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SUMMARY

It is now part of the conventional wisdom of international policymaking that economies open to international capital flows should either let their nominal exchange rate float freely or move to a currency board, full dollarization, "euroization" or currency union. This advice is rooted in the experience of the 1992-1993 collapse of the European exchange rate mechanism and the 1997-1998 crises on emerging markets.

At a closer look, however, the picture appears much less clear cut. First, the "two corner" approach does not have undisputed theoretical foundations. Oddly enough, no existing theoretical model produces hard pegs or free floating as optimal solutions of a welfare maximizing exercise where the full range of exchange rate regimes would be available as policy options. Second, growing empirical evidence suggests that intermediate exchange rate regimes are alive, under the form of dirty floats or unofficial soft pegs.

We present a simple model of exchange rate regime choice in a continuum going from a free float to a hard peg. The model goes beyond the conventional approach to exchange rate regime choice based on purchasing power parity and the inflation-output stabilization trade-off, by stressing the importance of credibility effects, of shocks to the capital account and of real exchange rate adjustment. We find that optimal exchange rate regime choice depends on the country structural characteristics and government preferences, namely: the magnitude of domestic and foreign shocks, the sensitivity of prices to the exchange rate, trade openness, the magnitude of the interest-rate channel, the persistence of inflationary reputation, and the government's time preference and aversion to inflation. We show that intermediate regimes such as crawling pegs or fluctuation bands are not necessarily more credible than a fixed pegs in the presence of large foreign demand shocks, but that the commitment problem can, to some extent, be limited by high reputation effects and/or high sensitivity of prices to the nominal exchange rate. On the whole, the model suggests that there is still some room for intermediate regimes, provided that trade shocks and shocks to the capital account are not prominent and that the interest-rate channel is not too powerful.

The empirical relevance of this theory is then assessed on a cross-section sample of 126 emerging and developed countries before and after the 1997-1998 emerging markets crises. We use a non-ordered trinomial Logit model so as to account for intermediate regimes separately from "corner" solutions. The estimations show that the probability of a free floating regime is lower for more open economies, whereas the probability of a hard peg is lower for more industrialized, less dollarized and politically unstable countries. Finally, the probability of an intermediate regime is higher when the debt ratio is lower.

The model is finally used as a benchmark to assess the probability of each regime for each country of the sample. Taking the highest probability as a the « in-sample » prediction of the model, the model correctly explains the "hollowing out" of official exchange rate regimes which has been observed between 1996 and 1999. In particular, for a number of emerging countries (Brazil, Chile, China, Indonesia, South Korea, Morocco, Poland,

Thailand), the model predicts a soft peg in 1996 but a free float in 1999. This applies in particular to China, where the probability of a free float rises to 94% in 1999.

ABSTRACT

We propose a model of exchange-rate regime choice which accounts for the existence of a continuous range of regimes, the need for real exchange-rate adjustment in response to shocks, the existence of capital account shocks and of balance-sheet effects, the sensitivity of prices to the nominal exchange rate, and the need for a commitment to make any given regime sustainable. Non-ordered Logit estimations on a cross-section sample of 126 emerging and developed countries before and after 1997-1998 currency crises broadly support our approach.. Specifically, we find that there is still a case for intermediate regimes in countries where the interest rate channel is weaker and which do not depend too much on commodities. The empirical model correctly predicts up to 83% of observed exchange rate regimes, and the recent "hollowing out" of intermediate regimes. It also provides a benchmark to assess the recent changes in individual exchange rate regimes.

JEL Classification: F33
Key Words: Exchange rate regime, Developing countries, Logit model

LA SURVIE DES RÉGIMES DE CHANGE INTERMÉDIAIRES

RÉSUMÉ

Il est aujourd'hui couramment admis que les économies ouvertes aux mouvements internationaux de capitaux ne disposent plus que de deux types de solutions en matière de régime de taux de change : ou bien laisser leur taux de change nominal flotter librement, ou bien mettre en place une caisse d'émission, adopter l'euro ou le dollar ou encore rejoindre une union monétaire. Ce conseil repose sur l'expérience des crises de change de 1992-1993 en Europe et de 1997-1998 dans les économies émergentes.

A y regarder de plus près, la situation n'est pourtant pas aussi tranchée. D'abord, l'approche par les « solutions en coin » n'a pas de fondement théorique clair : aucun modèle théorique permettant le choix au sein d'une palette complète de régimes de change n'admet comme seules solutions optimales le change fixe institutionnalisé ou le flottement libre. Ensuite, il est maintenant bien établi que des régimes de change intermédiaires subsistent en pratique, sous la forme en particulier de flottements administrés et d'ancrages officieux.

Nous proposons un modèle théorique simple de choix d'un régime de change dans un continuum de régimes allant du flottement libre au change fixe institutionnalisé. Le modèle étend l'approche conventionnelle du choix d'un régime de change (qui repose sur un arbitrage entre stabilisation de l'inflation et de l'activité et retient l'hypothèse de la parité de pouvoir d'achat) en mettant l'accent sur les effets de crédibilité, sur la possibilité de chocs d'origine financière et sur l'importance de l'ajustement du taux de change réel. Le régime optimal dépend alors des caractéristiques de chaque économie et des préférences de son gouvernement – amplitude des chocs d'origine interne et externe, degré de transmission du taux de change aux prix, ampleur des chocs de prime de risque et impact des taux d'intérêt sur l'économie réelle, importance des effets de réputation anti-inflationniste, préférence du gouvernement pour le présent et aversion pour l'inflation. On montre que les régimes d'ancrage souple tels que les parités à crémaillères ou les bandes de fluctuations ne sont pas nécessairement plus crédibles que les ancrages fixes, mais que l'engagement des autorités peut, dans une certaine mesure, être favorisé par d'importants effets de réputation et/ou une répercussion importante du taux de change nomianal dans les prix. Le modèle suggère qu'il existe encore une place pour les régimes de change intermédiaires, sous réserve que les chocs commerciaux et financiers ne soient pas trop importants et que le canal du taux d'intérêt ne soit pas trop puissant.

