

Linkages Between Exchange Rate Policy and Macroeconomic Performance

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Abstract

From a panel of 137 countries over the years 1971 to 2002, we find evidence that an exchange rate policy of ‘fear of floating’ (de jure float and de facto peg) is associated with superior macroeconomic performance in non-industrialized countries. We examine four different measures of performance—per capita GDP growth, ii) the CPI inflation rate, iii) GDP growth volatility, and iv) inflation volatility—and how they respond to a ‘words versus deeds’ measure of exchange-rate policy obtained by interacting a country’s de jure exchange rate policy with its de facto policy as codified by Rogoff and Reinhart (2004). For non-industrialized countries, the highest GDP growth rates are associated with those who pursue fear of floating whereas the lowest inflation rates are achieved by countries that pursue a matched fix (de jure and de facto fixing). Countries that exhibit fear of floating also experienced the lowest GDP and inflation volatility while those that pursued a matched de jure and de facto float experienced the greatest macroeconomic instability.

1 Introduction

This paper is an empirical investigation of the linkage between exchange rate policy and macroeconomic performance. We study a panel data set consisting of annual observations from 1971 to 2002 across 137 countries. Our measure of exchange rate policy is a four-category interaction between the official IMF (*de jure*) and the *de facto* classification of Reinhart and Rogoff (2004) that indicates whether the central bank actually implements its publicly announced policy. We refer to exchange rate policy measured in this way as ‘*words versus deeds*’ policy.

The literature has offered many reasons to think that exchange rate policy may impact economic performance but has been less clear-cut in the direction of its predictions. On the one hand, flexible exchange rates may lead to better performance because they provide better insulation and adjustment to external shocks. On the other hand, exchange rate uncertainty may have a negative impact on investment, and therefore growth, when investment is irreversible [Dixit and Pindyke (1994), Aizenman and Marion (1993)]. In this case, exchange rate stability may lead to better outcomes. Thus, it is perhaps not surprising that the empirical significance of exchange rate policy in macroeconomic performance remains an open question.

The modern genesis of this line of empirical work begins with Baxter and Stockman (1995), who found no difference in either the growth or volatility of GDP growth in OECD countries before and after the collapse of the Bretton Woods exchange rate system. Frankel and Rose (2000), on the other hand, estimate that joining a currency union can potentially raise GDP by as much as 38 percent. Ghosh *et al.* (2002), who use a consensus classification, and Reinhart and Rogoff (2004) (hereafter RR), who use their own natural *de facto* classification, find that high GDP growth is associated with more stable exchange rates.¹ However, Levy-Yeyati and Sturzenegger (2003) (LYS), who classify exchange rate regimes using cluster analysis, find that higher growth is associated with exchange rate flexibility.²

¹In Ghosh *et al.* (2002) the regimes are classified as fixed, intermediate and flexible. The highest growth rates are found to be associated with the intermediate regimes. Reinhart and Rogoff find the highest growth rates to be associated with regimes of “limited flexibility,” which is the second most stable category in their five-way classification.

²Frankel (2003) shows that these alternative *de facto* classifications are largely uncorrelated with each other. Harms and Kretschmann (2007) attribute such contradictory results to the fundamental differences of the exchange rate policies that the *de facto* classifications of LYS and RR capture .

A clearer picture of exchange rate policy and performance seems to be forming for non-industrialized countries. Husain *et al.* (2005) use the RR classification and find that the *de facto* pegging has a significant impact on the macroeconomic performance for developing countries by delivering low inflation without sacrificing economic growth. Using a set of 42 countries, Fatas *et al.* (2007) study how setting and achieving quantitative targets for monetary policy affects inflation. They examine several alternative monetary policy frameworks (including *de facto* currency pegging) and find that the economy enjoys the lowest rate of inflation when the central bank's deeds go along with its words. Our study contributes to the literature by considering the complete set of 'words vs. deeds' exchange rate policies which provides a more nuanced account of the exchange rate channel for domestic macroeconomic performance. The empirical part of our paper proceeds in two stages.

In the first stage, we examine the relationship among output growth, inflation, and exchange rate policy. Here we find that *de jure* floats and *de facto* pegs (Calvo and Reinhart (2002) fear of floating) are associated with the highest GDP growth rates, while the *de jure* and *de facto* peg (matched peg category) is associated with the lowest inflation. By identifying sub-categories of *de facto* peggers that produce different macroeconomic performance, our results extend the findings of RR and Husain *et al.* (2005), who find that *de facto* currency pegging is positively associated with the real GDP growth and negatively associated with inflation. Our first result supports the hypothesis that the fear of floating policy has a growth promoting effect, while the second result is consistent with the Barro-Gordon inspired notion on inflationary bias reduction by means of nominal anchors. The matched peg policy, which is the outcome of *de facto* pegging and *de jure* pegging, represents a disciplined monetary policy that is easily verifiable by the private sector and capable of successfully anchoring its inflationary expectations.

In the second stage of empirical analysis, we examine the impact of exchange rate policy on the volatility of GDP growth and inflation volatility. Ever since Lucas (1987) argued that welfare gains associated with higher growth exceed those to reduction of business cycle volatility, little attention has been paid to empirical modeling of macroeconomic volatility. In comparison to the huge literature devoted to finding statistically robust factors in the growth regression framework (see Levine and Renelt (1992), Romer (1986) for an overview), the literature on the determinants of macroeconomic volatility is very thin (see Ramey and Ramey (1995)). However, the possible returns from bringing growth and business cycle research together have considerably increased over the last

two decades as most central banks adopted macroeconomic stabilization as one of the principal objectives of monetary policy. Here, we find that non-industrialized countries that pursue fear of floating face a trade-off between GDP growth and inflation but are able to achieve lower volatility of GDP growth without higher inflation volatility.

What is it about fear of floating that associates itself with higher growth and macroeconomic stability? It is doubtful that countries purposively select fear of floating as a policy choice. Instead, some authors (Eichengreen (2002), Detken and Gaspar (2003), Kumhoff et al (2007)) suggest that formal or informal monetary policies that target inflation produces de facto stable exchange rates under a de jure float. Thus, our results can be viewed as evidence that inflation targeting is a sound policy if one buys this argument and views fear of floating as a way to identify whether a country is an inflation targeter.

The remainder of the paper is as follows. The next section describes the words versus deeds exchange rate policy classification that we employ and their evolution over our sample. The main empirical results are reported in Section 3 and Section 4 concludes.

2 Classifying exchange rate policy by words and deeds

Economists have long been dissatisfied with the *de jure* exchange rate classification due to the large discrepancies in the actual exchange rate behavior under publicly stated policies. For example, RR argue that exchange rates may have been much more flexible during the Bretton Woods era, which is associated with pegging, and much more stable during the post Bretton Wood era, which is associated with floating. This thinking has yielded a number of *de facto* schemes, which use the observed behavior of the nominal exchange rates and monetary policy indicators in order to define the exchange rate regimes actually pursued by the central bank.

We obtain our ‘*words vs. deeds*’ factors from an interaction between the *de facto* classification of RR and the *de jure* classification from the *IMF’s Annual Report on Exchange Rate Arrangements and Exchange Restrictions*.

The first two columns of Table 1 demonstrate how we reduce the 6-way IMF *de jure* classification to a 2-way coarse classification of “pegged” or “flexible”.³ If the announced

³Unlike studies of Husain *et al.* (2005) and Ghosh *et al.* (2002), we do not identify the intermediate regime in the original exchange rate classification.

regime for a given country in a certain year falls into any of the categories in column (1) of the table, we allocate it according to the categories in column (2).

Columns (3) and (4) demonstrate how we reduce the RR *de facto* 5-way classification into a 3-way coarse classification of “free falling”, “pegged” or “flexible” exchange rates regimes. RR pay particular attention to countries in situations of currency crisis and hyperinflation, which they classify as having a “free falling” exchange rate regime. In our classification we retain this regime as a separate category. The same country-year observations classified by RR according to column (3) are thus allocated according to column (4) of the table.

Table 1. Sorting the classifications

6-way de jure (IMF)	Coarse de jure	5-way de facto (RR)	Coarse de facto
(1)	(2)	(3)	(4)
1) Independently Floating	Flexible	1) Freely falling	Free Falling
2) Managed Floating		2) Freely floating - Managed floating - Noncrawling band	Flexible
3) Adjusted According to Indicators		3) - De facto wide crawling band - Pre announced wide crawling band	
4) Cooperative Arrangements	Fixed	- De facto narrow crawling band 4) - De facto crawling peg - Pre announced crawling band - Pre announced crawling peg	Fixed
5) Limited Flexibility		- De facto peg - Pre announced horizontal band 5) - Pre announced peg or currency board	
6) Currency Peg		- No separate legal tender	

In table 2 we create the ‘*words vs. deeds*’ classification that records the nature of agreement or disagreement between the coarse *de jure* 2-way and *de facto* 3-way classifications described in Table 1. The ‘*words vs. deeds*’ classification has five regimes, where four regimes capture the discrepancy between announced and *de facto* currency regimes in countries under normal conditions. The country-year observations identified by RR as crisis situations are allocated into a fifth free falling category regardless of the officially announced regime.

