Growth Effects of the Exchange-Rate Regime and the Capital-Account Openness in A Crises-Prone World Market: A Nuanced View

By

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1 Introduction

Every major international economic crisis of the past 15 years (save Brazil in 2002) has been rooted in rigid exchange rate regimes. The Asian crisis of 1997-1998 could be viewed as a watershed in the international economics thinking

concerning exchange rate regimes, the international contagion of macroeconomic instability from one country to another, and the deregulation of international capital flows. One of the lessons is that, in the presence of

weak financial and fiscal institutions, balance-of-payments crises often follow up capital account liberalizations. The paper evaluates policies of capital-account openness and policy switches between a peg and a float. The main hypothesis

of the paper is that balance-of-payments policies, geared toward exchange rate regimes and capital account openness, influence output growth through two channels:

(1) Directly, through their effect on the trade and financial sectors, and

(2) Indirectly, through their impact on the probability of a balance-of-payments crises.

(3) We also propose a re-examination of discrete high inflation crises.

2 Literature

It has been a remarkably difficult empirical task to identify clear-cut real

effects of exchange-rate regimes on the open economy. Indeed, Marianne

Baxter and Alan Stockman (1989) and Robert P. Flood and Andy Rose (1995) find that there are no significant differences in business cycles across exchange rate regimes.

Similarly, no definitive view emerges as to the aggregate e.ects of capital

account liberalizations. Eichengreen (2001) points to the lack of the profession's understanding of the policies. Rodrik (1998) finds no significant statistical association between capital account openness and growth.

3. Data

Our original data set consists of 106 low-and middle-income countries (48
African countries, 26 Asian countries, 26 countries from Latin America and
the Caribbean and 5 European countries). A subset of 100 countries, for
which we have complete data, is listed in Table 1. The main source of data
is the World Bank (World Development Indicators and Global Development
Finance).The annual data ranges from 1971 to 1996. Data on 100 countries
over the period 1971-1997 is assembled by Gian Maria Milesi-Ferretti and

Assaf Razin (2000).

The IMF standard official classification of exchange rate regimes prior to

1997, as described in the various issues of the IMF's Annual Report on Exchange Rate Arrangements and Exchange Rate Restrictions, was completely revamped by the pioneering work of Reinhart and Rogoff (2004). They classify the regimes in a range from free falling to a hard peg like in the CFA franc zone in Africa. An extension of our approach could look at episodes of a switch from broad categories of float (ranging from free falling, through freely floating, to managed floating) to broad categories of peg (ranging from limited flexibility to peg). The data covers 70 countries of the 100 countries in the Milesi-Ferretti and Assaf Razin (2000) data set.

Capital-account openness data are based on a weighted- average index of

several categories restrictions on capital account transactions, reported in the IMF Annual Report on Exchange Arrangements and Exchange Restrictions.

We define sharp depreciations in the real exchange rate, as the measure of

a balance-of-payments crisis, rather than free falls in the nominal exchange

rate, as has been typically in previous balance-of-payments crisis literature.

In doing so we attempt to capture the effects of crisis on the real side of

the economy. Specifically, the balance-of-payments crisis is defined by sharp changes of the real exchange rate, with a 15 percent-per-year threshold.

A peg exchange rate increases and capital controls reduce the probability

of such a crisis.

4. Findings

We estimate both the short as well as the long run effects of exchange and

capital controls regimes on growth, controlling for their effect on the likelihood of crisis. We report out findings in Table 3 and Table 4.

We start with the effects of exchange and capital controls switches (that

is, the short-run effect). We do so with and without country fixed effects. To

under-score the role of policy on growth on growth via its effect (indirect) on crisis, we estimate each specification twice. First, we ignore the probability of having a crisis on growth; Second, we incorporate the effect of policies on the likelihood of facing balance of payments crisis.

Two main facts emerge from Table 3:

(i) Policies switches do affect the likelihood of a crisis: by switching from

float to peg the probability of a crisis increases by approximately 30 percent;

Similarly by imposing capital controls the likelihood of a crisis declines by the same order of magnitude.

(ii) Ignoring the crisis probability in the growth equation we find negligible

Effects of policy switches; however, controlling for the crisis probability we

Find a substantial positive effect of a switch from float to peg and a negative effect, in a similar order of magnitude, of imposing capital controls.