La pertinence de cette analyse est évaluée par des estimations en coupe sur un échantillon de 126 pays émergents et développés avant et après les crises de 1997-1998. On utilise un modèle Logit à trois modalités non ordonnées, permettant de prendre en compte les régimes intermédiaires à côté des deux solutions en coin. Les résultats montrent que la probabilité d'un flottement libre est plus faible dans une économie plus ouverte, alors que la probabilité d'un change fixe institutionnalisé est d'autant plus faible qu'un pays est industrialisé, peu dollarisé et/ou politiquement instable. Enfin, la probabilité d'un régime intermédiaire diminue lorsque le taux d'endettement augmente.

Pour finir, le modèle est utilisé comme référence pour calculer la probabilité de chaque régime pour chaque pays de l'échantillon. En prenant la probabilité la plus élevée comme prédiction du modèle, on obtient une représentation correcte de la disparition progressive des régimes de change intermédiaires observée entre 1996 et 1999. En particulier, pour un certain nombre d'économies émergentes (Brésil, Chili, Chine, Indonésie, Corée du sud, Maroc, Pologne, Thaïlande), le modèle prédit un régime intermédiaire en 1996 mais un flottement libre en 1999. Ceci s'applique notamment à la République populaire de Chine, où la probabilité d'un flottement libre s'élèverait à 94% en 1999.

RÉSUMÉ COURT

Le choix d'un régime de change est formalisé selon une approche originale tenant compte de divers éléments du débat concret de politique économique, à savoir l'existence d'un continuum de régimes, le besoin d'ajustement du taux de change réel quelque soit le régime de change, l'existence de chocs financiers et d'effets patrimoniaux, la réactivité des prix au taux de change nominal, et la nécessité pour les autorités monétaires de fournir un engagement crédible quelque soit le régime de change. Des estimations Logit non ordonnées sur un échantillon en coupe de 126 pays émergetns et développés avant et après les crises de 1997-1998 confirment les principaux enseignements du modèle théorique. En particulier, un régime de change intermédiaire peut se justifier dans les pays pour lesquels le canal du taux d'intérêt n'est pas trop important et qui ne sont pas trop dépendants des marchés de matières premières. Le modèle empirique prédit jusqu'à 83% des régimes de change observés ainsi que la tendance récente à la disparition des régimes intermédiaires. Le modèle fournit également une référence pour évaluer les récentes modifications observées des régimes de change.

Classification *JEL* : F33
Mots-clefs : Régime de change, pays en développement, modèle Logit

THE SURVIVAL OF INTERMEDIATE EXCHANGE RATE REGIMES

Agnès Bénassy-Quéré [*] ***and Benoît Cœuré*** [**]

1. INTRODUCTION

1.1. Conventional wisdom

It is now part of the conventional wisdom of international policymaking that economies open to international capital flows should not try to fix their nominal exchange rate, unless they adopt a currency board or they move to full dollarization, "euroization" or currency union. This advice is rooted in the experience of the 1992-1993 collapse of the European exchange rate mechanism and the 1997-1998 emerging markets crises (Eichengreen, 1999 p. 105, Fischer, 2001). Accordingly, there is some empirical evidence of a "hollowing out" of the distribution of exchange rate regimes in recent years, away from intermediate regimes and towards free floats or hard pegs (IMF, 1997, Caramazza and Aziz, 1998, Eichengreen, 1999 p. 108, Fischer, 2001).

The crux of the argument in favor of the "two corner" theory of exchange rate regime choice is Robert Mundell's impossible trinity. In a world of high capital mobility, nominal exchange rate pegs cannot be sustained without giving up an independent monetary policy, either by implementing a currency board arrangement, by joining a currency union, or by adopting a currency issued by another country. The choice between a hard peg and free float then depends on the trade-off between stabilization and inflation and on optimal currency area arguments.

Recently, the argument has been tilted toward the "hard peg" corner by focusing on financial structure and asset markets channels. Domestic risk premia, liability dollarization and vulnerability to international contagion all favor dollarization against floating, at least for economies which are already partially dollarized – see Calvo (2001) or Eichengreen and Hausmann (1999)[1]. If this trend continues, the implications could be striking for what Cohen (1998) calls the "geography of money". The world may ultimately be structured into a few large currency areas (say, a US dollar area in the Americas, a euro area around Europe, and possibly an Asian currency area in a more distant future) and a handful of independently floating currencies. The whole issue of exchange rate regime choice would then belong to economic history.

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[1] For comprehensive studies of currency boards and dollarization, see Berg and Borensztein (2000), Gosh et al. (2000) or Levy-Yeyati and Sturzenegger (2001).

1.2. A fragile wisdom?

At a closer look, however, the picture appears much less clear cut. First, no existing theoretical model produces hard pegs or free floating as optimal solutions of a welfare maximizing exercise where the full range of exchange rate regimes would be available as policy options. Second, there is growing empirical evidence that intermediate exchange rate regimes are alive, under the form of dirty floats or unofficial pegs (Calvo and Reinhart, 2000; Levi-Yeyati and Sturzenegger, 2000; Bénassy-Quéré and Coeuré, 2001). Even drawing on the official classification, Masson (2001) has shown that the dynamics of exchange rate regime switches does not support the hypothesis that intermediate regimes will vanish in the long run.

Calvo and Reinhart (2000), among others, have suggested explanations for this *fear of floating:* exchange rate pass-through, liability dollarization, dollar invoicing of domestic and external transactions, and an underdeveloped market for currency hedging make more desirable to stabilize the nominal exchange rate. There remains of course a difference in terms of commitment and institutional framework between managed floats and traditional exchange rate commitments such as the crawling pegs or fluctuation bands advocated by Williamson (2000). What is important in our view, and what we will try to investigate in this paper, is the survival of "intermediate" exchange rate regimes, or soft pegs, defined in a broad sense as regimes other than free floats and hard pegs.

