SAY YOU FIX, ENJOY AND RELAX

THE DELETERIOUS EFFECT OF PEG ANNOUNCEMENTS ON FISCAL DISCIPLINE

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BANCO DE **ESPAÑA**

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Abstract

This paper explores the impact of actual exchange rate regimes on fiscal discipline, which we purportedly link to the effect of announcing the peg and to the availability of external funds. To stress this point, the focus of the analysis is emerging markets spanning from the beginning of the nineties, given the importance of financial integration in the last fifteen years and the centrality of external financing for these countries. We empirically show that announcing the pegs has deleterious effects on fiscal discipline, while 'de facto' pegs which have not been announced deliver superior fiscal outcomes. The evidence suggests that this is due to the initial positive credibility shock of the announcement, which allows for easier and less costly access to the financing of fiscal deficits in emerging countries.

1 Introduction

The financial history of emerging markets in the last fifteen years has been characterized by the ebb and flow of capital flows in a period of financial liberalization. Their exponential growth in the first part of the nineties, in a context of high global liquidity, allowed for a period of high and robust growth. When the flows reversed in the second half of the nineties, a series of financial crises ensued, bringing havoc to many of these economies. It is not surprising, then, that the choice of exchange rate regimes in emerging economies at that time was, in one way or other, closely related to the process of financial liberalization and access to the global supply of funds. Two cases stand out. In Asia, the outward oriented growth strategy implied –and still implies– a close, although not overtly declared, management of exchange rates which kept competitiveness high in spite of the upward pressure that capital inflows imposed on the exchange rates. In Latin America, where the recent history had made external financing hardly available and credibility was lacking, explicitly fixing the exchange rate became the cornerstone of the stabilization and reform programs setup in the aftermath of the 'lost decade' of the eighties.

The importance of financial integration and its effects over the effective discipline imposed by pegs was probably overlooked in some analysis of the benefits of fixed arrangements at the beginning of the nineties. This is especially true in the fiscal front. By cutting off the inflationary financing of the deficit, pegs were expected to induce higher fiscal discipline. However, the expected positive impact of rigid exchange rate regimeson fiscal discipline has proven ellusive in the data. Ghosh, Gulde and Wolf (2003) sum up the empirical evidence concluding that "[...] greater monetary discipline does not translate into fiscal discipline: Countries on pegged regimes ran larger fiscal deficits". Alberola and Molina (2003) arrive at similar conclusions, also when taking into account the effect of missing seignioriage in the analysis.

In this context, the aim of this paper is to address some of the deficiencies in the previous literature about the effects of exchange rate regimes on fiscal discipline, by advancing in two directions: first, we develop and test a rational to explain why certain exchange rate pegs may erode fiscal discipline; second, since the test of this hypothesis requires a careful consideration of actual exchange rate configurations, we take advantage of the progress made in classification of exchange rate regimes in the last years. The main focus of the analysis is emerging markets spanning from the beginning of the nineties, given the importance of capital liberalization and financial integration in the last fifteen years and the centrality of external financing for these countries.

The *actual* exchange rate behaviour and the interaction of public commitments and credibility is particularly relevant in our approach. Even after the demise of the majority of explicit ('de iure') fixed or intermediate exchange rates regime in the second half of the nineties, there has been an interest by the authorities to keep stable exchange rates, in the form of implicit or non-announced pegs. This preference for exchange rate pegs is a remarkable feature of emerging economies which has received increasing attention by the literature [Calvo and Reinhart (2002)]. The policy goal of keeping stable exchange rates through implicit pegs, or 'fear of floating' is explained by competitiveness concerns, the existence of liability dollarization and the need to avoid excessive volatility of interest rates, combined with the lack of credibility of the authorities, which find it difficult in the long run to

commit to and defend an announced peg. On the other hand, the frequency of exchange rate crisis implies that some pegging countries have behaved rather as floating regimes. Both phenomena create scope for significant differences between a country's legal ('de iure') exchange regime and the actual ('de facto') behaviour of exchange rates.

Therefore, a general caveat in many analyses of the economic impact of exchange rate regimes on economic variables lies in the difficulty to properly identify the actual regime of a given country. The most widely available taxonomy of exchange arrangements –published by the IMF– is basically a 'de iure' classification. Thus, it misses the importance of the 'de facto' regimes and takes for granted pegs which should be considered as floats. Recently, there have been efforts to overcome this situation, among others by Reinhart and Rogoff (2004) (RR, henceforth). A particularly useful feature of RR 'natural' classification is that it provides a wide taxonomy of regimes in which the actual degree of rigidity is established and from which the declared nature of the exchange rate commitment can be partially assessed. This is important because both features are theoretically relevant for the disciplinary effect of the exchange regime on monetary discipline.

By anchoring more firmly inflation expectations, it would a *priori* be expected that the more rigid the peg and the more explicit the announcement, the stronger would be the effect on both inflation and fiscal discipline. In our view, the use of RR 'natural' classification, if properly interpreted, is bound to improve the quality of the analysis and may change the previous conclusions. Indeed, when using this classification, we find a significant positive effect of pegs on fiscal discipline, which can be interpreted as supporting the conventional hypothesis. However, when exploring the issue in more detail, by considering the degree of rigidity of the exchange rate and the impact of announcing the peg, the results do not hold exactly as conventional wisdom would suggest. First, higher rigidity of the exchange rate does not significantly translate into stronger fiscal discipline, as it should be reasonably expected under the conventional hypothesis. In particular, intermediate regimes fare in general better than both fix and floating regimes. Second, and more importantly, the announcement of a peg is found to have a deleterious effect on fiscal discipline, while pegs that are not publicized do significantly improve fiscal discipline.

These results call for an alternative explanation to solve this apparent paradox. We advance an hypothesis based on the effects of pegging the exchange rate on the costs and availability of financing, More precisely, by announcing a peg, the economy enjoys better financing conditions, which relax the actual fiscal constraints of the authorities and, consequently, fiscal discipline. The empirical analysis backs the importance of external financing in explaining the deleterious effect of peg announcements on fiscal discipline in emerging markets. This suggests that the degree of financial integration is key to our hypothesis analysis and we will consider it explicitly in the analysis.

The paper is organized as follows. In the next section, the theoretical link between the exchange rate regimes and fiscal discipline is described. Section three deals with the construction of the database: two alternative exchange rate classifications are presented and the rest of data described. The fourth section presents the main empirical results and the last section concludes.

2 Exchange rate pegs and their link to fiscal discipline

Fiscal dominance of monetary policy, which has been traditionally a feature of emerging economies, shaped the conventional hypothesis that monetary external anchors (e.g. exchange rate pegs) would induce fiscal discipline. By pegging the exchange rate the monetary creation process is constrained, monetary seignoriage is reduced and, in response, fiscal discipline is expected to be enhanced. When this monetary channel to induce fiscal discipline has been tested, it has been far from supported by the empirical evidence. Gavin & Perotti (1997), Tornell & Velasco (1998), Calvo & Vegh (1998) and more recently Ghosh et al. (2003) have unanimously concluded that pegs do not provide higher fiscal discipline in emerging economies. This result is robust to the use of different gauges for fiscal discipline: overall or primary balance, even when fiscal balances are adjusted to account for seignoriage revenues [as in Alberola & Molina (2003)].

It should be noted that this conventional theory was based on a rather limited framework of analysis, as it only took into account the mechanical effect on the constraints on monetary creation, rather than the actual ultimate goal of many exchange rate pegs, which is to import credibility through tying authorities' hands. The credibility gains due to the peg tend to enable easier and cheaper access to financial markets and, thus, better conditions to finance domestic spending, both private and public. All things given, this easier access to financial markets could reduce the incentives of governments to maintain a prudent fiscal stance. Furthermore, it is well known that exchange rate based stabilizations lead to an increase in domestic demand –the 'boom' leg of the boom-bust cycle that has been emphasized by the literature [see Calvo and Vegh (1998)]. Typically, higher public spending can be financed by increasing revenues arising from the boom. If the increase in public expenditure exceeds the final realization of revenues, as could often be the case, fiscal discipline can be additionally eroded. This empirical regularity calls for an explicit consideration of the effects of the increase in economic activity associated to the peg in the empirical analysis.

The compounded impact of these effects of the peg, by loosening the authorities' fiscal constraint, may more than offset the monetary channel in terms of fiscal rectitude, a fact that could explain the deleterious impact of rigid exchange regimes over fiscal discipline.