Turning to the effects in the short and the long run (Table 4) we find:

(i) While policy switches do affect the crisis probability, policy levels do not;

(ii) Ignoring country fixed effects we find, controlling for the likelihood of facing a crisis, that both policy switches as well as policy levels affect growth.

However, conditioning out country-time-invariant heterogeneity we see that only policy switches affect growth. These findings point out the role of policy switches. As for the long run effects, it is hard to distinguish between what is known as country fixed effects and the permanent effects of exchange rate regime and capital controls on growth.

Similarly, no definitive view emerges as to the aggregate effects of capital account liberalizations. Eichengreen (2001) overviews the literature, pointing to the lack of the profession's understanding of the policies. Rodrik (1998) finds no significant statistical association between capital account openness and growth. A more definite view concerning positives effects of capital account liberalization on output, which is advanced by Fischer (1998), is supported by some evidence, provided by Quinn (1997). The role of preexisting policies, and of trade-account-capital-account sequencing, in determining the effects of capital control liberalization on growth and investment, is examined by Arteta, Eichengreen and Wyplosz (2001), Chinn and Ito (2002), and Tornell, Westermann, and Martinez (2004).[5]

2.1 Crisis Probability: A Model

The multiple-equilibrium financial crises theory does not provide a clear guide as to the role played by self-fulfilling expectations in financial crises. This is because in the theory the *probability* of a crisis is loosely related to the fundamentals.[6] Thus, it leaves as an open question whether observed fundamentals, such as government deficits, are sufficient to explain crisis outcomes; or whether there is a large unexplained component, that is attributed to self-fulfilling expectations. This feature of the theory runs counter to the

[5]See also Ariyoshi *et al* (2000), Bhagwati (1998), Edwards (1999, 2000) and Kaplan and Rodrik (2000). Note that the Chinese Renminbi has been pegged to the US Dollar throughout the the Asian crisis, and also after the crisis. At the same time, China went through a gradual process of removing the constraints on its closed capital account, while maintaining the rigid fixed exchange rate. Its high growth performance, since 1978, is by now well established. East Asia is moving currently towards closer cooperation on trade, bonds markets, currencies, and the management of foreign exchange reserves, which may eventually lead to a common Asian currency.

[6]The 1992 EMS currency crisis inspired the second-generation models, as in Obstfeld (1994). He explained crises as a consequence of a conflict between fixed exchange rate and the central bank desire to pursue more expansionary monetary policy, than what is consistent with the exchange rate and capital market regimes. The resulting pressure, in the foreign exchange market, can lead to multiple self-fulfilling expectations equilibria. The emerging market currency crises of 1997-8 inspired the third generation model of currency crises, generating subtle mechanisms with multiple self-fulfilling expectations equilibria.

intuition that bad fundamentals are more likely to trigger a currency crisis. Indeed, the more recent financial-crisis theory demonstrates that, in the presence of asymmetric information, even a small amount of uncertainty with respect to the fundamentals, transforms the equilibrium set into a unique fundamentals-driven equilibrium.[7]

Consider the "third-generation" model that Paul Krugman (2000) proposes to make sense of the number and nature of the emerging market crises of 1997-98. The most distinct characteristic that captured the violence of the shock to the real side of the economy in the presence of crisis is, arguably, the reversal in the current account and the corresponding massive real depreciation. We describe in this section briefly the role of noisy signals in the model, using Morris and Shin (2000) approach.

There are N domestic entrepreneurs, who are single mindfully engaged in wealth accumulation, and N foreign creditors, who supply the credit necessary for domestic investment. As we will see, a foreign creditor's incentive to withhold a loan to her domestic entrepreneur counterpart is highest when all other N-1 foreign creditors do so, and vice versa.

Foreign lenders impose a limit on leverage:

$I_t \leq (1+\lambda)W_t$

where, I stand for investment in capacity by an individual entrepreneur, and the leverage is λ times the entrepreneur's net worth, W. The latter is given by:

$W_t = \alpha y_t - p_t F_{t-1}$,

and y, F and p denote domestic output, produced by a Cobb-Douglas technology with a capital input income share α,net initial debt indexed to foreign goods, and the relative price of foreign goods in terms of domestic goods (the real exchange rate), respectively.

