THE ROLE OF POLITICS AND INSTITUTIONS IN LDC CURRENCY DEVALUATIONS[⊕]

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Abstract

This paper examines political, institutional and economic determinants of exchange rate performance in less developed countries in the 1990s. It models exchange rate depreciations as two separate processes, firstly a process determining whether a currency is devalued and secondly a process determining the size of devaluation. The paper utilizes the most recent political and institutional data as well as a new index of central bank governor turnover in the 1990s to examine the relative importance of political and economic factors. While institutional and political factors dominate the probability of devaluation, the size of devaluations is mainly governed by economic factors.

Keywords: exchange rate systems, less developed countries, speculative attack, fundamentals, institutions

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I: Introduction

Academics' and policy-makers' interest in developing country exchange rate regimes and their performance received a major boost in the 1990s. Firstly the decade saw the emergence of a large number of new (and newly convertible) currencies following the break-up of the Soviet Union. Choosing an exchange rate regime, which could deliver monetary stability was an important aspect of successfully managing economic transition. Several governments opted for currency pegs to affect inflation expectations and "borrow" credibility. A second major trend in the 1990s was financial liberalization in less developed countries (LDCs). This resulted in increasing financial integration and capital mobility, but also in increasing financial fragility: The 1990s saw several periods of turmoil on the foreign exchange markets, when central banks were faced with such massive speculative attacks that many currency pegs had to be abandoned.

Academic research on exchange rate regimes reflects that exchange rates are determined both by government preferences and market pressures. The literature on regime choice examines the economic, political and institutional factors that predispose a country towards choosing a floating exchange rate, a soft peg, a hard peg or monetary union.[1] The relevant institutions and economic factors are drawn from the literature on optimal currency areas[2], the "fear of floating" hypothesis[3] and political economy arguments.[4] The literature on currency crises on the other hand looks at the interaction between governments and markets. It initially focused on inconsistencies between the announced peg regime and the monetary and fiscal policies implemented by the country.[5] More recently the currency crises literature has also incorporated political[6] and financial[7] institutions, which determine the cost of peg defence, and the way in which politicians discount future benefits from maintaining a peg versus the short-term costs of defending the currency against a speculative attack.[8] This paper contributes to both these

literatures by examining the factors that determine whether a country maintains peg stability in a given year and if there is a devaluation, what factors determine the size of the devaluation.

The first contribution of the paper is the statistical examination of the most recent data on politics and institutions in a panel of LDCs, which are concurrent with the emerging market currency crises of the 1990s. For the question of whether peg stability is maintained the focus is on the credibility of the commitment to the peg. A very important explanatory variable is an index of central bank governor turnover in the 1990s. This was constructed for this study to avoid using 1980s data, which are both limited to non-transition countries and are in many cases out of date, given moves in many countries to improve central bank independence. While the question of political stability has been the focus of a number of previous studies on speculative attacks[9] and regime choice[10], the question of central bank independence has been neglected or been examined with 1980s data[11]. However, if the central bank is charged with maintaining peg stability and stands above the political fray (as for example in Estonia), even high political instability may not feed into devaluation expectations.

The second contribution of the paper is that unlike the regime choice literature it does not use multinomial logit analysis (somewhat arbitrarily) distinguishing between "intermediate" and "freely floating" regimes. Instead a political economy model of the size of devaluations is estimated. Devaluation size should reflect economic factors, however, the credibility of the government's commitment to maintaining monetary and fiscal discipline may also influence the size of the devaluation.

The third contribution arises from disentangling the decision to devalue from the size of devaluation. This helps to give a more nuanced picture of institutional factors, which

may have a negative effect on the probability of devaluation, but which can have a positive effect on the size of devaluation if it occurs. For example a democratic government facing an election is likely to prioritise internal over external objectives and therefore unlikely to impose the cost of pegging on the electorate. However, it is also unlikely to permit a catastrophic devaluation, as it would fear being punished for economic mismanagement. Such ambiguous effects of the institutional environment on exchange rate stability could not be picked up by previous studies of the effect of politics on currency pressure using linear regression analyses.[12]

The study is based on a panel of less developed countries from 1990 to 2000. There are a number of reasons for looking at developing countries separately from developed countries. Currency pegs in LDCs are generally unilateral. The stability of LDC exchange rate pegs therefore relies on the countries' economic performance and the credibility of their governments. In the absence of timely and reliable economic data, investors and speculators are likely to focus on the preferences and commitment mechanisms entered into by LDC governments when predicting the stability of pegs. Political and institutional factors should therefore take on a special significance in the LDC context.

It is shown that institutional factors dominate whether or not a devaluation occurs, even when economic control variables are included in the regression. Central to peg maintenance is the credibility of the commitment to exchange rate stability. This credibility is primarily a function of the degree of independence of the central bank, but also of the government's position in the polity and its time horizon and the level of financial development. Another significant factor is economic size, as argued by the literature on regime choice. If a government does not maintain a peg, however, the size of the devaluation appears to be mainly determined by the degree of internal

imbalances, the need to restore competitiveness and the degree of capital mobility, with some scope for using foreign exchange reserves to limit the size of devaluations. The empirical evidence for the importance of political factors in determining the size of devaluation is less strong, but an interesting result of modelling the devaluation problem as a two separate processes is that some variables change sign. While democracies are less likely to maintain a peg, they are also more likely to have smaller devaluations. Autocracies, which can postpone devaluations because they are able to impose the costs of peg defence on the population, tend to have higher devaluations when they occur. Financial sector development lowers the probability of devaluation, but if a more financially developed country is forced into a devaluation, it is likely to experience a major crisis.

The paper is organized as follows. In section 2 the relevant economic and institutional variables governing the probability and size of devaluations are identified through a review of the literatures on regime choice and currency crises and some descriptive statistics are presented. Section 3 discusses the methodology for this paper. Section 4 presents the results on the factors determining the probability of devaluation and the size of devaluations and discusses the results. Section 5 concludes.

II: Data Section

1 Dependent variable:

The dependent variable in the analysis is the change in the log of the annual average exchange rate vis-à-vis US$, unless a peg to another hard currency (Euro [DM, FF], SDR etc) is explicitly declared.[13] For the bivariate analysis the variable is categorized with all revaluations and peg stability as defined by the IMF (fluctuations within a 2% band) making up the "no devaluation" category and devaluations greater than 2%

making up the "devaluation" category. Overall about a third of the observations are in the "no devaluation" category. In the regression analysis studying the size of devaluation, the dependent variable is the change in the log of the annual average exchange rate in those countries, in which the devaluation of the average annual exchange rate exceeds 2%.[14]

2 Institutional Factors

According to the second-generation currency crises literature the main determinant of whether or not a currency crisis occurs is whether the authorities are willing to bear the political costs of defending the currency. The size of devaluation on the other hand depends on the change in monetary policy once the peg is abandoned, i.e. whether and to what degree the authorities will relax monetary policy once the constraints imposed by the peg are eased. Peg defence in a developing country context with limited foreign exchange reserves and without multilateral support involves raising the interest rate to stem capital outflows and (over time) correct any loss of competitiveness caused by past inflation differentials. There are several reasons why the authorities may resist such a rise in interest rates.

