.33 (1.95)	-.576 (-0.57)
F test (p)	16.48 (0.00)	17.48 (0.00)	42.60 (0.00)	
F test* (p)		3.06 (0.03)	2.02 (0.11)	
Wald test (p)				162.38 (0.00)
LR test (p)				68.22 (0.00)
R <sup>2</sup>	0.40	0.30	0.58	

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is  $INFLAT_{it} = \alpha_i + \beta YEARS_{it} + \gamma YEARS_{it}^2 + \delta GOV_{it} + \epsilon OPEN_{it} + \zeta GROW_{it} + \eta IM3_{it} + \theta INFLAT_{it-1} + v_{it}$ , in which  $INFLAT$  is the inflation rates,  $YEARS$  counts the years after democratisation and  $YEARS^2$  is its squared term,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP, and  $M3$  is a measure of financial development. POLS is the Pooled OLS, FE is the Fixed Effects and RC the Random Coefficients estimators

on inflation does not change much. In the first panel of Table 5 *DEMOC* presents negative signs and all estimates are statistically significant, as well as *POLITY* in the second panel. Loosely speaking, this indicates once more that an increase in *DEMOC* and *POLITY*, which represents less democracy, is associated with lower inflation, or that the populist view is valid in the region. Moreover, in the third panel the *DUMMY* estimates confirm that during the first 8 years of democratisation inflation was indeed higher.

Furthermore, the three control variables present, most of the time, the expected signs (*OPEN*, *GROW* and *M3* keep their negative effects, and most of the estimates are statistically significant). The *GOV* estimates are mostly positive and significant. In addition, the Lagrange Multiplier (LM) tests of independence suggest that we can not accept the null hypothesis of between-countries independence, which validates the use of the SUR estimator in this analysis.

It is also worth mentioning that Argentina presents the smallest political estimates amongst all countries, and a non-significant *DUMMY*, and this is probably because Argentina is the least unequal country in the sample (or the one facing less demand for redistribution). On the other hand, Bolivia and Brazil, for being the most unequal countries in the sample, present the largest political regime estimates of all. These cases illustrate the fact that re-democratisation in unequal countries, which still do not have particular political and economic institutions in place, indeed leads to higher redistributive spending, and consequently higher inflation and poor macroeconomic

**Table 7** Static and dynamic estimates of XCONST on inflation, 1970–2007

INFLAT	Static and dynamic models					
	POLS (1)	FE (2)	FE (3)	RC (4)	FE-IV (5)	FE-IV (6)
GOV	.024 (1.16)	-.010 (-0.35)	-.000 (-0.02)	.122 (3.20)	-.012 (-0.39)	-.001 (-0.07)
XCONST	-.972 (-5.28)	-1.07 (-5.81)	-.373 (-2.33)	-.589 (-2.84)	-1.26 (-5.74)	-.413 (-2.12)
OPEN	-.020 (-3.95)	-.041 (-3.40)	-.027 (-2.81)	-.038 (-0.65)	-.044 (-3.56)	-.027 (-2.80)
GROW	-.071 (-5.31)	-.067 (-4.91)	-.049 (-4.57)	-.038 (-2.82)	-.064 (-4.53)	-.050 (-4.53)
M3	-.019 (-3.88)	-.017 (-2.57)	.001 (0.24)	-.008 (-0.25)	-.018 (-2.66)	.000 (0.13)
INFLAT <sub>(-1)</sub>			.578 (9.80)	.436 (5.80)		.570 (9.23)
Constant	1.75 (3.68)	2.96 (3.91)	1.26 (2.06)	-1.05 (-1.52)	3.18 (4.09)	1.33 (2.11)
F test (p)	24.62 (0.00)	25.57 (0.00)	51.37 (0.00)			
F test* (p)		2.78 (0.04)	1.60 (0.19)		3.13 (0.02)	1.62 (0.18)
Wald test (p)				219.17 (0.00)	247.85 (0.00)	505.06 (0.00)
LR test (p)				61.09 (0.00)		
R <sup>2</sup>	0.45	0.42	0.64		0.41	0.64
Instrument					<i>XCONST</i> <sub>-1</sub>	<i>XCONST</i> <sub>-1</sub>

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is  $INFLAT_{it} = \alpha_i + \beta POLITY_{it} + \gamma GOV_{it} + \delta OPEN_{it} + \epsilon GROW_{it} + \zeta M3_{it} + \varepsilon INFLAT_{it-1} + v_{it}$ , in which  $INFLAT$  is the inflation rates,  $XCONST$  are the constraints on the executive,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP, and  $M3$  is a measure of financial development. POLS is the Pooled OLS, FE is the Fixed Effects, RC the Random Coefficients, and FE-IV is the Fixed-Effects with Instrumental Variables estimators

performance before consolidation takes place (Alesina and Drazen 1991; Veiga 2000 and Desai et al. 2003)<sup>10</sup>.

