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On the Endogeneity of Exchange Rate Regimes

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ABSTRACT

The literature has identified three main approaches to account for the way exchange rate regimes are chosen: i) the optimal currency area theory; ii) the financial view, which highlights the consequences of international financial integration; and iii) the political view, which stresses the use of exchange rate anchors as credibility enhancers in politically challenged economies. Using de facto and de jure regime classifications, we test the empirical relevance of these approaches separately and jointly. We find overall empirical support for all of them, although the incidence of financial and political aspects varies substantially between industrial and non-industrial economies. Furthermore, we find that the link between de facto regimes and their underlying fundamentals has been surprisingly stable over the years, suggesting that the global trends often highlighted in the literature can be traced back to the evolution of their natural determinants, and that actual policies have been little influenced by the frequent twist and turns in the exchange rate regime debate.

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I. Introduction

Much of the recent policy discussion on exchange rate regimes has focused mostly on the trends in regime choice as if this were largely independent from country-specific characteristics.[1] Following this interpretation, it is argued that after the early experiments with floats prompted by the collapse of Bretton Woods, we witnessed a regained popularity of pegs in the 80s and early 90s, to a large degree owing to their presumed beneficial effects on taming inflation. However, the stream of currency crises that started with the devaluation of the Mexican peso in 1994 have cast doubt on their sustainability, and the ephemeral enthusiasm with "hard" pegs (particularly, currency boards) advocated by the bipolar view was further debunked by the Argentine debacle. As a result, in recent years there has been a growing consensus in favor of flexible arrangements.

Yet such temporary fads, and the "one-size-fits-all" view of exchange rate arrangements that underlies them, seem at odds with both the casual evidence and the conventional wisdom that indicate that the regime choice is itself endogenous to the local and global economic contexts. This endogeneity of exchange rate regimes has not gone unnoticed in the economic literature. On the contrary, over the last forty years a large body of analytical work has provided key insights on the potential determinants of the regime choice.

This paper tests whether, and to what extent, the alternative approaches identified by the literature help explain the choice of exchange rate regimes, and how the drivers underlying the choice of regime have changed over time.

Our results are quite revealing. We find that, once all contending hypotheses are considered jointly, the choice of exchange rate regimes can indeed be traced back to a few

[1] An exception is Frankel (1999).

simple determinants that include a combination of trade, financial and political variables. Moreover, we find that the way countries choose their exchange rate regime in response to these basic determinants has not changed substantially over the last two decades, suggesting that, for good or bad, the key normative insights provided by the academic literature have influenced actual exchange rate policy beyond the occasional twists and turns that characterized the exchange rate debate.

To our knowledge, most of the empirical exploration of the determinants of the choice of regimes has been partial, focusing on a particular hypothesis without approaching the subject in a comprehensive model that encompasses all available candidate explanations –a concern given the frequently high correlation between the associated variables. Bayoumi and Eichengreen (1998), for example, center on the implications of the optimal currency area theory, Eichengreen et al (2002) on "original sin", and Stein and Frieden (2001) on political economy variables. The few attempts to tackle the issue from a broader perspective (for example, Edwards, 1996; Rizzo, 1998; and Juhn and Mauro, 2002) rendered disappointing results.[2] Closest to ours are Alesina and Wagner (2006) and Von Hagen and Zhou (2009). Alesina and Wagner (2006) estimate a similar, though somewhat simplified version, of what we do here and then focus on the decision to renege on the announced regime (as captured by the difference between de jure and de facto regimes). Von Hagen and Zhou (2009) estimate a simultaneous equations model and suggest that the choice of de facto regimes depends on the choice of de jure regimes but not vice versa.[3]

[2] See also Poirson (2001), and Collins (1996), for a sample of Latin American countries. The significant exception to these disappointing results has been the literature on the trade effect of currency unions started by Rose (2000). While not framed in terms of the choice of exchange rate regime, the estimated effects were so large that they would certainly have an impact on the choice of regime. See also Frankel and Rose (1997, 2002) and Frankel (2005) for a survey.

[3] See Von Hagen and Zhou (2007) for an additional description of the empirical literature and an analysis along the lines of the one we perform in this paper.

In this light, the main contribution of this paper is twofold. First, it assesses the empirical support of alternative explanations based on an updated dataset; using by now the standard distinction between de jure and de facto classifications of exchange rate regimes (see Tavlas et al 2008 for a review of this literature. The difficulty in identifying exchange rate regimes has also been underscored in Frankel et al 2000). Second, and more important, it nests the main theoretical views on the determinants of exchange rate regimes in a common framework that allows us to test them jointly, unveiling the relative relevance of each one of them. These two contributions provide the basis for what we believe is a comprehensive test of forty years of literature on exchange rate regimes.

More precisely, we simultaneously test what we believe are the three main competing approaches to explaining the choice of exchange rate regimes: i) the optimal currency area (OCA) theory pioneered by Mundell (1961), which relates the choice of regime to the country's trade links, size, openness and the characteristics of the shocks the economy is subject to;[4] ii) the financial view, which highlights the consequences of international financial integration;[5] and iii) and the political view, which regards the use of a peg (or, more generally, an exchange rate anchor) as a "policy crutch" for governments lacking (nominal and institutional) credibility.[6][7]

Our overall results using de facto regimes provide strong support for each of these views, although some of them apply differently for industrial and non-industrial economies. In

[4] While this tradeoff is often associated with the traditional Mundell-Fleming framework, the view of exchange rates as real shock absorbers dates back to the work of Meade (1950).

[5] This approach comprises the impossible trinity argument that stresses the role of increased capital mobility as a factor limiting the effectiveness of pegs (see, i.e., Rose, 1994; Fischer, 2001; and Obstfeld and Taylor, 2002), and the currency mismatch argument that claims that exchange rate variability in financially dollarized emerging economies is contained due to their deleterious balance sheet effects (see, i.a., Calvo and Reinhart , 2002, and Eichengreen and Hausmann, 1999).

[6] See Drazen (2000) and references there.

[7] Of course there may be other reasons for the choice of exchange rate regimes that we have left out of the analysis. One that comes to mind is the objective of fixing to ensure competitiveness and avoid overvaluations (see Aizenman and Lee, 2005 and Prasad et al, 2006). Because the universe would be potentially too large in this paper we have focused on the main hypotheses.

particular, we find that the implications of OCA theory carry through in both groups of countries. By contrast, whereas financial integration tends to foster flexible regimes among industrialized countries –in line with the impossible trinity view–, it increases the propensity to peg among non-industrial countries –something that we attribute to the fact that integration in those countries is strongly correlated with foreign currency-denominated external liabilities and larger currency mismatches, as documented by Eichengreen et al (2003). We also find support for the political view, albeit in a qualified version: pegs are more likely if the country lacks a good institutional track record, but less likely if the government is too weak to sustain them. Specifically, we find the choice of a peg to be *negatively* correlated with institutional quality –a result consistent with the policy crutch view–, but *positively* correlated with political strength –hinting at a sustainability problem. Indeed, we find that, although non-peg countries are more likely to adopt de jure (but not a de facto) peg in an inflationary context, most of these inflation-induced de jure pegs are ultimately short lived, a result that is consistent with recent work by Klein and Schambaugh (2006).

Finally, by recovering the time dummies estimated in our baseline specification, we can study whether the evolution of regimes over the last decades displays any particular time pattern beyond and above that spanned by our set of basic controls. The estimation based on the IMF's de jure classification reveals a clear trend throughout the 80s and 90s: a strong "peg bias" in the early years that narrows steadily to virtually disappear by the end of the period. However, when we repeat the exercise based on de facto regimes, we find no discernible time pattern. From these findings, we conclude: i) that the trends often highlighted in the recent exchange rate regime debate, visible in the evolution of de jure regimes, are not reflected in de facto exchange rate policies, and ii) that actual regime choices can be traced back to the evolution of regime determinants rather than to a

changing view of the relative merits of different arrangements: if anything, the debate can be credited for the increasing reluctance to adopt explicit exchange rate commitments at odds with underlying fundamentals.

II. The Theories of Exchange Rate Regimes Determination

Our exploration of the determinants of exchange rate regimes is centered on three main approaches that have long been part of the open economy macroeconomics toolkit: the theory of optimal currency areas (OCA), the financial integration approach (specifically, the incidence of the impossible trinity and balance sheet effects), and the political economy view of pegs as credibility enhancers.

In each case, a key aspect of the exercise consists in finding variables that capture, as close as possible, the factors highlighted by the theory. Since the choice of particular variables is bound to be controversial, we first evaluate a number of alternative controls for each of the three approaches separately. To do so, we run multinomial logit regressions for an unbalanced panel data set of 183 countries over the post-Bretton Woods period (1974-2004) on each set of controls.[8] We then run a parsimonious specification that includes all controls selected in the partial tests, to assess the relative importance of each set of explanations.

As noted, an important novelty of this paper lies in its focus on de facto exchange rate regimes. More precisely, our empirical exercises use as dependent variable a categorical variable that takes three values: 1 for floats, 2 for intermediates and 3 for pegs, according

[8] Appendix 1 lists the countries in our sample, grouped into the industrial and non-industrial categories.

to the de facto regime classification assembled by Levy Yeyati and Sturzenegger (2003, 2005).[9]

OCA theory

The first group of factors potentially underpinning the choice of regime is related to the geographical and trade aspects identified by the theory of optimal currency areas. This approach to the fix vs. float dilemma weighs the trade and welfare gains from a stable exchange rate vis à vis the rest of the world (or, more precisely, the country's main trade partners) against the benefits of exchange rate flexibility as a shock adjuster in the presence of nominal rigidities.