The previous discussion suggests that the way credibility is achieved may matter for the fiscal impact of exchange regime choice. In the long run, it is obvious that only when the peg is consistent with the underlying policies it will be credible and, thus, sustainable. Using the terminology by Levy-Yeyati and Sturzennegger (2005) deeds are in the end much more relevant than words. This is the idea behind Krugman (1979) first generation of balance of payments models, in which precisely time-inconsistent fiscal laxity of the government precipitated the attack on the currency. However, in the short run pegs may enjoy some credibility, so as to induce a 'honeymoon effect' derived from their announcement. To the extent that governments commit their word on the announcements it is quite probable that just by announcing the peg there is an initial positive credibility shock, mostly when the announcement is also backed by complementary economic measures (e.g. stabilization plans, like those set up in Latin America in the late eighties and beginning of the nineties). Therefore, at least in an initial phase, words and (or even rather than) deeds matter. The fact that both deeds and words count has recently been documented

by Genberg and Swoboda (2004) –when analyzing the expected behaviour of exchange rates– and by Vuletin (2004), in the context of fiscal variables.

The combination of time-inconsistency problems and 'free' credibility gains from announcements creates interesting implications for the expected impact of exchange arrangements. For example, it is conceivable that a very rigid 'de facto' peg which is not announced delivers no credibility at its inception. Notwithstanding this, as long as the authorities maintain disciplined policies under a peg which is not announced, they will build up credibility. Therefore, when the peg is non-announced, one would be expected to enjoy an optimal situation in terms of fiscal discipline: monetary constraint, plus no initial offsetting credibility effects, plus incentives to pursue discipline (which are in turn reinforced by the factors which explain the fear of floating). Turning the problem upside down, inconsistent but announced pegs, which enjoy an initial dilution of fiscal constraints and then fail to deliver discipline could potentially result in the worst fiscal results.

Most of our analysis focuses on this kind of implications. In order to separate the impact of announcements, however, careful attention must be paid to other dimensions of a peg that might also affect credibility. In particular, the rigidity of a peg is also expected to impact on credibility. Intuitively, the more rigid is the peg, the higher the monetary constraint, but also the larger the initial credibility it is expected to have. Nevertheless, we argue (and the data confirm) that most of the positive credibility shock depends on whether the peg is announced or not. Because of this, our ranking of *a priori* expected credibility of the exchange rate regimes can be established, from higher to lower as:

1. Announced fix regimes
2. Announced intermediate regimes
3. Non-announced fix regimes
4. Non-announced intermediate regimes
5. Floats

If the indirect channel we point out (v.g. easing of financing due to the announcement) was sufficiently relevant to fully compensate for the potential direct impact of exchange regime choice on monetary restraint, the previous credibility ranking would translate into the following expected fiscal discipline:

1. Non-announced fix regimes
2. Non-announced intermediate regimes
3. Announced intermediate regimes
4. Announced fix regimes

Note that floating regimes are not unequivocally ranked in this second scheme. They are expected to imply less discipline than non-announced pegs since they convey no monetary constraints and no credibility effect, but relative to announced pegs the expected result is not clear cut.

Our empirical strategy proceeds in three steps. First, we try to provide a more detailed look at the usual finding in the literature, investigating what can account for the missing impact of exchange arrangements over fiscal discipline and linking it to the use of diverse exchange rate classifications. Then, we claim that financial conditions may lie at the root of this result. Finally, we check more thoroughly the impact of exchange arrangements

over the financial constraints, and we distinguish the effect of announcements and rigidity, focusing on emerging markets.

Underscoring the previous remarks is the fact that the choice of exchange rate regime and its implementation might depend on expected fiscal outcomes. We are aware that this introduces endogeneity in the analysis which must be deal with. Note, however, that the expected influence of endogeneity bias is not clear-cut. On the one hand, countries with poor fiscal institutions and chronic excessive deficits might resort to pegging the exchange rate in order to correct these deficiencies. If this were the case, we would expect to find a negative correlation between pegging and fiscal discipline even if pegs had no actual impact over discipline. On the other hand, countries which succeed in using the peg to discipline fiscal policy are expected to maintain it for a longer time. This survival bias would tend to overestimate the positive correlation between pegs and fiscal discipline. Therefore, in the empirical analysis these questions must be carefully tackled.

3 Data construction

3.1 Exchange rate classification

As previously argued, one of the most contentious issues we have to deal with in the paper is the definition of the exchange rate regime for each country. In most of the literature, the main source of information is the declared exchange rate regime at the IMF, which is publicized annually in the International Financial Statistics. Following these criteria fixed exchange rate regimes have been labeled as "Pegged" according to IMF and intermediate regimes are matched with "Limited flexibility" regimes. The problem of inconsistency between what the countries really do and what they declare at the IMF has been increasingly relevant. In particular, in a period where many countries have abandoned their external anchors and have declared their currencies to be floating, the "fear of floating" phenomenon documented in Calvo and Reinhart (2002) has become a major focus of analysis. The IMF itself recognized this problem in a 1999 publication, reclassifying many countries' arrangements from year to year and admitting that in some cases "countries have a *de facto* regime which differs from its *de iure* regime".[1]

This classification problem has important implications for any economic analysis relating exchange rates and macroeconomic variables, as ours. Recent efforts have been made to come up with alternative classifications that correct the deficiencies in the IMF data or that simply ignore such source. Among this last group is the afore-mentioned paper by Levy-Yeyati and Sturzenegger (2005). These authors reclassified de iure exchange rate regimes into more refined categories by applying cluster analysis techniques on two variables: market exchange rates and central bank's international reserves.[2]

We prefer, however, to make use of the 'natural' classification by Reinhart and Rogoff (2004), since in our view is the most refined and, arguably, the most comprehensive classification to date. RR classify a sample of 153 countries in the period 1950-2001, applying an identification algorithm to each country and date in order to obtain a realistic description of the true exchange rate regime. Very broadly, their approach takes the official regime as a starting point and checks its consistency with the observed behaviour of the market exchange rate by applying statistical techniques. If both are consistent, that is, if deeds match words, the appropriate *de iure* classification is maintained. Additionally, the arrangement is labelled as a *pre-announced* regime. If this is not the case, the algorithm searches for an appropriate *de facto* regime by looking at the path and volatility observed in the exchange rate. Accordingly, the exchange rate arrangement is classified into a new 'de facto' category of *non-preannounced* regimes. In this way, RR identify 15 categories, as displayed in table 1, ranging from dollarization to freely floating; it is noteworthy that episodes with extreme exchange rate volatility and those where parallel exchange rate markets are

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1. Other problem with IMF definition is that its taxonomy has changed over time. In the seventies and eighties the IMF classified regimes in three gross categories (pegs, limited flexibility and floating). From 1995 on the definition has been refined by the addition of new categories, making it very difficult to build up consistent and reliable time series of exchange regimes. Also, this classification does not include some Exchange Rate Based Stabilizations (ERBS) that were not instrumented via strictly fixed exchange rates, but rather used crawling pegs or crawling bands, which are labeled as "More flexible arrangements" by the IMF. This is the case, for example, of Brazil's1994 Plano Real, a clear cut ERBS with a crawling peg link to the US dollar classified as "More flexible arrangements". On the contrary, the IMF defines Bolivia since 1986 as a floater, although its currency has been depreciating against the US dollar at a much slower pace.
2. Their paper distinguishes five (inconclusive, float, dirty float, crawling pegs and pegs) or three (float, intermediate and fix) categories A country is classified as a float if its exchange rate is relatively volatile and its international reserves are relatively stable. Correspondingly, a country that displays high volatility of reserves is classified either as a dirty float, a crawling peg or a fixed regime, depending on the volatility of both the level and the variation of the exchange rate.

functioning are considered separately, corresponding, respectively to the freely falling[3] and dual markets categories.

As suggested by RR, the use of de facto exchange rate classifications could in fact lead to a reinterpretation of the history of exchange regimes. Indeed, focusing only in official exchange rate arrangements results in a surprisingly high number of misclassifications.[4] More precisely, we can distinguish two types of errors when the IMF 'de iure' classification is used (see table 2). Paraphrasing the nomenclature of hypothesis testing , type I errors would arise when the IMF identifies an exchange rate regime as flexible when it is actually a peg; type II errors on the contrary, come up when the IMF takes as a peg an exchange rate which 'de facto' behaves as a floating or freely falling regime.

Table 2. Types of errors in the IMF classification

		IMF *de iure* classification	
		Peg	Float
Reinhart & Rogoff	Peg	✓	Type I error
De facto class.	Float / free falling	Type II error	✓

Obviously, these misclassifications could distort any attempt to analyze the impact of exchange regime choice on economic variables. As a prominent example, the introduction of *de facto* classifications has drastically changed the perception about the economic performance of floats.[5] Also, the bipolar view of exchange rates, which suggests that countries will have to choose between extreme pegs or pure floats as the world becomes more financially integrated finds surprisingly little support if one focuses on the *de facto* classification: intermediate *de facto* non-announced regimes still constitute the most common choice of exchange arrangement.