In essence, the estimates reported above indicate that the processes of re-democratisation of the South American countries in this sample (illustrated by a reduction in the indices of political regime characteristics and by *DUMMY* being equal to one soon after democratisation), were associated with higher rates of inflation. Loosely speaking, the introduction of more democratic institutions seen at the time was detrimental to macroeconomic performance, at least in terms of inflation rates, and therefore those societies had to wait for political and economic consolidation to take root (Veiga 2000 and Acemoglu et al. 2008). Alternatively speaking, although those transitions were announced well in advance, it can be said that the last dictators did not leave the first democratic coalition with high inflation rates.<sup>11</sup>

In a nutshell, it can be suggested that these societies of South America that implemented more democratic institutions should have made sure from the very beginning that the executive, even when democratically elected, was well constrained, and also introduced sound economic institutions such as a responsible fiscal authority and an

<sup>10</sup> For the sake of space we do not report the dynamic SUR estimates, nevertheless, the results are quantitatively and qualitatively similar to the ones in Table 5. Available on request.

<sup>11</sup> When we estimate static and dynamic equations with a dummy for the last 4 years of dictatorship, the estimates are negative and statistically significant, indicating lower inflation rates during the period. Available on request.

**Table 8** Dynamic estimates of DEMOC, POLITY, DUMMY, XCONST and YEAR on inflation, 1970–2007

INFLAT	MG				
	(1)	(2)	(3)	(4)	(5)
GOV	0.50 (0.52)	.050 (0.53)	.018 (0.18)	.041 (0.44)	.058 (0.86)
DEMOC	−.701 (−8.42)				
POLITY		−.130 (−8.78)			
DUMMY			.288 (7.60)		
XCONST				−.641 (−7.84)	
YEAR					.048 (2.14)
YEAR <sup>2</sup>					.000 (0.12)
OPEN	−.040 (−0.96)	−.040 (−0.97)	−.030 (−0.92)	−.041 (−0.99)	−.071 (−1.94)
GROW	−.046 (−5.09)	−.040 (−5.17)	−.050 (−4.61)	−.045 (−4.83)	−.043 (−4.01)
M3	−.010 (−0.45)	−.010 (−0.45)	−.002 (−0.10)	−.010 (−0.46)	−.020 (−0.75)
INFLAT <sub>(−1)</sub>	.406 (12.56)	.409 (13.31)	.483 (13.63)	.406 (13.50)	.420 (12.78)
Constant	.396 (0.22)	.053 (0.03)	.056 (0.03)	.481 (0.28)	.775 (0.52)
Wald test (p)	174.32 (0.00)	1700.23 (0.00)	234.60 (0.00)	212.83 (0.00)	73.97 (0.00)

T-ratios in parentheses. Number of observations:  $NT = 152$ . The basic estimated equation is  $INFLAT_{it} = \alpha_i + \beta POLITY_{it} + \gamma GOV_{it} + \delta OPEN_{it} + \epsilon GROW_{it} + \zeta M3_{it} + \varepsilon INFLAT_{it-1} + v_{it}$ , in which  $INFLAT$  is the inflation rates,  $DEMOC$ ,  $POLITY$  and  $XCONST$  are the political regime variables,  $GOV$  is the government's share in the real GDP,  $OPEN$  is a measure of economic openness,  $GROW$  is the growth rates of the real GDP,  $M3$  is a measure of financial development, and  $DUMMY$  takes the value one for the first 8 years after re-democratisation. MG is the Mean Group estimator

independent central bank, so that hyperinflation did not occur in the first place and stabilisations, when needed, were not delayed. These facts are particularly important for these South American countries, since political consolidation took some time to take root, and central bank independence and fiscal responsibility rules were implemented well after democratisation, only in the late 1990s.