The market clearing condition from which the equilibrium real exchange rate can be solved is:

$p_t = \frac{[1-(1-\alpha)(1-\upsilon)]y_t - (1-\upsilon)NI_t}{\tilde{X}_t}$,

where, υ denotes the marginal propensity to import, and $\tilde{X}_t$ is the stochastic value of domestic exports in terms of foreign goods. It plays the role of the fundamental which will

[7] See, for example, Goldstein and Pauzner (forthcoming).

determine whether there will be a low-output (no-credit) equilibrium or a high-output equilibrium. The offer of credit depends on what the foreign creditor thinks will be the value of the borrower collateral. However, because the debt is denominated in foreign goods, the value of borrowers' collateral depends, on the real exchange rate. The real exchange rate in turn depends on aggregate investment, which is determined by foreign creditors' incentive to lend. Every foreign creditor has to guess what the rest of the foreign creditors are going to do. A rational-expectations equilibrium of this global game will be a set of self fulfilling guesses so that the level of domestic investment implicit in the credit offers must match the actual level of investment that takes place given those offers.

A foreign creditor will finance domestic investment if

$(1+\mathrm{r}_t)\frac{p_t}{p_{t+1}} \geq (1+r*)$,

where, r and r* denote the marginal productivity of capital and the foreign interest rate, respectively.

Each foreign creditor i receives a private signal θ_i regarding $\tilde{X}_t; \theta_i = \tilde{X}_t + \varepsilon_{ti}$.

The error term ε_{ti} is independently and uniformly distributed over [-ε, ε]. The signal can be viewed as private information of the foreign creditor.

The foreign creditor's decision whether to extend credit to the domestic entrepreneur depends on her signal. The signal provides information not only about $\tilde{X}_t$, but also about the actions that the rest of foreign creditor will take.

Observe that the equilibrium p_t is a decreasing function of $\tilde{N}_t$,the number of foreign creditors that decide to extend credit to domestic enterpreneurs, and a decreasing function in $\tilde{X}_t$, the fundamental. Therefore there exists a cut-off signal $\theta_i^* = \tilde{X}_t^* + \varepsilon_{ti}^*$, so that

$\underset{N \tilde{} U[0,1]}{E}[(1+r_t)\frac{p_(\tilde{N}_t^*, \tilde{X}_t^*)}{p_{t+1}}] - (1+r*) = 0,$

for the marginal foreign creditor, who is indifferent when faced by the signal $\theta_i^* = \tilde{X}_t^* + \varepsilon_{ti}^*$, between withholding her credit , or extending it, to the domestic entrepreneur.

One can see that the cumulative distribution function, denoted by G(X), determines the ex-ante probability of a balance-of-payments crisis. The probability of balance of payments crisis is then given by

Prob $(\mathrm{I}_t N = 0)$ =G($\tilde{X}_t^*$).

Thus the better is the quality of the fundamental, X_t, the lower will be the ex-ante probability of a balance-of-payments crisis. At the same time the higher will be the expected value of domestic investment,

$(\bar{I}_t N)(1 - G(\tilde{X}_t^*))$,

where $\bar{I}_t$the investment level determined by rate-of-return considerations, not by the credit constraint.

In this version of the Krugman model, the fundamentals and the crisis-driven outcomes are indeed *correlated*. Importantly, self fulfilling beliefs can be summarized by a unique probability of crisis, which, in turn, is a function of observed fundamentals. Specifically, when the fundamentals are weak, the probability is large, and vice versa. The asymmetric -equilibrium setup implies that fundamentals-driven market expectations determine ultimately the observed performance of the economy. This yields a compelling interpretation to our econometric approach in this paper, where the probability of balance-of-payments crisis is at the center of the analysis.

3 Data

Our original data set consists of 106 low-and middle-income countries (48 African countries, 26 Asian countries, 26 countries from Latin America and the Caribbean, and 5 European countries). A subset of 100 countries, for which we have complete data, is listed in Table 1. The main source of data is the World Bank (World Development Indicators and Global Development Finance). The annual data ranges from 1971 to 1996. The data on 100 countries over the period 1971-1997 is assembled by Gian Maria Milesi-Ferretti and Assaf Razin (2000).