Table 2

Characteristics of the fear factor exchange rate regime classification

<i>Fear factor</i> classification (1)	<i>De jure and de facto</i> classifications (2)	Characteristics (3)
1. Matched float	de jure floaters \cap de facto floaters	- Announce the currency float and allow the currency to fluctuate - Monetary policy is discretionary
2. Matched fix	de jure fixers \cap de facto fixers	- Announce the currency peg and maintain pegging - Monetary policy is anchored to the foreign policy
3. Fear of floating	de jure floaters \cap de facto fixers	- Announce floating but exhibit the characteristics of fixers - Monetary policy may have domestic anchors
4. Broken commitments	de jure fixers \cap de facto floaters	- Announce the currency peg but not able to maintain it - Monetary policy is officially anchored but is not credible
5. Free falling	de facto free falling	- The announced regime can belong to any category but de de facto country is in crisis

Countries in categories (1) and (2) do what they say, while those in categories (3) and (4) do not. Calvo and Reinhart (2002) present a systematic study of countries in category (3) countries, which they say have a ‘fear of floating.’

2.1 Evolution of exchange rate policies

One of the reasons for choosing the RR classification is that it does a good job of distinguishing the 'fear of floating' policy. Figure 1 provides an overview of the evolution of the exchange rate policies according to constructed '*words vs. deeds*' classification. The vertical axis tracks the share of countries that pursued certain exchange rate policy, plotted on the graph, in a given year with respect to the total sample in that year. We observe a downward trend in the relative number of countries that adhered to fixed exchange rate arrangements. An important observation is that the proportion of countries that *de facto* delivered their *de jure* commitment to pegging (Match Peg category) was gradually decreasing until the currency crises of 1997-1998, while the proportion of countries that *de jure* pegged but *de facto* floated (Broken Commitment) was stable until the 1990s (when it started decreasing).

An opposite picture is observed for the *de jure* floaters. The percentage of *de jure* floaters that let their currencies to float freely (Match Float category) was fairly stable in the 1970-80s time, and gradually increased in the 1990s. Most interestingly, the proportion of Fear Floaters whose actual behavior diverged from the stated exchange rate policy of *de jure* floating steadily increased until the late 1990s.

Figure 2 plots a similar graph for the sample of non-industrialized countries, which is central to our study. We observe the same trends as for the all countries sample with the exception of a less pronounced drop in the proportion of fear of floating countries after the Asian crises in 1997, which means that fear of floating remains a popular exchange rate policy in the non-industrialized countries.

Fig. 1 Evolution of *words vs. deeds* exchange rate policies constructed from the RR classification (All countries sample)

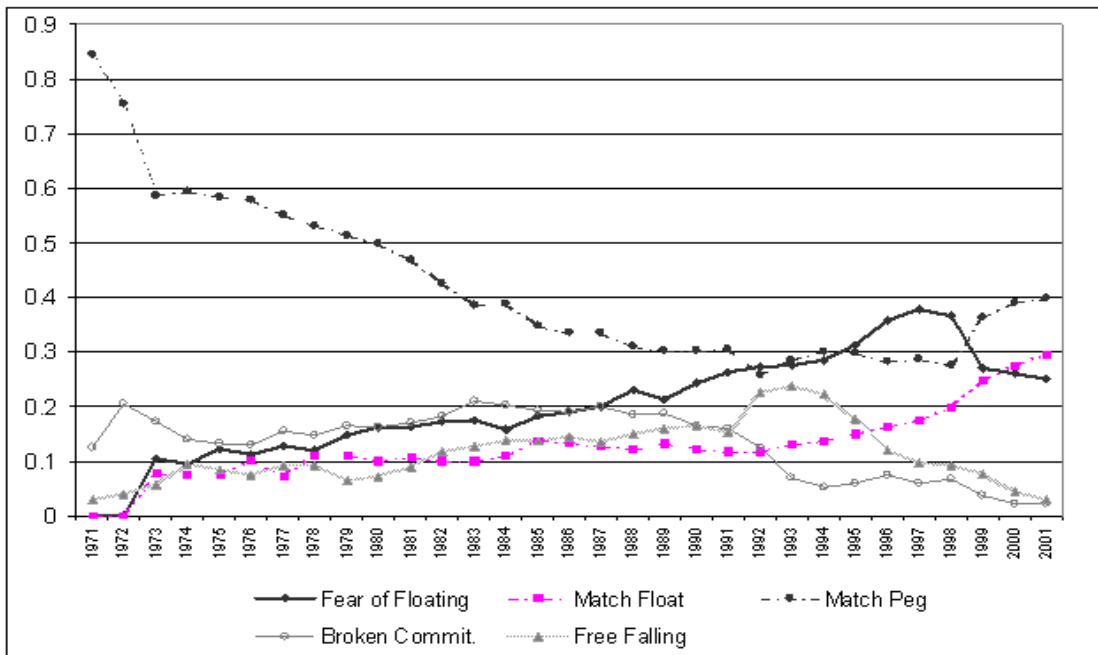
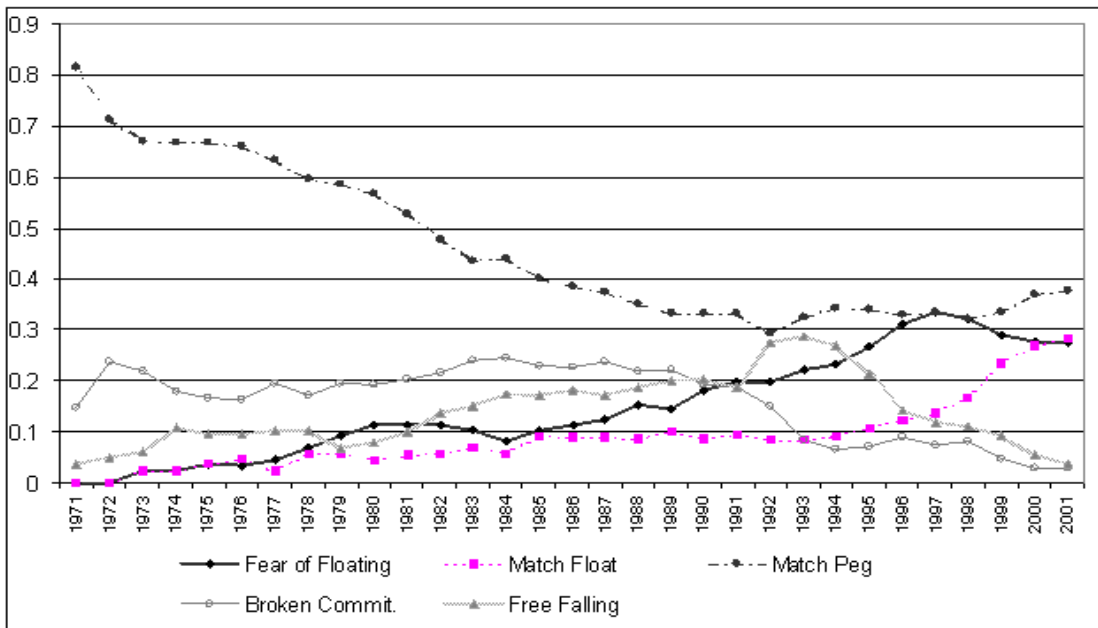


Fig. 2 Evolution of *words vs. deeds* exchange rate policies constructed from the RR classification (Non-Industrialized countries)



An overall observation is that until the 1990s, trends in exchange rate policies were fairly stable across countries, with a growing number of central banks allowing their currencies to float *de jure*. However, as of the last decade of the previous century, the situation started changing and the variability in exchange rate policies across countries significantly increased. Several noticeable jumps in that time period deserve attention.

The first shift occurred in 1991, when the share of Free Falling countries increased by nearly 10% in the whole sample, and the share of Broken Commitments category fell by 10%. This has two explanations. First, in 1991, a number of newly independent countries from the former Soviet Union and the Eastern Block entered the sample for the first time. Among them are: Albania, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Poland, Romania, Russia, Slovenia, Tajikistan, and Ukraine. Since these countries were in financial turmoil, RR classify them as free falling. This boosts the free falling share in the sample. Secondly, in Table D1 in Appendix A, we can see that a number of countries that were classified as Broken Commitment up to the early 1990s switched to *de jure* floating exchange rate policies in that time period. Among them are China, Egypt, Haiti, Iran, Jordan, Kenya, Malawi, Mauritania, Mauritius, Mongolia, Suriname, and Zimbabwe.