According to this argument, country characteristics that favor a more stable (or fixed) exchange rate are openness (which enhances the trade gains derived from stable bilateral exchange rates),[10] smallness (indirectly through the higher propensity of small economies to trade internationally, and directly by limiting the scope for the use of a national unit of account), and the concentration of the country's trade with the peg currency country (which, again, increases the gains from reducing the bilateral exchange rate volatility).[11]

Regarding the incidence of real shocks, the traditional Mundell-Flemming framework argues that, in order to minimize output fluctuations, fixed (flexible) exchange rates are to be preferred if nominal (real) shocks are the main source of disturbance in the economy.[12]

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[9] The robustness of the results to the standard IMF-based de jure classification, as well as Reinhart and Rogoff´s (2004) alternative de facto classification is addressed below.

[10] An alternative explanation relies on Cavallo and Frankel (2004) who show that open economies are less prone to a sudden stop, thus reducing the benefits of flexibility.

[11] In the case of pegs to a basket of currencies, the reference currency is the main currency in the basket peg. For intermediate and floating regimes, the reference currency is assumed to be the one that exhibits the least volatility relative to the local currency among major international currencies and currencies of the main regional partners. See Levy Yeyati and Sturzenegger (2005) for details.

[12] Classic references on this are Fleming (1962) and Mundell (1963).

For example, high volatility of terms of trade would provide a rationale for a float. Moreover, to the extent that real shocks become increasingly important due to growing trade flows and capital market integration (alternatively, as monetary shocks or inflation concerns become less of a priority) one should expect to see a global trend towards more flexible arrangements.[13]

In order to test the optimal currency area hypothesis we use measures of size (the logarithm of the country's GDP in US dollars, Size), openness (the GDP share of the average of exports plus imports, Openness),[14] geographical concentration of trade (the share of exports to the reference currency country multiplied by openness, *TradeConc*), and, to capture the incidence of real shocks, terms of trade volatility (computed as the standard deviation of terms of trade changes over the previous five years weighted by the degree of openness, *TOTShocks*).[15] We use lagged values (indicated by placing a 1 after the variable) where we believe endogeneity may be a concern.[16] All regressions in the paper include year dummies.

Table 1 reports the results from our partial test of the OCA approach, for the whole sample as well as for the industrial and non-industrial subsamples. The expected sign is shown in the first column. As can be seen, the theory is strongly supported by the data. For the whole sample (columns i and ii), all coefficients show the correct sign and are highly

[13] Eichengreen et al (2002), Lane (1995), and Frieden et al (2000) provide empirical evidence suggesting that, contrary to the nominal-real story, terms of trade variability is positively related with the probability that a country selects a peg. Eichengreen et al (2002) propose the following explanation: "fixed exchange rate regimes should result in deeper financial markets, which should be particularly important in economies facing important terms of trade shocks". However, two recent papers by Broda (2004) and Edwards and Levy-Yeyati (2005) using de facto classifications of exchange rate regimes provide empirical evidence that pegs indeed exhibit larger output sensitivity to real shocks.

[14] The use of Frankel and Romer's (1999) measure of openness ("actual trade share", defined as the ratio of imports plus exports to GDP (Penn World Table, Mark 5.6, Series OPEN).) to mitigate endogeneity problems yields similar results at the cost of fewer observations. We come back to the issue of endogeneity below.

[15] An alternative would have been to use the trade with the whole block of countries pegged to the reference country as in Klein and Shambaugh (2004) and Meissner and Oomes (2006).

[16] Appendix 2 presents a list of variables and sources, as well as a table with summary descriptive statistics.

significant. However, there is a difference between industrial and non-industrial countries in the effect of real shocks (*TOTShocks)*. For non-industrial countries (columns iii and iv), this effect is less strong and it seems to decrease the probability of choosing a peg and there is no significant effect in the probability of choosing a float. On the other hand, industrial countries (columns v and vi), are more likely to choose a flexible regime when real shocks become more important. The OCA approach appears as a stronger determinant in the case of industrial economies than in the non-industrial ones. This is evident from the individual coefficients as well as from the higher R-squared.

The financial view

A key ingredient of the textbook Mundell-Fleming framework is the assumption of perfect capital mobility that implies international interest rate arbitrage across countries in the form of the uncovered interest parity. From this framework, it follows that monetary policies in open economies cannot be aimed both at maintaining stable exchange rates and smoothing out cyclical output fluctuations due to real shocks. This is usually referred to as the "impossible trinity," namely, the fact that policymakers can choose at most two out the three vertexes of the trinity (capital mobility, monetary policy and a fixed exchange rate).

Obstfeld and Taylor (2002) link the evolution of exchange rate arrangements to the historical phases of financial globalization, based on this "impossible trinity" argument. They argue that, while capital mobility prevailed at a time when monetary policy was subordinated to exchange rate stability (as in the gold standard), as soon as countries attempted to use monetary policy to revive their economies during WWI, they had to impose controls to curtail capital movements.[17] Inverting their argument, it has been

[17] On the same point, see Bordo and Flandreau (2001). Note that the trinity argument suggests the joint endogeneity of exchange rate and capital account regime choices, to which we come back below.

argued that, as financial globalization deepened in the last decades, monetary policy became increasingly at odds with fixed exchange rates. This argument underscores the so-called "bipolar view" of exchange rate regimes, according to which increased capital mobility has made intermediate regimes less viable in (financially open) industrial and emerging economies.[18] In addition, a rapid process of financial deepening and innovation (which typically has advanced *pari passu* with financial integration in international capital markets) has gradually reduced the effectiveness of capital controls, with the same consequences in terms of the monetary policy-exchange rate stability dilemma.

Recent literature has stressed that currency mismatches in financially dollarized economies may also be critical to the choice of exchange rate regimes. In particular, countries with important (private or public) foreign liabilities may be more prone to fix (either de jure or de facto) due to the deleterious impact of sharp nominal depreciation of the currency on the solvency of balance sheets with currency mismatches.[19] Notice that this channel, if present, may undo the positive relationship between capital account openness and flexible regimes suggested by the impossible trinity argument. To the extent that financial openness induces large swings in capital flows that in turn lead to large changes in the value of the exchange rate, financially dollarized countries may find it more convenient to fix rather than float merely for prudential reasons, a phenomenon that has been dubbed "fear of floating" by Calvo and Reinhart (2002). As the authors argue, "defaults and general debt servicing difficulties mount if the exchange rate is allowed to slide," which "may help explain why, at least historically, there has been a marked

[18] See, e.g., Fischer (2001). The point had been raised earlier by Quirk (1994) and Eichengreen (1994), among others.

[19] See, e.g., Eichengreen and Hausmann (2003). It has to be noted that, while the real exchange rate adjustment in the event of a negative external shock cannot be avoided by sustaining a peg, the downward rigidity of prices may postpone the process over time, preventing a financial collapse. In addition, a nominal adjustment of the exchange rate is usually accompanied by an exchange rate overshooting that can only reinforce the negative financial implications.

tendency in most countries to confine exchange rate movements to relatively narrow bands…"

Thus, disentangling empirically these two countervailing aspects –impossible trinity and currency mismatches– is particularly challenging in the case of non-industrial economies, many of which tend to exhibit important levels of financial dollarization. Moreover, in most cases, financial integration is likely to be correlated with larger stocks of foreign liabilities denominated in a foreign currency, rendering balance sheet considerations relatively more pressing. In this regard, it is important to note that, as holders of foreign assets and liabilities differ (at least from a legal point of view), a sudden devaluation is likely to hurt dollar debtors irrespective of the amount of foreign assets owned by the country's residents; hence, our focus on gross (as opposed to net) foreign liabilities as a measure of the currency mismatch.[20]

With this in mind, we examine the following five alternative variables to capture the influence of financial linkages on the choice of regime:

i) Chinn and Ito´s (2007) measure of de jure capital account openness (*KAOpen*). The measure, available for 105 countries since 1977, is based on four binary dummy variables reported in the IMF´s *Annual Report on Exchange Rates and Exchange Restrictions* with a higher number indicating a lower overall level of restrictions.[21]

ii) The sum of the absolute value of inward and outward flows of portfolio investments and financial derivatives (sourced from the *International*

[20] See Levy Yeyati (2004) for a discussion along these lines.

[21] Kaminsky and Schmukler's (2001) capital controls index, an alternative candidate, failed to be significantly correlated with the regime choice, possibly due to the fact that it covers only 28 countries.

Financial Statistics) as a share of GDP (*Portfolio*), a measure of *de facto* capital account openness.[22]

iii) A financial development dummy (*FinDev*), equal to one when the country belongs to the industrial group or when it is included in the JP Morgan's EMBI Global index.[23]

iv) The country's gross stock of foreign assets over GDP (*CumLoans*), an alternative measure of de facto capital account openness, where the asset stock (computed by Lane and Milesi-Ferreti, 2001) is measured as the cumulative flows of portfolio debt assets, other assets and net errors and omissions.

v) The ratio of foreign liabilities in the domestic financial sector relative to money stocks (*FLM*), a measure of liability dollarization to proxy for the presence of currency mismatches.[24]

Table 2 shows the correlations between these different measures of financial linkages. The first four are all strongly (positively) correlated, and virtually uncorrelated with our measure of liability dollarization, with the exception of the stock of foreign assets. As the latter is available only for a limited set of countries and periods, we drop it from our empirical tests below.[25] Since *FinDev* may be correlated with the size of the economy for

[22] This is a modified version of Juhn and Mauro's (2002) portfolio openness measure, computed as the sum of the absolute value of the change in financial assets and liabilities, which includes (longer term) FDI and (presumably countercyclical) official flows. The latter are arguably less relevant to the hypotheses that we want to test and are therefore excluded from our measure. The distinction between de jure and de facto capital account openness (more precisely, between restrictions on capital flows and realized capital flows) is highlighted by Prassad et al (2003).