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Capital-account openness data are based on a weighted- average index of several cate-

by sharp changes of the *real exchange rate*, with a 15 percent-per-year threshold.

Table 2 describes the frequency of sudden-stop crises, exchange-rate regime, and capital-account policy switches. Overall, about 22% of the observations are associated with balance-of-payments crises; an average of 1% to 4% of the observations indicate a float-to-peg, peg-to-float, liberalization-to-capital-controls, or capital-controls-to-liberalization policy switches.

4 The Econometric Framework

To evaluate the *cyclical* and the *persistent* growth effects of the exchange-rate-regime policy switch and a capital-account-openness policy switch, we address two econometric issues. First, the potentially confounding effect on growth of the policy switch, working through the two conflicting channels. Second, the potential endogeneity of policy.

4.1 The statistical model

Let $Y_{1,j,t}$ denote the growth rate of country j in time t as measured in terms of GDP per capita. Let $Y^*_{2,j,t}$ denote a latent variable indicating the crisis prone state of the economy. That is, if $Y^*_{2,j,t} \geq 0$, a currency crises occurs, whereas if $Y^*_{2,j,t} < 0$ a currency crises does not occurs. That is:

$$Y_{2,j,t} = \begin{cases} 1 & if\ Y^*_{2,j,t} \geq 0 \\ 0 & else \end{cases}, \tag{1}$$

where, $Y_{2,j,t}$ is a binary variable which equals 1 if currency crises occurs in country j at time t and 0 otherwise.

Consider two policies: (i) a float-peg policy and (ii) a liberalization-controls policy. To simplify, assume that a policy is binary. Denote by D_1 the float-peg policy and by D_2 the liberalization-controls policy:

$$D_{1,j,t} = \begin{cases} 1 & \text{if peg} \\ 0 & \text{if float} \end{cases}, \tag{2}$$

Roubini (2002), and Eichengreen and Hausmann (1999).

and:

$$D_{2,j,t} = \begin{cases} 1 & \text{if capital controls} \\ 0 & \text{if liberalization} \end{cases} . \tag{3}$$

To simplify let us assume that both $Y_{1,j,t}$ and $Y_{2,j,t}$ can be expressed as a linear function of policy variables (D_1, D_2), standard controls (X). The growth equation is as follows.

$$Y_{1,j,t} = \beta_1 X_{j,t} + \gamma_1 D_{1,j,t} + \delta_1 D_{2,j,t} + \phi_1 Y^*_{2,j,t} + \varepsilon_{1,j,t}, \tag{4}$$

where, $\varepsilon_{1,j,t}$ is a country specific time variant $i.i.d.$ random shock. Similarly the latent variable equation is a linear function of policy variables (D_1, D_2) and standard controls (Z):

$$Y^*_{2,j,t} = \beta_2 Z_{j,t} + \gamma_2 D_{1,j,t} + \delta_2 D_{1,j,t} + \phi_2 Y_{1,j,t} + \varepsilon_{2,j,t}, \tag{5}$$

where, $\varepsilon_{2,j,t}$ is a country specific time variant $i.i.d.$ random shock.

Let $P_{j,t}$ be the conditional probability that country j will face currency crisis in period t, that is $P_{j,t} = \Pr(Y_{2,j,t} = 1 \mid \cdot)$. Given our assumption,

$$P_{j,t} = \Pr(\beta_2 Z_{j,t} + \gamma_2 D_{1,j,t} + \delta_2 D_{1,j,t} + \phi_2 Y_{1,j,t} > -\varepsilon_{2,j,t}) \tag{6}$$

Assuming that $\varepsilon_{2,j,t} \sim N(0,1)$ then:

$$P_{j,t} = \Phi(\beta_2 Z_{j,t} + \gamma_2 D_{1,j,t} + \delta_2 D_{2,j,t} + \phi_2 Y_{1,j,t}) \tag{7}$$

where Φ is the cdf of the unit normal distribution (above).