### 3 Concluding observations

We investigated in this paper the role of more democratic regimes in inflation in a panel of South American countries that re-democratised in the 1980s. The results, based on panel time-series analysis, suggest that those countries suffered from higher rates of inflation shortly after they re-democratised. Moreover, macroeconomic stabilisations came only after a long and protracted delay. All in all, the populist view of inflation, which predicts that newly elected coalitions coming into power and which are faced with demand for redistribution, and which are not entirely constrained by particular political and economic institutions, end up generating higher public spending and, in turn, higher inflation, is confirmed by the data and analysis conducted here.

The relevance of carrying out a historical study on the South American hyperinflationary experience is mostly to avoid unwarranted generalisations. For instance, in an unequal country like South Africa, with its fairly young democracy, central

bank independence and fiscal rules were implemented at the very beginning of the democratisation process in 1995 (not to mention that the political party coming into power in 1995 had been in opposition for 80 years, therefore well consolidated), and coincidentally enough there was no episode of populism nor high inflation. This suggests not only that generalisations about inequality, democracy and populism are not always warranted (e.g., [Desai et al. \(2003\)](#) suggest that democracy and inequality tend to lead to higher inflation, however this is not the case in South Africa, nor in modern South America), but also that a sort of learning mechanism is taking place in democratisation processes.

Furthermore, the quality of the evidence presented is, to a certain extent, boosted not only because we focus on those countries which re-democratised without having particular institutions in place and suffered from hyperinflation in South America, but also because we use a proxy for political regime characteristics based on principal component analysis, which reduces model uncertainty and has more explanatory power. In addition, we take advantage of panel time-series analysis, which deals with important empirical issues in relatively thin panels not covered by the previous large panel studies, such as heterogeneity bias in dynamic panels, economic endogeneity and between-country dependence. Therefore the analysis conducted here represents a step forward in terms of achieving more insightful estimates, and consequently in deepening our understanding of South America.

Regarding future work, on the one hand, the inclusion of economic inequality would be a welcome development to this analysis. However data on inequality from Bolivia and Peru are fragmented, which precludes a study on the impact of political regime characteristics and inequality on inflation. More realistically, the use of an alternative proxy for political consolidation (e.g., the number of political parties in congress since re-democratisation) would be a feasible alternative to Polity IV variables. Moreover, with extended time series and information on central bank independence we could interact political consolidation with central bank independence to get a proxy for political and economic maturity which would bring more explanatory power to this analysis.

To conclude, understanding the South American hyperinflationary experience is informative because it exemplifies an interesting pattern seen in the continent at the time. Societies that re-democratised and which still do not have the right political context or enough political maturity, nor the right economic institutions such as an independent central bank conducting sound monetary policy and a credible fiscal authority in place, will end up doing more harm than good in terms of macroeconomic performance, which affects mainly the welfare of the poor. Moreover, those South American countries took, roughly speaking, 9 years to stabilise, which is also an example of a delayed stabilisation. Macroeconomic stabilisation came only when those countries matured their political regimes, and also when they introduced central bank independence, inflation targeting and fiscal responsibility laws in the 1990s.<sup>12</sup>

Ultimately, in this paper we do not make a case against democracy in the region, quite the opposite (the political liberalisation in South America must have been accom-

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<sup>12</sup> For instance, [Santiso \(2006\)](#) highlights the importance of the much improved macroeconomic performance in Latin America recently to produce better economic outcomes from the late 1990s onwards.

panied by some sort of political consolidation and also by the implementation of the right economic institutions, so that all could have benefited, from the very beginning, of the regime change and the more democratic institutions implemented).

## Appendix

In Table 6 we report the estimates of a variable that counts the number of years (*YEARS*) after democratisation and its respective squared term. The static estimates suggest a non-linear relationship, which indicates that in the long run democracy matures and with that maturity comes not only better institutions, but also better macroeconomic performance. Moreover, in Table 7 we report estimates using the Polity IV variable constraints on the executive, and the estimates confirm the ones reported in the paper, which suggest that macroeconomic performance deteriorated after democratisation. Finally, in Table 8 we report the dynamic pooled estimates provided by the MG estimator, and the results, once again, confirm the prediction that those countries experienced higher inflation rates after re-democratisation.

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