[23] The use of the EMBI index as an indicator of financial development, also borrowed from Juhn and Mauro (2002), is motivated by the fact that non-industrial countries make it to the EMBI Global portfolio if their (typically external) sovereign bond issues have sufficient liquidity (JPMorgan, 1999). Furthermore, EMBI indexing tends to fuel international investors interest and, through this channel, helps strengthening the country's financial links with international markets.

[24] Alternative candidates such as Eichengreen et al's (2002) "ability to pay" measures and Levy Yeyati's (2004) deposit dollarization ratios are available only for a limited number of countries or for recent years.

[25] Its inclusion yields results that are comparable with those for the other capital account openness controls, at the expense of an important reduction in the size of the sample.

the non-industrial sample due to the minimum trading volume required to be in the EMBI index, we include size as an additional control in the regressions to partial out this effect.

Table 3 shows the results of our partial test of the financial linkages approach, for the whole sample as well as for the industrial and non-industrial subsamples. As before, we estimate a multinomial logit, where the dependent variable is a categorical variable that reflects the de facto three-way classification of exchange rate regimes. According to the currency mismatch hypothesis, we should expect higher liability dollarization to be positively associated with the propensity to peg, something that bears out in the two groups as identified by negative and significant coefficients of the foreign liability variable (*FLM*). The financial integration variables, on the other hand, exhibit different results for each of the two groups of countries. For the non-industrial sample (columns iii and iv), the coefficients are negative and significant, suggesting that the implications of impossible trinity should be qualified by the presence of currency mismatches that appear to prevail in the choice of exchange rate policy. By contrast, for (non-financially dollarized) industrial economies with smaller currency mismatches (columns v and vi), the regime choice is more consistent with the impossible trinity argument, as indicated by the positive correlation between capital openness and the probability of choosing a flexible regime. Notice that these results are also consistent with Aghion et al (2006), who show that exchange rate volatility enhances growth for financially developed economies. While we have not divided our sample on the basis of financial development, to the extent that developed economies are more developed financially, the fact that capital account openness leads to floating regimes for developed economies but not so for less developed economies may be signaling the different impact of exchange rate volatility for the two groups.

The political economy view

A large strand of literature has studied the use of the exchange rate as a nominal anchor to reduce inflation. In particular, it has been argued that governments with a preference for low inflation but handicapped by low institutional credibility, facing the uphill task of convincing the public of their commitment to nominal stability, may adopt a peg as a "policy crutch" to tame inflationary expectations. It follows that countries with a poor institutional track record may be more prone to rely on fixed exchange rate arrangements as a second best solution to a commitment problem. As the argument goes, weak governments that are more vulnerable to "expansionary pressures" or "fiscal voracity" (i.e., pressures from interest groups with the power to extract fiscal transfers) may choose to use a peg as a way of fending off these pressures.[26]

To be sure, the literature does not provide an unambiguous answer regarding the sign of the link between political strength and exchange rate regimes. Indeed, the policy crutch effect can be easily reversed: weak governments could be associated with larger deficits (or lower ability to reduce them, if needed) that makes the peg more difficult to sustain. This is particularly true in the presence of wars or social unrest, but could be extended to episodes of political turmoil or even to tranquil times to the extent that anemic governments become more vulnerable to the political pressure from interest groups. More in general, a "sustainability hypothesis" that links weak governments with either the collapse of existing pegs or the inability to launch a credible one would entail a positive correlation between political strength and pegs, rather than the other way around as the policy crutch argument would imply.

[26] See Fratianni and Von Hagen (1990) and Drazen (2000), for an extensive review, including a careful discussion of Giavazzi and Pagano (1988) where the idea was first developed. On the fiscal voracity effect, see Tornell and Lane (1999).

Testing these views, in turn, is challenging due to the difficulty of capturing in a single, or even a few observable variables the concepts of credibility and sustainability. Thus, we adopt a fairly candid view to examine a diverse set of variables used in the economic and political science literature to reflect political and institutional characteristics, and to assess whether they could be interpreted as indicators of political strength. The first three variables, taken from the World Bank's Database of Political Institutions (2006), include the number of years that the incumbent administration has been in office (YearsinOffice), a Herfindahl index of congressional politics (Herfindahl), and a legislative index of electoral competitiveness (LegComp).

Since our data covers all countries in the world, long tenures may indicate both relatively successful governments, as well as long-lasting (possibly totalitarian) regimes with a high degree of control of the local political process. If so, years in office would represent a measure of government strength, possibly subject to a diminishing effect as the clout of longer governments eventually wears out. The Herfindahl index is defined as the sum of the squared seat-shares of all parties in the government. As discussed early on by Olson (1982, 1993) the atomization of political players is associated with the deepening of common pool problems, leading to greater incentives to extract from the common resources and mounting fiscal pressure. Thus, a larger value of the Herfindahl index would be associated with political strength. Finally, the legislative index of electoral competitiveness increases as the legislatures become more competitive. Ranging from a value of 1, when there is no legislature, to a value of 7 when the largest party in congress holds less than 75% of the seats, this index would be correlated with political weakness.

We also test a fourth political variable, namely, the number of veto points in the political system (*VetoPoints*) as reported in Henisz's *Polcon Database* (2005), which measures directly the difficulties or steps required by a government to push its agenda. Accordingly, we expect it to represent a measure of government weakness.

Finally, we examine two alternative institutional quality indicators. First, we use the operations risk index (*OperationsRisk*), a survey that gauges the domestic environment for the operation of foreign businesses assembled for 53 countries by *Business Environment Risk Intelligence S.A,* where a higher value indicates a better environment. Second, we evaluate the *World Bank's Country Policy and Institutional Assessment Rating System* (*CPIA*). These ratings are based on the assessment of each country's governance as well as its economic, structural, social, and public reform policies prepared by the World Bank's country economists; again, a higher value would indicate higher institutional quality.[27] In both cases, we would expect to observe a negative link between the quality of institutions and the propensity to peg.

The correlations matrix reported in Table 4 confirms our priors concerning the political variables: measures of political strength (Herfindahl and years in office) and political weakness (veto points and legislative competitiveness) are positively correlated with each other, and negatively correlated with the other group. In addition, the two institutional variables (operation risk and the CPIA) are also strongly correlated with each other, as expected.

This allows us to build a parsimonious specification that avoids excessive multicollinearity for the partial tests of the political approach. More precisely, we select three variables that

[27] These ratings, prepared for a broad set of developing economies, cover the longer period (1977-1999) required by our empirical tests, unlike other governance indicators assembled by The World Bank that are available only since the mid-90s.

capture, political strength (*YearsinOffice*, which is also included squared to test for the potential diminishing effect of long tenures noted above), political weakness (*VetoPoints*), and institutional quality (*CPIA*, available for the non-industrial sample).[28] For the latter, the absence of an institutional control for the industrial sample should not be a concern to the extent that it is reasonable to assume that the differential influence of institutional quality on the choice of regime among developed countries, with comparably high standards, should be, at best, very minor.

As the regression results show (Table 5), the probability of choosing a peg is negatively correlated with the quality of institutions, as the policy crutch view would indicate. The table also shows that pegs are positively related to political strength, in line with the sustainability hypothesis: weak governments appear to be less prone to implement (and sustain) pegs, although the result appears to be not very strong for developed economies.

How can we reconcile this second finding with the long-dated debate about the use of pegs as nominal anchors in inflationary economies –and the many historical experiences in this direction? To address this issue, it is useful to focus more narrowly on the incidence of inflation on the decision to move to a peg from a non-peg regime. Following Vegh (1992), Calvo and Vegh (1999) and Frieden et al (2000), it could be argued that countries with moderate to high inflation have incentives to use the exchange rate as an anchor.[29] However, persistent high inflation also creates pressures on the exchange rate market that may force monetary authorities to float (either voluntarily or as a consequence of a currency crisis). Thus, the correlation between inflation and exchange rate rigidity may

[28] We drop Herfindahl due to relatively fewer observations, Operations Risk because of its very limited coverage, and Leg.Comp because, as opposed to VetoPoints, it has the same value for all industrial countries in our sample. The inclusion of the whole set of variables yields comparable results at the cost of severely limiting sample size.

[29] There is empirical evidence that (long-lasting) pegs have been successful at reducing inflation. See, among others, Ghosh et al (1997) and Levy Yeyati and Sturzenegger (2001).

reflect both credibility and sustainability aspects. To disentangle these two effects, and bearing in mind that most exchange rate-based stabilizations in the past were preceded by hyperinflation bursts, it is useful to differentiate moderate from high inflation (and hyperinflation) episodes known to elicit rapid policy reactions.

To that end, in Table 5b, we restrict our sample to countries that in the preceding period are not classified as pegs, and test the effect associated with a dummy for high inflation (*High250*) that is equal to one whenever the inflation rate in the previous year exceeds 250%, which we believe reflects more accurately the need for a quick credibility enhancement. Using a de facto classification, the results indicate that the probability of adopting a peg is not significantly higher in countries coming from high inflation (column iv).