1.3. Which currency regime is right for which country and at which time?

Given these competing arguments and the lack of a unified framework to sort them out, most scholars of exchange-rate regime choice now follow Frankel (1999) in concluding that « no single currency regime is right for all countries at all times ». The fact that this vision has been more or less endorsed by the IMF (see Mussa et al., 2000) and by policymakers[2] is not necessarily reassuring. Although it is an apt summary of the literature, it has become an excuse for the official community to keep their hands off the exchange rate regime issue. Repeatingly, exchange rate-related crises recall us that this is a mistake. On the contrary, we think that the international community needs an analytical and empirical tool in order to give each country, given its economic structure and at a given point in its history, the right policy advice. This is the direction we try to explore.

To sort out the arguments, we start (Section 2) from a simple model of exchange rate regime choice in a continuum going from a free float to a hard peg. We find that optimal choice is likely to be an intermediate regime, with a degree of exchange rate flexibility depending on country structural characteristics and government preferences, namely: the magnitude of domestic and foreign shocks, trade openness, the magnitude of the interest-rate channel, the persistence of inflationary reputation, and the government's time

[2] A recent example is the 2001' Asia-Europe finance ministers' meeting concluding statement : " *Ministers acknowledged that there is a spectrum of possible exchange rate arrangements, depending on various aspects such as the size of the economy, trade and investment structure, the sequencing of capital account liberalization and the level of economic development. No single arrangement is necessarily right for all countries all the time.*"

preference and aversion to inflation. We also discuss how costly it will be for the government to commit to this optimal regime.

In Section 3, the relevance of this theory is assessed by estimating a non-ordered trinomial Logit model on a cross-section of 126 countries before and after the 1997-1998 emerging markets crises. We then use the estimated model as a benchmark to identify countries which have departed from average behavior. Section 4 concludes and suggests priorities for future research.

2. EXCHANGE RATE REGIME CHOICE: THEORY

2.1. Existing literature[3]

Popular models of exchange-rate regime choice are open economy extensions of a Barro-Gordon trade-off between stabilization and disinflation. Most of them concentrate on two simplified cases: fixing and floating, without making a difference between conventional and hard pegs or considering "intermediate" regimes as an option (see e.g. Edwards, 1996; Ghosh et al., 1997; Berger et al., 2000; Méon and Rizzo, 2002). An important but isolated contribution is Aizenman and Frenkel (1985) where the degree of exchange rate flexibility is introduced as the elasticity of the money supply to the nominal exchange rate.[4] Lahiri and Végh (2001) propose a model of optimal choice among four policy options: nominal exchange rate peg, pure floating, dirty floating, and sterilized intervention. Concentrating on monetary shocks, they find that the optimal rule depends on the size of the shock: policymakers should let the exchange rate adjust for small negative monetary shocks, while for larger shocks they should intervene to stabilize it.

This literature misses several important dimensions of the ongoing policy debate. First, it does not distinguish between the degree of flexibility, which ranges from a fixed peg to a free floating regime, and the degree of institutional commitment, which differentiates hard pegs from intermediate regimes in a broad sense. Second, these models usually do not capture the financial channels which are at the heart of the most recent discussion on exchange-rate regimes. In particular, they fail to describe how the credibility of the regime may impact balance sheets and thereby the real economy, through the domestic interest rate.[5] Finally, they assume purchasing power parity, whereas all recent crises have included at some point real exchange rate misalignments.[6] We find it difficult to think of exchange

[3] See Edwards (2000) or Mussa et al. (2000) for a general overview of exchange rate regime choice.

[4] In an early survey of the literature, Wikham (1985) insists on the relevance of intermediate regimes in developing countries where true floating may be infeasible due to underdeveloped domestic capital markets.

[5] An exception is Cukierman et al. (2002) who analyze the choice of a regime within the class of exchange-rate bands when the monetary authorities have to account for possible speculative attacks. In their model, however, the authorities are assumed to value exchange-rate stability for itself, and the cost of reneging the commitment is exogenous.

[6] A different strand of the literature concentrates on deviations from PPP based on pricing-to-market and compares free floats to fixed pegs through welfare analysis (see Devereux and Engel, 2000). However this

rate regime choice in Argentina without considering that the peso may have been overvalued. In the next section, we present a simple model which incorporates these various ingredients.

2.2. Optimal exchange rate flexibility

In Appendix A, we present a new model of exchange rate regime choice in a small economy. There are two periods, short term and long term. In the long run, prices are fully flexible and the real exchange rate balances the current account through nominal exchange rate or through price adjustment. The exchange-rate regime is neutral for the real economy and the only difference between a fixed and a flexible regime is the amount of price adjustment. In the short run, exchange rate movements pass partially through prices, depending on the role of imported inputs, on wage indexation and on the degree of de facto dollarization.[7] Long-run depreciation expectations are built into the interest rate, thereby impacting aggregate demand. Lastly, there is an inflation reputation effect: Period 1 inflation has a lasting impact on Period 2.

The economy is hit by permanent shocks on domestic demand, foreign demand and the risk premium. A distinctive feature of our model is that, whatever the exchange-rate regime, the real exchange rate has to adjust in the long term after a foreign demand shock. Hence, fixing the nominal exchange rate can trigger long-run price instability if foreign demand shocks are prominent. This aspect of the problem has been an important component of recent discussions on hard pegs in Eastern European countries, for instance.

The authorities pick the exchange rate regime for each of the two periods in a continuum ranging from a hard peg to a free float. They can use the exchange rate to stabilize short run aggregate demand, but to a certain extent only, depending on how much they weight price stability. The cost of exchange-rate flexibility in terms of price instability is higher in countries with high pass-through (a given level of demand stabilization is obtained with larger nominal exchange-rate variation) and large reputation effect (a given nominal exchange-rate variation in the short run has larger lasting impact on inflation). Finally, there is a cost *à la* Drazen and Masson (1994) to changing regimes; this cost is proportional to the amount of added flexibility and it is used by the authorities as a commitment not to renege on their first period choice. Thus the degree of institutional commitment is endogenous. The implications of the model are the following (see Appendix A).