Time Horizons: According to macro-economic feedback models, the government resists interest rate rises because of their effects on the real economy, causing unemployment, bankruptcies and hence slower growth.[15] The authorities' willingness to bear these costs depends mainly on the time horizon of the policy-maker, who weighs up the (short-term) costs of peg defence against the (longer-term) benefits of exchange rate stability. One option of demonstrating commitment to a peg is to delegate peg maintenance to an independent central bank set up to maximize welfare over a longer time horizon than politicians.[16] The time horizon of politicians in turn depends on the stability of the polity: whether and when they have to face an election and how likely it

is that they will lose power.[17] In this study the question of time horizons will be captured with the following proxies:

Central Bank Governor Turnover: it was impossible to find a comprehensive dataset on the degree of central bank independence for developing countries in the 1990s. The Cukierman [1992] dataset of the *de jure* independence of central banks is a geographically limited data-set for the 1980s, although it has been updated with a number of entries for post-Soviet countries by Cukierman *et al* [1992 and 2001]. However, several authors have pointed out that *de jure* independence may not be a good proxy for actual independence, particularly in a developing county context.[18] Cukierman *et al* [1992] therefore developed an alternative proxy for actual independence based on the average turnover of central bank governors in a given period. A high turnover rate is taken to indicate a low degree of central bank independence: if governors are easily replaced then they are less likely pursue policies that are disadvantageous to the government[19]. The proxy appears relevant in the context of time horizons of the monetary authority: the higher the turnover rate, the less a governor will gain from pursuing long-term policies, as he will be punished for imposing short-term costs[20]. Using the period average of governor turnover rather than the year of governor change-over limits the endogeneity problem arising from the potential of governors being sacked as a political response to devaluation. The turnover rate variable was not available for the 1990s and was therefore constructed as the number of central bank governors divided by number of years the central bank / currency existed from 1990-1999.[21]

Regarding the time horizons of politicians there are a number of potential proxies. However, some of these proxies tend to be highly correlated with each other and are therefore not used together in the regressions.[22]

Degree of democracy: Democratic regimes are more accountable to the electorate than autocratic regimes and face the risk of being replaced at elections (or through a break-up of a ruling coalition) if unemployment rises and growth plummets. Democracies are therefore likely to be sensitive to the short-term cost of peg defence and likely to discount the long-term benefits of a stable currency more strongly than autocracies.[23] On the other hand a large devaluation would undermine the government's reputation for competent economic management and democracies are likely to be more sensitive to this than stable autocracies.

Concentration of political power: Among democracies the least stable form of government under deteriorating economic conditions is a multi-party coalition, as under economic pressure individual parties tend to withdraw from the coalition agreement for fear of being associated with economic mismanagement. On the other extreme are single-party governments with large majorities, as they are unlikely to be quickly replaced in response to electoral discontent and can therefore more easily absorb short-term economic costs.[24]

Veto-player changeover: This variable from the Beck et al [2001] database records the proportion of political veto-players (president / government / second house), which are replaced in a year. If the variable is used as an annual indicator of the extent of political instability, there is a potential reverse causality problem, as a government is unlikely to survive a catastrophic devaluation. It was therefore not used in the regressions studying the probability of devaluation. If averaged over the period 1990 –2000 period (or whichever sub-period the country existed) it proxies for the time horizon of politicians, with high turnover rates indicating that politicians have little scope for maximizing welfare over a long time horizon. However, the averaged variable was not significant in any specification of the regressions and is therefore omitted from the reported results. Veto player turnover can; however, be used in the regressions on devaluation size to study the effect of political instability on the government's ability to limit the size of

devaluation.[25] The variable is only significant in purely political models of devaluation size, as soon as economic indicators are added to the model the statistical significance of the variable disappears and the explanatory power of the model improves greatly. It is therefore omitted from the reported results.

***Election Year*:** A government is less likely to undertake politically costly defence of the exchange rate and is more likely to use monetary and exchange rate policy to boost employment when they face an election. The effect of an election year on the size of devaluation on the other hand is ambiguous – before an election a large devaluation would lower the probability of re-election. On the other hand after an election an incoming government may choose to boost the economy by devaluing, particularly if the new administration does not feel bound by the commitments made by its predecessors. The variable takes the value one if there was a legislative and/or an executive election in the year.[26]

Banking sector instability: According to banking sector models of currency crises, a higher interest rate destabilizes weak banking systems, as weak debtors fall behind with their payments and depositors start to withdraw in response to lower portfolio quality.[27] Finding a proxy capturing the solidity of the banking system in developing countries is difficult, as data about the proportions of bad loans are very limited (both in terms of countries and years for which they are available) and often do not accurately reflect the true extent of problem loans, as different countries have different regulations regarding the declaration of bad loans.[28] Therefore a number of broader measures of financial fragility and financial development are currently used in the academic literature on financial and currency crises.

Banking crisis dummy: The incidence of a banking crisis in an economy may be endogenous to the occurrence of a currency crisis: banking and currency crises tend to occur together.[29] The direction of causality may run either way, as the currency crises

could be caused by the weakness in the banking system. On the other hand a devaluation may destabilize a banking sector which has borrowed in hard currency to make loans in domestic currency. For this paper a dummy variable was used taking the value 1 if there was a banking crisis starting or ongoing in the previous year, to avoid the causality problem surrounding twin crises[30]. However, as the variable is never statistically significant it is not reported in the results tables below.

Financial Depth: Broad money as a ratio of GDP is sometimes used to measure the level of a country's financial development. However, in financially underdeveloped countries a large component of broad money is currency held outside the banking system. Demetriades and Hussain [1996] suggest that any measure of financial development should exclude currency in circulation from the broad money stock. In this paper (M3–M1)/GDP from the World Development Indicators is used as a proxy for financial development. Banking systems, which are more developed and perceived to be more stable, will attract a larger amount of long-term deposits. Excluding sight deposits also reduces potential endogeneity problems, as people withdraw short term deposits in the face of an emerging "twin crisis".

A number of alternative proxies were also considered, which might capture weaknesses in the banking system. *Liquid reserves / total assets in banking system*: A high level of reserves could be indicative of a financially repressed or unstable banking system in which banks are increasing their cash positions in anticipation of bank runs[31]. On the other hand, a high level of reserves may help to prevent liquidity problems in the banking sector, so the effect of this variable is ambiguous and indeed it is not significant in any of the regressions. *Interest rate spread* (lending minus deposit rate): This is another measure of the efficiency and competitiveness of the banking system. However, the interest rate spread also tends to be linked to inflation performance, so it is not a pure indicator of banking sector performance and is therefore omitted from the

regressions. *Bank Ratings*: Default and operational risk ratings for banks would appear to be a highly relevant measure of vulnerability to interest rate changes. However, ratings have been shown to be highly pro-cyclical.[32] For example in the Asian crisis country and corporate ratings deteriorated markedly after the crisis had broken, making this variable potentially endogenous. Standard and Poor's information on financial systems such as the "share of gross problematic assets" have only been available since 1998.