As we commented earlier, the RR classification is particularly suited for our purposes[6] since it distinguishes regimes using the two dimensions we are interested in, namely, whether they are announced or not, and their degree of flexibility. We thus construct a parsimonious classification in which we collapse RR fifteen natural categories into six different groups, as shown in table 1. Graph 1 shows the share of each of these categories for the sample period 1970-2001 for the total and for each grouping of countries, and also for the sub-sample that we will preferably use in what follows, 1991-2001. Note that the share of flexible is highest in the developed countries and that this share is really low in developed and emerging markets. On the contrary, the share of free falling is very reduced in developed countries and relevant in the other two sub-categories. We also checked our announced category with the IMF classification. There are few differences

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3. Situations where the real exchange rate experiences a very rapid devaluation or inflation exceeds 40% yearly; since these situations are not, in principle, the result of a intentional policy, it seems unnatural to consider them as floats.
4. Even in the fifties, RR found that almost 25% of official pegs were in reality another kind of regime. In the seventies, eighties and nineties they found also a high number of pegs that devaluated very often ('false peggers'). Finally, in the period 1991 to 2001 the frequency of false peggers has decreased but the fear of floating phenomenon took preponderance: 25% of declared floaters were not floaters in reality.
5. RR note that floating seems an unattractive choice when one considers a *de iure* classification, because countries that float grow less and suffer spectacular inflation rates. However, the use of their natural classification leads to exclude from floaters situations of freely falling currencies; a correction that results in the finding that floats display, in fact, lower inflation and good growth prospects.
6. Of course, this is not the say that it is without problems. First of all, regimes are classified via a probit analysis of the performance of market exchange rates in the previous five years. Because of this, changes in the exchange regime are not necessarily related to real changes in policies or specific announcements. Besides that, when Reinhart and Rogoff label a regime as a *de facto* we do not know what was the starting official regime that was rejected by the data, yet it could be critical from the point of view of credibility.

between our classification of announced regimes and that derived from the IMF publication.[7] In the annex we show the main statistics of our sample by type of regime.

3.2 Data set

Our empirical analysis makes use of a panel data set comprising 110 countries, for the period running from 1970 to 2001, although, as explained below, we will focus on data of the last decade. Countries include 23 OECD developed economies plus 87 developing economies. Of these, 24 are European transition countries (plus Cyprus, Malta and Turkey) and ex-Soviet Union, another 21 are from Latin America, 24 are from Africa, 14 more from Asia and 4 from Middle East.[8] Given the wide coverage of countries in both the IMF and RR exchange arrangement classifications, the selection is made, basically, upon the availability of sufficiently long series of fiscal variables, especially for interest payments.

In terms of the data set, we depart from previous approaches [for example, Alberola and Molina (2003) and Ghosh et al. (2003)] in two fundamental points. First, we prefer to test our hypothesis in a small sub sample of developing economies with access to international private capital markets, the so-called emerging markets. The choice of emerging markets for the analysis is consistent with the hypothesis we try to assess, which relies on access to international financial markets. This is in line with some recent papers that have dealt with the impact of exchange rates over inflation and growth [see Husain et al. (2004)] or fiscal balances, such as Vuletin (2004). Emerging economies are identified as those included in the definition of Morgan Stanley Capital International (MSCI): countries that have issued some kind of public or private debt in international markets, and allow access to its Stock Exchange to international investors. This sub-sample includes 25 countries, 7 in Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela), 9 in Asia (China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Turkey and Thailand), 4 Eastern European countries (Czech Republic, Hungary, Poland and Russia), 3 in Africa (Egypt, Morocco and South Africa), and finally 2 in Middle East (Israel and Jordan).[9] Non-emerging developing countries and the OECD developed countries are also used in the analysis as control groups.

The second distinguishing feature of our analysis is the use of a shorter database. In our view, the use of long samples is hindered by structural changes, which we believe have been too profound in the last 15 years as to simply pool the data. As can be observed in graph 2 the accession to external financing by emerging markets has grown exponentially in the nineties and only in the last years it has moderated. Another gauge for financial integration –which will be used in the empirical analysis below–, is the existence of a rating from the agencies to developing countries and emerging markets, which signals the disposition of these countries to issue external debt. The graph shows that at the end of the nineties and beginning of the nineties the share of developing and emerging markets with rating grew exponentially. Now, 60% of the sum of both groups have a ranking today

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7. For example, Thailand before 1997 is labelled as "de facto peg" as the evolution of bath against dollar was very stable. But Thailand declared to the IMF that it was implementing a peg to a "secret" basket of currencies. In our view, Thailand was, in fact, a pre-announced peg. Another prominent case is Austria since 1991, classified as *de facto* peg by Reinhart and Rogoff and as "peg to a single currency" by the IMF.

8. OECD countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States. European Transition countries are Albania, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazaksthan, Kyrguiz Republic, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, Tajikistan and Ukraine. Latin American countries are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. From Africa we consider Algeria, Bostwana, Burkina Fasso, Burundi, Cameroon, Republic of Congo, Côte d'Ivoire, Egypt, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Morocco, Senegal, South Africa, Swaziland, Tunisia, Uganda, Zambia and Zimbabwe. Asian countries comprises China, Hong Kong, India, Indonesia, Iran, Korea, Malaysia, Mongolia, Nepal, Pakistan, Phillippines, Singapore, Sri Lanka, and Thailand. Finally in Middle East we took Jordan, Kuwait, Lebanon and Israel.

9. Taiwan is also included in MSCI index, but no data are available for this country.

compared to less than 20% at the beginning of the nineties (by definition, now the 100% of emerging markets enjoy a rating). This process of financial integration has been led by the emergence of two group of countries, Latin American countries after the debt crisis and European transition economies, which returned to international markets searching for financing its process of economic transformation and obtaining macro stability via nominal external anchors.

More to the point of the paper, it seems obvious that the trend towards the internationalization and liberalization of financial markets has completely altered the trade-offs involved in pegging the exchange rate from 1970 to the nineties or nowadays. The huge tide of capital flows moving from one country to another depending on macro policies and credibility is now central in policy decisions, especially, but not exclusively, in the case of emerging economies. This was not necessarily the case 30 years ago. Other examples of this problem are capital and current account controls: the typical emerging market peg during the seventies was usually accompanied by a battery of controls to reinforce the durability of the peg. In the nineties, the incidence of these restrictions was substantially lower, especially in the case of current account controls. Approximately 60% of emerging economies with some kind of peg applied these controls before 1990, and less than 40% after this date; for capital account controls, the numbers are 77% and 71%, respectively.

For all these reasons, our estimation sample will be restricted in most cases to the period 1991 to 2001, and we will pay particular attention to emerging markets. While this choice reduces drastically sample size, it also reduces the (non-negligible) risk of obtaining biased conclusions which are not applicable to the current context.

The bulk of data is taken from World Bank's World Development Indicators database, and is completed with IMF's International Financial Statistics and national sources when it is possible. It includes basically three variables: public primary surplus or deficit over GDP, interest payments on public debt as a share of GDP and a proxy for the cycle, which is used as control. We choose interest payments over GDP as our proxy for financial conditions. Increases in interest payments should reflect worsening financial conditions, all things given. If the indirect channel we are interested in were significant we would expect a disciplining effect of interest payments over the primary surplus. Albeit this measure has some potential drawbacks, alternative gauges (such as sovereign bond spreads or interest payments over total debt) drastically reduce the sample size. The cycle proxy is defined as deviations of the yearly rate of change of real GDP over a long term rate of growth (average from 1970 to 2001). We are aware that this is an unsatisfactory choice for a proxy, but the high volatility of growth in developing countries makes the use of more adequate filters difficult. In any case, the weakness of the proxy must be taken into account when interpreting the results. All in all, for the 1991-2001 period, we have around 950 observations (depending on the precise specification being considered), of which 270 are for emerging economies, 430 for the rest of developing and 250 for OECD countries. In the annex we present the main statistics of the samples used in the empirical tests.

4 Empirical analysis

4.1 The standard IMF classification

As stated on the introductory section, most previous studies of fiscal performance under alternative exchange arrangements have been based on the IMF *de iure* classification or slightly adapted classifications, and basically all of them fail to prove that pegs provide higher fiscal discipline. As a starting point in our analysis, the first column of table 3 roughly replicates the results of Ghosh, Gulde and Wolfe (2003) (GGW, henceforth), except for the use of ordinary least squares instead of medians. A significant parameter implies that the effect of the regime is statistically different from the floating regimes which are used as control throughout most of the analysis.