(i) The optimal exchange rate regime is generally an intermediate one. This result is hardly a surprise in the presence of a trade-off between stabilization and disinflation. Whatever the exchange rate regime chosen by the authorities in the short run, real exchange rate adjustment will require some amount either of nominal exchange rate or of price flexibility in the long run.

type of setting does not perfectly fit the policy debate concerning developing countries. The latter often emphasizes the *lack* of pricing-to-market from foreign suppliers, leading to large exchange-rate pass through on the import side.

[7] Here we call pass-through the impact of exchange-rate variations on domestic prices, although pricing-to-market is likely to be small in developing countries.

(ii) The optimal degree of exchange rate flexibility depends on several elements: the structure of the economy, the nature of the shocks it faces, the preferences of monetary authorities, and the persistence of inflationary reputation. All things being equal, the following patterns will tend to favor *less* flexible regimes:

- a more persistent inflationary reputation, a higher aversion to inflation and/or a longer time horizon of monetary authorities. This latter result is in line with theoretical contributions which stress the cost of adjustment under a hard peg, thus the difficulty of sustaining such a regime for governments with a weak political support -see e.g. Edwards (1996), and Frieden, Ghezzi and Stein (2000) for a survey;
- a higher degree of exchange rate pass-through. This is consistent with the literature on the fear of floating, which stresses the importance of *de facto* dollarization and the role of imported inputs;[8]
- a less open economy, because of a lesser need to accommodate foreign shocks. Consistently, hard pegs are more likely to be chosen by countries facing shocks on domestic demand or on the capital account than by countries facing shocks on foreign demand;
- an aggregate demand less reactive to real interest rates, for instance due to longer term debt contracts or weaker balance sheet effects; this feature has also been highlighted by the fear-of-floating literature;

(iii) The authorities may want to renege on the exchange rate regime. However, they can tie their hands by raising ex-ante the cost of changing regimes. We find that soft pegs do not necessarily need less commitment than conventional fixed pegs. This is especially the case in countries which are specially vulnerable to trade shocks, because such shocks create an incentive to use the nominal exchange rate (rather than the price level) in the medium run to achieve part of the necessary adjustment of the real exchange rate to its long-run level. Interestingly, reputation effects and the pass-through coefficient can act as partial substitutes for formal commitment, because they both reduce the cost of exchange-rate fixity in the presence of trade shocks.[9]

On the whole, the model attributes the « fear of floating » to strong pass-through effects and to the magnitude of capital account shocks relatively to trade shocks. It also attributes the hollowing out of intermediate regimes to rising foreign demand shocks and higher vulnerability of the economies to interest-rate variations, which make it more difficult to commit to a given exchange-rate regime.

[8] See Jadresic (1998) or Devereux and Lane (2001).

[9] The strength of reputation to back a commitment has been discussed by Canavan and Tommasi (1997) who argue that a peg yields more reputation effects than price stability because it is a less noisy signal, and by Frankel et al. (2001) who underline the lack of verifiability of intermediate regimes as compared to corner solutions.

3. EXCHANGE RATE REGIME CHOICE: EMPIRICS

We now turn to the empirical relation between exchange rate regime choice and countries characteristics and preferences. Recent studies of the determinants of exchange rate regime choice[10] have concentrated on the impact of political instability (Edwards, 1996; Méon and Rizzo, 2002) and/or on specific geographic areas (Latin America in Frieden et al., 2000; transition countries in von Hagen and Zhou, 2002). They highlight the role of variables suggested by the theory of optimum currency areas such as trade openness or product differentiation, and also conclude that political instability makes fixed pegs more difficult to sustain, consistently with the seminal study of Klein and Marion (1997).

Other recent contributions are Rizzo (1998), Berger et al. (2000), Poirson (2001), Juhn and Mauro (2002), Cartapanis and Dropsy (2002), Masson and Ruge-Murcia (2002). Rizzo finds a significant role for optimal currency area criteria: country size, level of development, openness and geographical diversification of trade. Berger, Sturm and de Haan (2000) concentrate on the volatility and correlation of domestic and foreign output. Poirson (2001) evidences the role of country size, external shock vulnerability, inflation performance, capital mobility, level of reserves, political risk, partial dollarization and foreign currency borrowing. Cartapanis and Dropsy focus on "macro-financial" criteria such as capital openness and the external financing structure. Finally, Masson and Ruge-Murcia work on regime shifts rather than regime choice and find that high inflation and (to a lesser extent) low growth and low trade openness tend to increase exits from prevailing regimes.

We want to improve on these studies in three directions. First, all of them (except Juhn and Mauro, and Masson and Ruge-Murcia) use a binomial or an ordered multinomial discrete choice model, or even a linear relationship between an exchange rate flexibility index and the explanatory variables (Poirson; Cartapanis and Dropsy). In so doing, they impose an implicit pecking order on exchange rate regime choice. They are therefore not suited to identify factors which may favor intermediate regimes against corner solutions, and they are not consistent with the empirical finding of Masson (2001) that transitions are symmetrical between the three types of regimes. In the following, we give the three categories the same status by estimating a multinomial logit model. The second innovation is the use of a consistent classification of exchange-rate regimes which allows to identify hard pegs, free floats and intermediate regimes. Since the conventional wisdom has been changing following the 1997-1998 crises, we use two sets of regimes corresponding to the pre-crises and to the post-crises period. Finally, our theoretical analysis suggests that the choice of an exchange-rate regime should depend on structural variables that are more country-dependent than time-dependent. Hence we carry out cross-section rather than panel data estimations.[11]

[10] See Juhn and Mauro (2002) for a recent survey.

[11] Juhn and Mauro also use cross-section estimations. The time dimension is misleading since explanatory variables are likely to be auto-correlated and/or linked to unobserved factors.

3.1. Identifying exchange rate regimes

Two classifications of exchange-rate regimes are alternatively used here: official and *de facto*. In the official IMF classification (IMF, 1997 and 2000), we break regimes down to three categories: adjustable pegs, crawling pegs, regimes with fluctuation bands and managed floats are grouped into "intermediate regimes", while currency boards, dollarized regimes and currency unions are grouped into "hard pegs".