3 Preferences

These variables are based on the "optimal currency area"[33], the "fear of floating"[34] and political economy arguments. The theory of optimal currency areas sets up a cost-benefit analysis for a country based on how exposed its economy is to exchange rate fluctuations and how costly it is to address trade deficits through internal adjustments rather than changes in the exchange rate. There is a caveat, however, that the characteristics of size of the economy, openness and the level of development can be highly correlated.

GDP: larger economies tend to have some influence on the price of traded goods.[35] Large countries are therefore not as exposed to international price shocks and therefore have less to gain from fixing their exchange rates.

Openness is a measure of how exposed the economy is to fluctuations in the exchange rate.[36] In relatively closed economies exchange rate fluctuations only affect a few internationally traded commodities, making pegging less attractive.

GDP/Capita: is sometimes used as a measure of diversification of the economy and hence a measure of how exposed the economy is to foreign demand shocks. In diversified economies disturbances in individual markets will offset each other. While a diversified economy is less likely to peg, diversification is likely to make a float relatively smooth. The main problem with this variable is its high correlation with other

explanatory variables, such as its correlation coefficient of 0.63 with the financial development variable and a correlation coefficient of 0.47 with the openness variable. The correlation coefficient between GDP and GDP *per capita* is 0.24. GDP *per capita* is never significant in the regressions alongside the other indicators of preferences and is therefore omitted from the reported regressions.

Terms of trade shocks: This variable captures diversification of trade as well as pressures to devalue to restore competitiveness[37]. Countries with well-diversified geographical and product group trade patterns are less likely to be affected by external shocks. Lagged changes in import and export prices are used to avoid picking up effects of price shocks linked to a devaluation. As an alternative a variable capturing the size of the current account surplus / deficit is used in some regressions, which is discussed below.

Fear of Floating: According to the fear of floating hypothesis countries there are multiple reasons why countries prefer to suppress variation in their exchange rates.[38] Countries with unhedged foreign currency denominated debt (pervasive in emerging markets) have an incentive to peg to the currency in which they have borrowed. A devaluation compromises the country's ability to service its debt, as revenues are generated in local currency.

Foreign currency denominated external debt/GDP[39]: It is argued that a high level of foreign currency denominated debt should increase a government's commitment to a peg. On the other hand, a high level of foreign debt also makes a government more vulnerable to changes in investor confidence. At times of crises the supply of external funds becomes inelastic, risk premia rise and make it difficult to service the debt.[40] Market forces may therefore be more important than the government's preferences.

A second reason for governments to limit exchange rate fluctuations arises from a combination of lack of credibility and the pass-through from exchange rates to prices, which interferes with inflation targeting. A high degree of dollarisation of the economy indicates such credibility problems: In countries with a history of high inflation and frequent devaluations savers tend to hold hard currency deposits instead of deposits in the local currency. If there are restrictions on hard currency deposits or the banking system is fragile, asset substitution takes the form of "currency dollarisation", where people hold foreign cash in under the mattress savings instead of local currency deposits or cash.[41] This lowers the amount of domestic currency in circulation and exaggerates the inflationary effects of expansionary monetary policies. Maintaining a stable relationship between the domestic currency and the hard currency of choice in the country is often hoped to reverse or at least prevent further dollarisation. However, given the two aspects of dollarisation the more obvious "deposit dollarisation" and "currency dollarisation", which is more difficult to measure, there are no comprehensive and comparable datasets of the degree of dollarisation in less developed countries and this aspect of "fear of floating" is not examined statistically in this paper.[42]

In political economy the question of political preferences is discussed in addition to preferences based on the economic structure.

Left-wing dummy: Left wing governments are seen as more focused on internal (employment / growth) rather than external objectives.[43] This variable was developed for the OECD context and is based on words in the party name such as conservative / socialist / labour. It may therefore not capture the political preferences of developing countries, where the political spectrum is more likely to be split along ethnic or nationalistic lines than a traditional left-right spectrum. The proxy takes the value 1 in each year the Beck *et al* [2001] database records that a left-wing government was in power.

4 Conflict between pegs and domestic economic conditions

The first three variables are based on the first generation currency crisis literature, in which crises are caused by a contradiction between the announced peg and the government's fiscal and monetary policies[44]. The fourth variable (economic growth) is included according to second-generation macro-economic feedback models, in which the government is concerned about domestic economic performance and abandons the peg to concentrate on internal balance. All data are from the World Development Indicators.

Fiscal Deficit: Large deficits (lagged) may indicate a need for seigniorage finance, endangering the peg. However, as fiscal data are not widely available, this variable is not used in the regressions, but (lagged) inflation is used directly.

Inflation: Countries whose inflation rates diverge from those of the anchor countries will find it difficult to maintain currency stability over extended periods of time. Lagged inflation is used, as current inflation will be affected by devaluations through rising import prices.

Log of foreign exchange reserves: According to Krugmann's [1976] model of currency crises one of the leading indicators of currency crises is the loss of foreign exchange reserves as domestic credit grows. The variable is lagged by one year to circumvent endogeneity problems, as a speculative attack will deplete foreign exchange reserves. Although the currency crises in the 1990s have shown that central bank reserves in LDCs are not sufficient to avert a currency crisis in the face of a concerted speculative attack, foreign exchange interventions may help to limit the size of a devaluation.

Recession: Lagged GDP growth reflects the government's temptation to inflate the economy to achieve internal balance (current GDP growth may be endogenous to a devaluation occurring – see e.g. the recessions after the Tequila and Asian crises).

Current account imbalance: Large current account deficit (lagged) may indicate a need to devalue to achieve external balance. The lagged variable is used, as the cost of imports increases and export revenues decrease immediately after the devaluation event, as part of the J-curve effect. The current account variable is used alternately with the terms of trade shocks variable.

5 Liquidity of the foreign exchange market and central bank reserves

Variables capturing liquidity should be included to control for the magnitude of capital outflows during a period of currency instability. The lower capital mobility the greater the scope for using foreign exchange reserves rather than the interest rate to defend the peg. There are a number of variables capturing the liquidity in a market. [45] *High bid-offer* spreads may reflect explicit transaction costs such as taxes, inventory-carrying costs and order-processing costs by dealers, as well as oligopolistic market structures. High transactions costs lead to thin markets. The problem with using this measure is that foreign exchange risk is part of the transaction costs implicit in bid-ask spreads (through inventory-carrying costs). *Turnover ratios* and *trading volumes* measure the breadth of a market. However, there are few data available for OTC markets like the foreign exchange market. *Market efficiency coefficients* measure the liquidity of a market by looking at how new information affects prices in the short term – how smoothly and quickly do prices adjust to their equilibrium level? However, this measure tends to deteriorate in advance of episodes of currency crises due to foreign exchange market in interventions (damping effects) or inaccurate price determination due to uncertainty regarding fundamentals (excessive volatility). As these traditional measures of liquidity are either unavailable or inappropriate in the context of currency crises, a crude proxy of market size might be more appropriate. *Size of financial market* (M3): Relatively large and developed financial markets are likely to receive more foreign speculator interest, than small and underdeveloped financial markets. However, this

variable is highly correlated with GDP (the correlation between logM3 and logGDP is 0.96) and is therefore omitted from the regressions.