Another interesting phenomenon is a rapid increase in the proportion of fear of floating countries in 1994-1997 and a simultaneous decrease in the share of free falling countries. This development corresponds to a global trend of inflation stabilization, as the number of countries that were experiencing annual inflation rates over 40% managed to decrease the percentage rates to more normal levels. It is tempting to think that the surge in the number of fear of floaters and the *de facto* stabilization of exchange rates pursued by those countries is the cause of the inflation moderation and the drop of the proportion of free falling countries. However, it is also possible that the inflation stabilization was a result of monetary policies targeting domestic inflation, which also resulted in stable exchange rates. While explicit inflation targeting is not possible for most countries with weak monetary institutions, Carare and Stone (2006) identify alternative, the so-called inflation targeting lite (ITL) policies. These policies include informal inflation targets and a package of measures directed at reducing inflation, such as controlling money supply growth or smoothing out exchange rate fluctuations by adjusting domestic interest rates. When countries pursuing ITL policies succeeded in reducing inflation rates and left the Free Falling category, most of them relocated to the Fear of Floating group as their exchange rate policies were *de jure* floating but *de facto* pegged. Countries

that switched to the fear of floating type of exchange rate policy in the mid-nineties are: Algeria, Armenia, Azerbaijan, China, Dominican Republic, Egypt, Gambia, Guyana, Hungary, Jamaica, Kazakhstan, Malawi, Malaysia, Mauritania, Mauritius, Nicaragua, Peru, Philippines, Slovenia, Uruguay, Venezuela, and Zimbabwe⁴.

The last significant change in the conduct of exchange rate policies occurred in 1998, when we observe a sharp decline in the number of fear of floaters and an increase in the proportion of countries whose *de facto* and *de jure* policies match. This can be described as a so called “vanishing middle ground phenomenon” [Eichengreen (1994), Frankel *et al.* (2001)] meaning that a large number of countries opted for the “corner solutions”. Among them are: Brazil, China, Guinea, Hungary, Indonesia, Korea, Lebanon, Malawi, Malaysia, Paraguay, Philippines, Saudi Arabia, Singapore, and Sri Lanka. The timing of the trend and the countries involved confirm that the “corner solution” was an aftermath of the Asian, Russian and Latin American currency crises⁵.

However, as can be seen from Figure 2 and Appendix D, a fair number of countries (especially in Latin America) continues to pursue the fear floating policies until the end of our sample period. Unfortunately, the RR data ends in 2001, as a result of which we can not extend our *words vs. deed* analysis beyond that year.

3 Exchange Rate Policies and Macroeconomic Performance

3.1 Growth and Inflation

Let Y_{it} be the measure of economic performance of country i in year t , X_{it} be a vector of control variables and $P_{i,j,t}$ be the exchange rate policy dummy variable pursued by country i in year t . With the Match Peg exchange rate policy being the reference category, the subscript j refers to one of the four *words vs. deed* exchange rate policies defined in

⁴Appendix E lists countries that are classified by Carare and Stone (2006) as ITL together with the list of countries that pursued fear of floating exchange rate policies in the 1990s. As can be seen from the table, the lists largely overlap.

⁵Kumhof *et al.* (2007) demonstrate that countries pursuing inflation targeting policies and whose exchange rate resembles a fear of floating behavior are vulnerable to speculative attacks and the size of the attack is increasing in the tradables consumption share.

Table 2. The panel-data regressions take the form:

$$Y_{it} = \sum_{j=1}^4 \delta_j P_{i,j,t} + \beta' \mathbf{X}_{it} + \alpha_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where the error term $\alpha_i + \gamma_t + \varepsilon_{it}$ has an error-components decomposition. γ_t is a year fixed time effect, α_i is a random (country specific) effect⁶ and ε_{it} are i.i.d. random variables with finite second moments. The key parameters of interest are the δ_j which links exchange rate policy to growth.

For the growth regression specification, the independent variables X_{it} represent the Levine-Renelt standard growth controls. They are the investment share to GDP, the annual rate of population growth, and the annual rate of terms of trade growth. They are shown to be robust proxies for the domestic policy outcomes in many empirical studies and are also used in the open economy context by Husain *et al.* (2005).

For the CPI inflation regression, we choose independent variables based on the studies of Ghosh *et al.* (2002) and Fatas *et al.* (2007). They are openness, terms of trade volatility and GDP per capita in US dollars.

We extend the previous study of Husain *et al.* (2004), who focus only on *de facto* exchange rate regimes, by examining how announcing and delivering exchange rate policies affects the macroeconomic performance. In our *words vs. deeds* classification the exchange rate policies correspond to the following types of monetary policies: i) Match Peg - successful exchange rate quantitative target; ii) Broken Commitment - unsuccessful exchange rate quantitative target; iii) Fear of Floating - implicitly pursued quantitative monetary target (inflation targeting lite) with emphasis on exchange rate smoothing; iv) Free Floating - any other quantitative monetary targets without exchange rate smoothing. Table A1 in appendix A provides the summary statistics of the GDP growth and CPI inflation performance across the *words vs. deeds* regimes.

The results reported in column (8) of Table 3 suggest that, in the case of industrialized economies, exchange rate policies are largely neutral with respect to growth as the estimates are statistically insignificant⁷. Hence, the following discussion focuses only on the economically and statistically significant results for non-industrialized countries.

⁶The method of including country specific effects has the advantage of controlling for the incidence of time-invariant omitted variables that may be correlated with the set of controls.

⁷However, the relative sizes of the coefficients indicate that the Match Float category is associated with the highest economic growth. This is consistent with Husain *et al.* (2004), who find that the *de facto* floating exchange rate policy is the most advantageous policy for developed countries.

The benchmark estimates for the non-industrialized sample, which includes 90 countries, are reported in column (2) of the table. We see that relative to the reference Match Peg category, only the Fear of Floating dummy is statistically significant. The sign of the estimated coefficient suggests that fear of floating exchange rate policy is positively associated with real economic growth.

In order to check if the results are not driven by outliers we conduct a battery of sample modifications. In column 3 we drop the observations for which the fitted regression standard errors are more than three standard deviations from the mean. In column 4 we exclude countries that didn't change their *word vs. deeds* exchange rate policy over time.⁸ This is done because some countries could be naturally better suited for a certain exchange rate regime and the choice of the exchange rate policy is predetermined. Also because the free falling regime is not the natural country's choice we exclude all observations that correspond to Reinhart-Rogoff free falling regime in column 5. The overall conclusion that one can draw from this exercise is that the benchmark estimates are robust to the exclusion of outliers.

It is tempting to interpret the results as causal, but reverse causality or "endogeneity" remains a concern. As pointed out by Husain *et al.* (2004), the problem can not be fully resolved in the single equation framework but could be partially mitigated by using the regime prevailing in the previous 2 years as the explanatory variable. This controls for the situation when a temporary change in macroeconomic performance influences a change in the choice of exchange rate regime. The estimates of the specification with all exchange rate regime lagged by 2 years and applied to the full non-industrialized countries sample is reported in column (6) of the table. The signs and significance of the estimates are unchanged.

In order to further check the robustness of our findings, we reduce the benchmark non-industrialized countries sample and focus on the 1986-2002 time period. As can be seen in Figures 1 and 2, there is a much higher variation of exchange rate regimes in the in the post-1985 sample compared to the pre-1985 sample, when the Match Peg category prevailed. The estimates are reported in column (7) of Table 3 and, compared to the

⁸See Appendix D for the complete list of non-industrialized countries. The list of dropped countries includes: Antigua and Barbuda, Benin, Botswana, Cameroon, Central African Republic, Chad, Cote d'Ivoire, Croatia, Dominica, Equitorial Guinea, Estonia, Gabon, Grenada, Kuwait, Lesotho, Libya, Mali, Malta, Niger, Panama, Saudi Arabia, Senegal, Slovenia, St. Kitts and Nevis, St. Lucia, St. Vincent, Swaziland, Syria, Togo.

full sample results, all exchange rate dummy estimates are statistically significant.

Our results provide a partial reconciliation to the contradictory RR and Levy-Yeyati and Sturzenegger (2003) results on exchange rate regimes and growth. We find that countries that pursued *de jure/de facto* floating (Match Float) grew faster relative to those that pursued *de jure/de facto* pegging (Match Peg). However, the Fear of Floating exchange rate policy is associated with the highest real GDP growth.