Several methods are available to identify *de facto* exchange rate pegs (see Bénassy-Quéré and Coeuré, 2001, for a discussion). Most authors regress the bilateral exchange rate against some numeraire currency (or a commodity, or a basket of currencies) on the exchange rates of reference currencies against the same numeraire (see e.g. Frankel and Wei, 1995). This approach is not satisfactory since the numeraire is likely to be correlated with one or all of the reference currencies. Recently, Levi-Yeyati and Sturzenegger (2000) have suggested using cluster analysis to classify countries according to the volatility of exchange-rate variations and of official reserves. However their classification does not discriminate hard pegs from more traditional fixed pegs, which makes it unsuitable to test for the choice of corner solutions against intermediate regimes.

As for *de facto* regimes, we use our own classification which gives a symmetrical role to reference currencies (Bénassy-Quéré and Coeuré, 2001). A currency is said to be freely floating over some period of time if there exists no stable combination of its bilateral exchange rates against the US dollar, the euro and the yen. Unsurprisingly, such situations are less frequent than reported by the IMF.[12] Our approach is complementary to Levy-Yeyati and Sturzenegger and others in the sense that we do not measure exchange rate *policies* but the ex-post behavior of the exchange rate. We define intermediate regimes as those regimes where a *de facto* basket peg (or single currency peg) is identified but not reported to the IMF as a hard peg, and we define hard pegs the same way as the IMF. The estimation is run separately for each country on weekly data on the pre-crises (January 1994-June 1997) on post-crises (October 1998-March 2001) periods.[13]

3.2. The empirical model

In order to draw the lessons of the 1997-1998 emerging markets crises and to allow for a possible structural break, we run the estimation separately on the same sample of countries before and after the crises. Given the availability of the data (see below), this leaves us with 126 countries (IMF classification) or 91 countries (de facto classification) which comprise industrial, emerging and less developed economies. The estimated logit model is:

[12] On a sample of 92 countries, we find that the proportion of true floats has increased only from 10% to 11% after 1997/98, while the official proportions are 24 % and 28 %, see Bénassy-Quéré and Coeuré (2001).

[13] The method is detailed in Bénassy-Quéré and Coeuré (2001). A spreadsheet with complete estimation results, including basket coefficients for each country, is available on http://www.cepii.fr/anglaisgraph/pagepers/Webabq/ongoing.htm.

$$P(Y_i=1|X_i) = f^1 (a_0^1 + a_1^1 OPEN_i + a_2^1 IND_i + a_3^1 M2_i + a_4^1 DEBT_i + a_5^1 CAPC_i + a_6^1 POL_i + u_i) \quad (1a)$$

$$P(Y_i=2|X_i) = f^2 (a_0^2 + a_1^2 OPEN_i + a_2^2 IND_i + a_3^2 M2_i + a_4^2 DEBT_i + a_5^2 CAPC_i + a_6^2 POL_i + v_i) \quad (1b)$$

$$P(Y_i=0|X_i) = 1- P(Y_i=1|X_i) - P(Y_i=2|X_i) \quad (1c)$$

Y_i is the exchange rate regime of country i: $Y_i = 0$ for a free float, 1 for an intermediate regime and 2 for a hard peg. Contrary to an ordered logit, the two probabilities $P(Y_i=1)$ and $P(Y_i=2)$ are not nested. The normalized functional form f^j (j = 1,2) is:

$$f^j(X_i) = \frac{e^{aj' X_i}}{1 + \sum_{s=1}^{2} e^{as' X_i}} \quad (2)$$

where *aj* is the vector of the parameters (see Greene, 1997 p. 915). The explanatory variables included in X_i can be grouped into three categories covering the three types of country characteristics highlighted by the theoretical analysis (data sources are provided in Appendix B):

- Demand and supply effects of openness: *OPEN* is the ratio of exports to GDP in 1996 or 1999. One problem with this variable is that it may capture both demand and supply effects: high openness means large exposure to foreign demand shocks; but it also means that the nominal exchange rate has little impact on real variables (hence exchange-rate flexibility is of little use). In order to disentangle the two effects, we supplemented *OPEN* with the share of manufacturing in value–added, *IND,* as a rough proxy of sectoral diversification.[14] Openness is also supplemented with *M2* which is the ratio of the money aggregate M2 over GDP, in percentage, in 1996 and 1999. This variable is used as a proxy of dollarization: a highly dollarized country will little use domestic money as both a means of payments and a reserve item. A potential problem with M2 is that its World bank definition includes foreign currency deposits. However foreign banknotes are not included. In addition, we have checked that there is a strong relationship between this variable and a dollarization index constructed by Baliño, Bennett and Borensztein (1999) for a limited subset of countries. The relationship is not stronger with M1 instead of M2. As M1 is available for a smaller number of countries, we decided to work with the M2/GDP ratio.[15]

[14] This follows Poirson (2000). The idea is that a larger weight of manufacturing, thus a smaller weight of primary goods, makes an emerging market economy less dependent on commodity market fluctuations, which are especially large. However it makes it also less dependent on exports of dollar-denominated commodities which are clearly a source of pass-through.

[15] In the literature, M2/GDP is sometimes used as a proxy of financial sector development. For instance, von Hagen and Zhou (2002) interpret the positive relationship between M2/GDP and the probability of a flexible regime as the ability of financially developed countries to conduct domestic open market operations

- Interest rate channel: *DEBT* is the ratio of total (domestic + foreign) debt to GDP in 1996 or 1999. This variable catches the importance of the interest-rate channel in the economy. It includes foreign debt since an interest rate rise due to depreciation expectations will lead domestic agents to expect a re-evaluation of foreign currency debt. This variable is equal to the public debt ratio for industrial countries due to data limitations. Shocks to the risk premium are captured through *CAPC* which is an index of capital controls taken in 1996 (pre crises) or 1999 (post crises) from the corresponding IMF exchange arrangements and exchange restrictions reports (IMF, 1997 and 2000).[16] Capital controls reduce the likeliness of financial account shocks, hence of shocks to the risk premium.