As it can be seen, fixed regimes are worse in terms of fiscal discipline, while intermediate and floats are indistinguishable. This and similar results are the basis for the standard finding in the empirical literature, when using *de iure* regimes. The GGW results are based on the central government overall fiscal balance. The use of the central government balance as a gauge for fiscal discipline is not without drawbacks, beyond the fact that provincial or town spending can be very important in many countries. The main problem associated with this measure is conceptual. Given that the budget balance is the sum of the primary surplus and interest payments, it blurs the distinction between policy variables (the primary surplus) and market determined outcomes (interest payments). As such, the use of the overall balance does not allow us to investigate whether exchange rates have a differential impact on these dimensions and, therefore, makes it impossible to test the kind of hypothesis we are interested in. This is the reason we will focus on the primary surplus as our preferred gauge for fiscal discipline. Column 2 replicates the GGW result using the primary surplus. As can be seen, this change does not alter the essential message of the literature: pegged (both fixed and intermediate) regimes seem to reduce fiscal discipline. Another consideration which could be important is the bias introduced in the data by not taking into consideration the seignoriage revenues, which tend to be proportional to inflation, and therefore, higher in floats. However, Alberola and Molina (2003) show that the results hold after controlling for seignoriage.

A look at the remaining columns in table 3 shows that, if we focus on ordinary least squares (OLS) regressions, the GGW result is clearly dependent on the use of a long sample, starting from the 70s. In fact, once we focus on the 90s, it is apparent that there is some evidence of a positive impact of exchange regime choice over fiscal discipline, but it is not homogenous among countries. In particular, developing countries that pegged their exchange rate did indeed show a higher level of fiscal surpluses. On the other hand, developed countries' pegs were not successful in reducing fiscal deficits. Although intermediate regimes –whose parameter is positive and marginally significant– rank somewhat better than fixed regimes; the equality tests show that the parameters are not statistically different. As regards emerging markets, simple means do not suggest any significant impact of exchange regime choice over fiscal discipline; moreover in this case, the parameter for the intermediate regimes is negative (but very imprecisely estimated) and significantly lower than for fixed regime, suggesting that intermediate regimes in emerging markets deliver less discipline. All in all, thus, the doubts about the effectiveness of exchange regimes as a disciplining device remain valid for emerging economies even if we focus in the last 15 years.

Given the somewhat simplistic framework adopted in table 3, endogeneity of exchange regime choice with respect to unobservables that might also affect fiscal policy could be an issue in the previous regressions. In order to correct partially for this bias, we calculated the previous models introducing country dummies. As can be seen in the fixed effects column (FE), the results do change for the developing and developed countries sample, but for the emerging sample the evidence is mixed. For developed countries, the expected impact of fixed and intermediate regimes on fiscal discipline becomes positive. The fact that fixed-effects estimates are now positive, suggest that likely peggers among developed countries during the nineties exhibited a lower level of idiosyncratic fiscal discipline that was partially offset by the disciplining effect of the peg. As regards developing countries, the inclusion of country-dummies turns the estimated impact of pegs over the primary surplus into negative, although it is statistically insignificant. This suggests that likely peggers among developing nations were precisely those countries with better fiscal institutions. On the other hand, the results for emerging economies corroborate the impression that fixed regimes have not delivered higher discipline, but point to a positive impact of intermediate regimes, although the parameters are not statistically different. Thus, the results presented above maintain the essential message, namely the lack of clear and systematic evidence that de iure peggers among emerging economies perform better in terms of fiscal discipline. This contradicts the standard notion that pegs bring about improvements in fiscal discipline in a mechanical fashion. The next section investigates how much of this *a priori* puzzle can be explained by using an alternative classification of exchange arrangements.

4.2 Reinhart and Rogoff's "natural" classification

Table 4 presents the corresponding regressions when exchange rate regimes are separated according to Reinhart and Rogoff's (2004) "natural" classification. Here we take advantage of the freely floating category to control for it throughout the analysis. Similar to our previous findings, using a long sample blurs any impact from exchange rate regimes on fiscal discipline (see the first column in table 4), although intermediate regimes display a significant positive parameter in the OLS regression. Once we focus on the 90s, fixed regimes significantly favour fiscal discipline, while intermediate regimes lose their significance. Within groups of countries, the parameters are positive but non-significant or marginally significant for developed countries and developing countries. However, in the case of emerging markets there seems to be some evidence that pegs (either by fixing or choosing some intermediate arrangement) are significantly correlated with improvements in the primary surplus, and this result is robust to the inclusion of country specific intercepts. Note that the disciplining result in emerging economies is much more robust for intermediate than for fixed regimes, although, according to the p-values of the equality tests, the parameters can not be considered as statistically different among both groupings.

Our findings suggest that pegs do now have a positive impact on fiscal discipline in emerging economies. The change in our perception about the fiscal effectiveness of pegs hinges crucially on the correction of type I errors on the IMF classification accomplished by the use of RR classification,[10] v.g. de facto pegs that are classified as floats by the IMF. Recall that the IMF classification just looks at countries official statements about their exchange rate regime and we have seen that announced pegs do not contribute to better fiscal performance. Therefore, we can conclude successful pegs (i.e. those that result in a stable

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10. RR also correct for type II errors and exclude from the peg category those announced pegs that behave as freely falling. This explanation, however, can not be the main responsible for the differences in the estimated coefficients. Remarkably, the proportion of official floats and official intermediate regimes among the freely falling emerging economies was roughly equal during the 90s.

exchange rate) do improve fiscal discipline but note that this effect is basically attributable to non-announced pegs, since announcement seems to dilute this positive effect.

A first potential caveat in the above interpretation is that causality could work in the opposite direction. The fact that only non-announced pegs display better fiscal results could be taken as evidence that our results are driven by countries that do not deliberately peg their currency but follow sound economic policies leading to general economic stability and, in particular, low volatility of the exchange rate.

Yet a more thorough look at the classification and the actual policy behaviour behind it suggests that this potential source of bias is not relevant in our sample of emerging economies. Even the most successful emerging markets are exposed to fairly large external shocks that are bound to generate some exchange rate volatility. Therefore, since the RR threshold for defining a country as a fix is rather strict,[11] we can be quite confident that countries classified in this category maintain specific policies aimed at correcting the impact of these shocks. In practice, the same holds true as regards RR intermediate regimes. We can support this claim, by analysing the behaviour of reserves under different definitions. More precisely, the results do not change significantly when we run the regressions in table 4 restricting the peg (intermediate plus fix) category under RR to include only those countries that simultaneously display high volatility of reserves according to the Levy-Yeyati and Sturzenegger (2005) classification, that is, those countries which probably manage their exchange rate actively.[12] As a final check, it is important to note that the mean (and median) annual volatility of international reserves is about 2% higher for non-announced intermediates regimes than for flexible arrangements, suggesting that they intervene in the exchange rate markets.[13] These facts are hard to reconcile with the idea that RR non-announced pegs are in reality stable floaters and with a problem of reverse causality plaguing our analysis.

This is not to say that sound policies are independent of the management of exchange rates, particularly in emerging countries where excessive volatility of exchange rate is a cause of great concern. Actually, as underscore among others by Edwards (2002), exchange rate interventions or fear of floating may be the result of a desire to follow some optimal Taylor rule. Indeed, this is to some extent what we are observing in regions like Latin America in the last years, where the overall objective of price stability requires avoiding excessive swings in the exchange rates. But note that this comment actually reinforces our view: countries pursue disciplined policies under the 'facto' pegs which are the 'iure' floats.

These preliminary outcomes seem to conform to our hypothesis, whereby, in emerging economies, the announcement effect tends to soften discipline and is more significant than the degree of rigidity of the peg. We now investigate these findings in more detail, first by exploring the links between the indirect channel (the financing costs) on fiscal discipline, and then, by looking at more detail the implications of the announcement and rigidity of the regimes on our results.

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11. A country is classified as a peg if its exchange rate does not change at all during four or more consecutive months or if the probability of the exchange rate remaining within a 1% band over a rolling five year period is higher than 80%.
12. Also, in regressions of annual volatility of international reserves on the level of reserves relative to GDP, openness [as in Demarmels and Fischer (2003)] and dummies for exchange arrangements, the dummy for non-announced intermediate regimes is generally positive and significant, depending on the specification. Results are available from the authors upon request.
13. This figure is roughly consistent with the results in table-2 of Levy-Yeyati and Sturzenneger (2005).

4.3 Fiscal constraints and fiscal discipline

When looking for evidence about the channels through which financial conditions may affect the primary surplus, we are actually exploring whether there is a "disciplining" effect of worsening financial conditions over fiscal policy.