Table 3. Growth performance and *word vs. deeds* factors

Dependent variable: real per capita GDP growth, Annual Panel for 1971-2002

Independent Variable	Non-Indust.						Indust.
	Full Sample	Without Outliers	Without constant regime ^b	Without free falling	2-year lagged regime ^c	1986-2002 Sample ^c	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fear of floating	0.913*** (0.346) ^a	0.944*** (0.243)	0.647** (0.322)	0.872*** (0.269)	0.669*** (0.276)	0.855*** (0.316)	0.100 (0.256)
Broken commitment	-0.413 (0.379)	-0.174 (0.366)	-0.871*** (0.412)	-0.302 (0.386)	-0.156 (0.355)	-0.960** (0.474)	0.074 (0.554)
Matched float	0.161 (0.439)	0.225 (0.321)	-0.035 (0.385)	0.166 (0.332)	0.151 (0.352)	0.110*** (0.370)	0.171 (0.259)
Free falling	-3.222*** (0.428)	-2.978*** (0.494)	-3.262*** (0.521)		-0.462 (0.433)	-3.773*** (0.784)	
Terms of trade growth	0.068*** (0.005)	0.095*** (0.008)	0.094*** (0.474)	0.062*** (0.019)	0.060*** (0.017)	0.054*** (0.023)	0.056*** (0.014)
Population growth	-0.672*** (0.107)	-0.667*** (0.114)	-0.563** (0.167)	-0.855*** (0.112)	-0.811*** (0.113)	-0.444*** (0.171)	-0.596*** (0.179)
Investment to GDP per capita	0.158*** (0.014)	0.143*** (0.019)	0.184** (0.031)	0.158*** (0.021)	0.159*** (0.021)	0.141*** (0.026)	0.186*** (0.026)
Constant	0.173 (0.827)	0.188 (0.996)	0.025 (1.038)	0.636 (1.110)	0.240 (1.071)	0.277*** (0.935)	-0.769 (0.830)
Num. Obs.	2173	2148	1532	1950	2170	1275	630
Num. Countr.	90	90	63	90	90	89	21
Wald test	0.000	0.000	0.000	0.019	0.115	0.000	0.930
Breusch-Pagan	0.000	0.000	0.000	0.000	0.000	0.002	0.000

Notes: ^a Heteroskedasticity robust standard errors are in parenthesis.^b Sample excludes countries that didn't change their exchange rate policy through time.^c Full initial sample is used. ** Denotes significance at 5% *** Significance at 1%.

The next table reports regression results for CPI inflation. Given the negative link between high inflation and exchange rate stability established in previous studies [Ghosh *et al.* (2002), Fatas *et al.* (2007)], we attempt to assess if lower CPI inflation under currency peg is due to the reduction of the exchange rate pass-through effect or if it is a result of disciplined and transparent monetary policies of central banks.

Our estimates reported in columns (2) through (7) of Table 4 indicate that, relative to the reference Match Peg category, Match Float and Fear of Floating policies are associated with a significantly higher CPI inflation. These results provide evidence, that in the case of non-industrialized countries, publicly announced *de jure* peg that is *de facto* maintained delivers lower CPI inflation than policies that *de jure* float. Interestingly, fear of floating policies that *de facto* stabilize the exchange rate are not associated with a significant inflation reduction.

As the Match Peg category represents the successful quantitative monetary policy target, our findings support the argument made by the Barro-Gordon inspired literature that explicit exchange rate pegging is the policy that is most transparent and easily understood by the public⁹. Our results suggest that this policy provides a good nominal anchor for stabilizing inflationary expectations and reducing inflationary bias¹⁰.

Mishkin and Savastano (2001) point out that the *de jure* free floating exchange rate policies mean nothing but a lack of a pronounced commitment to maintaining the domestic currency within a certain range and could be combined with any other type of monetary policies. Since non-industrialized countries typically have weak institutions, it is highly unlikely that they pursue explicit quantitative targets such as full-fledged inflation targeting (IT). This suggests that the Match Float category for this group of countries captures those countries that either do not pursue domestic inflation stabilization policies or do so unsuccessfully. It is not surprising that inflation is significantly higher for this group relative to the Match Peg category¹¹.

⁹Frankel *et al.* (2001) emphasize the issue of verifiability of exchange rate regimes by the private sector. High verifiability of *de facto/de jure* pegged exchange rate policy may explain its superior inflation performance relative to other policies.

¹⁰Giavazzi and Pagano (1988) argue that some European countries successfully pursued such a strategy in the 1980s by joining the Exchange Rate Mechanism (ERM).

¹¹There is a body of empirical literature relevant to industrialized countries that establish evidence of weak exchange rate pass-through to consumer prices. [Engel (1993), Parsley and Wei (2001)] Our results do not contradict this evidence as we capture the impact of monetary policy conduct by central banks on inflation rather than the correlation between exchange rate movements and domestic

The most interesting result is obtained with respect to the Fear of Floating category of countries, whose central banks pursue *de jure* floating combined with domestic policies that smooth out exchange rate fluctuations and reduce exchange rate pass-through. It is argued that the *de facto* pegging may isolate countries from nominal shocks and lower domestic inflation by reducing the pass-through effects from the exchange rate variability. Our results demonstrate that *de facto* pegging alone, without a publicly announced commitment, does not deliver low inflation relative to the successful exchange rate peg. This is consistent with the literature on local currency pricing (LCP), which argues that the link between movements in exchange rates and national consumer prices is weak [Devereux and Engel (2003, 2006)]. If producers set prices in local currency the variability of the exchange rate has a less pronounced impact on inflation. However, the absence of a credible and easily verifiable nominal anchor leads to inferior inflation performance in comparison with the Match Peg policy under which it is present.

The results from the first stage of our analysis reported in Tables 3 and 4 suggest that, in the case of non-industrialized countries, Fear of Floating and Match Float policies are associated with higher real economic growth and higher CPI inflation relative to the Match Peg policies. This means that there is a trade-off between growth promoting and inflation reducing monetary policies associated with the exchange rate channel. This is consistent with the results obtained by Tambakis (2007) within a Barro-Gordon model who demonstrates that fear of floating policy is more appropriate for financially fragile developing economies for which the output costs are higher when the financial crises coincide with the currency crises.

prices. The fact that the Match Float exchange rate policy is associated with higher inflation in non-industrialized countries demonstrates inability of central banks with weak institutions to credibly follow anti-inflationary domestic policies.

Table 4. Inflation performance and *word vs. deeds* factors
 Dependent variable: CPI inflation, Annual Panel for 1971-2002

Independent Variable	Non-Indust.						Indust.
	Full Sample ^b	Without Outliers	Without constant regimes ^b	Without free falling	2-year lagged regime ^c	1986-2002 Sample ^c	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fear of floating	10.274*** (2.736) ^a	7.732*** (1.528)	7.253*** (2.951)	7.169*** (1.593)	11.719*** (2.842)	10.257*** (4.144)	-2.678*** (0.575)
Broken commitment	1.154 (1.790)	3.792*** (0.898)	-4.200 (3.744)	3.918*** (1.045)	2.614* (1.551)	2.946 (2.444)	-0.724 (0.852)
Matched float	9.529*** (2.022)	8.661*** (1.288)	6.165*** (2.323)	8.163*** (1.329)	12.229*** (1.943)	14.008*** (3.408)	-2.858*** (0.604)
Free falling	94.938*** (12.026)	70.115*** (6.585)	94.133*** (10.904)		82.550*** (10.477)	103.846*** (18.324)	
Government expenditure	1.194* (0.734)	-0.044 (0.139)	1.710* (0.912)	-0.059 (0.112)	1.225* (0.694)	1.571 (1.073)	0.131*** (0.039)
M2 growth	0.057 (0.288)	-0.271*** (0.098)	0.153 (0.387)	-0.103*** (0.036)	-0.207 (0.295)	0.427 (0.368)	0.039* (0.029)
Terms of trade volatility	5.800*** (1.771)	2.557*** (0.906)	7.260*** (2.866)	0.539 (0.649)	5.757*** (1.736)	7.220*** (2.337)	-0.209 (0.371)
Openness	-0.129*** (0.042)	-0.054*** (0.011)	-0.178*** (0.043)	-0.036*** (0.011)	-0.139*** (0.041)	-0.119*** (0.045)	0.009 (0.011)
Constant	-3.572 (0.827)	8.437* (4.573)	-7.380 (20.696)	19.512*** (3.913)	0.173 (14.970)	0.173 (14.970)	13.608 (1.497)
Num. Obs.	1716	1697	1219	1560	1750	1078	245
Num. Countr.	85	85	60	85	85	83	9
Wald test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Breusch-Pagan	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: ^a Heteroskedasticity robust standard errors are in parenthesis.

^b Sample excludes countries that didn't change their exchange rate policy through time.

^c Full initial sample is used. ** Denotes significance at 5% *** Significance at 1%.

3.1.1 Additional robustness checks

Here, we briefly describe some additional specifications that we considered. First, in addition to using the lagged regime variable in order to control for the endogeneity bias we also employed instrumental variables regression. The instruments that explain the exchange rate policy well but are not partially correlated with the macroeconomic outcomes are borrowed from the studies by LYS (2003) and Fatas *et al.* (2007). Broadly, they can be divided into three groups: the natural country characteristics, the political variables, the lagged exchange rate regimes.

The first group of instruments are the country's land area and the size of the economy relative to the US economy. The second group of instruments are: political constraints due to Henisz (2005), civil liberty indicator reported by the Freedom House, the age of the ruling party and the indicator variable for the presidential or parliamentary electoral systems both taken from the World Bank Database of Political Institutions [Keefer (2007)].

To economize on space, the instrumental variable estimation results are relegated to Appendix B, Table B1. Here, we simply report that As can be seen the benchmark estimates for the GDP growth hold up well. As for the CPI inflation, the statistical significance of the *words vs. deeds* factors declines after we instrument them, however, signs and the relative magnitude of the estimated coefficients are similar to those found in the single-equation framework.