- Political channel: *POL* is the number of changes of dominant party over 1990-1994. This variable is used as a proxy for the discount factor: more political instability will induce policy authorities to reduce their time horizon. Because it is not available for all countries, this variable is not included in the first, baseline estimation.[17]

3.3. Estimation results

The maximum-likelihood estimation results are presented in Table 1 (baseline model) and Table 2 (adding political instability).

The first four columns give the estimates and corresponding p-values for the coefficients of the probabilities of intermediate regimes $P(Y_i=1|X_i)$ and of hard pegs $P(Y_i=2|X_i)$. The last four columns report the derivatives of the three probabilities with respect to the explanatory variables.[18] Note that the level of significance and sign of the coefficients are robust to estimating the logit model on the same sample of countries (see Appendix C).

The rate of correctly predicted observations goes from to 56% (baseline model, IMF classification, post-crises) to 83% (model with political instability, de facto regimes, pre-crises). This rate, as well as the log-likelihood, are systematically higher when using the de facto classification rather than the IMF one. This feature is robust to estimating on the same sub-sample of countries (see Appendix C). The performance is also higher when using the

and to avoid banking crises when the exchange rate varies. This interpretation is complementary to ours, although it is not possible to discriminate between both.

16 Namely, CAPC is the proportion of financial transactions categories subject to government restrictions.

17 Another possibility could have been to use the inflation record as a proxy of the discount factor, on the ground that high inflation will increase the incentive for the central bank to build credibility. However high past inflation can also lead a fixed exchange rate regime to collapse. Indeed, past inflation is is not significant in Frieden et al. (2000) and hardly so in Poirson (2000).

18 The coefficients are estimated on the assumption that that Xi does not impact on the residual probability of a free floating regime. All coefficients need not be significant at the same time for the two alternatives to a free float. In order to calculate the partial derivatives, the coefficients arethen normalized in the way described by Equation (2) with $f^0(X_i) = 1/\left(1+\sum_{s=1}^{2} e^{\alpha s' X_i}\right)$

augmented model rather than the baseline one, and higher before the 1997-1998 crises, perhaps suggesting that the relationship between exchange rate regimes and structural features of the economies have not yet settled back to a "stable" configuration in 1999. We now turn to the interpretation of the estimated coefficients.

- Demand and supply effects of openness: trade openness (OPEN) significantly raises the probability of an intermediate regime and even more of a hard peg, relatively to a free float.[19] As OPEN captures both the extent of foreign demand shocks (which is expected to favor flexibility) and the impact of the exchange-rate on prices (which is expected to favor fixing), the result suggests that the latter tends to dominate. The same interpretation applies to the coefficient on the manufacturing share IND which is highly significant too: hard pegs are less likely (intermediate regimes are more likely) when IND is higher, thus when the economy is more immune to global shocks and less dependent on dollar-denominated exports of commodities.[20] Finally, the M2/GDP ratio also has a significant negative impact on the probability of a hard peg. Given that this ratio is negatively correlated with the extent of dollarization, it can be concluded that a lowly dollarized economy displays lower probability to choose a hard peg. Interestingly, low dollarization favors intermediate regimes, whereas the extent of dollarization has little impact on the probability of a float. On the whole, hence, supply effects seem to dominate demand effects, higher openness, dependence on commodities and dollarization favoring hard pegs.
- Interest rate channel: although the coefficient is not always significant, a higher debt ratio DEBT seems to reduce the probability of an intermediate regime. This is consistent with the fact that intermediate regimes lead to more unstable interest rates (which are all the more costly that debt is higher), and with the fact that a more powerful interest-rate channel raises the needs for backing the intermediate regime with a strong commitment (see the theoretical model). Note that the debt ratio does not clearly favor hard pegs over free floats. Hence it is simply a cause of the hollowing out of intermediate regimes. Finally, capital controls CAPC seem to lower the probability of an intermediate regime using the official classification, while having an ambiguous effect when using the de facto classification. Savvides (1990), finding greater capital mobility to be associated with a fixed exchange-rate regime over 1976-1984, explains this result as "an effort by policymakers to employ exchange-rate policy to offset the effects of capital movements on the current account" (p. 448). This interpretation makes sense for East-Asian countries which have been fighting exchange-rate appreciation through reserve accumulation before the crisis. Of course, it stays

[19] This result is consistent with Edwards (1996), Frieden et al. (2000), Cartapanis and Dropsy (2002), von Hagen and Zhou (2002), but it contrasts with Rizzo (1998), Méon and Rizzo (2001), Poirson (2001) Berger et al. (2000) who find either no significant relationship or a positive relationship between openness and exchange rate flexibility. One possible explanation for the discrepancy relative to the two groups of results is that the latter studies include country size along with trade openness, and larger countries are more likely to be found floating. Von Hagen and Zhou work on a smaller, specific sample of transition countries.

[20] Lower vulnerability to foreign demand shocks (due to output diversification) also reduces the commitment requirement, as highlighted by the theoretical model.

inconsistent with the impossible trinity, and this inconsistency has been one major explanation of 1990 currency crises.[21]

- Political channel: political instability (POL) reduces the probability of a hard peg, consistent with the theoretical outcome with a relatively impatient government. This result, which is robust to the use of another proxy of political instability, is in line with Poirson (2000) Frieden et al. (2000) and Méon and Rizzo (2002) showing that more instability favors floats. Note that the coefficient rises after the crises, suggesting that hard pegs are increasingly choices of stable (possibly non democratic) political regimes.

- Lastly, the constant is significant only on the post-crises samples. It is positive for the hard peg regime, meaning that the probability of choosing a hard peg became higher than would have said the explanatory variables, perhaps reflecting the popularity of hard pegs during this period.

[21] Other empirical studies have generally failed to evidence a strong relationship between capital mobility and the exchange-rate regime (see Juhn and Mauro, 2002).