As with most econometric analysis of macroeconomic variables dealing with structural equations from panel data, coefficient heterogeneity, simultaneity in variables and the combination of unobservables and dynamics are a potential source of bias in ordinary least-squares regressions. In particular, as it is well known, the presence of any of all of these features changes the adequate interpretation for the coefficients estimated by standard regression techniques, such as OLS or within-group panel estimators. Nevertheless, since we cannot be confident that any particular econometric specification has a clear edge over others, we present a battery of alternative results based on commonly used estimators. In any event, the essential message remains unchanged regardless of the estimation method: emerging economies increase (decrease) their fiscal discipline in response to a hardening (easing) of financing conditions. If anything, the consistence among alternative methods is relieving from both an economic and an econometric perspective. From an economic standpoint, it suggests that the proposed link is sufficiently strong as to be robust to different specifications; from an econometric perspective, it indicates that the sort of biases and statistical problems hinted above may not be relevant enough.[14]

Table 5 presents our main results for the whole sample, together with the developed countries and emerging groupings. In each specification, we take the primary surplus as our dependent variable and analyze its relation with interest payments (our proxy for financing conditions). Also we control for the deviation of growth from the country mean and for freely falling regimes which can potentially distort the results.

We start our investigation by looking at an ordinary least square regression (column 1 for each sample). Due to the aforementioned econometric issues, we would be cautious before giving the coefficients in this regression the causal interpretation we are after, but nevertheless the estimated parameters are useful for measuring the sign of relevant correlations among variables. As can be seen, this preliminary approach confirms that financial conditions strongly and positively related with fiscal variables. As expected, higher rates of growth also impact positively on fiscal balance in every single case,[15] and freely falling regimes come hand in hand with a deterioration of the public finances. The fact that the relationship between interest payments and the primary surplus is positive suggests the presence of a significant "discipline effect". Note that if causality went from the primary surplus to interest payments we would expect a negative relation between these variables. It is also noteworthy that the impact of the interest payments is higher for emerging markets than for developed countries, as expected if we sustain that emerging markets fiscal behaviour depends more heavily on the financing conditions they face.

This result also holds true if we try to account for the effect of time-invariant unobserved country characteristics (such as the quality of institutions or the extent of corruption) that may affect both the choice of exchange arrangement and the average level of fiscal discipline. As can be seen in the coefficients from standard fixed-effects regressions shown in table 5, only for the developed countries sample the coefficient for

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14. If the mentioned econometric problems do not exist, the parameters would be the same for each estimation method
15. Note in any case that the elasticity is lower in emerging economies as is to be expected from the higher a priori cyclicality of expenditure in emerging markets.

interest payments turns negative, implying that once we take country characteristics, the coefficient would be consistent with an inverse causality interpretation: higher primary surplus are related to lower interest payments. That is precisely the outcome we would expect in a standard setting, to which developed countries fit: higher fiscal discipline related to –actually inducing– lower financing costs.

The next step is to introduce a more refined measure of the impact of interest payments on the fiscal balance, through a GMM approach. On the one hand, since policy decisions are subject to considerable inertia and the economic costs of drastic reductions in the primary surplus may be substantial, we would like to model some time-dependence in our variables. To do so, we introduce the lagged primary surplus as an explanatory variable. Also, we would like to acknowledge that interest payments and growth are simultaneously determined together with the primary surplus. This requires using appropriate instruments for both variables, which in our case exploit the panel dimension of our data. Formally, we estimate an Arellano-Bond dynamic fixed-effects model, including the lag of the primary surplus. If the error term in the regression is suspected to be correlated with both the interest payments and the cyclical position, the model is best estimated using the general method of moments (GMM) techniques summarized in Arellano (2003). This estimator exploits the assumption that interest payments and growth are predetermined variables with respect to the primary surplus, that is, their current values do not depend on future innovations in the primary surplus. Note that, under the implicit moment conditions that are used in estimation, the estimated coefficients of this models can be given a structural interpretation. In particular, they reflect the impact of exogenous increases in interest payments or growth over the primary surplus.[16]

The column GMM in table 5 shows that positive shocks to interest payments affect positively the level of the primary surplus, once endogeneity, omitted time-invariant factors and dynamics are taken into account through the GMM specification. We view this as reinforcing the evidence of a positive structural effect of financing costs on fiscal discipline, as envisaged in our central hypothesis (and also on the failure to capture any deleterious impact of the cycle on fiscal discipline). As we commented earlier, there is also evidence of a higher relevance of interest payments in emerging markets. Also it is important to note that the GMM of the structural model that has interest payments as dependent variable (not shown) displays a significant negative parameter on the primary surplus regressor (as expected, since higher primary surplus should tend to reduce financing cost, other things being equal) for developed countries, but the parameter is positive (and significant) again in emerging markets. It is also noteworthy to mention that growth again has a positive impact on the primary balance, although it is lower for the case of emerging markets, which confirm the intuition that their expenditures are more procyclical.

It may be convenient at this point to return to the relevance of financial integration for our hypothesis and results. It can be argued that restricting our sample to the emerging market countries in the nineties is too rough a way to capture the impact of the process of financial deepening in our empirical model. As a matter of fact, not all the considered countries 'emerged' to the international financial arena at the same time, as we noted when discussing the year of rating granting which appeared in graph 2. This variable can be used as a proxy for financial integration in the estimation. More precisely, we generate a dummy which takes value one since the year in which each country first holds a rating and multiply it

by the interest payments variable, setting up a compounded variable where the proxy for financial integration interacts with the interest payment effect. Then we repeat the estimations in table 5 (not shown), which measure the impact of the financial constraints on the primary balance, adding this compounded variable, but for the whole available period. For the sample of emerging countries, the compounded variable is positive for all the three estimation methods and significant in the OLS and GMM cases. This indicates that the degree of financial integration helps to explain the disciplining impact of interest payments on the primary balance.

On account of all things, this battery of results provides in our view a robust evidence of the deleterious effect of lower financing costs on fiscal discipline in emerging economies.

4.4 Exchange rate regimes and fiscal constraints in emerging economies

Up to this point, we have hinted that announcing the regime may relax fiscal discipline through the loosening of the financing constraints and that financing costs are statistically related to the behaviour of public balances. Now, we attempt to knot these threads together, focusing on emerging markets, in order to analyze the importance of announcing the exchange regime for fiscal discipline, and review the impact of the rigidity of regimes. In table 6 we run regressions for the considered fiscal constraints and the primary surplus on a dummy that takes the value of 1 if a regime is pre-announced, using both OLS and fixed effect specifications (see footnote 21, to understand the exclusion of GMM in this table). As such, the associated parameter must be interpreted as relative to floating plus non-announced pegs. The results give some validity to the view that announcements do matter for fiscal constraints.

Regarding interest payments, announced pegs pay significantly lower interest rates –that is, financing conditions are more favourable, and the impact of announcing the regime on the primary surplus is negative and significant. These results convey a rather convincing picture: by announcing the peg, financial costs decrease and primary surpluses are lower. If we draw a causality inference between both outcomes, announced exchange rate regimes, by relaxing the financing constraint also bring about a relaxation of fiscal discipline.

Moreover, our results in the next table (table 7) indicate that, once we control for the effect of financial costs and growth, announced regimes do not behave in a different fashion than non-announced or floats, as far as fiscal discipline is concerned, in any of the specifications (OLS, FE, GMM). In our view this result is important to reinforce our hypothesis. While it is not possible to rule out other channels, it underscores that the reduction of financing costs induced by the announcement toin order is able to explain by itself the deleterious effect of announcing the peg on fiscal discipline.

As regards the importance of rigidity, in table 8 we extend the previous analysis to a more comprehensive classification of regime types. Relative to floating, only fixed announced regimes significantly reduce interest payments.[17] Non-announced regimes, on the contrary, increase interest payments relative to floating. Moreover, when we look at the direct impact of each sub-category on the primary surplus, non-announced regimes display higher fiscal discipline, in every case considered. Moreover, point estimates suggest intermediate regimes are superior to fixed regimes, in both the announced and non-announced categories. In any

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17. Fixed announced regimes in the sample are only Argentina and Malaysia. Since Argentina was fixed for the whole period, this leads to the non-identifiability of the fixed-effect coefficient for this regime.

case, as previously commented, announced regimes and floating regimes are similar, while non-announced are superior to both of them. The above results do not suggest a clear prevalence of fixed regimes over intermediate or floating regimes, according to their fiscal discipline. On the contrary, if anything, the evidence points to some advantages of intermediate regimes.

5   Conclusions

In this paper we have pursued an explanation to the widely documented failure of pegs to induce more fiscal discipline in emerging markets. Our strategy has followed two different, albeit complementary, venues.