One could argue, however, that the use of an exchange rate anchor is intimately related to an *explicit* commitment to a peg. If so, we would expect inflation-challenged governments to peg de jure (rather than de facto). This is indeed what the evidence seems to indicate. When we use the de jure regime classification, the high inflation dummy becomes significant and with the expected positive sign: high inflation tends to induce the de jure adoption of an exchange rate anchor.[30]

These results can be illustrated by a cursory look at the data. Out of the 37 non-peg high inflation country year observations included in the regression, 16 moved to a de jure peg the following year.[31] But of these, only 3 qualify as de facto pegs. This suggests that,

[30] The choice of 250% is not arbitrary. Lower levels did not deliver significant results, indicating that the credibility effect at lower inflation rates is not sufficient to induce the choice of a peg.

[31] Note that this amounts to 43% of the high inflation observations, significantly above the 25% probability of switching from non-peg to peg for the whole sample.

whereas weak governments tend to implement explicit (de jure) exchange rate commitments as a policy crutch against inflation, these attempts tend to be short-lived as the peg becomes ultimately unsustainable.

Thus, our preliminary findings provide a nuanced support for the policy crutch approach. On the one hand, institutional quality is inversely related to the propensity to peg, as countries rely on an exchange rate anchor to compensate for low institutional credibility. On the other, the fact that weak governments are likely to exhibit more flexible exchange rate arrangements points at sustainability as the main driving aspect. Again, this does not contradict the view of pegs as policy crutches: it provides evidence that hard-pressed governments are prone to resort to a jure peg as a deflationary device, despite the fact that they are later on unable to sustain it.

III. Putting it all together

The previous section showed that the factors identified by the literature, taken separately, exhibit significant links to the choice of exchange rate regimes. We are ready to tackle the main objective of the paper, namely, to test the alternative hypotheses simultaneously in a framework that allows us to assess their relative importance –a crucial step given the fact that the three groups of controls are likely to be correlated with each other, potentially biasing the result of our partial tests.[32]

[32] The joint test also addresses the problem that many of the variables will be related among them. For example, political instability may be correlated with financial dollarization, and so on. By estimating all variables jointly we test for the effect of the orthogonal component relative to the other regressors for each variable, thus providing a more convincing setup to interpret the effect of each variable as corresponding to its autonomous effect on the dependent variable.

To ensure consistency and comparability of the results, we put the three approaches to test by pooling the selected controls in a baseline specification and testing them jointly.[33] However, since our primary interest is to examine the relevance of different analytical approaches to the regime choice problem rather than the significance of individual variables we also report joint significance tests for each group of variables.

The results of our baseline regression, shown in Table 6, are in line with our previous findings. As can be seen, the estimated coefficients for the whole sample (columns i and ii) reflect closely those for the non-industrial group (columns iii and iv). The probability of choosing a peg is higher in small open economies with high levels of foreign liabilities and financial integration, poor institutional quality and strong governments. At the bottom of the table we report the Wald test of joint significance for all the coefficients corresponding to each approach –all of them strongly statistically significant.

Columns v and vi replicate the baseline for industrial countries. OCA variables remain strong predictors of exchange rate choice. However, capital account openness controls now show the opposite sign –like liability dollarization, which is significant only relative to the intermediate category– supporting the impossible trinity hypothesis. Moreover, the coefficients of political variables display a less clear pattern. These results are, again, in line with our partial tests, suggesting that exchange rate policy in industrial countries, relatively free from political or financial constraints, enjoys a higher degree of independence and respond essentially to standard economic factors.

[33] Due to its more limited sample coverage and its strong correlation with openness, we dropped the trade concentration variable from our baseline specification. Results for the complete specification are similar and available upon request.

Overall, the model displays good levels of predictive accuracy. For the non-industrial sample, the baseline specification correctly identifies 72% of pegs and 77% of non-pegs, showing significant in-sample predictive power. The numbers are even better for the industrial sample: 90% of pegs and 83% of floats are correctly identified.[34]

For the non-industrial sample, the predictive power is also quite good out of sample. The predictions for 2004, based on the baseline estimated for the period 1974-2003, indicate that the model has a success of about 67%, correctly predicting 45 cases out of a total of 68. Interestingly, a similar exercise for industrial countries correctly predicts all the non-pegs. However, the prediction is only correct in 4 out of 13 de facto pegs. This result is due to the European countries, indicating that the rationale for the exchange rate constraints imposed by the convergence to the Euro may go beyond the natural determinants captured by the present model.

What is the economic relevance of these results? Figure 1 addresses this point by computing the change in the estimated probability of choosing a peg as we span the support of each explanatory variable (while others are kept fixed at their mean values). To visualize the relative significance of each variable, we set the vertical axis to the [0,1] range for all variables. The exercise is conducted for non-industrial and industrial countries to highlight the differences between the two groups.

The results are illuminating. As can be inferred from the figure, size appears to be critical as a determinant of exchange regime: very small (large) countries choose a peg (float) almost with probability one. Openness also plays a significant role. A developing economy

[34] These results correspond to a threshold of 50%, based on the fact that the percentage of pegs in our sample is slightly above 50%. Alternative rules still yield good (albeit more biased) accuracy levels. For example, using an estimated probability threshold of 60%, the model correctly identifies 59% of pegs and 86% of non-pegs for the non-industrial sample, and 82% of pegs and 87% of floats for the industrial sample.

with a trade to GDP ratio equal to 1 is 30% more likely to choose a fixed regime than a fully closed economy. Trade openness is even more strongly associated with the propensity to peg in industrial economies, where a 50% trade to GDP ratio virtually implies a peg. The volatility of terms of trade, important for industrials, is almost negligible for non-industrials.

The divergence of the impact of financial variables across the two groups of countries is clearly illustrated in the figure. Capital account openness has a negative influence on the propensity to peg for developed economies; as opposed to a *positive* effect for developing ones (although both effects are relatively minor). In the case of the portfolio flows, the effect for the industrial sample presents the same sign but a different pattern than for non-industrials. In particular, a developing economy with flows of about 10% of GDP has a 30% higher propensity to peg than one with no flows. Moreover, as the graph indicates, virtually no developing economy with flows of 20% of GDP or higher allows its currency to float. Finally, increasing the liability dollarization ratio from zero to twice the money base raises the preference for a peg among developing economies by roughly 10%, and reduces it by about 10% in developed ones.

Finally, regarding political variables, tenure in office appears to be more relevant among non-industrials (it increases the probability of choosing a peg throughout the initial twenty years), while the number of veto points has a sizable effect for industrials (close to a 60% variation over the whole range).

Alternative regime classifications

Reinhart and Rogoff (2004; RR) build an alternative de facto classification based on the "verification" of the de jure regime, reclassifying the regimes where the exchange rate behavior does not match what is expected from the stated policy. Compared with the LYS classification used here, RR offers the advantage that it corrects for multiple exchange rates, a practice that, while common among developing countries until the early 1970s, diminished steadily to less than 10 percent of cases during the post-Bretton Woods period. However, it is silent about the degree of exchange rate intervention, an aspect that is essential to characterize exchange rate policy, particularly when it comes to regime choice, to the extent that this choice is likely to depend critically on the policy constraints imposed by each regime.[35]

It is reassuring to see that our findings are broadly preserved when we rerun our baseline specification using RR (Table 7). For the sake of comparison, the sample used in the regressions includes only those observations that are also classified under the LYS methodology (the first four columns reproduce the results using LYS).[36] As can be seen, the results for non-industrial countries are comparable, providing strong support for the OCA, the currency mismatch and the sustainability hypotheses. The results are also similar for industrials countries, with the exception of financial linkages variables that appear as stronger determinants of flexible regimes.

While we have been mostly concerned with the determinants of actual exchange rate policies as reflected in de facto regimes, it is interesting to examine how the determinants identified above influence the choice of de jure arrangements. With this view, Table 7b

[35] For example, due to the presence of multiple exchange rates, RR classify as intermediates or floats about 250 observations (or 7.5% of their database) for which the official exchange rate does not move, despite the fact that these cases display an average monthly exchange rate intervention of 4% of the monetary base, indicating that the objective of keeping the official rate constant was an effective policy constraint.

[36] Note that, while RR goes farther back in time than LYS, sample coverage is not an issue for the post-Bretton Woods period studied in this paper, for which the number of classified cases is virtually the same: 4220 under LYS and 4395 under RR.

presents the baseline estimation using the IMF-based de jure classification.[37] Once again, the results compare surprisingly well with those for the de facto classification. The results for non-industrial countries provide evidence in favor of OCA and for the currency mismatch hypotheses. However, it delivers contradictory results for the political variables. For industrial countries the de jure classification finds an effect of balance sheet exposure and provides support for the impossible trinity hypothesis.

In sum, our main findings are robust to the classification criteria, confirming the overall relevance of the OCA approach, the support for the impossible trinity view in the case of industrial countries, and the incidence of currency mismatch considerations as an incentive to peg in non-industrial countries. Additionally, our findings are consistent with the view that countries with poor institutional quality tend to resort to pegs as policy crutches, subject to the constraints imposed by their political ability to sustain them.

Robustness

While most of the key explanatory variables that we used can be reasonably assumed to be exogenous to the regime decision, not all are free from reverse causality concerns. For example, a peg, by reducing bilateral exchange rate volatility, may foster trade with other users of the peg currency and, in turn, may increase openness.[38] Financial depth has also been associated to exchange rate regimes, as a fixed exchange rate reduces exchange rate volatility, stimulating capital flows.[39] Others have argued that a peg, by creating the perception of an implicit exchange rate guarantee, fosters financial dollarization. In all

[37] The data on de jure regimes is taken from Ghosh et al (2003).