Table 1 : Baseline regression results

	Estimations				$dP(Y_i=s)/dX_i$			
	Official regimes		De facto regimes		Official regimes		De facto regimes	
	1996	1999	Before crises	after crises	1996	1999	before crises	After crises
$P(Y_i=0\|X_i)$ free float								
Const.	-	-	-	-	.252	-.164	-.007	-0.214
OPEN	-	-	-	-	-.009	-.009	-.006	-0.008
IND	-	-	-	-	.002	.001	.006	0.008
M2	-	-	-	-	.001	.002	-.001	0.001
DEBT	-	-	-	-	.076	.022	.025	0.079
CAPC	-	-	-	-	-.246	.002	-.250	-0.100
$P(Y_i=1\|X_i)$ soft peg								
Const.	-1.409	.569	.065	2.653	-.213	-.021	-.038	-.152
	(.158)	(.540)	(.973)	(.153)				
OPEN	**.036**	**0.040**	**.084**	**.116**	.002	.003	-.001	.002
	(.014)	**(.005)**	**(.051)**	**(.010)**				
IND	.021	**-.041**	-.085	**-.096**	.011	.001	.009	.010
	(.427)	**(.088)**	(.153)	**(.099)**				
M2	.004	-.003	.020	-.009	.003	.002	.007	.004
	(.643)	(.697)	(.238)	(.463)				
DEBT	**-.539**	-.198	-.410	**-1.472**	-.109	-.050	-.049	-.188
	(.054)	(.417)	(.368)	**(.005)**				
CAPC	.724	-.057	**3.509**	1.696	-.047	-.022	-.102	.151
	(.251)	(.926)	**(.023)**	(.194)				
$P(Y_i=2\|X_i)$ hard peg								
Const	-1.140	1.442	.471	**4.560**	-.096	.184	.044	.367
	(.414)	(.199)	(.852)	**(.028)**				
OPEN	**.0759**	**0.056**	**.137**	**.142**	.007	.005	.006	.007
	(.000)	**(0.001)**	**(.003)**	**(.002)**				
IND	**-.101**	**-.100**	**-.218**	**-.194**	-.013	-.013	-.015	-.018
	(.007)	**(.002)**	**(.002)**	**(.002)**				
M2	**-.038**	**-.021**	-.038	**-.040**	-.005	-.003	-.006	-.005
	(.027)	**(.060)**	(.151)	**(.023)**				
DEBT	-.039	0.045	-.169	**-.613**	.032	.029	.023	.109
	(.869)	(.843)	(.733)	**(.050)**				
CAPC	**2.877**	.081	**6.535**	1.165	.294	.020	.352	-.051
	(.005)	(.911)	**(.001)**	(.403)				
Log-likelihood	-105.8	-122.4	-50.7	-62.0	-	-	-	-
% of correct predictions	63%	56%	73%	69%	-	-	-	-
Nb of observations	126	126	91	91	-	-	-	-

P-values in parenthesis.

Table 2 : Results with political instability

	Estimations				$dP(Y_i=s)/dX_i$			
	Official regimes		De facto regimes		Official regimes		De facto regimes	
	1996	1999	before crises	after crises	1996	1999	before crises	after crises
$P(Y_i=0\|X_i)$ free float								
Const.	-	-	-	-	-.087	-.600	-.044	-.317
OPEN	-	-	-	-	-.006	-.006	-.009	-.010
IND	-	-	-	-	-.002	.012	.007	.009
M2	-	-	-	-	.005	.005	-.000	.024
DEBT	-	-	-	-	.006	-.067	.033	.135
CAPC	-	-	-	-	.024	.357	-.202	-.094
POL	-	-	-	-	.108	.115	.046	.029
$P(Y_i=1\|X_i)$ soft peg								
Const.	-.159	2.461	.380	2.725	-.242	-.173	-.278	-.398
	(.915)	(.112)	(.884)	(.190)				
OPEN	.028	**.031**	**.158**	**.131**	.001	.002	.003	.005
	(.205)	**(.095)**	**(.025)**	**(.006)**				
IND	.039	-.044	-.115	-.085	.014	.005	.005	.010
	(.362)	(.313)	(.165)	(.153)				
M2	-.010	-.014	.019	-.014	.005	.003	.011	.005
	(.419)	(.250)	(.357)	(.360)				
DEBT	-.093	.293	-.636	**-2.395**	-.032	-.010	-.058	-.296
	(.820)	(.573)	(.308)	**(.001)**				
CAPC	-.415	**-1.979**	**3.510**	2.116	-.145	-.130	.091	.372
	(.646)	**(.045)**	**(.052)**	(.133)				
POL	-.554	-.355	-.754	.193	-.048	.087	.020	.200
	(.231)	(.476)	(.335)	(.797)				
$P(Yi=2\|X_i)$ hard peg								
Const.	3.801	**7.386**	4.182	**8.704**	.328	.774	.322	.716
	(.264)	**(.001)**	(.309)	**(.002)**				
OPEN	**.083**	**.049**	**.215**	**.152**	.005	.004	.006	.005
	(.009)	**(.032)**	**(.004)**	**(.002)**				
IND	**-.118**	**-.156**	**-.255**	**-.249**	-.012	-.017	-.013	-.020
	(.067)	**(.005)**	**(.010)**	**(.001)**				
M2	**-.129**	**-.067**	**-.107**	**-.075**	-.010	-.008	-.010	-.007
	(.018)	**(.005)**	**(.062)**	**(.006)**				
DEBT	.255	.768	-.301	-.499	.027	.077	.024	.005
	(.586)	(.169)	(.653)	(.228)				
CAPC	1.171	**-3.024**	**4.574**	-.785	.121	-.227	.111	.161
	(.514)	**(.019)**	**(.056)**	(.643)				
POL	-1.080	**-1.733**	-1.487	**-1.915**	-.060	-.202	-.066	-.229
	(.169)	**(.013)**	(.150)	**(.043)**				
Log-likelihood	-54.78	-62.47	-34.30	-41.86	-	-	-	-
% of correct predictions	74%	61%	83%	78%	-	-	-	-
Nb of observations	76	76	76	76	-	-	-	-

P-values in parenthesis.