The first venue has been mainly methodological: exchange rate classifications matter to ascertain the effect of regimes on fiscal discipline. When using the traditional 'de iure' classification exchange rate pegs are shown not to provide fiscal discipline and this is a robust result. However, when reconstructing the classification to account for the actual behaviour of the exchange rate regimes, that is, by trusting more deeds than words, the result is reversed. The divergence among both classifications suggests that what dilutes fiscal discipline is announcing the exchange regime.

This conclusion points to the importance of credibility and stresses expectation effects of the regime announcements in eroding fiscal discipline. In particular, we argue that credibility which is achieved by simply announcing the regime and not based on a track record of consistent policies tends to dilute fiscal discipline. Why? Because this positive credibility effect softens the budget constraint of the fiscal authorities. This channel is bound to work more neatly in emerging markets which have observed their access to external financial markets grew exponentially since the late eighties, and this is why we focus on our analysis in this grouping and in that period.

For these countries, the reduction in the cost of financing deficits arising from announcing the regime dilutes the pressures for fiscal discipline, and wekens the fiscal efforts by authorities. The results also highlight that, also contrary to the conventional wisdom, more rigidity does not deliver more fiscal discipline. In fact, intermediate regimes seem to perform best in terms of fiscal discipline, although the evidence is not too robust.

More precisely, returning to our initial scheme in section 2, we have found evidence that in terms of fiscal discipline non-announced pegs are superior than floating regimes, which in turn are superior to announced pegs. At the same time, we have not been able to provide a thorough ranking of exchange rates depending on their rigidity, although intermediate regimes, in general, tend to fare better than fixed regimes.

These results are subject to some caveats. First, by the nature of the data and the narrowness of the empirical model, the link between financing costs and fiscal discipline is not unequivocally established, although we are rather confident that it exists; second, a better treatment of the cyclical position of the economy and its impact on the fiscal discipline would be convenient. However, the difficulties to filter out cyclical components in the volatile GDP series in emerging economies is a major hindrance. More generally, the frailty of some results calls for further study of the empirical model and alternative specifications, so as to deliver more robust results, if possible. All these remarks invite for further research.

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Annex: data and exchange rate classification

Table A.1. Main statistics of the sample: 1991 to 2001

Developing economies subsample	Observations	Average	Standard deviation	Median	Minimum	Maximum
Primary balance (% GDP)	**451**	**0.76**	**4.33**	**0.36**	**-16.55**	**17.62**
Latin America	129	1.41	3.26	0.87	-7.60	11.63
Eastern Europe (1)	132	-0.39	3.23	-0.21	-10.24	10.51
Asia	60	0.51	6.99	-0.68	-16.55	17.62
Africa	117	1.78	3.75	1.69	-6.24	13.76
Middle East	13	-1.92	7.89	-4.21	-10.58	13.26
Interest payments (% GDP)	**454**	**2.96**	**3.00**	**1.78**	**0.00**	**20.20**
Latin America	129	2.91	2.75	1.85	0.49	13.93
Eastern Europe (1)	132	2.49	2.93	1.44	0.00	20.20
Asia	60	1.91	2.08	1.29	0.00	6.74
Africa	119	3.58	2.86	2.82	0.12	14.10
Middle East	14	7.27	5.30	5.81	1.38	15.22
Total balance (% GDP)	**554**	**-2.30**	**5.13**	**-2.22**	**-45.09**	**26.90**
Latin America	143	-1.67	2.68	-1.64	-13.25	5.27
Eastern Europe (1)	150	-2.95	3.24	-2.50	-19.03	2.78
Asia	66	-1.81	7.33	-3.44	-17.86	16.90
Africa	180	-2.21	5.13	-2.38	-45.09	11.38
Middle East	15	-5.18	15.78	-8.28	-25.80	26.90
Real growth (real GDP change)	**661**	**2.18**	**6.57**	**3.56**	**-44.90**	**38.20**
Latin America	154	3.04	3.30	3.29	-13.18	9.57
Eastern Europe (1)	192	-0.54	9.67	2.88	-44.90	13.53
Asia	66	4.16	4.09	4.77	-9.50	12.26
Africa	227	3.08	3.77	3.70	-11.61	13.79
Middle East	22	4.87	11.02	3.08	-8.30	38.20
Real growth (deviation from long term average)	**661**	**0.00**	**5.76**	**0.24**	**-38.64**	**31.20**
Latin America	154	0.00	2.92	0.30	-12.75	6.65
Eastern Europe (1)	192	0.00	8.82	0.98	-38.64	17.46
Asia	66	0.00	3.57	0.07	-9.69	7.52
Africa	227	0.00	3.31	0.12	-14.96	10.44
Middle East	22	0.00	10.80	-2.75	-11.03	31.20
Developed OECD economies subsample						
Primary balance (% GDP)	253	2.44	3.08	2.34	-5.52	10.18
Interest payments (% GDP)	253	4.76	2.74	3.94	0.26	13.91
Total balance (% GDP)	253	-2.32	3.71	-2.39	-13.37	7.09
Real growth (real GDP change)	253	2.78	2.51	2.69	-6.26	13.22
Emerging (MSCI) economies subsample						
Primary balance (% GDP)	248	1.36	2.96	1.01	-9.61	10.24
Interest payments (% GDP)	248	3.84	3.03	3.42	0.19	22.88
Total balance (% GDP)	260	-2.56	3.22	-2.22	-15.52	5.00
Real growth (real GDP change)	271	3.64	4.70	4.25	-14.50	17.00
Real growth (deviation from long term average)	271	0.00	4.10	0.47	-17.13	12.01

(1) Including Cyprus and Malta
(2) Including Turkey.

Developing economies subsample

	Primary balance	Interest payments	Total balance	Dev. from long term growth	Real growth
Primary balance	1.000	---	---	---	---
Interest payments	0.192	1.000	---	---	---
Total balance	0.786	-0.456	1.000	---	---
Deviation from long term growth	0.047	-0.083	0.124	1.000	---
Real growth	0.124	-0.127	0.204	0.877	1.000

Developed OECD economies subsample

	Primary balance	Interest payments	Total balance	Dev. from long term growth	Real growth
Primary balance	1.000	---	---	---	---
Interest payments	0.193	1.000	---	---	---
Total balance	0.689	-0.579	1.000	---	---
Deviation from long term growth	---	---	---	---	---
Real growth	0.281	-0.170	0.359	---	1.000

Emerging (MSCI) economies subsample

	Primary balance	Interest payments	Total balance	Dev. from long term growth	Real growth
Primary balance	1.000	---	---	---	---
Interest payments	0.421	1.000	---	---	---
Total balance	0.522	-0.554	1.000	---	---
Deviation from long term growth	0.207	-0.083	0.284	1.000	---
Real growth	0.172	-0.221	0.386	0.871	1.000

Table A.3. Main statistics of the sample: developing economies: 1991 to 2001

FIXED REGIMES	Observations	Average	Standard deviation	Median	Minimum	Maximum
TOTAL						
Primary balance (% GDP)	117	1.09	3.58	0.75	-10.58	10.51
Interest payments (% GDP)	119	2.95	2.91	1.75	0.12	15.22
Total balance (% GDP)	156	-2.01	4.44	-1.49	-25.80	5.53
Real growth (deviation from long term average)	187	0.69	4.05	0.31	-9.19	15.25
Real growth (real GDP change)	187	3.63	3.46	3.89	-6.90	13.79
ANNOUNCED						
Primary balance (% GDP)	85	1.75	3.28	1.66	-5.58	10.51
Interest payments (% GDP)	87	2.20	1.75	1.66	0.12	8.44
Total balance (% GDP)	119	-0.96	2.76	-1.04	-7.05	5.53
Real growth (deviation from long term average)	147	0.07	4.01	-0.29	-11.60	11.96
Real growth (real GDP change)	147	3.57	3.59	3.89	-6.90	13.79
NOT ANNOUNCED						
Primary balance (% GDP)	32	-0.67	3.82	-0.49	-10.58	5.67
Interest payments (% GDP)	32	5.00	4.22	4.22	0.84	15.22
Total balance (% GDP)	37	-5.40	6.67	-2.78	-25.80	4.83
Real growth (deviation from long term average)	40	1.73	4.83	0.88	-5.20	15.25
Real growth (real GDP change)	40	3.83	2.98	3.88	-5.88	9.36
INTERMEDIATE REGIMES						
TOTAL						
Primary balance (% GDP)	209	1.01	4.59	0.57	-10.25	17.62
Interest payments (% GDP)	210	2.69	2.36	1.83	0.36	13.93
Total balance (% GDP)	239	-1.55	5.20	-2.18	-13.25	26.90
Real growth (deviation from long term average)	257	0.56	3.84	0.45	-12.75	31.02
Real growth (real GDP change)	257	3.88	3.91	4.27	-13.18	33.75
ANNOUNCED						
Primary balance (% GDP)	14	-2.08	2.50	-1.90	-7.16	2.56
Interest payments (% GDP)	14	3.29	2.06	2.33	1.13	6.37
Total balance (% GDP)	14	-5.38	2.89	-5.33	-9.78	0.81
Real growth (deviation from long term average)	17	-1.03	2.44	-0.70	-7.55	2.94
Real growth (real GDP change)	17	4.54	2.12	4.33	-1.17	9.33
NOT ANNOUNCED						
Primary balance (% GDP)	195	1.23	4.63	0.69	-10.25	17.62
Interest payments (% GDP)	196	2.65	2.38	1.79	0.36	13.93
Total balance (% GDP)	225	-1.32	5.22	-2.07	-13.25	26.90
Real growth (deviation from long term average)	240	0.42	4.34	0.38	-14.25	33.45
Real growth (real GDP change)	240	3.83	4.00	4.27	-13.18	33.75
FLEXIBLE REGIMES						
Primary balance (% GDP)	47	0.53	4.10	-0.19	-9.29	11.81
Interest payments (% GDP)	47	2.89	3.17	1.77	0.00	13.67
Total balance (% GDP)	57	-2.46	3.99	-2.27	-12.34	11.47
Real growth (deviation from long term average)	73	0.91	4.41	0.74	-11.27	10.96
Real growth (real GDP change)	73	3.21	4.16	3.68	-9.50	11.75