[38] This point is made forcefully in Frankel and Rose (1997). See, among others, Rose and Van Wincoop (2001) and Micco, Stein and Ordonez (2003).

[39] Hausmann et al (2000). See also Von Hagen and Zhou (2008) for an analysis of the two-way causality between exchange rate regimes and financial openness and integration.

three cases, the reverse link, from regime choice to openness, portfolio flows and liability dollarization, has the same positive sign as the one discussed above; hence, the potential endogeneity cannot be easily dismissed.

While in previous tests we used lagged values to attenuate the potential endogeneity, here we approach the problem more directly. We replicate the baseline specification (columns i and ii of Table 6) using initial values for openness and liability dollarization (these variables are identified with an *i* at the end), as well as the average of portfolio flows over the previous five years (*Portfolio5*), all variables that, as noted, may be affected by reverse causality. The results are reported in Table 8: the coefficients on initial values all have the same sign as those obtained in Table 6, and in most cases are similar in size.

Correcting for endogeneity by replacing the variables with their initial values may be a highly imperfect way of dealing with the problem, particularly if some variables show country-specific or global trends that may alter them significantly over long periods of time, rendering the initial value relatively uninformative. This may be the case for financial variables such as liability dollarization and portfolio flows. To address this shortcoming, we resort to instrumental variable (IV) estimation for the portfolio flows and dollarization variables. Standard econometric packages do not carry a routine for IV estimation in logit models; thus, for proper computation of standard errors we used a bootstrapping technique. Specifically, we replicate the equation for the prediction of the endogenous variables 1000 times by bootstrapping the errors. We then replaced the instrumented variables in the exchange rate regime equation, which gave us a set of 1000 coefficients for each variable from which consistent estimators of the standard errors could be obtained. We used these standard errors to test hypotheses in the original specification.

As predictors of portfolio flows we use income per capita (strongly correlated with portfolio flows, with higher income countries showing much larger degrees of financial integration) and the overnight LIBOR, based on the evidence that lower rates in industrial countries tend to foster capital flows, particularly towards developing countries.[40] For liability dollarization, we use its first lag, as well as Kauffman et al.'s (2002) Rule of Law index (ROL, averaged for each country), under the assumption that higher contractual risk tends to induce more rigid contracts (of which dollarization is one common example).[41] The results, reported in columns (v) and (vi), confirm our previous findings.

One additional source of concern is the omission of relevant variables that may be correlated with (and spuriously captured by) the included regressors. The most general way to control for (country-specific, time-invariant) omitted variables is through the use of country fixed effects. Unfortunately, the introduction of fixed effects suffers in our case from an important drawback. By restricting information to within-country variability, it limits the scope of the exercise as some of the hypotheses tested here (most notable, OCA) involve slow moving variables. With this caveat in mind, we report the estimates from a fixed effect estimation of the baseline specification. As can be seen, most results remain unchanged.

Global Trends and sensitivity analysis

Our empirical specification also allows us to test the presence of global trends in the choice of exchange rate regimes beyond and above those driven by the evolution of their underlying determinants. These trends can be recovered from the coefficients of the year

[40] On this, see, for example Calvo et al. (1992).

[41] De Nicoló et al. (2003) and Rajan (2004) provide empirical evidence along these lines. It has to be noted, however, that we implicitly assume ROL remains relatively stable over time, since the variable is available only since 1996.

dummies in any of the previous regressions. The value of these dummies can be interpreted as the impact of common global trends not captured by the fundamentals included in the specification as well as a bias reflecting the preferences of policy makers as a result of the evolving economic debate (or, possibly, transitory fads).

Figure 2 shows the difference in the change in the probability of choosing a peg associated to each year dummy in the baseline specification evaluated at the mean values of the remaining controls. In short, these values indicate by how much the probability of choosing a peg was affected by factors beyond those captured by our fundamentals. For comparison, we replicate the exercise using the de jure regime classification.

As can be seen, year dummies obtained from de facto regimes do not display any significant trend or systematic bias over the last twenty years (i.e. since the mid eighties). On the other hand, de jure regimes display a strong pro-fix bias that decreases steadily throughout the period. Initially countries exhibited a probability of choosing a peg that was almost 50% higher than warranted by fundamentals. By the end of the period this bias had fallen to 5%. These findings may be a reflection of the Bretton Woods inheritance: a prevalence of de jure pegs that were not justified by fundamentals –and, possibly because of this, plagued by frequent realignments or sudden collapses.

If so, the results may be indicating that a welcome influence of the intellectual debate on exchange rate policies (and perhaps the only one) lies in the increasing reluctance to embrace explicit exchange rate commitments when underlying fundamentals and sustainability concerns recommend otherwise. By contrast, it appears that the way in which de facto regimes relate to underlying fundamentals has remained relatively stable

despite the heated discussions and frequent changes of heart that have characterized the exchange rate debate.

IV. Conclusions

The evidence presented in this paper indicates that the positive choice of exchange rate regimes can be traced back to a group of geographical, financial and political variables in line with the existing normative theories of regime determination highlighted by the economic literature. While the relevance of these theories naturally depends on the particular characteristics of individual countries, our tests reveal some general patterns. More precisely, we find that, while OCA considerations affect similarly industrial and non-industrial countries, the influence of financial linkages differs across the two groups: whereas the impossibly trinity view prevails for the former, currency mismatch concerns appear to dominate in the case of the latter. Similarly, institutional quality and sustainability aspects appear to play a substantive role only in the case of non-industrials economies.

To the extent that the underpinnings of the choice of exchange rate regimes has not changed in a visible way over the last two decades, one can also conclude that, far from the fireworks of the occasional academic fads, policy makers that have to choose actual exchange rate arrangements continue to balance the few simple tradeoffs suggested by the optimal currency area, the need to gain credibility and the effects of financial integration.

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Table 1. OCA Theory

		Full Sample		Non-Ind.		Ind.	
	Expected Sign	I	ii	iii	iv	v	vi
Size1	+	0.448***	0.242***	0.604***	0.452***	0.650***	0.395***
		(0.027)	(0.025)	(0.040)	(0.037)	(0.146)	(0.109)
Openness1	-	-3.705***	-2.936***	-2.714***	-2.689***	-14.725***	-0.947
		(0.353)	(0.331)	(0.355)	(0.353)	(2.094)	(1.305)
TOTshocks	+	3.699***	3.727***	1.736	2.268*	37.000***	-12.148
		(1.262)	(1.164)	(1.333)	(1.240)	(10.204)	(9.524)
Observations		2941		2351		590	
Pseudo R^2		0.140		0.162		0.327	

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a de facto flexible exchange rate regime, 2 if intermediate and 3 if fixed. Estimations from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted *X*1. Robust standard errors in parentheses. Significantly different from zero at the 90%(*), 95%(**) and 99%(***) confidence level.

Table 2. The Financial View – Correlations

	KAOpen	Portfolio	FinDev	CumLoans	FLM
KAOpen	1				
Portfolio	0.4424†	1			
FinDev	0.4136†	0.2591†	1		
CumLoans	0.3436†	0.3462†	0.0741†	1	
FLM	0.0397‡	0.054†	0.0709†	0.5355†	1

Partial correlations between different measures of financial linkages. Significantly different than zero at 95%(‡) and 99%(†) .

Table 3. The Financial View

	Expected Sign		Full Sample		Non-Ind.		Ind.	
	Impossible Trinity	Currency Mismatch	i	ii	iii	iv	v	vi
KAOpen1	+	-	-0.047	-0.168***	-0.163***	-0.098**	0.824***	-0.272
			(0.045)	(0.046)	(0.049)	(0.048)	(0.199)	(0.208)
Portfolio1	+	-	-15.498***	-10.959***	-9.022***	-12.013***	-18.758*	-1.924
			(3.022)	(2.808)	(2.334)	(3.051)	(11.007)	(1.383)
FinDev1	+	-	-0.175	-1.373***	-0.152	-1.019***		
			(0.182)	(0.197)	(0.227)	(0.259)		
FLM1		-	-0.719***	-0.032**	-0.289**	-0.042**	-1.885***	0.341
			(0.156)	(0.014)	(0.144)	(0.018)	(0.564)	(0.230)
Size1	+	+	0.639***	0.532***	0.543***	0.543***	1.100***	0.805***
			(0.041)	(0.039)	(0.043)	(0.042)	(0.146)	(0.164)
Obs.			2413		1945		468	
Pseudo R^2			0.158		0.125		0.442	

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a de facto flexible exchange rate regime, 2 if intermediate and 3 if fixed. Estimations from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted X1. Robust standard errors in parentheses. Significantly different from zero at the 90%(*), 95%(**) and 99%(***) confidence level.

Table 4. The Political View - Correlations

	Herfindahl	Years inOffice	VetoPoints	LegComp	OperationsRisk	CPIA
Herfindahl	1					
Years inOffice	0.3025†	1				
VetoPoints	-0.511†	-0.376†	1			
LegComp	-0.59†	-0.187†	0.6663†	1		
OperationsRisk	-0.217†	-0.105†	0.457†	0.3255†	1	
CPIA	-0.156†	0.079†	0.306†	0.2409†	0.4693†	1

Partial correlations between different political variables. Significantly different than zero at 95%(‡) and 99%(†) . Herfindahl and Years in Office measure political strength, while VetoPoints and LegComp capture political weakness.