Our second set of robustness checks investigates long-run growth and long-run inflation performance across exchange rate regimes A large strand of the growth regression literature [Bekaert *et al.* (2005), Loayza and Ranciere (2002)] focuses on the economic policy impact on the long run growth and long run inflation. In this subsection we apply our benchmark specifications to the five-year averaged data. In deciding on the exchange rate policy for the five-year span we chose the *words vs. deeds* policy that prevailed in each five-year interval for each country.

Here too, we relegate the results to the appendix. The principal findings here are that the results for GDP growth are similar to the annual data results from Table 1, and the long-run CPI inflation estimates for the coefficients on the *words vs deeds* factors are similar in terms of signs and the sizes to the benchmark results reported for the annually sampled data.

3.2 Volatility regressions

A number of empirical studies document a negative link between growth and macroeconomic volatility [Ramey and Ramey (1995), Acemoglu et al. (2003), Hnatkovska and Loyaza (2005)]. The work of Loyaza *et al.* (2007) summarizes these findings and demonstrates that the welfare costs of macroeconomic volatility are particularly large in the developing countries. For example, Hnatkovska and Loyaza (2005) estimate that a one-standard deviation increase in macroeconomic volatility results in an average loss of 1.28 percentage points in annual per capita GDP growth. The literature on macroeconomic volatility identifies three main reasons why developing countries experience higher volatility than industrialized countries: larger exogenous shocks, self-inflicted policy mistakes and weaker “shock absorbing” institutional development.

In this section, we proceed with our investigation of macroeconomic volatility performance across alternative exchange rate policies. There is no consensus on volatility measurement in economics, as different authors use different techniques and time horizons. However, it is acknowledged that different volatility measures produce similar qualitative results in empirical studies. For example, Eichengreen (1994) points out that the cycle component extracted by the Hodrick-Prescott filter measures long-term swings in the business cycle, while the centered moving standard deviation measures short-term variability. Applying these two techniques to pre- and post- Bretton Woods samples, he does not find any strong qualitative difference between the two measures of business cycle variability.

We construct our volatility series by applying the centered moving standard deviation formula to the original data for each country in our sample¹².

$$Vol(Y_t) = \left\{ \frac{1}{2m} \sum_{k=(t-m)}^{t+m} \left[Y_{t-k} - \frac{1}{2m+1} \left[\sum_{k=(t-m)}^{t+m} Y_{t-k} \right] \right]^2 \right\}^{1/2} \quad (2)$$

By setting $m = 2$ in our calculations, we have a 5-year moving window of “realized volatility.”

¹²The moving average of the standard deviation has been widely used as a measure of exchange rate volatility in the international trade literature (for example Koray and Lastrapes (1989) and the references therein) and recently in studies by Bekaert *et al.* (2004) and Di Giovanni and Levchenko (2005).

We run a regression of the following form:

$$\ln(\text{Vol}(Y_{it})) = \sum_j \delta_j P_{i,j,t} + \beta' \mathbf{X}_{it} + \alpha_i + \gamma_t + \varepsilon_{it} \quad (3)$$

where $\text{Vol}(Y_{it})$ are volatility measures of real GDP growth and CPI inflation. The log transformation effectively handles the non-normality of the original series. The set of variables \mathbf{X}_{it} includes variables that control for domestic government policy and exogenous real shocks.

Because macroeconomic volatility may be induced by erratic fiscal and monetary policies, we include volatility of government consumption growth and volatility of short-term deposit rates in the set of control variables \mathbf{X}_{it} . The first variable controls for fiscal policy stability, while the second controls for domestic monetary policy stability¹³. Inclusion of these variables on the right hand side of our specification nets out their effects on the partial correlation between macroeconomic volatility and exchange rate policy.

Previous studies [Loyaza *et al.* (2007)] have found that external real shocks, such as abrupt changes in international terms of trade, are one of the primary sources of instability in non-industrialized countries. Di Giovanni and Levchenko (2005) and Loayza and Raddtzt (2007) also show that countries that are more open to trade tend to be more volatile. They attribute this effect to the increase in specialization and industry concentration. In order to control for external shocks, we include terms of trade volatility and openness into the set of control variables in our regression.

As seen from the Table 5, the estimated coefficients on all control variables in all columns are positive and highly significant. The signs are expected and are consistent with previous studies on macroeconomic volatility.

Regressing growth volatility on *words vs. deeds* exchange rate policy on the non-industrialized countries sample yields the Fear of Floating dummy as the only statistically significant coefficient. The negative sign of the estimate suggests that the Fear of Floating countries experience lower GDP growth volatility relative to the Match Peg and all other exchange rate policies. The coefficient estimates for the industrialized countries reported in column (8) of Table 5 are insignificant which goes along with the Baxter and Stockman (1985) neutrality results for the OECD countries. Our results

¹³Due to the skewness of the distributions all volatility measures were subject to a natural log transformation. Since we have a log-log panel regression the coefficients have an interpretation of elasticity.

compare favorably with recent work on exchange rate regimes and growth volatility. For example Ghosh *et al.* (2002), who use their own consensus *de facto* classification, find that pegged and intermediate regimes are associated with significantly lower volatility of output in the case of low and lower-middle income countries. Our *words vs. deeds* classification draws a distinction between *de facto* fixers according to their *de jure* policies. The results in columns (2)-(7) of Table 5 demonstrate that, relative to the reference Match Peg category, *de facto* pegging combined with *de jure* floating has a stabilizing impact on GDP volatility¹⁴.

The next step is to look at inflation volatility performance across alternative exchange rate arrangements. From Table 4, we know that Fear of Floating and Match Float policies result in a significantly higher level of CPI inflation than Match Peg policies. For the second moment of CPI inflation, results are different. In Table 6, we see that CPI volatility is significantly higher only under the Match Float category, which confirms our claim that this category identifies countries that either do not pursue nominal anchors or are not successful in maintaining them.

For the Fear of Floating policy category, inflation volatility performance is not significantly different from the Match Peg. If we accept the argument made by Eichengreen (2002), Detken and Gaspar (2003), and Kuhmoff et al (2007), who show that Fear of Floating policy is observationally equivalent to policies that pursue domestic price stability (Inflation Targeting Lite under Carare and Stone (2006) classification), the results reported in columns (2)-(7) suggest that *de facto* currency smoothing is associated with inflation volatility performance that is not statistically different from the performance under the explicit currency peg.

This means that non-industrialized countries pursuing Fear of Floating policy face a trade-off between high levels of GDP growth and CPI inflation, but on average they are able to achieve lower volatility of GDP growth without experiencing higher volatility of CPI inflation relative to other exchange rate policies.

¹⁴This result is also consistent with the more general "stylized fact" on a negative link between GDP growth and volatility of GDP growth reported in Ramey and Ramey (1995).

Table 5. GDP volatility performance and *word vs. deeds* factors

Dependent variable: volatility of real per capita GDP growth, Annual Panel for 1971-2002

Independent Variable	Non-Indust.						Indust.
	Full Sample	Without Outliers	Without constant regime ^b	Without free falling	2-year lagged regime ^c	1986-2002 Sample ^c	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fear of floating	-0.166*** (0.074) ^a	-0.184*** (0.076)	-0.141* (0.085)	-0.172** (0.079)	-0.111* (0.070)	-0.163* (0.091)	0.004 (0.071)
Broken commitment	-0.004 (0.072)	0.010 (0.073)	0.120 (0.084)	-0.017 (0.075)	-0.048 (0.067)	0.123 (0.096)	0.283** (0.148)
Matched float	0.007 (0.084)	-0.005 (0.086)	0.041 (0.092)	-0.006 (0.090)	-0.103 (0.079)	0.052 (0.101)	0.070 (0.075)
Free falling	0.036 (0.099)	0.016 (0.101)	0.103 (0.107)		0.013 (0.093)	0.043 (0.120)	
Govt.consump. growth volatility	0.158*** (0.028)	0.166*** (0.027)	0.129*** (0.031)	0.175*** (0.029)	0.159*** (0.027)	0.173*** (0.032)	0.192*** (0.043)
Volatility of deposit rate	0.049*** (0.017)	0.053*** (0.017)	0.056*** (0.017)	0.064*** (0.024)	0.047*** (0.016)	0.058*** (0.019)	0.099*** (0.031)
Terms of trade volatility	0.349** (0.036)	0.356*** (0.036)	0.365** (0.045)	0.361*** (0.039)	0.339*** (0.037)	0.385*** (0.043)	0.069 (0.045)
Openness	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.000)	0.002*** (0.000)	0.002** (0.001)
Constant	-0.232*** (0.213)	0.188 (0.996)	0.025 (1.038)	0.636 (1.110)	-0.202 (0.212)	-0.392*** (0.165)	0.599 (0.156)
Num. Obs.	1170	1146	799	1056	1159	821	474
Num. Countr.	79	79	55	79	79	78	20
Wald test	0.031	0.016	0.003	0.051	0.374	0.002	0.186
Breusch-Pagan	0.000	0.000	0.000	0.000	0.000	0.002	0.007

Notes: ^a Heteroskedasticity robust standard errors are in parenthesis.^b Sample excludes countries that didn't change their exchange rate policy through time.^c Full initial sample is used. ** Denotes significance at 5% *** Significance at 1%.