Table 1. Exchange rate regimes dummies from Reinhart and Rogoff's natural list

ANNOUNCEMENT FLEXIBILITY	Announced (de iure) regimes	Not preannounced regimes	Observations Sample (*) (RR (**))
Fixed regimes	1-No separate legal tender 2-Pre-announced peg 3-Pre-announced horizontal band	4.- De facto pegs	**349** (550)
Intermediate regimes	5-Pre-announced crawling peg 6,9-Pre-announced crawling band 11-Moving band	7-De facto crawling peg 8,10-De facto crawling band	**459** (545)
Observations: Sample (*) (RR (**))	**239** (433)	**569** (662)	
Flexible regimes	12-Managed floating 13-Freely floating		**198** (214)
Free falling	14-Freely falling 15-Dual market		**192** (248)

(*) Database used in the empirical tests presented in the paper,
including emerging, developing and OECD economies, from 1991-2001.
(**) Original Reinhart and Rogoff's database (from 1991 to 2001)

Table 3. Fiscal discipline according to the IMF classification

	Overall Balance	Primary Balance									
	All countries, 1970-1999	All countries, 1970-1999		All countries, 1990-1999		Developed countries, 1990-1999		Emerging economies, 1990-1999		Developing countries, 1990-1999	
	OLS	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Fix	-1.02***	-1.82***	-2.31***	0.65**	0.57	0.59	2.97***	0.73	0.57	1.14**	-0.1
	(0.26)	*(0.24)*	*(0.32)*	*(0.33)*	*(0.43)*	*(0.58)*	*(0.88)*	*(0.51)*	*(0.84)*	*(0.53)*	*(0.65)*
Intermediate	-0.09	-0.55**	-0.72**	0.8***	0.54	0.82*	2.36***	-0.19	1.1*	1.51***	-0.31
	(0.28)	*(0.22)*	*(0.35)*	*(0.31)*	*(0.37)*	*(0.46)*	*(0.77)*	*(0.53)*	*(0.64)*	*(0.57)*	*(0.56)*
Constant	-3.67***	0.97***	1.26***	0.91***	1.04***	1.56***	0.52	1.35***	0.83*	0.09	1.2***
	(0.21)	*(0.18)*	*(0.26)*	*(0.24)*	*(0.26)*	*(0.38)*	*(0.48)*	*(0.41)*	*(0.5)*	*(0.4)*	*(0.39)*
Ho: Fix = Intermediate p-value	0.00	0.00	0.00	0.63	0.93	0.66	0.34	0.04	0.44	0.48	0.78
Observations	2855	2115	2115	778	778	207	207	209	209	362	362
R^2	0.01	0.03	0.03	0.01	0	0.02	0.06	0.02	0.02	0.02	0.00

(OLS) = ordinary least square estimates; (FE) = fixed-effects within estimates

Robust standard errors in parenthesis; *,** and *** denote significance at 10%,5% and 1%

When testing hypothesis Ho, a value lower than 0.05 is interpreted as a rejection of the null hypothesis (introduced in the corresponding line) at the 5% significance level

Table 4. Fiscal discipline according to the "natural" classification

Primary Balance

	All countries, 1970-2001		All countries, 1990-2001		Developed countries, 1990-2001		Emerging economies, 1990-2001		Developing countries, 1990-2001	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
Fix	0.24	-0.42	0.66**	1.4***	0.89*	-0.55	1.08*	1.22*	0.56	1.76
	(0.27)	(0.37)	(0.33)	(0.51)	(0.46)	(0.95)	(0.56)	(0.71)	(0.68)	(1.12)
Intermediate	0.71***	0.21	0.33	0.65	0.62	-2.79***	1.36***	2.05***	0.48	0.79
	(0.26)	(0.33)	(0.33)	(0.44)	(0.55)	(0.94)	(0.39)	(0.57)	(0.67)	(0.86)
Freely Falling	-0.99**	-2.07***	-1.16**	-0.27	.	.	0.12	0.55	-0.76	-0.12
	(0.4)	(0.4)	(0.51)	(0.49)	.	.	(0.82)	(0.7)	(0.79)	(0.79)
Constant	-0.24	0.3	1.17***	0.72**	1.9***	3.4***	0.43	-0.02	0.53	-0.04
	(0.22)	(0.27)	(0.27)	(0.35)	(0.38)	(0.63)	(0.32)	(0.47)	(0.59)	(0.74)
Ho: Fix = Intermediate										
p-value	0.03	0.03	0.23	0.08	0.57	0.00	0.57	0.20	0.86	0.29
Observations	2300	2300	952	952	253	253	248	248	451	451
R^2	0.01	0.02	0.02	0.01	0.02	0.07	0.04	0.06	0.01	0.01

(OLS) = ordinary least square estimates; (FE) = fixed-effects within estimates
Robust standard errors in parenthesis; *,** and *** denote significance at 10%,5% and 1%
When testing hypothesis Ho, a value lower than 0.05 is interpreted as a rejection of the null hypothesis (introduced in the corresponding line) at the 5% significance level

Table 5. Fiscal constraints and fiscal policy. 1991-2001

| | Primary Balance | | | | | | | | |
| | All countries | | | Developed countries | | | Emerging markets | | |
	OLS	FE	GMM	OLS	FE	GMM	OLS	FE	GMM
Interest Payments	0.36***	0.4***	0.47***	0.26***	-0.46***	0.46***	0.49***	0.74***	0.62***
	(0.05)	(0.06)	(0.11)	(0.06)	(0.14)	(0.08)	(0.06)	(0.06)	(0.13)
Cycle	0.05*	0.19***	0.15***	0.43***	0.24***	0.26***	0.16***	0.2***	0.1***
	(0.03)	(0.03)	(0.02)	(0.1)	(0.07)	(0.06)	(0.04)	(0.03)	(0.03)
Freely Falling	-1.77***	-0.44	0.08	.	.	.	-1.6***	-0.59	-0.73
	(0.39)	(0.38)	(0.54)	.	.	.	(0.59)	(0.48)	(0.6)
Primary surplus (t-1)	.	.	0.42***	.	.	0.72***	.	.	0.39***
	.	.	(0.06)	.	.	(0.05)	.	.	(0.07)
Constant	0.24	-0.08	0.07**	1.25***	4.68***	0.19***	-0.3	-1.39***	-0.08**
	(0.21)	(0.23)	(0.03)	(0.34)	(0.67)	(0.04)	(0.24)	(0.28)	(0.04)
Observations	950	950	873	253	253	252	247	247	240
R^2	0.10	0.11		0.14	0.11		0.27	0.43	.