Table 5. The Political View

	Expected Sign		Full Sample		Non-Ind.		Ind.	
	Policy crutch	Sustainability	i	ii	iii	iv	v	vi
CPIA1	+				0.513***	0.121		
					(0.079)	(0.081)		
YearsinOffice	+	-	-0.099***	-0.126***	-0.122***	-0.087***	-0.135	-0.364*
			(0.020)	(0.019)	(0.024)	(0.022)	(0.104)	(0.193)
YearsinOffice²	-	+	0.002***	0.003***	0.003***	0.002***	0.016**	0.022
			(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.020)
VetoPoints1	-	+	0.284***	0.122***	0.182***	0.155***	0.085	0.036
			(0.024)	(0.022)	(0.034)	(0.032)	(0.197)	(0.257)
Observations			3374		2168		599	
Pseudo R²			0.0783		0.0931		0.0838	

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a de facto flexible exchange rate regime, 2 if intermediate and 3 if fixed. Estimations from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted X1. Robust standard errors in parentheses. Significantly different from zero at the 90%(*), 95%(**) and 99%(***) confidence level. CPIA captures institutional quality, YearsinOffice political strength and VetoPoints political weakness.

Table 5b

			Adopting a Peg†	
	Expected Sign		lys	imf
	Policy crutch	Sustainability	i	ii
YearsinOffice	-	+	0.140***	-0.081**
			(0.033)	(0.031)
YearsinOffice²	+	-	-0.003***	0.003***
			(0.001)	(0.001)
VetoPoints1	+	-	-0.048	-0.193***
			(0.038)	(0.035)
High250	+	-	-0.225	0.684**
			(0.465)	(0.345)
Observations			1308	1132
Pseudo R²			0.0697	0.0932

The dependent variable is propensity to peg, a dummy variable that takes the value 1 if a country is classified as a de facto fixed exchange rate regime. All regressions include year dummies. Lagged values of variable X are denoted X1. Robust standard errors in parentheses. Significantly different than zero at the 90 %(*), 95 %(**) and 99 %(***) confidence level. †The sample includes countries that are classified as non-pegs in the previous year.

Table 6. Baseline Specification

	Full Sample		Non-Ind.		Ind.	
	Float	Int	Float	Int	Float	Int
	i	ii	iii	iv	v	vi
Size1	0.647***	0.517***	0.601***	0.681***	0.998***	0.999***
	(0.055)	(0.055)	(0.072)	(0.070)	(0.228)	(0.203)
Openness1	-1.924***	-1.155**	-1.924***	-1.120**	-19.964***	-4.210*
	(0.532)	(0.474)	(0.623)	(0.561)	(4.379)	(2.550)
TOTshocks	1.900	1.779	2.296	2.619	56.971***	11.826
	(1.481)	(1.484)	(1.925)	(1.936)	(17.705)	(14.847)
KAOpen1	-0.111**	-0.201***	-0.141**	-0.011	0.770***	-0.363
	(0.053)	(0.053)	(0.069)	(0.066)	(0.298)	(0.235)
Portfolio1	-17.986***	-14.274***	-14.033***	-20.875***	-17.798	-2.265
	(3.846)	(4.659)	(4.147)	(5.767)	(13.168)	(1.683)
FinDev1	-0.880***	-1.900***	-0.251	-1.404***		
	(0.219)	(0.241)	(0.288)	(0.336)		
FLM1	-0.783***	-0.046	-0.411**	-0.074**	-0.913	0.547**
	(0.175)	(0.030)	(0.194)	(0.034)	(0.744)	(0.254)
CPIA			0.553***	-0.047		
			(0.129)	(0.116)		
YearsinOffice	-0.067**	-0.117***	-0.116***	-0.111***	0.155	-0.298
	(0.028)	(0.024)	(0.032)	(0.028)	(0.219)	(0.225)
YearsinOffice^2	0.002*	0.003***	0.003***	0.002***	-0.004	0.019
	(0.001)	(0.001)	(0.001)	(0.001)	(0.015)	(0.018)
VetoPoints1	0.317***	0.180***	0.223***	0.171***	1.540***	1.349***
	(0.042)	(0.036)	(0.047)	(0.041)	(0.420)	(0.388)
Observations	2028		1392		452	
Pseudo R^2	0.203		0.193		0.500	
Joint test†						
OCA	208.40***	124.21***	102.43***	119.09***	80.88***	35.88***
Financial	112.46***	129.61***	24.93***	49.19***	7.41*	5.49
Political	121.18***	97.74***	78.28***	69.54***	27.25***	14.47***

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a de facto flexible exchange rate regime, 2 if intermediate and 3 if fixed. Estimations from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted X1. Robust standard errors in parentheses. Significantly different from zero at the 90%(*), 95%(**) and 99%(***) confidence level. †Reports the χ^2 corresponding to the Wald test of the variables associated with each group of explanations.

Table 7. Alternative Regime Classifications

	LYS				RR			
	Non-Ind.		Ind.		Non-Ind.		Ind.	
	Float	Int	Float	Int	Float	Int	Float	Int
	i	ii	iii	iv	v	vi	vii	viii
Size1	0.571***	0.546***	0.998***	0.999***	0.571***	0.638***	-0.940***	-0.456***
	(0.062)	(0.062)	(0.228)	(0.203)	(0.084)	(0.066)	(0.310)	(0.126)
Openness1	-1.343**	-1.255**	-19.964***	-4.210*	-4.644***	-1.065*	-44.421***	-9.553***
	(0.526)	(0.498)	(4.379)	(2.550)	(1.102)	(0.575)	(7.397)	(2.115)
TOTshocks	0.570	0.976	56.971***	11.826	5.223**	3.498*	62.476**	20.026*
	(1.523)	(1.545)	(17.705)	(14.847)	(2.392)	(2.035)	(26.022)	(10.806)
KAOpen1	-0.157***	-0.089	0.770***	-0.363	-0.345***	-0.123**	1.639***	-0.153
	(0.060)	(0.058)	(0.298)	(0.235)	(0.096)	(0.058)	(0.543)	(0.172)
Portfolio1	-11.254***	-20.951***	-17.798	-2.265	-5.005	-8.821***	-14.162***	-5.439
	(3.236)	(5.005)	(13.168)	(1.683)	(3.129)	(3.359)	(5.247)	(4.305)
FinDev1	-0.180	-1.075***			-0.391	-0.995***		
	(0.269)	(0.317)			(0.383)	(0.298)		
FLM1	-0.315**	-0.059*	-0.913	0.547**	-0.091	-0.283***	-3.322***	-0.175
	(0.151)	(0.031)	(0.744)	(0.254)	(0.092)	(0.095)	(0.719)	(0.221)
YearsinOffice	-0.104***	-0.120***	0.155	-0.298	-0.102***	0.059**	0.327	0.351**
	(0.030)	(0.027)	(0.219)	(0.225)	(0.039)	(0.025)	(0.285)	(0.172)
YearsinOffice^2	0.003***	0.003***	-0.004	0.019	0.002	-0.002**	-0.009	-0.033**
	(0.001)	(0.001)	(0.015)	(0.018)	(0.001)	(0.001)	(0.019)	(0.015)
VetoPoints1	0.287***	0.194***	1.540***	1.349***	0.264***	0.390***	13.539***	0.865***
	(0.044)	(0.038)	(0.420)	(0.388)	(0.057)	(0.039)	(0.985)	(0.282)
Observations	1576		452		1448		452	
Pseudo R^2	0.185		0.500		0.216		0.491	
Joint test†								
OCA	102.43***	119.09***	80.88***	35.88***	93.82***	108.39***	41.93***	28.58***
Financial	24.93***	49.19***	7.41*	5.49	22.77***	42.22***	22.92***	4.37
Political	78.28***	69.54***	27.25***	14.47***	61.40***	116.10***	210.98***	13.89***

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a flexible exchange rate regime, 2 if intermediate and 3 if fixed. LYS reflects the Levy Yeyati and Sturzenegger (2003, 2005) classification and RR reflects the Reinhart and Rogoff (2004) one. Estimations from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted X1. Robust standard errors in parentheses. Significantly different from zero at the 90%(*), 95%(**) and 99%(***) confidence level. †Reports the χ^2 corresponding to the Wald test of the variables associated with each group of explanations.