Table 6. Inflation volatility performance and *word vs. deeds* factors
 Dependent variable: volatility of CPI inflation, Annual Panel for 1971-2002

Independent Variable	Non-Indust.						Indust.
	Full Sample	Without Outliers	Without constant regime ^b	Without free falling	2-year lagged regime ^c	1986-2002 Sample ^c	
(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)
Fear of floating	-0.010 (0.104) ^a	0.021 (0.105)	-0.135 (0.124)	0.017 (0.105)	0.031 (0.083)	-0.071 (0.161)	0.013 (0.066)
Broken commitment	-0.002 (0.087)	0.044 (0.091)	0.151 (0.105)	0.056 (0.089)	0.261*** (0.077)	0.103 (0.147)	0.496** (0.124)
Matched float	0.434*** (0.106)	0.410*** (0.111)	0.253** (0.125)	0.413*** (0.109)	0.421*** (0.087)	0.579*** (0.165)	0.122* (0.071)
Free falling	1.588*** (0.162)	1.417*** (0.165)	1.485*** (0.172)		2.129*** (0.144)	1.596*** (0.242)	
Terms of trade volatility	0.350*** (0.043)	0.319*** (0.041)	0.423*** (0.055)	0.268*** (0.040)	0.325*** (0.039)	0.472*** (0.056)	0.015 (0.044)
Openness	-0.005*** (0.001)	-0.005*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)	-0.004*** (0.001)	-0.005*** (0.001)	-0.001 (0.044)
GDP per capita in dollars	-0.148*** (0.049)	-0.174*** (0.050)	-0.096* (0.058)	-0.150*** (0.050)	-0.142*** (0.045)	-0.013 (0.062)	-0.729*** (0.108)
Constant	2.476 (0.359)	2.735 (0.381)	1.973 (0.451)	2.653 (0.351)	2.283 (0.344)	0.906 (0.461)	8.167 (1.048)
Num. Obs.	1708	1528	1236	1537	1740	1076	583
Num. Countr.	85	85	60	85	85	83	21
Wald test	0.000	0.016	0.000	0.002	0.000	0.000	0.000
Breusch-Pagan	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: ^a Heteroskedasticity robust standard errors are in parenthesis.

^b Sample excludes countries that didn't change their exchange rate policy through time.

^c Full initial sample is used. ** Denotes significance at 5% *** Significance at 1%.

4 Conclusion

This paper investigates the empirical linkages between a country’s exchange rate policy, per capita GDP growth and CPI inflation in an attempt to improve understanding of the how the choice of exchange rate regime impacts economic performance.

Our work can be viewed as *indirectly* addressing the exchange-rate disconnect puzzle, posed by Obstfeld and Rogoff (2000) as “the remarkably weak short-term feedback link between the exchange rate and the rest of the economy.” Using a so-called *words vs. deeds* classification of exchange rate policies, which is based on the Rogoff and Reinhart (2002) *de facto* and the IMF *de jure* schemes, we identify clear patterns in macroeconomic performance across alternative exchange rate arrangements in non-industrialized countries. Our work, further, extends the results of Husain *et al.* (2005), who found that *de facto* pegging has a significant impact on growth and inflation in the developing countries.

A number of recent theoretical models [Gali and Monacelli (2005), Clarida *et al.* (2001), Devereux and Engel (2003)] have the objective to represent monetary policy in an open economy context. Our study of *words vs. deeds* policies could also be considered as providing a set of “stylized facts” for the exchange rate channel in these theoretical models. Moreover, the results reported in our paper provide a partial reconciliation to the contradictory results on exchange rate regimes and growth found in RR and Levy-Yeyati and Sturzenegger (2003). We find that non-industrialized countries pursuing the *de jure/de facto* floating (Match Float) grew faster than those pursuing *de jure/de facto* pegging (Match Peg). However, it is the Fear of Floating (*de facto* pegging under *de jure* floating) exchange rate policy, which is the most growth promoting. The estimates for industrialized countries are statistically insignificant, but the sizes of the coefficients suggest that Match Float is associated with the highest real GDP growth for this group of countries.

Our results on CPI inflation illustrate a trade-off between growth promoting and inflation reducing exchange rate policies. Relative to Match Peg, both Match Float and Fear of Floating policies are associated with a significantly higher CPI inflation. These findings support the argument made by the Barro-Gordon inspired literature that explicit exchange rate pegging (represented by the Match Peg category in our analysis) is the most transparent and easily understood policy, that provides a good nominal anchor for stabilizing inflationary expectations and reducing inflationary bias (see Fatas *et al.*

(2007) for an overview).

Moving to macroeconomic volatility performance, we find that the trade-off between exchange rate policies that seek to stabilize the second moments of output and inflation is less clear-cut. Our results demonstrate that for non-industrialized countries Fear of Floating exchange rate policy is associated with the highest reduction in output volatility without sacrificing inflation volatility. On the contrary, countries that pursue Match Float policies exhibit the highest volatility of inflation relative to other categories without any gain on output stabilization.

We attribute the overall results regarding Fear of Floating policies to inflation targeting lite (ITL) policies pursued by the central banks in non-industrialized countries. This type of policy takes place under a publicly announced floating exchange rate when central banks adopt the package of domestic measures directed at offsetting foreign shocks that *de facto* stabilize the exchange rate. Our results suggest that relative to Match Peg (which represents the successful quantitative target), this policy results in significantly higher economic growth but also higher CPI inflation. At the same time, the inflation volatility performance of Fear of Floating countries is not significantly different from that of countries pursuing Match Peg policy. Coupled with a better output volatility performance, this suggests that Fear of Floating might be the most advantageous exchange rate policy for non-industrialized countries.

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Appendix A. Summary statistics

Table A1. Growth and inflation by industrialization and words vs. deeds factors

	<u>Non-Industrialized</u>		<u>Industrialized</u>		<u>All Countries</u>	
	mean	obs. ^a	mean	obs.	mean	obs.
<u>A. GDP growth</u>						
Matched float	1.343	223	2.090	190	1.686	413
Broken commitment	1.425	323	2.700	17	1.489	340
Fear of floating	2.758	444	2.011	283	2.467	727
Matched pegged	1.686	1089	2.486	140	1.777	1229
Free falling	-2.106	238			-2.106	238
All	1.433	2317	2.159	630	1.588	2947
<u>B. CPI inflation</u>						
Matched float	15.250	228	6.188	171	11.366	399
Broken commitment	12.185	330	7.316	17	11.946	347
Fear of floating	13.976	414	6.791	283	11.058	697
Matched pegged	8.621	1023	7.289	159	8.441	1182
Free falling	117.455	214			117.455	214
All	21.384	2209	6.767	630	18.141	2839

^aObs. is the number of country-year observations

Table A2. Volatility of growth and inflation by industrialization and words vs. deeds factors

	<u>Non-Industrialized</u>		<u>Industrialized</u>		<u>All Countries</u>	
	mean	obs. ^a	mean	obs.	mean	obs.
<u>A. GDP growth volatility</u>						
Matched float	0.911	219	0.399	184	0.677	403
Broken commitment	1.077	293	0.564	15	1.052	308
Fear of floating	0.751	441	0.431	274	0.629	715
Matched pegged	1.243	989	0.483	115	1.164	1098
Free falling	1.393	221			1.394	221
All	1.102	2157	0.435	588	0.959	2745
<u>B. CPI inflation volatility</u>						
Matched float	1.725	221	0.315	189	1.075	410
Broken commitment	1.604	304	1.104	15	1.580	319
Fear of floating	1.540	442	0.425	283	1.105	725
Matched pegged	1.577	1023	0.492	121	1.462	1144
Free falling	4.084	226			4.084	226
All	1.844	2216	0.421	608	1.537	2824

^aObs. is the number of country-year observations

5 Appendix B. The instrumental variable results

Table B1. Instrumental Variable Results: Growth performance and *word vs. deeds* factors
 Dependent variable: real per capita GDP growth, Annual Panel for 1971-2002

Independent Variable	Non-Indust.			Indust.
	Full Sample	Without free falling	Full Sample Country fixed Effects	
(1)	(2)	(3)	(4)	(9)
Fear of floating	1.212*** (0.477)	1.041** (0.480)	1.459** (0.711)	0.398 (0.328)
Broken commitment	0.327 (0.625)	0.393 (0.595)	0.531 (0.940)	0.182 (0.761)
Matched float	-0.084 (0.651)	0.089 (0.642)	0.063 (0.891)	0.199 (0.305)
Free falling	-3.222*** (0.428)		-2.461** (1.011)	
Terms of trade growth	0.044*** (0.006)	0.043*** (0.006)	0.041*** (0.006)	0.070*** (0.016)
Population growth	-0.648*** (0.145)	-0.736*** (0.143)	-0.673*** (0.230)	-0.556*** (0.211)
Investment to GDP per capita	0.188*** (0.016)	0.185*** (0.016)	0.194*** (0.021)	0.196*** (0.026)
Constant	0.455 (1.018)	0.708 (1.008)	-0.644 (1.148)	
Num. Obs.	1376	1229	1376	550
Num. Countr.	77	77	77	21