Note that we can identify the parameters of the "crisis-selection" equation by estimating the Probit equation (7) ,where the projected likelihood is:

$$\hat{P}_{j,t} = \Phi\left(\hat{\beta} Z_{j,t} + \hat{\gamma}_2 D_{1,j,t} + \hat{\delta}_2 D_{1,j,t} + \hat{\phi}_2 Y_{1,j,t}\right) \tag{8}$$

Assuming momentarily that policy is exogenous[11] we could recover the parameters of interest in the growth equation by estimating the following equation:

$$Y_{1,j,t} = \beta_1 X_{j,t} + \gamma_1 D_{1,j,t} + \delta_1 D_{2,j,t} + \phi_1 \Phi^{-1}\left(\hat{Y}^*_{2,j,t}\right) + \varepsilon_{1,j,t}, \tag{9}$$

[11] Typically, policy action is endogenous. Thus obviously we cannot identify the parameters of interest using the OLS estimators for equations (4) and (7). Therefore, we use lag variables to instrument policy variables $D_{1,j,t}$ and $D_{2,j,t}$.

Equation (9) provides consistent estimates for the parameters of interest.

4.2 The confounding effect of policies

To illustrate the importance of incorporating crises state into the empirical analysis assume that the standard growth equation is estimated using valid instrument for policy variables. Consider the confounding of the direct and indirect effects of balance-of-payments policies on growth.

The estimated growth effect of D_1 and D_2 when the likelihood of a currency crisis is ignored are:

$$E\left(\hat{\gamma}_1^{IV}\right) = \frac{\partial E\left(Y_{1,j,t} \mid X_{j,t},\ D_{1,j,t}^{IV},\ D_{1,j,t}^{IV}\right)}{\partial D_{1,j,t}} = \frac{1}{1-\phi_1\phi_2}\left(\gamma_1 + \phi_1 \frac{\partial \Phi^{-1}\left(\hat{P}_{j,t}\right)}{\partial D_{1,j,t}}\right) \tag{10}$$

and:

$$E\left(\hat{\delta}_1^{IV}\right) = \frac{\partial E\left(Y_{1,j,t} \mid X_{j,t},\ D_{1,j,t}^{IV},\ D_{1,j,t}^{IV}\right)}{\partial D_{2,j,t}} = \frac{1}{1-\phi_1\phi_2}\left(\delta_1 + \phi_1 \frac{\partial \Phi^{-1}\left(\hat{P}_{j,t}\right)}{\partial D_{2,j,t}}\right) \tag{11}$$

where $D_{1,j,t}^{IV},\ D_{1,j,t}^{IV}$ are the instrumented policy variables.

It is common wisdom that the likelihood of currency crisis has a negative effect on growth:

$$\phi_1 < 0, \phi_1\phi_2 < 1 \tag{12}$$

It is also common to assume that a peg exchange rate increases the likelihood of a currency crisis (all other things equal), and that capital controls reduce the probability of such a crisis:

$$\begin{aligned} \frac{\partial \Phi^{-1}\left(\hat{P}_{j,t}\right)}{\partial D_{2,j,t}} &> 0 \\ \frac{\partial \Phi^{-1}\left(\hat{P}_{j,t}\right)}{\partial D_{2,j,t}} &< 0 \end{aligned} \tag{13}$$

Therefore, the IV estimate for the effect of exchange-rate regime on growth equals to:

$$\left(1-\phi_1\phi_2\right) E\left(\hat{\gamma}_1^{IV}\right) = \gamma_1 + \phi_1 \frac{\partial E\left(\Phi^{-1}\right)}{\partial D_{1,j,t}} < \gamma_1 > 0, \tag{14}$$

where the IV estimate for the effect of capital controls on growth is:

$$(1-\phi_1\phi_2)\,E\left(\hat{\delta}_1^{IV}\right)=\delta_1+\phi_1\frac{\partial E\left(\Phi^{-1}\right)}{\partial D_{2,j,t}}>\delta_1<0. \tag{15}$$

Note that the $\partial E\left(\Phi^{-1}\right)/\partial D_{1,j,t}$ and $\partial E\left(\Phi^{-1}\right)/\partial D_{1,j,t}$ are the the (sample) average effect of the policy on the probability of facing a crisis. As long as the shocks are not uniformly distributed, $\frac{\partial E\left(\Phi^{-1}\right)}{\partial D_{2,j,t}}>\frac{\partial\left(\Phi^{-1}\right)}{\partial D_{2,j,t}}$ for countries with strong fundamentals, and $\frac{\partial E\left(\Phi^{-1}\right)}{\partial D_{2,j,t}}<\frac{\partial\left(\Phi^{-1}\right)}{\partial D_{2,j,t}}$ for country with weak fundamentals. Moreover, by ignoring the likelihood of a sudden stops crisis, in evaluating the effect of peg-float or liberalization-controls policies on growth, one understates the direct effect of each one of these policies. Namely, the ceteris paribus positive effect of a peg policy on growth is biased downwardly to zero and the ceteris paribus negative effect of capital controls on growth is upwardly biased toward zero.