Table 7b. The De Jure Classification

	LYS				IMF			
	NON-IND.		IND.		NON-IND.		IND.	
	FLOAT	INT	FLOAT	INT	FLOAT	INT	FLOAT	INT
	I	II	III	IV	V	VI	VII	VIII
Size1	0.571***	0.546***	0.998***	0.999***	0.247***	0.753***	0.003	0.868***
	(0.062)	(0.062)	(0.228)	(0.203)	(0.067)	(0.060)	(0.183)	(0.165)
Openness1	-1.343**	-1.255**	-19.964***	-4.210*	-3.599***	-1.457***	-18.544***	7.170***
	(0.526)	(0.498)	(4.379)	(2.550)	(0.660)	(0.547)	(3.735)	(2.691)
TOTshocks	0.570	0.976	56.971***	11.826	3.752	1.351	32.720*	48.050***
	(1.523)	(1.545)	(17.705)	(14.847)	(2.436)	(2.279)	(16.936)	(14.154)
KAOpen1	-0.157***	-0.089	0.770***	-0.363	-0.003	-0.029	1.600***	-0.294*
	(0.060)	(0.058)	(0.298)	(0.235)	(0.068)	(0.059)	(0.279)	(0.168)
Portfolio1	-11.254***	-20.951***	-17.798	-2.265	-7.117	-20.983***	-5.550	-2.264
	(3.236)	(5.005)	(13.168)	(1.683)	(5.079)	(4.973)	(6.792)	(1.943)
FinDev1	-0.180	-1.075***			0.392	-1.298***		
	(0.269)	(0.317)			(0.302)	(0.325)		
FLM1	-0.315**	-0.059*	-0.913	0.547**	-0.418**	-0.707***	0.305	-1.086***
	(0.151)	(0.031)	(0.744)	(0.254)	(0.203)	(0.208)	(0.244)	(0.254)
YearsinOffice	-0.104***	-0.120***	0.155	-0.298	0.013	0.019	0.307	-0.410*
	(0.030)	(0.027)	(0.219)	(0.225)	(0.042)	(0.030)	(0.256)	(0.231)
YearsinOffice^2	0.003***	0.003***	-0.004	0.019	-0.002	-0.002**	-0.032	0.038*
	(0.001)	(0.001)	(0.015)	(0.018)	(0.002)	(0.001)	(0.024)	(0.021)
VetoPoints1	0.287***	0.194***	1.540***	1.349***	0.188***	0.246***	0.770	-0.804**
	(0.044)	(0.038)	(0.420)	(0.388)	(0.047)	(0.040)	(0.894)	(0.324)
Observations	1576	1576	452	452	1536	1536	446	446
Pseudo R^2	0.185		0.500		0.249		0.514	
Joint test†								
OCA	102.43***	119.09***	80.88***	35.88***	49.88***	195.05***	39.81***	39.98***
Financial	24.93***	49.19***	7.41*	5.49	7.07*	31.08***	33.23***	30.43***
Political	78.28***	69.54***	27.25***	14.47***	47.29***	92.65***	2.56	8.60**

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a flexible exchange rate regime, 2 if intermediate and 3 if fixed. LYS reflects the Levy Yeyati and Sturzenegger (2003, 2005) classification and IMF the de jure one. Estimations from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted X1. Robust standard errors in parentheses. Significantly different from zero at the 90%(*), 95%(**) and 99%(***) confidence level.

†Reports the χ^2 corresponding to the Wald test of the variables associated with each group of explanations

Table 8. Additional Robustness Checks

	Initial Values		Fixed Effects		IV†	
	Float i	Int ii	Float iii	Int iv	Float v	Int vi
Size1	0.506***	0.427***	0.664***	0.537***	0.743***	0.616***
	(0.051)	(0.050)	(0.067)	(0.067)	(0.066)	(0.069)
Openness1			-1.977***	-1.318*	-0.482	0.505
			(0.676)	(0.679)	(0.708)	(0.718)
Opennessi	-4.332***	-2.531***				
	(0.595)	(0.521)				
TOTShocks	2.724*	2.864*	1.983	1.806	3.598*	3.762*
	(1.631)	(1.624)	(2.093)	(2.091)	(2.269)	(2.388)
KaOpen1	-0.155***	-0.206***	-0.232***	-0.325***	-0.105**	-0.178***
	(0.052)	(0.053)	(0.069)	(0.071)	(0.063)	(0.065)
Portfolio1			-17.579***	-16.377***	-21.302***	-23.996***
			(3.142)	(3.459)	(4.803)	(6.864)
Portfolio5	-20.155***	-11.257**				
	(5.085)	(5.690)				
FinDev1	-0.656***	-1.731***	-0.008	-0.929***	-0.827***	-1.757***
	(0.215)	(0.242)	(0.267)	(0.285)	(0.233)	(0.243)
FLM1			-0.867***	-0.178	-0.697***	-0.061***
			(0.187)	(0.154)	(0.246)	(0.027)
FLMi	-0.413**	-0.016				
	(0.168)	(0.019)				
YearsinOffice	-0.049*	-0.106***	-0.075**	-0.113***	-0.064***	-0.118***
	(0.025)	(0.024)	(0.032)	(0.031)	(0.031)	(0.029)
YearsinOffice ^{2}	0.001*	0.002***	0.002**	0.002***	0.001*	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
VetoPoints 1	0.321***	0.179***	0.447***	0.305***	0.323***	0.18***
	(0.040)	(0.036)	(0.055)	(0.052)	(0.047)	(0.04)
Observations	2185		2028			
Pseudo R^2	0.196					

The dependent variable is a categorical variable that takes the value 1 if a country is classified as a flexible exchange rate regime, 2 if intermediate and 3 if fixed. The estimations come from a multinomial logit where the baseline category is the fixed regime. All regressions include year dummies. Lagged values of variable X are denoted *X*1. Initial values of variable *X* are denoted *X*i. Robust standard errors in parentheses. †IV: instruments for Portfolio1: Libor and per capita GDP in USD; instruments for FLM1: Rule of Law and lagged value of FLM1 (FLM2). Significantly different than zero at the 90%(*), 95%(**) and 99%(***) confidence level.

Figure 1

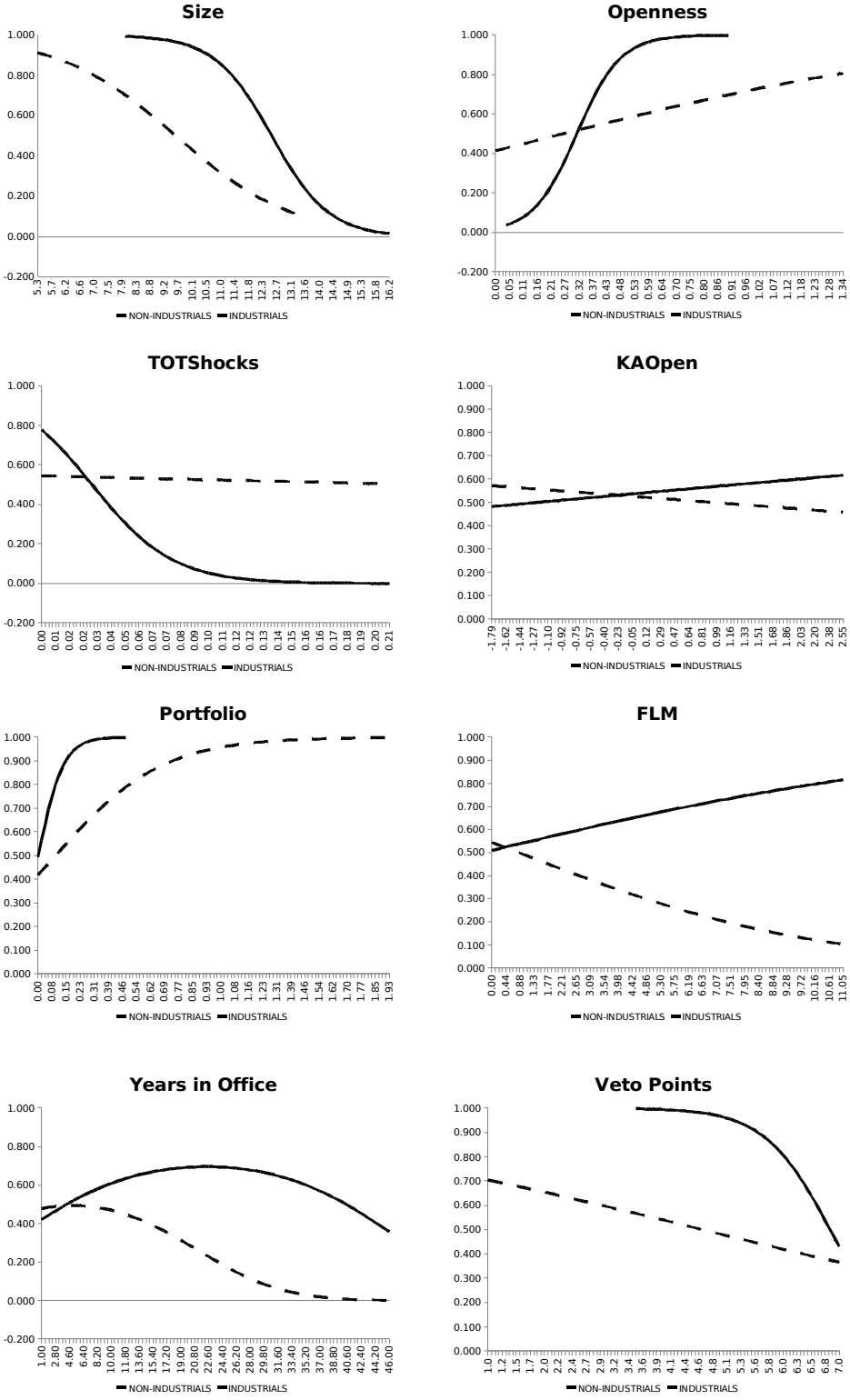
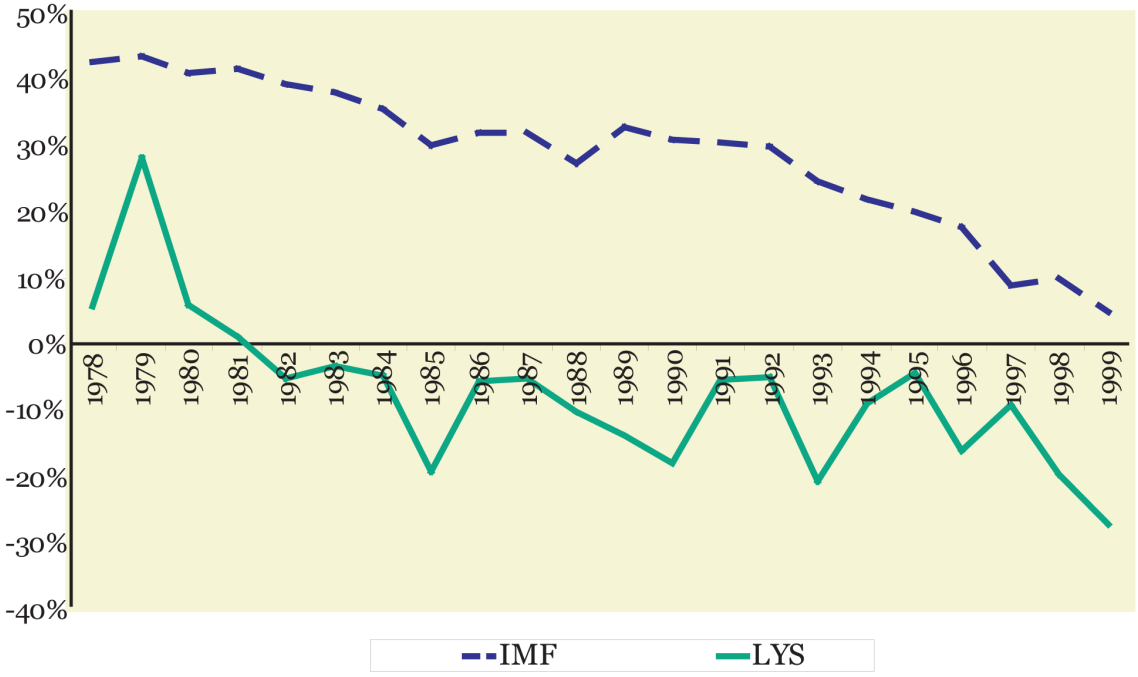