6 Control variables

A further area of research in the field of currency crises is that of contagion, that is financial instability spreading from one country to its trade partners or among countries perceived to have similar characteristics.[46]

Year 1997 dummy: Of the various year-dummies introduced into regressions, the only significant contagion effects are observed in the Asian crisis.

7 Descriptive Statistics

Insert table 1 here

The descriptive statistics presented in table 1 lend preliminary support to most of the hypotheses explored above. Country years without devaluations have on average lower central bank governor turnover than country years in which a devaluation is experienced. The difference in the degree of democracy is even more pronounced: the mean in the no devaluation cases is highly autocratic (-7.288 with a minimum of –10), whereas the mean in the devaluation countries is democratic, even if not highly democratic (1.851 with a maximum of +10). The difference in concentration of power and election years is not as prominent, but the no devaluation cases have a lower proportion of elections and a greater concentration of power as expected.

Of the variables capturing preferences no strong conclusions can be drawn from the small differences in the size of the economy. However, the no devaluation cases are on average more open economies. The “fear of floating” hypothesis is contradicted as the no devaluation cases have a lower ratio of external debt to GDP than the devaluation

cases. The other economic variables presented show that the degree of vulnerability as captured by the first generation currency crises variables (inflation and fiscal deficit) is markedly lower in the no-devaluation cases than in the devaluation cases. The second generation variables also receive some support as export prices in the no devaluation cases were increasing faster and growth was higher on average than in the no devaluation cases. However, there are no prominent differences in the levels of foreign exchange reserves or the size of the current account deficits. Finally the year 1997 saw a higher than average proportion of devaluations.

III: Methodology

The main focus of this paper is to examine the differences between the factors that govern whether a currency remains stable or not and the factors that determine the size of a devaluation if it does take place. The methodology chosen is to analyse the first question (of peg stability) with a panel logit analysis, which examines what factors affect the odds ratio of a devaluation event occurring.[47] The regression takes the form:

(1) $$\mathbf{Ln\,[P\,/(1\text{-}P)] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \sigma_u + \varepsilon_{it}}$$

P is the probability of getting outcome A and (1-P) is the probability of not getting outcome A. The ratio P / (1-P) is the odds ratio and denotes the odds in favour of getting outcome A. The probability of the devaluation occurring is modelled as a function of a range of fixed effects from the independent x variables, plus a random effect (σ_u) plus an error term (ε_{it}).

The dataset is in the form of a panel with observations for up to 98 countries for up to 11 years (1990 – 2000). Therefore the logit function used is a cross-sectional time series logit. In the panel cross sectional effects dominate the time series effects as most of the institutional indicators do not change over time in a given country (e.g. the

concentration of power variable tends to be stable over time and the central bank independence indicator is calculated as an average of 10 years and has no in-group variance). Similarly there is no in-group variation in the dependent variable in 25 countries, which either remain stable exchange rates throughout the period (e.g. Saudi Arabia) or devalue every year (e.g. Turkey). Therefore a random effects logit is estimated.

Different combinations of the variables discussed above are used as explanatory variables. In the cases where different proxies capture similar institutions or are highly correlated alternative proxies were used in different regressions. The first set of regressions focuses on institutional and political factors only. The second set of regressions compares the political model to alternative economic models. The third set of regressions uses both political and economic explanatory factors for a full model. The fourth set of regressions uses the same combinations of explanatory variables as in the full model to examine what governs the size of devaluation in country-years where the change in the annual average exchange rate exceeds 2%, using a linear regression.

IV: Results

1 Factors affecting the probability of devaluation

1.1 A Political Model

Insert table 2 here

The proxy for central bank independence is highly significant in all the regressions looking at institutional variables only. Any increase in the turnover of central bank governors (interpreted as a high degree of political interference in monetary policy) strongly raises the probability of devaluation and the coefficient is relatively robust in different specifications of the regressions.

The degree of democracy is also a highly significant explanatory variable. More democratic countries have a raised probability of devaluation, suggesting that more democratic governments find it more difficult to impose the cost of peg defence on their populations. On the other hand it is possible that the degree of democracy here proxies for other factors of development.

Regressions 1:3 and 1:4 provide support for the hypothesis that strong governments (either due to an autocratic regime or a democratically elected government which faces little effective opposition) can avoid devaluations, as costs of adjustment can be imposed on the populations. Concentration of power has a negative and significant effect on the probability of devaluation.

There is also support for the hypothesis that short time horizons raise the probability of devaluation with election years being statistically significant explanatory variables (regressions 1:1 to 1:4). Another explanation for the result would be that an incoming government does not feel bound by the commitments regarding peg stability made by a previous government. [48]

Neither regression 1:2 nor regression 1:4 lends any support to the political economy argument that left-wing governments tend to be more focused on internal balance rather than exchange rate targets. While the hypothesis may be confirmed in a developed country sample, in LDCs the party name (on which the variable is based) does not appear to give much information on the government's exchange rate regime preferences or the perceived credibility of its commitment to the peg.

Regressions 1:3 and 1:4 suggest that more developed banking sectors are less vulnerable to attacks. This means that the aspect of the variable, which captures the stability of the financial system, dominates that of foreign speculator interest and activity on a country's foreign exchange market.

To compare the political model to its alternatives regression 1:5 uses the economic factors that describe preferences instead of institutional variables. As expected larger and more diversified economies are less likely to peg. Openness is not statistically significant. The positive coefficient on the external debt variable contradicts the "fear of floating" hypothesis – higher levels of debt make it more difficult to peg. Overall the preferences model does not perform as well as the political / institutional model, despite being estimated on a larger dataset.

Regressions 1:6 and 1:7 use economic fundamentals variables only. Regression 1:6 is again estimated using a larger set of observations than the political model, but none of the economic variables is statistically significant. Regression 1:7 includes fiscal performance as an explanatory variable, which reduces the data-set to 699 observations. In this reduced dataset inflation is significant at the 10 per cent level with the expected sign. Neither economic model outperforms the institutional model.

1.2 The Full Model

Insert table 3 here

When political, institutional and economic factors are included in the regression simultaneously, the main factor determining whether or not a country devalues still appears to be the position of the central bank in the polity. Countries with central banks whose governors are frequently replaced have a much raised probability of devaluation (regressions 2:1 – 2:3). None of the other factors describing the political institutions retains its explanatory power in the regressions including economic factors in regression 2:1 to 2:3, though the expected signs are retained, with democracy raising the probability of devaluation while concentration of power lowers the probability of devaluation.