Why should a policy maker care about the ceteris paribus effect of a policy rather than the reduced form effect?

Our model makes clear that the overall effect of policy (D_1 and D_2), via the crisis-probability channel, is intrinsically *non-linear*. There is a range of values of the determinant variables in which the effect of policy on the likelihood of a crisis is large, and another where it is small. Accordingly, the overall effect of the policy on growth depends on the values of determinants of the the crisis probability.

5 IMF classification: findings

We estimate both the cyclical as well as the persistent effects of exchange-rate and capital-controls regimes on growth, controlling for their effect on the likelihood of a sudden-stop crisis. We report out findings in Table 3 and Table 4.

We start with the effects of float-peg and capital-controls-liberalizations switches. We do so, with, and without country fixed effects. To underscore the role of policy on growth via its indirect effect on the probability of a crisis, we estimate each specification twice, including and excluding the probability of a crisis.

Table 1:
The Frequency of Crises, Switches Between Float and Peg and Switches between Capital Controls and Liberalizations (%)

Variable	Frequency
Crsises	22.61
Switches to peg	1.71
Switches to float	3.91
Switches to controls	1.03
Switches to liberalizations	0.9

Table 2:
List of Countries

(1)	Algeria	(51)	Malawi
(2)	Argentina	(52)	Malaysia
(3)	Bangladesh	(53)	Maldives
(4)	Barbados	(54)	Mali
(5)	Belize	(55)	Malta
(6)	Benin	(56)	Mauritania
(7)	Bhutan	(57)	Mauritius
(8)	Bolivia	(58)	Mexico
(9)	Botswana	(59)	Morocco
(10)	Brazil	(60)	Myanmar
(11)	Burkina Faso	(61)	Nepal
(12)	Burundi	(62)	Nicaragua
(13)	Cameroon	(63)	Niger
(14)	Cape Verde	(64)	Nigeria
(15)	Central African	(65)	Oman
(16)	Chad	(66)	Pakistan
(17)	Chile	(67)	Panama
(18)	China	(68)	Papua New Guinea
(19)	Colombia	(69)	Paraguay
(20)	Comoros	(70)	Peru
(21)	Congo	(71)	Philippines
(22)	Cote d'Ivoire	(72)	Portugal
(23)	Dominican Rep.	(73)	Romania
(24)	Ecuador	(74)	Rwanda
(25)	Egypt, Arab Rep	(75)	Sao Tome and Pr
(26)	El Salvador	(76)	Senegal
(27)	Equatorial Guin	(77)	Seychelles
(28)	Ethiopia	(78)	Sierra Leone
(29)	Fiji	(79)	Solomon Islands
(30)	Gabon	(80)	Somalia
(31)	Gambia, The	(81)	South Africa
(32)	Ghana	(82)	Sri Lanka
(33)	Grenada	(83)	St. Vincent
(34)	Guatemala	(84)	Sudan
(35)	Guinea	(85)	Swaziland
(36)	Guinea-Bissau	(86)	Syrian Arab Rep
(37)	Guyana	(87)	Tanzania
(38)	Haiti	(88)	Thailand
(39)	Honduras	(89)	Togo
(40)	Hungary	(90)	Trinidad and To
(41)	India	(91)	Tunisia
(42)	Indonesia	(92)	Turkey
(43)	Iran, Islamic R	(93)	Uganda
(44)	Jamaica	(94)	Uruguay
(45)	Jordan	(95)	Vanuatu
(46)	Kenya	(96)	Venezuela
(47)	Lao PDR	(97)	Western Samoa
(48)	Lesotho	(98)	Zaire
(49)	Liberia	(99)	Zambia
(50)	Madagascar	(100)	Zimbabwe