Size
Openness
TOTShocks
KAOpen
Portfolio
FLM
Years in Office
Veto Points
NON-INDUSTRIALS
INDUSTRIALS

Figure 2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APPENDIX 1

List of countries (183)

Industrials	BAHRAIN	EQUATORIAL GUINEA	MALAWI	SEYCHELLES
AUSTRALIA	BANGLADESH	ESTONIA	MALAYSIA	SIERRA LEONE
AUSTRIA	BARBADOS	ETHIOPIA	MALDIVES	SINGAPORE
BELGIUM	BELARUS	FIJI	MALI	SLOVAK REPUBLIC
CANADA	BELIZE	GABON	MALTA	SLOVENIA
DENMARK	BENIN	GAMBIA, THE	MARSHALL ISLANDS	SOLOMON ISLANDS
FINLAND	BHUTAN	GEORGIA	MAURITANIA	SOMALIA
FRANCE	BOLIVIA	GHANA	MAURITIUS	SOUTH AFRICA
GERMANY	BOSNIA AND HERZEGOVINA	GRENADA	MEXICO	SRI LANKA
GREECE	BOTSWANA	GUATEMALA	MICRONESIA, FED.STS.	ST. KITTS AND NEVIS
ICELAND	BRAZIL	GUINEA	MOLDOVA	ST. LUCIA
IRELAND	BRUNEI DARUSSALAM	GUINEA-BISSAU	MONGOLIA	ST. VINCENT & GRENS.
ITALY	BULGARIA	GUYANA	MOROCCO	SUDAN
JAPAN	BURKINA FASO	HAITI	MOZAMBIQUE	SURINAME
LUXEMBOURG	BURUNDI	HONDURAS	MYANMAR	SWAZILAND
NETHERLANDS	CAMBODIA	HUNGARY	NAMIBIA	SYRIAN ARAB REPUBLIC
NEW ZEALAND	CAMEROON	INDIA	NEPAL	TAJIKISTAN
NORWAY	CAPE VERDE	INDONESIA	NETHERLANDS ANTILLES	TANZANIA
PORTUGAL	CENTRAL AFRICAN REP.	IRAN, I.R. OF	NICARAGUA	THAILAND
SAN MARINO	COLOMBIA	IRAQ	NIGER	TOGO
SPAIN	COMOROS	ISRAEL	NIGERIA	TONGA
SWEDEN	CONGO, DEM. REP. OF	JAMAICA	OMAN	TRINIDAD AND TOBAGO
SWITZERLAND	CONGO, REPUBLIC OF	JORDAN	PAKISTAN	TUNISIA
UNITED KINGDOM	COSTA RICA	KAZAKHSTAN	PALAU	TURKEY
UNITED STATES	COTE D IVOIRE	KENYA	PANAMA	TURKMENISTAN
	CROATIA	KIRIBATI	PAPUA NEW GUINEA	UGANDA
	CYPRUS	KOREA	PARAGUAY	UKRAINE
Non-Industrials	CZECH REPUBLIC	KUWAIT	PERU	UNITED ARAB EMIRATES
AFGHANISTAN, I.S. OF	CHAD	KYRGYZ REPUBLIC	PHILIPPINES	URUGUAY
ALBANIA	CHILE	LAO PEOPLE'S DEM.REP	POLAND	VANUATU
ALGERIA	CHINA,P.R.: MAINLAND	LATVIA	QATAR	VENEZUELA, REP. BOL.
ANGOLA	CHINA,P.R.:HONG KONG	LEBANON	ROMANIA	VIETNAM
ANTIGUA AND BARBUDA	DJIBOUTI	LESOTHO	RUSSIA	YEMEN, REPUBLIC OF
ARGENTINA	DOMINICA	LIBERIA	RWANDA	ZAMBIA
ARMENIA	DOMINICAN REPUBLIC	LIBYA	SAMOA	ZIMBABWE
ARUBA	ECUADOR	LITHUANIA	SAO TOME & PRINCIPE	
AZERBAIJAN	EGYPT	MACEDONIA, FYR	SAUDI ARABIA	
BAHAMAS, THE	EL SALVADOR	MADAGASCAR	SENEGAL	

APPENDIX 2

Variables	Definitions and Sources
Size	Logarithm of GDP in dollars. (Source: World Economic Outlook-IMF).
Openness	Ratio of [export + import]/2 to GDP (Source: IFS (line 90c+line 98c)/2/ line 99b).
TradeConc	Geographical concentration of trade, the share of exports to the reference currency country multiplied by openness. (Source: Direction of Trade Statistics- IMF).
TOTShocks	Standard deviation of the logarithm of terms of trade over the previous five years adjusted by average openness in the 5 previous years. (Source: WDI Series Code: NY.EXP.CAPM.KN).
KAOpen	Measure of capital openness provided by Chinn and Ito (2007), based in four binary dummy variables reported in the IMF´s Annual Report on Exchange Rates and Exchange Restrictions with a higher number indicating capital account liberalization.
Portfolio	Sum of the absolute value of inward and outward flows of portfolio investments and financial derivatives as a ratio of GDP. (Source: IFS.(|line 78bfd|+|line 78bgd|+|line 78bwd|+|line 78bxd|) /GDP).
FinDev	Dummy indicating that the country made it into the EMBI global Index or belongs to industrial group.
CumLoans	Sum of cumulative flows of portfolio debt assets, other assets and net errors and omissions. (Source:External Wealth of Nations Data Set).
FLM	Ratio of Foreign Liabilities to Money. (Source: IFS line 26C/ (line 14 + line 24).
Herfindahl	The sum of the squared seat shares of all parties in the government. (Source: Database of Political Institutions 2006, Thorsten et al. (2001)).
YearsinOffice	Years the incumbent administration has been in office. (Source: Database of Political Institutions 2006, Thorsten et al. (2001)).
VetoPoints	Variable referred to the extent of institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities. (Polcon_2005 Database).
LegComp	Legislative index of electoral competitiveness. (Source: World Bank´s Database of Political Institutions 2006, Thorsten et al. (2001)).
OperationsRisk	Survey to gauge the operations climate for foreign businesses, a higher value indicating a better environment. (Source: Business Environment Risk Intelligence S.A.).
CPIA	World Bank´s Country Policy and Institutional Assessment Rating System. This measure is composed of 20 different components covering macroeconomic and sectoral policies, as well as issues such as the rule of law and corruption. Each of the twenty components is rated by country specialists, on a scale of 1-6, using standardized criteria.
Inflation	Logarithm of one plus the annual percentage change in Consumer Price Index. (Source: IFS line 64)
High250	Dummy variable for High Inflation. (Inflation greater than 250% in the previous year).
Variable1	Lagged value of Variable
Variablei	Initial value of Variable
Dependent Variables	Categorical Variable LYS (Levy-Yeyati, Eduardo and Federico Sturzenegger, 2005) Categorical Variable RR (Reinhart, Carmen and Kenneth Rogoff, 2004) Categorical Variable IMF (Ghosh, Atish; Gulde, Anne-Marie and Wolf Holger, 2003)

Summary statistics (baseline sample)

Variable	Observations	Mean	Std. Dev.	Min	Max
Size	2028	10.066	2.107	5.318	16.210
Openness	2028	0.349	0.185	0.000	1.337
TOTShocks	2028	0.051	0.052	0.002	0.878
KAOpen	2028	0.210	1.524	-1.810	2.530
Portfolio	2028	0.026	0.099	0.000	1.928
FinDev	2028	0.308	0.462	0	1
FLM	2028	0.816	4.270	-0.047	81.589
YearsinOffice	2028	6.979	7.525	1	46
VetoPoints	2028	4.716	2.352	1	7
CPIA	1392	3.225	0.746	0	5.075