The financial development variable, however, remains (mostly highly) significant in lowering the probability of devaluation as was expected from the institutional analysis: financial systems perceived as trustworthy destinations for long term savings are more likely to withstand interest hikes in defence of currency pegs.

The significant positive coefficient of the GDP variable on the probability of devaluation confirms the optimal currency area argument, that larger economies have less interest in pegging the exchange rate. Another interpretation of the positive coefficient on the GDP variable is that it partially proxies for foreign interest in the country and hence the speculative pressures that can be brought to bear on a country's exchange rate peg.[49] The OCA argument that more open economies would prefer greater currency stability is not backed up by the results in table 2.[50]

The "fear of floating" argument that a high level of external debt to GDP should predispose a government to maintaining the peg is not supported by the regressions and regression 2:3 and 2:4 contradict it. The fact that a country has a large amount of external debt appears to make it particularly vulnerable to reversals in investor confidence and hence currency crises.

The final variable that is significant in all the regressions 2:1 to 2:4 is the year 1997 dummy, which shows that in terms of devaluations this year was indeed exceptional (unlike any other year dummy). This lends support to the contagion hypothesis.

None of the variables proxying for the extent of economic tensions and governments' temptation to reflate their economies has an effect on the probability of devaluation. Lagged inflation is significant at the 10% level in regression 2:3, but the effect is opposite to what would be expected, as higher rates of inflation appear to lower the probability of devaluation. Lagged growth, the position of the current account and lagged changes in export prices have no significant effect on the probability of

devaluation. Similarly the extent of foreign exchange reserves does not influence the ability of a government to maintain a peg.

In regression 2:4 the central bank governor turnover proxy is omitted from the regression to test whether governor turnover is a proxy of the government's overall policy preferences and hence economic outcomes. Omitting the variable produces a very similar pattern of results, except that the Herfindahl index of concentration of political power now becomes highly significant with the expected negative sign. Financial development continues to lower and the GDP variable raises the probability of devaluation and the coefficients are robust. External debt / GDP and contagion continue to be significant risk factors regarding the probability of devaluation.

2: Factors affecting the magnitude of devaluations

Insert table 4 here

Unlike the question of whether or not a country devalues, the magnitude of devaluation appears to be dominated by economic factors. Political factors appear to have some effect on the size of the devaluation, but they are not robust across different specifications of the regression. In regression 3:1 the index of the concentration of power has a positive effect on the size of devaluation. This makes sense in that if powerful governments have the option of postponing adjustment to pegs (a negative effect on the probability of devaluation) then if a devaluation occurs it is more likely to be sizeable and again the government is less likely to be punished for this. This is backed up by the negative coefficient on the democracy variable in regression 3:3, which shows that although more democratic governments are less likely to prioritise an exchange rate peg over internal objectives (from table 2), they are also likely to be more worried about allowing large devaluations for fear of being punished for mismanagement. Lastly regression 3:4, which omits the central banking variable, shows that election years have a positive effect on the size of devaluation. Either internal

balance receives priority over the exchange rate in the run-up to the election, or the devaluation occurs after the election and its magnitude is increased by political uncertainty and incoming governments breaking promises made by their predecessors.[51]

In contrast to the regressions reported in table 2, the proxy for financial development now has a highly significant positive coefficient, indicating that more developed financial systems are more vulnerable to capital outflows.

Similarly the larger the amount of external debt / GDP the more vulnerable a country is to large devaluations, contrary to the fear of floating hypothesis. While "fear of floating" would suggest that if a devaluation cannot be avoided the government should do its best to limit its size, it appears that a more indebted government is less able to do this.

All the regressions in table 4 confirm that the magnitude of devaluations when they occur is a function of the economic tensions within the economy. The higher the inflation rate the country experienced in the past year the higher the exchange rate adjustment necessary in the current year. However, the better the growth performance of the economy the smaller the devaluation. While the current account variable is not statistically significant, the lagged change in export prices is statistically significant in regression 3:3 where it has the expected negative sign – if export prices went up in the previous year there is less need for a devaluation of the exchange rate.

Regressions 3:1 and 3:4 suggest that a high level of foreign exchange reserves may help a country limit the size of a devaluation, even if it is ineffective in preventing a devaluation. However the coefficient is only significant at the 10% level in two regressions and is insignificant in the other regressions. Therefore the result is not robust.

Finally, while contagion appeared to be a significant factor in explaining whether or not a country devalued, it does not appear to have a statistically significant effect on the magnitude of devaluations in 1997.

3: Discussion of Results

3.1 Robustness of results:

The logit regression results were tested for robustness, considering both the sensitivity to outliers in the dependent variables and the definition of the dependent variable. The results of the logit regressions are not materially altered in terms of significance levels if the 9 countries, which had a single central bank governor from 1990 –1999, are excluded from the regression. Similarly removing the four countries with more than 5 central bank governors in the period does not alter the results significantly. The results for the democracy variable are sensitive to excluding the 7 highly autocratic countries (with democracy scores of -10 and –9). If these countries are excluded the democracy variable loses significance and the banking sector variable takes on significance at the 2% level instead. When the 19 countries with very high scores of democracy (9 or 10) are excluded, the political variables remain significant: either at the 1% level (Central bank and banking sector) or the 5% level (democracy, elections and the left-wing government dummy) but the predictive power of the political model is reduced somewhat (to 67.6%). Similarly the results are robust to excluding observations with low concentration of power, but the Herfindahl index loses statistical significance when the observations with a high concentration of power (115 observation where concentration of power =1) are excluded from the analysis. Finally excluding the 92 observations of extremely low banking sector development does not alter the results significantly, but the significance of the banking sector variable and the fit of the regression are improved if the 84 observations of highly developed financial systems (such as Hong Kong, Singapore, Malta and Cyprus) are excluded from the regressions.

The results reported for the logit analysis (whether or not a devaluation occurs) used a devaluation greater than 2% as the cut-off point for the dependent variable. If the dependent variable is reclassified using a devaluation of 5% as the threshold, the election year dummy in the political model loses statistical significance, the significance level of the democracy variable declines to 5%, the banking sector variable is significant at the 5% level rather than the 1% level in regressions 1:1 and 1:2. The concentration of power is only significant at the 10% level in all four regressions.

Regressions 1:1 to 1:4 and 2:1 to 2:3 show the central importance of the central bank's position in the polity. But it is also possible that there is an endogeneity problem: the fact that the country devalues may cause the government to fire the central bank governor. This problem is partially addressed by averaging turnover over the decade. Moreover, regression 2:4 shows that the results obtained are not purely dependent on the inclusion of the central banking variable, but that the explanatory power of the model is maintained when the central bank variable is omitted. Instead the concentration of power variable, the GDP variable and the external debt variable take on additional significance and the inflation rate changes to the expected positive sign. This suggests that there is a problem of multicollinearity in the data. However, the correlation coefficients between governor turnover and the Herfindahl index is the highest at 0.25, the lagged inflation rate 0.22, Log of GDP 0.16 and external debt 0.01.