Table 3:
Exchange Regime and Capital Controls: Cyclical Effects

Panel A: Dependent Variable: Growth Rates				
Variables	**OLS (i)**	**OLS (ii)**	**FE (iii)**	**FE (iv)**
Switching to peg between t-2 to t-1	**1.6423 (0.7503)***	**4.6209 (1.4795)****	**1.2041 (0.9958)**	**5.0215 (1.7630)****
Switching to float between t-2 to t-1	0.1761 (0.6483)	0.6383 (0.6692)	-0.0539 (0.7039)	0.2005 (0.7401)
Switching to Capital Controls between t-2 to t-1	**-1.8832 (0.8616)***	**-4.7173 (1.5363)****	**-1.9592 (1.0495)**	**-6.3843 (2.0713)****
The probability of having currency crisis this year ^		**-9.6164 (5.0663)**		**-12.7791 (4.9934)***
Controllers				
1970 GDP per capita	**-0.0012 (0.0005)***	**-0.0011 (0.0005)***	--	--
Currency crisis at time t-1	0.5612 (0.5949)	2.7602 (1.2740)*	0.7579 (0.4506)	2.5482 (0.8331)**
Currency crisis at time t-2	-2.1345 (0.6375)**	-1.5347 (0.7221)*	-1.6442 (0.4525)**	-2.2155 (0.4852)**
Growth rate at time t-1	0.2540 (0.0464)**	0.2552 (0.0469)**	0.1802 (0.0275)**	0.2267 (0.0312)**
Growth rate at time t-2	0.1093 (0.0366)**	0.1048 (0.0372)**	0.0069 (0.0274)	-0.0224 (0.0313)
Panel B: Dependent Variable: Currency Crisis (0,1). 1 if REE(t)-REE(t-1)>15% - Probit (dF/dX) estimators				
1970's GDP per capita		0.0000 (0.0000)		--
Switching to peg between t-2 to t-1		**0.3125 (0.0991)****		**0.2893 (0.1028)****
Switching to float t-2 to t-1		**0.0557 (0.0510)**		0.0325 (0.0516)
Switching to Capital Controls between t-2 to t-1		**-0.2656 (0.0470)****		**-0.3313 (0.0524)****
Currency crisis at time t-1		0.2299 (0.0377)**		0.1314 (0.0349)**
Currency crisis at time t-2		0.0563 (0.0296)		-0.0307 (0.0256)
Government def t-1 ^^		0.0000 (0.0000)		0.0000 (0.0000)
Country fixed-effects		**No**		**Yes**

Note:
Data includes 106 countries in the years 1970 to 1997
^ Currency crisis =1 if the real exchange rate increased by 15% between t-1 to t (1 STD)
All specifications include linear time trend
( ) Standard errors in parenthesis
* significant at 5%; ** significant at 1%

Table 4:
Exchange Regime and Capital Controls: Cyclical and Persistent Effects

Variables	OLS (i)	FE (ii)
Panel A: Dependent Variable: Growth Rates		
Peg at time t-1	-0.6088 (0.2899)*	-0.1813 (0.4787)
Switching to peg between t-2 to t-1	3.9786 (1.2935)**	4.9046 (1.4604)**
Switching to float between t-2 to t-1	0.4657 (0.7124)	0.8090 (0.8382)
Capital Controls at t-1	-1.2843 (0.4539)**	-1.1997 (0.9385)
Switching to Capital Controls between t-2 to t-1	-1.2843 (0.4539)**	-5.9101 (1.7511)**
The probability of having currency crisis this year ^	-7.9131 (6.0140)	-13.7764 (4.4409)**
Controllers		
1970 GDP per capita	-0.0013 (0.0006)*	--
Currency crisis at time t-1	2.3069 (1.4183)	2.6221 (0.7543)**
Currency crisis at time t-2	-1.7389 (0.7269)*	-2.3438 (0.4911)**
Growth rate at time t-1	0.2481 (0.0456)**	0.2247 (0.0312)**
Panel B: Dependent Variable: Currency Crisis (0,1). 1 if REE(t)-REE(t-1)>15% - Probit (dF/dX) estimato		
1970's GDP per capita	0.0000 (0.0000)	--
Peg at time t-1	-0.0192 (0.0221)	0.0368 (0.0361)
Switching to peg between t-2 to t-1	0.2798 (0.1029)**	0.2106 (0.1070)*
Switching to float t-2 to t-1	0.0801 (0.0567)	0.1085 (0.0674)
Capital Controls at t-1	-0.0383 (0.0283)	-0.1021 (0.0639)
Switching to Capital Controls between t-2 to t-1	-0.2491 (0.0513)**	-0.2820 (0.0646)**
Currency crisis at time t-1	0.2264 (0.0373)**	0.1255 (0.0345)**
Country fixed-effects	**No**	**Yes**