Instruments: Political constraints, civil liberty, presidential electoral system, parliamentary electoral system, ruling party age, land area, economy size, lagged exchange rate regimes

Table B2. Instrumental Variable Results: CPI inflation performance and *word vs. deeds* factors
 Dependent variable: CPI inflation, Annual Panel for 1971-2002

Independent Variable	Non-Indust.			Indust.
	Full Sample ^b	Without free falling	Full Sample Country Fixed Effects	
(1)	(2)	(3)	(4)	(5)
Fear of floating	10.019* (5.318) ^a	0.932 (1.488)	15.612* (8.859)	-3.810*** (0.688)
Broken commitment	-6.070 (6.688)	0.291 (1.741)	-0.882 (11.219)	-2.005** (0.985)
Matched float	8.259 (6.989)	4.201*** (1.789)	17.428* (10.193)	-3.615*** (0.709)
Free falling	156.105*** (9.691)		160.452*** (14.462)	
Govern. expenditure	2.094*** (0.377)	-0.143 (0.098)	2.949*** (0.545)	0.129*** (0.040)
M2 growth	0.499*** (0.127)	-0.062** (0.027)	0.434*** (0.134)	0.048* (0.029)
Terms of trade volatility	4.932** (2.571)	0.789 (0.580)	5.869* (3.265)	-0.088 (0.392)
Openness	-0.107** (0.052)	-0.023* (0.013)	0.071 (0.094)	0.001 (0.011)
Constant	-30.489 (13.751)		-54.110*** (17.002)	
Num. Obs.	1181	1080	1181	217
Num. Countr.	75	75	75	9

Instruments: Political constraints, civil liberty, presidential electoral system, parliamentary electoral system, ruling party age, land area, economy size, lagged exchange rate regimes

6 Appendix C. Long-run growth and long run-inflation

Table C1. GDP growth performance and *word vs. deeds* factors

Dependent variable: real per capita GDP growth, Five-Year Averaged Panel for 1971-2002

Independent Variable	Non-Indust.			Indust.
	Full Sample	Without Outliers ^b	Without free falling	
(1)	(2)	(3)	(4)	(5)
Fear of floating	0.812** (0.359) ^a	0.681** (0.337)	0.823*** (0.348)	-0.209 (0.302)
Broken commitment	-0.503 (0.468)	-0.500 (0.455)	-0.352 (0.457)	0.053 (0.653)
Matched float	-0.549 (0.437)	-0.487 (0.419)	-0.407 (0.421)	-0.097 (0.364)
Free falling	-2.154*** (0.686)	-1.414*** (0.576)		
Terms of trade growth	0.166*** (0.024)	0.187*** (0.022)	0.155*** (0.024)	0.158*** (0.051)
Population growth	-0.335* (0.207)	-0.444** (0.199)	-0.597*** (0.195)	-0.156 (0.292)
Investment to GDP per capita	0.176*** (0.027)	0.146*** (0.024)	0.166*** (0.027)	0.057 (0.040)
Constant	-1.092 (0.828)	-0.044 (0.864)	-0.113 (0.872)	0.497 (1.155)
Num. Obs.	446	434	394	126
Num. Countr.	90	90	89	21

Notes: ^a Heteroskedastisity robust standard errors are in parenthesis.

^b Sample without observations for which the fitted standard error is more than three standard deviations from the mean.

Table C2. CPI inflation performance and *word vs. deeds* factors
 Dependent variable: CPI inflation, Five-Year Averaged Panel for 1971-2002

Independent Variable	Non-Indust.			Indust.
	Full Sample	Without Outliers ^b	Without free falling	
(1)	(2)	(3)	(4)	(5)
Fear of floating	10.019 (6.381) ^a	4.389 (3.864)	4.266*** (1.607)	-2.678*** (0.606)
Broken commitment	-0.567 (4.119)	2.290 (2.274)	4.894*** (1.721)	-0.724 (0.835)
Matched float	12.562*** (4.878)	9.083*** (3.277)	9.342*** (1.989)	-2.858*** (0.679)
Free falling	107.221*** (20.989)	85.395*** (16.965)		
Govern. expenditure	2.718 (1.871)	1.095* (0.641)	0.068 (0.207)	0.131*** (0.035)
M2 growth	-0.372 (0.408)	0.017 (0.499)	0.065 (0.153)	0.039* (0.022)
Terms of trade volatility	10.076* (5.623)	6.999** (3.136)	2.935 (0.870)	-0.209 (0.295)
Openness	-0.235*** (0.111)	-0.206*** (0.083)	-0.036** (0.016)	0.009 (0.011)
Constant	-42.247 (34.629)	-10.504 (12.009)	3.586 (3.994)	13.608 (1.967)
Num. Obs.	373	365	329	245
Num. Countr.	85	84	84	9

Notes: ^a Heteroskedastisity robust standard errors are in parenthesis.

^b Sample without observations for which the fitted standard error is more than three standard deviations from the mean.

7 Appendix D. List of countries with duration of the exchange rate regimes.

Table D1. Exchange rate policies of the non-industrialized countries by years

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Albania		1994-1996 1998-2001	1991-1993 1997		
Algeria			1994	1973-1993	1995-2001
Antigua and Barbuda	1971-2001				
Argentina	1991-2001		1971-1978 1981-1984 1986-1990		1979-1980 1985
Armenia	1992-1995				1996-2001
Azerbaijan			1993-1995		1996-2001
Belarus			1992-2001		
Benin	1971-2001				
Bolivia		1987	1973-1974 1980-1986	1971-1972 1975-1979	1988-2001
Bosnia and Herzegovina	1995-2001				
Botswana	1971-2001				
Brazil	1995-1996	1973 2000-2001	1975-1994 1999	1971-1972 1974	1997-1998
Bulgaria	1997-2000		1991-1996		
Burkina Faso	1971-2001				
Burundi	1971-1985	1999-2001	1996	1986-1995 1997-1998	

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Cameroon	1971-2001				
Central African Republic	1971-2001				
Chad	1971-2001				
Chile	1979-1981	1983-2001	1971-1977 1982		1978
China	1974-1978 2000-2001	1991-1992		1971-1973 1979-1990	1993-1999
Colombia		1984-2001			1975-1983
Congo			1975-1997	1971-1974	
Costa Rica	1974-1980	1984-1990	1981-1983	1971-1973	1991-2001
Cote d'Ivoire	1971-2001				
Cyprus	1971-1997				1998-2001
Czech Republic	1990-1995	1997-2001	1996		
Dominica	1971-2001				
Dominican Republic	1971-1978	1986 1992	1985 1987-1991	1979-1984	1993-2001
Ecuador	1971-1981 2000-2001	1985-1986 1994-1996	1982-1983 1987-1993 1998-1999	1984	1997
Egypt		1991		1971-1990	1992-2001
El Salvador	1971-1982 1994-2001	1985 1989		1983-1984 1986-1988	1990-1993
Equatorial Guinea	1971-2001				
Estonia	1993-2001		1992		
Gabon	1971-2001				

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Gambia	1971-1980	1987-1991	1986		1992-2001
Georgia		1999-2001	1992-1996		
Ghana	1971	1984-1985 1988-1989 1991-1993 1997-1999 2001	1974-1983 1986-1987 1990 1994-1996 2000	1972-1973	
Grenada	1971-2001				
Guatemala	1971-1984		1985-1986 1989-1990	1987-1988	1991-2001
Guinea	1975-1982	2000-2001		1971-1974	1986-1999
Guinea-Bissau	1977-1983 1997-2001				1984-1992
Guyana	1971-1980 1984-1987		1988-1991		1981-1983 1995-2001
Haiti	1971-1988	1991-1992 1995-2001	1993-1994	1989-1990	
Honduras	1971-1984	1991-1998	1990	1985-1989	1999-2001
Hungary	1994	1999-2001		1981-1993	1995-1998
Iceland	1971-1972 1987 1989-1999	1976 1984-1986 2001	1973-1975 1977-1983		1988 2000
India	1971-1978				1979-2001
Indonesia	1971	1978 1999-2001	1971-1974 1998	1975-1977	1979-1997
Iran	1971-1976	1978-1979 1992-1993	1994-1995	1977 1980-1991 1996-2001	
Iraq	1971-1981			1982-1998	