3.2. Interpretation of Results:

The regression results reported in tables 2 and 3 show that the model correctly predicts just over 70% of devaluation / stability observations. Interestingly the predictions of the full model controlling for economic factors and the contagion effect in 1997 does not perform significantly better than the "pure" institutional model. Indeed most of the additional explanatory power arises from the 1997 dummy. Economic variables become

significant in the linear regression models of table 4, where variables capturing economic pressures to devalue are highly and robustly significant.

Looking at specific country cases, the logit models correctly predict devaluation probabilities in excess of 80% throughout the period for countries like Venezuela, on account of its low financial development and its 4 central bank governors in the 1990s, plus a relatively democratic and decentralized polity. On the other side of the spectrum, the model correctly predicts extreme stability for all the Gulf States with their autocratic, centralized polities and generally long-lived central bankers, as well as relatively well-developed financial sectors. Pure institutional models predict devaluation probabilities of about 25% for Saudi Arabia through the decade, while the mixed models hover around 35% devaluation probability. For countries that have experienced a process of democratization the models correctly predict increasing vulnerability. For example the probability of devaluation in South Africa rises by 15 percentage points between 1990 and 2000. However, for countries, which have a mixed pattern of episodes of stability and years of devaluation, the models are often not sensitive enough to predict year on year performance, except for instability associated with elections and contagion in 1997.

For an imaginary country at the mean of the sample distribution – what are the effects of changing the statistically significant explanatory variables?[52] In the institutional model of regression 1:2 a country at the mean of the sample distribution has a 70.2% probability of devaluation. A hypothetical country with all the worst characteristics has a near certainty of devaluation and a country with all the best characteristics has almost no risk of devaluation (results presented in Table 5). If a country at the mean of the sample distribution has just one additional central bank governor the probability of devaluation rises by 11%. Similarly moving from the mildly democratic mean to a fully

democratic polity raises the probability of devaluation by 9.3%. Finally, election years in a country at the mean raise the probability of devaluation by 15 percentage points.

For the full model including economic and control variables (regression 2.2) the hypothetical country at the sample mean has a probability of devaluation of 72.3%. For the mean observation of country-years with stable exchange rates the probability of devaluation is 55.7%. This rises to 77.9% for the mean of the observations in which a devaluation occurred. Holding all variables at the sample mean but adding an extra central bank governor raises the probability of devaluation by 6.5 percentage points, while contagion effects in 1997 increased the probability of devaluation by 10.3 percentage points. If a country at the sample mean increases its financial development by one standard deviation (29.2%) then the probability of devaluation is reduced by 11.6% and a country at the maximum level of financial development (and all other variables at the mean) has a probability of devaluation of just 7.6% (results presented in Table 6).

V: Conclusions

Many developing countries continue to prefer "intermediate" exchange rate regimes to the "corner solutions" of free floats or hard pegs supported by currency boards or outright monetary unions even after the series of currency crises of the 1990s.[53] If countries continue to manage their exchange rate, policy advice on how to make such regimes stable is important. This paper used LDC data to analyse the factors determining the probability of devaluation and then compared them to the factors that determine the magnitude of a devaluation in country-year observations where a devaluation occurred. Potential explanatory variables were drawn from a review of the literatures on regime choice and on currency crises.

It was shown that institutional factors play an important role in determining whether or not a less developed country devalues. Of particular importance appears to be the central bank's time horizon. Under strong governments the probability of devaluation seems to be lower. The strength of the financial sector also plays a role in determining the probability of devaluation, with more developed financial sectors more able to cope with the monetary implications of maintaining a peg. Further factors undermining the ability to maintain a peg are the level of foreign debt and contagion factors. The degree of economic imbalances in an economy, however, seems to have little explanatory power when it comes to the maintenance of a stable exchange rate in a given year.

A different picture emerges from the analysis of the determinants of the size of devaluation where economic pressures such as the inflation rate and the growth performance of the economy dominate. While the coefficients of the institutional factors maintain their expected signs, the coefficients are no longer robust to different specifications of the regression, though there is limited evidence that highly concentrated polities have larger devaluations and more democratic countries limit the size of devaluations. Election years seem to produce greater devaluations than non-election years. The only robust institutional variable is the financial sector variable. However, in contrast to the logit analysis, greater levels of financial development have a positive effect on the magnitude of devaluation, perhaps because more developed systems facilitate greater capital outflows.

The regression results indicate that a devaluation is a two-stage process. The decision whether or not to devalue is influenced mainly by the institutional set-up of the country, which determines whether a pegged exchange rate arrangement appears to be credible. Once a country decides to float, however, the size of the devaluation is mainly driven by

economic fundamentals, though there is some evidence to suggest that democratically elected governments may try to limit devaluations. Future research should concentrate on refining the proxies for the political, central banking and particularly the financial fragility proxies. This would allow us to draw more specific conclusions for policy advice to LDCs choosing to peg their currencies.

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Notes

[1] E.g. Benassy-Quere and Coeure [2002]; Berg and Borensztein [2000]; Poirson [2001]
[2] McKinnon [1963], Heller [1978], Dreyer [1978], Holden *et al* [1979]; Rizzo [1998]
[3] Calvo and Reinhart [2000]
[4] Edwards [1996] Meon and Rizzo [2002]
[5] Krugmann [1979]
[6] e.g. Obstfeld [1994], Ozkan and Sutherland [1995]
[7] e.g. Alba *et al* [1998], Bisignano [1999]
[8] e.g. Bussiere and Mulder [1999]; Leblang and Bernhard [1999]
[9] e.g. Bussiere and Mulder [1999]; Leblang and Bernhard [1999]
[10] e.g. Meon and Rizzo [2002], Poirson [2001] and Benassy-Quere and Coeure [2002]
[11] e.g. Benassy-Quere and Coeure [2002] use 1980s governor turnover to examine regime choice in the 1990s
[12] e.g. Bussiere and Mulder [1999] and Leblang and Bernhard [1999]
[13] IMF Exchange arrangement and exchange restrictions
[14] This categorisation differs from the dependent variables in studies examining peg choice, which look at the choice between hard pegs, soft pegs and pure floating, based on either declared or *de facto* regime choices. (See for example discussion on "classification of exchange rate regimes" in Poirson [2001] pp 6-12 and Bubula and Otker-Robe [2002] pp 6-13) The advantage of the proposed categorisation is that it offers an unambiguous way of dividing the sample for the two stages of the analysis.
[15] Drazen and Masson [1994]; Ozkan and Sutherland [1995]; Obstfeld [1994]
[16] This idea has long been part of the literature on central banking and inflation, but has not been empirically tested in the context of currency crises.
[17] Grilli *et al* [1994]
[18] eg Cukierman [1992]; Forder [1996]
[19] However, there is an alternative argument that a government would not replace a very compliant central banker, whereas an independent-minded governor could lose his job. In this case low turnover would indicate a low degree of independence. In practice governments tend to blame compliant central bankers for negative policy outcomes and sack them as scapegoats – see for example the 6 central bank governors in Brazil's high inflation episode from 1990 – 1994.
[20] An alternative interpretation of this proxy would be that rather than capturing an underlying power relationship between the government and the central bank it captures the degree of monetary policy stability, especially in autocracies where there may not be a way of implementing meaningful central bank independence / separation of powers.
[21] Based on the methodology suggested by De Haan and Kooi [2000] using IFS yearbooks and central bank web-pages. Ranges from 0.1 to 0.9.