Note:
Data includes 106 countries in the years 1970 to 1997
^ Currency crisis =1 if the real exchange rate increased by 15% between t-1 to t (1 STD)
All specifications include linear time trend
( ) Standard errors in parenthesis
* significant at 5%; ** significant at 1%

Table 5.a:
The Frequency of Sudden Stop and Domestic Prices Crises
Using Reinhart-Rogoff (2004) Classification*,**

		Domestic Price Crises		
		0	**1**	
Sudden Stops Crises	**0**	24.6	9.9	34.5
	1	29.3	36.3	65.5
		53.9	46.1	100.0

Notes:
* Reinhart and Rogoff (2002) classified into 5 categories: (i) peg,
(ii) limited flexibility, (iii) managed floating , (iv) freely floating and (v) freely falling.
We aggregate it into 2 main categories: (i) peg_rr, including the first 3 and (ii)
float_rr, including the other two.
** Data includes 58 countries in the years 1970 to 1997
Domestic prices crisis = 1 if the inflation rate is above 20% per year and 0 otherwise.
Sudden stop crisis = 1 if the real exchange rate depreciation is above 15% per year and 0 otherwise.

Table 5.b:
Switches Between Float and Peg
Using Reinhart-Rogoff (2004) Classification*,**

Variable	Frequency
Switches to peg	10.18
Switches to float	9.97

Notes:
* Reinhart and Rogoff (2002) classified into 5 categories: (i) peg, (ii) limited flexibility, (iii) managed floating , (iv) freely floating and (v) freely falling. We aggregate it into 2 main categories: (i) peg_rr, including the first 3 and (ii) float_rr, including the other two.
** Data includes 58 countries in the years 1970 to 1997

Table 6:
Exchange Regime and Capital Controls
Using Reinhart-Rogoff (2004) Classification*,**
Fixed-Effects Estimators

Dependent Variable: Growth Rates

Variables	(i)	(ii)	(iii)
Peg at time t-1	1.656	1.330	1.729
	(0.557)	(0.549)	(0.565)
Capital Controls at t-1	-0.439	-0.587	0.156
	(0.890)	(0.991)	(1.022)
Switching to Capital Controls between t-2 to t-1	-5.852	-3.374	-6.155
	(1.799)	(1.518)	(1.809)
The probability of having currency crisis this year^ excluding the effect of price crisis	-14.843		-22.359
	(4.937)		(7.996)
The probability of having currency crisis this year - real^^ including the effect of price crisis		-6.824	7.632
		(4.084)	(6.578)
Controllers			
Growth rate at time t-1	0.176	0.191	0.183
	(0.034)	(0.034)	(0.034)
Growth rate at time t-2	0.008	0.022	0.019
	(0.035)	(0.035)	(0.035)
Currency crisis at time t-1	2.812	0.917	3.340
	(0.978)	(0.629)	(1.069)
Currency crisis at time t-2	-1.904	-1.804	-1.831
	(0.479)	(0.483)	(0.481)
Price (CPI) crisis at time t-1	-0.100	1.078	-1.251
	(0.491)	(0.772)	(1.133)
Price (CPI) crisis at time t-2	0.385	0.374	0.468
	(0.488)	(0.491)	(0.490)

Notes:
* Reinhart and Rogoff (2002) classified into 5 categories: (i) peg, (ii) limited flexibility, (iii) managed floating , (iv) freely floating and (v) freely falling. We aggregate it into 2 main categories: (i) peg_rr, including the first 3 and (ii) float_rr, including the other two.
** Data includes 58 countries in the years 1970 to 1997
^ The estimated the likelihood for a currency crisis ignoring the effect of price crisis.
^^ The estimated probability for a currency crisis including the effect of past price crisis
All specifications include linear time trend
( ) Standard errors in parenthesis