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Israel	1986-1988 1990	2000-2001	1974-1985	1971-1973 1989 1991-1999	
Jamaica	1971-1977 1979-1982 1989	1993	1978 1991-1992 1998		1983-1988 1990 1994-2001
Jordan	1971-1988 1993-2001			1989-1992	
Kazakhstan			1992-1995		1996-2001
Kenya	1971-1986	1994-2001	1992-1993	1987-1991	
Korea	1974-1979	1999-2001	1998	1971-1973	1980-1997
Kuwait	1971-2001				
Kyrgys Republic			1992-1999		2000-2001
Lao PDR	1972		1988-1989 1997-1999	1971 1973-1987	1990-1996
Latvia	1995-2001		1992-1993		1994
Lebanon	1971-1972 2000-2001	1976-1983	1984-1991		1973-1975 1992-1999
Lesotho	1971-2001				
Liberia	1971-1987				1998-2001
Libya	1971			1972-1998	
Lithuania	1995-2001		1992-1994		
Madagascar	1971-1984	1986-1990 1996-2001	1994-1995	1985 1991-1993	
Malawi	1971-1973	1993 2000-2001	1994 1998-1999	1974-1992	1995-1997
Malaysia	1971-1972 1975-1992 1999-2001	1998			1973-1974 1993-1997
Mali	1971-2001				

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Malta	1971			1972-2001	
Mauritania	1971-1983	1993-1994		1984-1992	1995-2001
Mauritius	1976-1981 1993-1994			1982-1992	1995-2001
Mexico	1971-1975	1994 1996-2001	1982-1988 1995		1976-1981 1989-1993
Mongolia			1993-1997	1991-1992	1998-2001
Morocco	1971-1977 1979 1991-2001				1978 1980-1990
Myanmar	1971-1973		1974-1975 1988-1990 1993 1997-1998	1976-1987 1991-1992 1994-1996	
Nepal	1974-1977 1982-1991 1993-2001			1978-1981 1992	
Nicaragua	1971-1978 1991-1992		1983-1990	1979-1982	1993-2001
Niger	1971-2001				
Nigeria	1971	1974-1976 1978-1982 1985-1990 1997-2001	1983-1984 1991-1995	1972-1973 1977 1996	
Pakistan	1972-1981 1999				1988-1998 2000-2001
Panama	1971-2001				
Paraguay	1971-1973	1999-2001	1985 1989-1990	1974-1984 1986-1988	1991-1998
Peru			1976-1993		1994-2001

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Philippines		1973-1983 1993-1995 1998-2001	1984	1971-1972	1985-1992 1996-1997
Poland	1990	2000-2001	1988-1989 1991-1992	1995-1999	
Romania		2001	1990-2000		
Russia			1992-1999		2000-2001
Saudi Arabia	2000-2001				1988-1999
Senegal	1971-2001				
Singapore	1971-1986	1999-2001			1987-1998
Slovak Republic	1993-1997	1999-2001		1998	
Slovenia			1992		1993-2001
South Africa	1971-1972	1980-1985 1995-2001		1973-1978	
Sri Lanka	1973-1976	2000-2001		1971-1972	1977-1999
St. Kitts and Nevis	1988-2001				
St. Lucia	1971-2001				
St. Vincent and the Grenadines	1971-2001				
Suriname	1971-1974	1996-1997	1986-1987 1991-1995 1998-2000	1979-1985 1988-1990	
Swaziland	1971-2001				
Syria	1971-1973			1974-2001	
Tajikistan			1993-1997 1999-2001		1998

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Tanzania	1971	1986-1990 1994-2001	1974 1984 1992-1993	1972-1973 1975-1983 1985 1991	
Thailand	1971-1981 1984-1996	1998-2001	1997		1982-1983
Togo	1971-2001				
Tunisia	1971-1985				1986-2001
Turkey	1971	1975-1976 1981-1983 1998-2000	1977-1980 1984-1997 2001	1972-1974	
Turkmenistan			1993-1997		
Uganda	1971 1987-1989	1983 1993-2001	1981-1982 1984-1986 1990-1992	1972-1980	
Ukraine		1999	1992-1996		2000-2001
Uruguay			1971-1978 1983-1990 1992-1995		1979-1982 1991 1996-2001
Venezuela	1971-1982	1990-1992	1987-1989 1993-1996	1983-1986	1997-2001
Zambia	1971		1985-2001	1972-1983	
Zimbabwe	1980-1982 2001	1995-1997	1991-1994 1998	1983-1990	1999-2000

Table D2. Exchange rate policies of industrialized countries by years

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
Australia	1971-1982	1984-2001		1983	
Austria	1971-1995 1999-2001				1996-1998
Belgium	1971-1972 1999-2001				1973-1998
Canada	1971-1972				1973-2001
Hong Kong, China	1971-1974 1983-2001				1975-1982
Denmark	1971-1972				1973-2001
Finland	1971-1991 1999-2001				1992-1998
France	1971-1972 1999-2001	1973-1974			1975-1998
Germany	1972 1999-2001	1973-1998		1971	
Greece	1971-1972 1974 2000-2001	1981-1984			1973 1975-1980 1985-1999
Ireland	1971-1978 1999-2001				1979-1998
Italy	1971-1972 1999-2001	1976-1982			1973-1976 1983-1998
Japan	1971-1972	1978-2001			1973-1977
Netherlands	1971-1972 1999-2001				1973-1998

	Words and Deeds Exchange Rate Policies				
	Match Peg	Match Float	Free Falling	Broken commitment	Fear of floating
New Zealand	1971-1984	1985-2001			
Norway	1971-1972	1973-1977 1992-2001		1978-1991	
Portugal	1971-1972 1999-2001	1973-1980			1981-1998
Spain	1971-1976 1999-2001				1977-1998
Sweden	1971-1972 1978-1991	1993-2001			1973-1977 1992
Switzerland	1971-1972	1973-1981			1982-2001
United Kingdom	1971	1973-1990 1993-2001		1972	1991-1992
United States	1971	1978-2001		1972	1973-1977

Appendix E.

List of Fear Floaters and countries classified as pursuing Inflation Targeting Lite policies.

Fear Floating Policy ^a	Inflation Targeting ^b	
Algeria, 1995-2001	Lite	
Armenia, 1996-2001		
Azerbaijan, 1996-2001		
Bolivia, 1988-2001		
China, 1993-1999		
Costa Rica, 1991-2001		
Cyprus, 1998-2001		
Dominican Republic, 1993-2001		Lite
Egypt, 1992-2001		
Gambia, 1992-2001		
Guatemala, 1991-2001		
Guinea, 1986-1999		
Guyana, 1995-2001		
Honduras, 1999-2001		Lite
Hungary, 1995-1998	Full-fledged	
India, 1979-2001	Lite	
Indonesia, 1979-1997		
Jamaica, 1994-2001		

Fear Floating Policy ^a	Inflation Targeting ^b
Kazakhstan, 1996-2001	Lite
Korea, 1980-2001	Full-fledged
Lebanon, 1992-1999	
Malaysia, 1993-1999	Lite
Mauritius, 1995-2001	
Nicaragua, 1993-2001	
Pakistan, 1988-2001	
Paraguay, 1991-1998	Lite
Peru, 1994-2001	
Philippines, 1996-1997	Lite
Russia, 2000-2001	Lite
Saudi Arabia, 1988-1999	Lite
Singapore, 1987-1998	
Slovenia, 1993-2001	Lite
Sri Lanka, 1977-1999	Lite
Tunisia, 1986-2001	Lite
Uruguay, 1996-2001	
Venezuela, 1997-2001	

Note:

^aSample is restricted to non-industrialized countries .

^bInflation targeting (IT) policy according to Carare and Stone (2003)

Appendix F. Variables and Sources

Variable	Definition and Sources
GDP growth	Rate of growth of real per capita GDP (constant LCU) (Source: WDI, series code: NY.GDP.PCAP.KN)
Inflation	Inflation CPI (Source: WDI, series code: FP.CPI.TOTL.ZG)
Terms of trade growth	Change in terms of trade - exports as a capacity to imports (constant LCU) (Source:WDI, series code:NY.EXP.CAPM.KN)
Terms of trade volatility	Centered moving standard deviation of terms of trade growth over five-year period
Population	Rate of growth of the total population (Source: WDI, series code: SP.POP.TOTL)
Investment to GDP	Fixed Capital Formation (Source: WDI,) series code: NE.GDI.TOTL.ZS
Openness	Ratio of export+import to GDP
GDP per capita in dollars	GDP per capita (constant 2000 US\$) (Source: WDI, series code: NY.GDP.PCAP.KD)
M2 as per cent of GDP	Money and quasi money (M2) as % of GDP (Source: WDI, series code: FM.LBL.MQMY.GD.ZS)
Civil Liberty	Index of civil liberties (measured on a 1 to 7 scale) (Source: Freedom House)
Presidential or Parliamentary	Indicator variables
Electoral system	(Source: WB Database on Political Institutions)
Ruling Party age	Number of years (Source: WB Database on Political Institutions)
Political constraint	Index of political constraint (Source: Henisz (2005))
Economy size	GDP in dollars over US GDP