[22] The correlation coefficient between the concentration power and the degree of democracy is -0.51 (autocracies tend to have high concentration of power) and democracies also have higher average instability (correlation coefficient of 0.42)
[23] The variable ranges from –10 (completely autocratic) to +10 (completely democratic) with a mean of about 1. From Polity IV database.
[24] The proxy is based on the Herfindahl index collected in the Polity IV database. The value of the index H, is the sum of the squares of the market shares of all parties in a polity, giving the highest scores to single-party polities. The proxy is not particularly useful for discriminating between stable and unstable autocracies as an unstable democracy may either be characterised by rising opposition representation or by a complete clampdown on political competitors.
[25] E.g. in Indonesia in 1997 / 98 political instability during and after the crisis created uncertainty about future policies and resulted in a much larger depreciation of the currency and a longer period of overshooting than in other countries affected by the Asian crisis, which maintained political stability, such as Malaysia and Singapore.
[26] From Polity IV database.
[27] Alba *et al* [1998], Bisignano [1999], Goldstein *et al* [2000]
[28] Barth *et al* database of financial Institutions
[29] e.g. Kaminsky and Reinhart [1998]
[30]From Caprio and Klingebiel [2003] In countries where it is not clear when the banking crisis ended (eg.1987-?) I assume it lasted five years from the start date. If the entry is "1990s" the variable takes the value 1 from 1991 – 2000. If the entry is "early 1990s" the variable takes the value 1 from 1991 – 1996.
[31] From WDI
[32] e.g. Ferri et al [1999], Monfort and Mulder [2000]
[33] Heller [1978], Dreyer [1978], Holden *et al* [1979]; Rizzo [1998]
[34] Calvo and Reinhart [2000]
[35] GDP from WDI
[36] Imports + Exports/ GDP from WDI
[37] A series of export prices was constructed from the WDI series of export revenues in current local currency / export revenues in constant local currency and converted to US$ prices. Likewise for imports.
[38] Calvo and Reinhart [2002]
[39] WDI
[40] This argument is presented by the liquidity crises models of currency crises in which the rise in the interest rate compromises a country's ability to service its debt, e.g. Goldfaijn and Valdes[1996]; Radelet and Sachs [1998]
[41] Ooomes [2003], Fielding and Shortland [2002]
[42] Poirson [2001] uses foreign currency deposits / broad money in her study of exchange rate regime choice, however, these data are only available for a very small subset of the developing countries examined in this paper.
[43] e.g. Simmons [1994]
[44] Krugmann [1979], Fielding and Mizen [2001]
[45] Sarr, A and Lybeck, T [2002]
[46] Alba *et al* [1998]; Eichengreen *et al* [1996], Masson [1999]
[47] Very similar results are obtained when using the probabilistic rather than logistic regressions.
[48] This is consistent with the results of Bussiere and Mulder [1999] who find that both pre and post-election periods are times of particular vulnerability for exchange rate stability.
[49] Based on the high correlation with the size of the financial market variable M3 discussed above.
[50] Different transformations of the openness variable such as log openness and log (1+openness) were used alternatively to address the somewhat skewed distribution, but the variable was never significant.
[51] Bussiere and Mulde [1999] who studied pre and post-election periods separately reach the conclusion that the post-election period is the most vulnerable period for currency pegs.
[52] Choosing the regressions with the highest explanatory power for the institutional model (1:2) and the full model (2:2)
[53] Benassy-Quere and Coeure [2002], Bubula and Otker-Robe [2002], Calvo and Reinhart [2002]

Table I:

Descriptive Statistics: Mean values

Variable	Sample	No Devaluation	Devaluation >2%
Central Bank governor turnover	0.296	0.252	0.322
Democracy	0.927	-7.288	1.851
Concentration of Power	0.513	0.557	0.487
Election Year	0.241	0.198	0.264
(M3 – M1) / GDP	29.66	39.918	23.822
Log GDP	22.604	22.393	22.637
Openness (%)	82.19	97.20	74.63
External Debt / GDP	83.28	70.16	89.77
Lagged Inflation (%)	118.79	34.37	167.51
Lagged growth (%)	2.72	3.60	2.22
Lagged current account / GDP (%)	-8.59	-8.09	-8.88
Lagged Fiscal deficit	-2.82	-2.28	-3.16
Lagged change in exports prices (%)	2.03	3.852	1.07
Lagged log of foreign exchange reserves	5.883	5.972	5.833
Year 1997	0.09	0.06	0.11

Table II:
Political / Institutional Model

Regression number	1:1	1:2	1:3	1:4
Central Bank	**6.291*****	**5.917*****	**5.359*****	**5.215*****
Governor turnover	(1.902)	(1.739)	(1.576)	(1.555)
Democracy	**0.056*****	**0.055*****		
	(0.023)	(0.023)		
Concentration of Power			**-1.037****	**-1.107****
			(0.510)	(0.501)
Leftdummy		0.390		0.272
		(0.300)		(0.298)
Election Year	**0.517****	**0.512****	**0.393***	**0.388***
	(0.219)	(0.219)	(0.214)	(0.213)
(M3 – M1) / GDP	-0.008	-0.009	**-0.018*****	**-0.017*****
	(0.007)	(0.006)	(0.006)	(0.006)
Constant	-0.948	-0.907	-0.281	-0.272
Number of Observations	934	934	882	882
% correctly predicted	70.9	71.7	71.0	71.5

Preferences Model

Regression number	1:5
GDP / Capita	**-0.0002****
	(0.0001)
Openness	-0.001
	(0.003)
Log GDP	**0.187****
	(0.083)
External Debt / GDP	**0.334****
	(0.168)
Constant	-3.047
	(4.957)
# of Observations	1234
% correctly predicted	67.9% [54]

Imbalances Model

Regression number	1:6	1:7
Lagged Inflation	0.052	**0.23***
	(0.071)	(0.12)
Lagged Growth	-0.02	0.03
	(0.013)	(0.026)
Lagged Current Account	-0.009	0.007
	(0.008)	(0.012)
Forex Reserves	0.002	-0.038
	(0.06)	(0.087)
Fiscal Surplus		-0.087
Constant	0.761	0.273
	(0.461)	(0.737)
# of Observations	1174	699
% correctly predicted	68.8%[55]	68.9%

*, ** and *** represent significance at 10%, 5% and 1% respectively
Standard errors in parentheses