(OLS) = ordinary least square estimates; (FE) = fixed-effects within estimates; (GMM)
= Arellano-Bond dynamic fixed-effect estimates
Robust standard errors in parenthesis; *,** and *** denote significance at 10%,5% and
1%

Table 6. Announcement effect over fiscal constraints. Emerging markets, 1991-2001

	Interest Payments		Cycle		Primary Balance	
	OLS	FE	OLS	FE	OLS	FE
Announced	-0.96**	-1.11*	-0.14	-1.74	-0.85*	-1.45*
	(0.4)	(0.6)	(0.75)	(1.07)	(0.44)	(0.73)
Freely Falling	1.89**	0.43	-2.64***	-4.78***	-1.06	-1.11*
	(0.85)	(0.51)	(0.94)	(0.94)	(0.78)	(0.62)
Constant	3.7	3.92	-0.01	0.5	1.61	1.69
	(0.19)	(0.17)	(0.27)	(0.33)	(0.2)	(0.21)
Observations	248	248	271	271	248	248
R^2	0.06	0.02	0.05	0.1	0.02	0.02

(OLS) = ordinary least square estimates; (FE) = fixed-effects within estimates
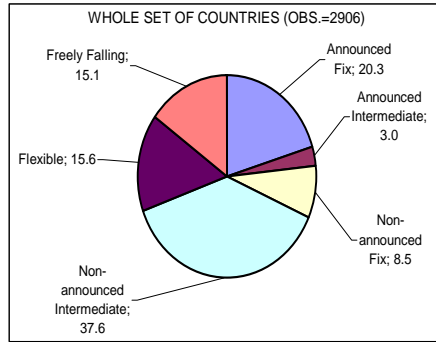Robust standard errors in parenthesis; *,** and *** denote significance at 10%,5% and 1%
When testing hypothesis Ho, a value lower than 0.05 is interpreted as a rejection of the null hypothesis (introduced in the corresponding line) at the 5% significance level

Table 7. Direct impact of announcement. Emerging markets, 1991-2001

	Primary Balance		
	OLS	FE	GMM
Interest payments	0.49***	0.74***	0.61***
	(0.06)	(0.06)	(0.13)
Cycle	0.16***	0.19***	0.10***
	(0.04)	(0.03)	(0.02)
Announced	-0.35	-0.29	-0.6
	(0.42)	(0.57)	(0.49)
Freely falling	-1.64***	-0.65	-0.91
	(0.6)	(0.5)	(0.66)
Primary surplus (t-1)	.	.	0.39***
	.	.	(0.07)
Constant	-0.23	-1.33***	-0.08***
	(0.26)	(0.3)	(0.04)
Ho: Announced = Non-announced			
p-value	0.21	0.09	0.14
Observations	247	247	240
R²	0.27	0.43	.

(OLS) = ordinary least square estimates; (FE) = fixed-effects within estimates; (GMM) = Arellano-Bond dynamic fixed-effect estimates

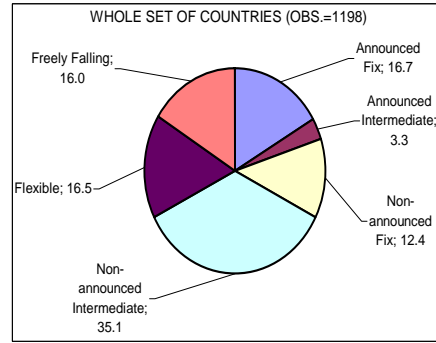Robust standard errors in parenthesis; *,** and *** denote significance at 10%,5% and 1%

When testing hypothesis Ho, a value lower than 0.05 is interpreted as a rejection of the null hypothesis (introduced in the corresponding line) at the 5% significance level
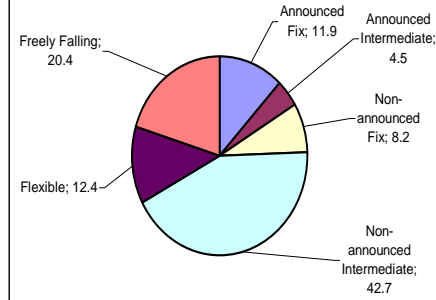
Table 8. Exchange rates and fiscal constraints. Emerging markets, 1991-2001

	Interest Payments				Cycle				Primary Balance			
	OLS	OLS	FE	FE	OLS	OLS	FE	FE	OLS	OLS	FE	FE
Announced	-0.17		-0.92		0.84		-0.18		0.33		0	
	(0.45)		(0.67)		(0.94)		(1.17)		(0.5)		(0.79)	
Fix		-0.9**		.		2		0.35		0.16		.
		(0.39)		.		(1.5)		(2.84)		(0.34)		.
Intermediate		0.23		-0.86		0.03		-0.11		0.43		0.16
		(0.58)		(0.67)		(0.9)		(1.24)		(0.68)		(0.79)
Non-announced	1.00***		0.31		1.26*		2.58***		1.49***		2.29***	
	(0.37)		(0.46)		(0.69)		(0.84)		(0.4)		(0.55)	
Fix		0.06		0.05		0.85		1.74		1.36**		1.49**
		(0.5)		(0.59)		(0.69)		(1.15)		(0.67)		(0.7)
Intermediate		1.31***		0.43		1.41*		2.91***		1.53***		2.66***
		(0.4)		(0.5)		(0.74)		(0.89)		(0.4)		(0.58)
Freely Falling	2.68***	2.68***	0.62	0.66	-1.67	-1.67	-3.2***	-3.1***	0.12	0.12	0.28	0.39
	(0.88)	(0.89)	(0.58)	(0.58)	(1.1)	(1.1)	(1.06)	(1.06)	(0.82)	(0.82)	(0.69)	(0.69)
Constant	2.91***	2.91***	3.69***	3.62***	-0.99	-0.99	-1.37**	-1.42**	0.43	0.43	-0.02	-0.1
	(0.29)	(0.29)	(0.39)	(0.37)	(0.63)	(0.63)	(0.69)	(0.71)	(0.32)	(0.32)	(0.46)	(0.44)
Observations	248	248	248	248	271	271	271	271	248	248	248	248
R^2	0.08	0.10	0.03	0.03	0.06	0.07	0.13	0.13	0.05	0.05	0.10	0.11

(OLS) = ordinary least square estimates; (FE) = fixed-effects within estimates

Robust standard errors in parenthesis; *,** and *** denote significance at 10%,5% and 1%

Table 8. Exchange rates and fiscal constraints (contd.). Emerging markets, 1991-2001

	Interest Payments				Cycle				Primary Balance			
	OLS	OLS	FE	FE	OLS	OLS	FE	FE	OLS	OLS	FE	FE
Ho: Announced = Non-announced												
p-value	0.00		0.05		0.58		0.01		0.01		0.02	
Ho: Fix announced = Fix non-announced												
p-value		0.04		0.93		0.41		0.63		0.05		0.03
Ho: Intermediate announced = Intermediate non-announced												
p-value		0.05		0.04		0.07		0.01		0.09		0.00

When testing hypothesis Ho, a value lower than 0.05 is interpreted as a rejection of the null hypothesis (introduced in the corresponding line) at the 5% significance level

Graph 1

SAMPLE FROM 1970 TO 2001 (% TOTAL OBS.)   **SAMPLE FROM 1991 TO 2001 (% TOTAL OBS.)**

WHOLE SET OF COUNTRIES (OBS.=2906)

Freely Falling; 15.1
Announced Fix; 20.3
Announced Intermediate; 3.0
Flexible; 15.6
Non-announced Fix; 8.5
Non-announced Intermediate; 37.6

WHOLE SET OF COUNTRIES (OBS.=1198)

Freely Falling; 16.0
Announced Fix; 16.7
Announced Intermediate; 3.3
Flexible; 16.5
Non-announced Fix; 12.4
Non-announced Intermediate; 35.1

EMERGING COUNTRIES (OBS.=696)

Freely Falling; 20.4
Announced Fix; 11.9
Announced Intermediate; 4.5
Non-announced Fix; 8.2
Flexible; 12.4
Non-announced Intermediate; 42.7

EMERGING COUNTRIES (OBS.=274)

Freely Falling; 14.6
Announced Fix; 5.1
Announced Intermediate; 7.3
Non-announced Fix; 14.6
Flexible; 16.4
Non-announced Intermediate; 42.0

DEVELOPING COUNTRIES (OBS.=1520)

Freely Falling; 18.8
Announced Fix; 29.5
Announced Intermediate; 2.6
Flexible; 12.0
Non-announced Fix; 4.0
Non-announced Intermediate; 33.1

DEVELOPING COUNTRIES (OBS.=671)

Freely Falling; 22.7
Announced Fix; 22.1
Announced Intermediate; 2.5
Flexible; 10.9
Non-announced Fix; 6.0
Non-announced Intermediate; 35.9

OECD COUNTRIES (OBS.=690)

Announced Intermediate; 2.2
Announced Fix; 8.6
Freely Falling; 1.4
Flexible; 26.7
Non-announced Fix; 18.8
Non-announced Intermediate; 42.3

OECD COUNTRIES (OBS.=253)

Freely Falling; 0.0
Announced Fix; 15.0
Announced Intermediate; 0.8
Flexible; 31.6
Non-announced Fix; 27.3
Non-announced Intermediate; 25.3

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