[54] Estimated on full set of observations but predictions restricted to same dataset as institutional model
[55] as before

Table III:
Factors Affecting the Probability of Devaluation – controlling for economic conditions

Regression number	2:1	2:2	2:3	2:4
Central bank	**3.706*** **	**3.567** **	**2.995** **	
Governor turnover	(1.467)	(1.561)	(1.487)	
Democracy		0.026		
		(0.027)		
Concentration of Power	-0.598		-0.658	**-0.968*** **
	(0.526)		(0.580)	(0.449)
Election Year	0.172	0.305	0.239	0.180
	(0.242)	(0.246)	(0.254)	(0.219)
(M3 – M1) / GDP	**-0.024*** **	**-0.018***	**-0.026*** **	**-0.022*** **
	(0.008)	(0.010)	(0.008)	(0.007)
Log GDP	**0.207***	0.141	**0.221***	**0.213** **
	(0.124)	(0.133)	(0.126)	(0.104)
Openness	-0.001	-0.005	-0.003	-0.004
	(0.005)	(0.005)	(0.005)	(0.004)
External Debt / GDP	0.435	0.435	**0.599***	**0.548** **
	(0.303)	(0.314)	(0.323)	(0.245)
Lagged log of inflation	-0.061	-0.026	**-0.194***	0.015
	(0.096)	(0.101)	(0.116)	(0.086)
Lagged growth	-0.013	-0.019	-0.003	-0.013
	(0.015)	(0.016)	(0.017)	(0.014)
Lagged current account / GDP	0.004	0.003		0.004
	(0.013)	(0.014)		(0.010)
Lagged change in export prices			0.001	
			(0.007)	
Lagged log of foreign	-0.098	-0.084	-0.080	-0.070
exchange reserves	(0.078)	(0.082)	(0.081)	(0.064)
Year 1997	**0.672***	**0.659***	**0.665*** **	**0.961*** **
	(0.365)	(0.359)	(0.375)	(0.331)
Constant	-3.076	-2.308	-3.218	-2.602
Number of Observations	640	686	583	799
% correctly predicted	73.1	73.8	71.7	73.3

*, ** and *** represent significance at 10%, 5% and 1% respectively

Table IV:
Factors Determining the Size of Devaluation

Regression number	3:1	3:2	3:3	3:4
Central Bank	-0.039	-0.000	-0.005	
Governor turnover	(0.201)	(0.197)	(0.178)	
Democracy		-0.006	**-0.008****	
		(0.004)	(0.003)	
Concentration of Power	**0.151***			0.115
	(0.092)			(0.077)
Election Year	0.052	0.025	0.047	**0.073****
	(0.039)	(0.041)	(0.034)	(0.037)
(M3 – M1) / GDP	**0.006*****	**0.006*****	**0.004*****	**0.005*****
	(0.001)	(0.002)	(0.001)	(0.001)
Log GDP	0.016	0.016	0.023	0.013
	(0.020)	(0.019)	(0.018)	(0.016)
Openness	-0.0002	-0.000	-0.000	-0.001
	(0.0008)	(0.001)	(0.007)	(0.001)
External Debt / GDP	**0.203*****	**0.150*****	**0.197*****	**0.134*****
	(0.032)	(0.032)	(0.028)	(0.027)
Lagged log of inflation	**0.123*****	**0.147*****	**0.121*****	**0.149*****
	(0.015)	(0.016)	(0.015)	(0.013)
Lagged growth	**-0.011*****	**-0.008*****	-0.001	**-0.011*****
	(0.003)	(0.003)	(0.003)	(0.003)
Lagged current account / GDP	0.0008	-0.001		0.000
	(0.002)	(0.002)		(0.002)
Lagged change in export prices			**-0.002***	
			(0.001)	
Lagged log of foreign	**-0.023***	-0.020	-0.005	**-0.016***
exchange reserves	(0.013)	(0.013)	(0.012)	(0.010)
Year 1997	0.025	0.001	0.004	0.021
	(0.053)	(0.0546)	(0.046)	(0.048)
Constant	-0.618	-0.649	-0.802	-0.561
Overall R-Squared	0.3517	0.3157	0.3072	0.354
Number of Observations	447	441	441	538

*, ** and *** represent significance at 10%, 5% and 1% respectively

Table V:
Marginal Effects: Institutional Model

	Co-efficients	At mean	Worst	Best	Extra Governor	Maximum Democracy	Election Year
Central Bank Independence	**5.917*** **	1.751	5.3253	0.032	2.343	1.751	1.751
Democracy	**0.055*** **	0.050	0.55	-18.51	0.050	0.55	0.050
Election Year	**0.512** **	0.123	0.512	0	0.123	0.123	0.512
(M3 – M1) / GDP	-0.009	-0.266	-0.006	-1.998	-0.266	-0.266	-0.266
Leftdummy	0.390	0.105	0.39	0	0.105	0.105	0.105
Constant	-0.907	-0.907	-0.907	-0.907	-0.907	-0.907	-0.907
Xβ		0.85	5.86	-21.38	1.449	1.356	1.745
Probability		**0.702**	**0.997**	**0**	**0.81**	**0.795**	**0.851**

Table VI:
Marginal effects: Full Model

Regression number	Coefficients	At mean	Stable sample	Devaluers	Extra Governor	Year 1997	Extra Fin. Developmt.
Central Bank Independence	**3.567**** (1.561)	1.056	0.899	1.149	1.413	1.056	1.056
Democracy	0.026 (0.027)	0.024	-0.189	0.048	0.024	0.024	0.024
Election Year	0.305 (0.246)	0.073	0.06	0.081	0.073	0.073	0.073
(M3 – M1) / GDP	**-0.018*** (0.010)	-0.534	-0.719	-0.429	-0.534	-0.534	-1.059
Log GDP	0.141 (0.133)	3.187	3.157	3.191	3.187	3.187	3.187
Openness	-0.005 (0.005)	-0.411	-0.486	-0.373	-0.411	-0.411	-0.411
External Debt / GDP	0.435 (0.314)	0.361	0.305	0.391	0.361	0.361	0.361
Lagged log of inflation	-0.026 (0.101)	-0.066	-0.052	-0.073	-0.066	-0.066	-0.066
Lagged growth	-0.019 (0.016)	0.035	0.047	0.029	0.035	0.035	0.035
Lagged current account / GDP	0.003 (0.014)	-0.026	-0.024	-0.027	-0.026	-0.026	-0.026
Lagged log of foreign exchange reserves	-0.084 (0.082)	-0.494	-0.502	-0.490	-0.494	-0.494	-0.494
Year 1997	**0.659*** (0.359)	0.059	0.039	0.072	0.059	0.659	0.059
Constant	-2.308	-2.308	-2.308	-2.308	-2.308	-2.308	-2.308
Xβ		0.959	0.228	1.261	1.316	1.558	0.434
Probability		**0.723**	**0.557**	**0.779**	**0.788**	**0.826**	**0.607**