3.4. Case studies

We now turn to "in-sample" predictions relying on the highest probability for each country. Individual predictions are detailed in Appendix D. Table 3 provides a summary, whereas Tables 4 and 5 report the "most certain" predictions of the model for official regimes as measured by the 20 highest and 20 lowest predicted probabilities for each regime.[22]

Table 3: Logit predictions for official regimes (number of countries in each regime)

Regime	Free float	Soft peg	Hard peg	Total
1996				
Logit	9	51	16	76
Actual	20	40	16	76
1999				
Logit	20	29	27	76
Actual	23	30	23	76

Source: IMF and model predictions.

The model correctly predicts the hollowing out of official regimes observed between 1996 and 1999. Indeed, corner solutions have been rising while intermediate regimes have been falling in both logit predictions and IMF reported regimes. It is worth noting that while 53 out of 76 countries did change their regime between 1996 and 1999, according the model, 45 of the 76 countries would have changed. Detailed predictions can be summarized as follows.

- The model predicts hard pegs correctly for CFA countries in both periods and the monetary unification in 1999 of France, Germany, Italy and Luxembourg. The probability of a hard peg rises substantially between 1996 and 1999 for EMU countries, perhaps because the 1999 model is keener towards hard pegs; the prediction in 1999 for the Netherlands and Spain is between a soft peg and a hard one, and it is a soft peg for Greece. The prediction for Argentina and Panama is a soft peg for 1996, while it is ambiguous for 1999. A soft peg is predicted for Ecuador. Other hard peggers are not in the sample.

- The model correctly predicts a free float for Japan, India, Pakistan and the United States in both periods. A soft peg is predicted for Canada where the probability of a free float has been falling between 1996 and 1999 while the probability of a hard peg has been rising. For a number of emerging countries (Brazil, Chile, China, Indonesia, South Korea, Morocco, Poland, Thailand), the model predicts a soft peg in1996 but a free float in 1999 (the probability of a free float rises to 94% for China!). A notable exception is Mexico for which the model predicts a hard peg in 1999.

- Finally, the model predicts a soft peg in Ecuador and in a number of Latin American countries (Bolivia, Uruguay, central American countries) and European countries (Denmark, Norway, Hungary). It still predicts a soft peg in some East-Asian countries

[22] We concentrate here on official regimes and on the model with political instability. The same calculation can be applied to de facto regimes. The complete set of results is available from the authors on request.

(Malaysia, Philippines, Singapore) in 1999. However it predicts a hard peg (instead of a soft one) in Venezuela for 1999.

Table 4: highest and lowest probabilities for each regime (official regimes, 1996)

Free float		Soft peg		Hard peg	
Pakistan	67%	Malaysia	94%	Guinea-Bissau	98%
Greece	64%	Mauritius	89%	Coted'Ivoire	90%
Ethiopia	57%	Venezuela	87%	Niger	90%
Japan	57%	Luxembourg	87%	Cameroon	88%
Lebanon	56%	TrinidadandTol	85%	Chad	86%
United States	56%	Netherlands	83%	Senegal	80%
India	55%	Jamaica	82%	Comoros	76%
Guatemala	54%	Korea,Rep,	82%	Zimbabwe	71%
Bangladesh	49%	Singapore	81%	Rwanda	69%
Bolivia	47%	Indonesia	79%	Swaziland	67%
NewZealand	46%	Germany	74%	Mali	67%
Israel	46%	Norway	73%	Benin	61%
Thailand	46%	Italy	73%	CongoRep	60%
Denmark	38%	PapuaNewGuir	72%	SierraLeone	53%
Turkey	37%	China	72%	Mexico	43%
Togo	37%	ElSalvador	72%	SriLanka	41%
Australia	37%	SouthAfrica	70%	Nicaragua	40%
Uruguay	36%	CostaRica	70%	Togo	39%
Egypt	35%	Portugal	70%	Honduras	39%
Poland	35%	Ecuador	69%	Colombia	32%
...					
Rwanda	15%	Guatemala	38%	TrinidadandTo	1%
TrinidadandTo	14%	CongoRep	36%	Greece	1%
Mexico	13%	Nicaragua	36%	Morocco	1%
Jamaica	13%	Greece	35%	Australia	0%
Mauritius	11%	Pakistan	32%	Indonesia	0%
Nigeria	10%	Swaziland	31%	Norway	0%
Chad	8%	SierraLeone	27%	Netherlands	0%
Venezuela	8%	Togo	24%	Canada	0%
Zimbabwe	7%	Ethiopia	23%	Mauritius	0%
Senegal	6%	Zimbabwe	22%	Malaysia	0%
Malaysia	6%	Rwanda	16%	United States	0%
Luxembourg	5%	Benin	15%	Jordan	0%
Cameroon	4%	Mali	14%	Portugal	0%
Niger	4%	Senegal	14%	Israel	0%
CongoRep	4%	Comoros	9%	Egypt	0%
Gabon	3%	Cameroon	8%	NewZealand	0%
Coted'Ivoire	3%	Coted'Ivoire	7%	Thailand	0%
Swaziland	2%	Niger	6%	China	0%
Guinea-Bissau	1%	Chad	6%	Lebanon	0%
Singapore	1%	Guinea-Bissau	1%	Japan	0%

Source: model predictions

Table 5: highest and lowest probabilities for each regime (official regimes, 1999)

Free float		Soft peg		Hard peg	
China	94%	Singapore	88%	Guinea-Bissau	100%
Lebanon	83%	Malaysia	78%	Cameroon	88%
India	76%	Canada	71%	Niger	86%
Japan	70%	Mauritius	70%	Comoros	84%
Pakistan	70%	Jordan	69%	Luxembourg	82%
Chile	69%	TrinidadandTo	69%	Zimbabwe	78%
SouthAfrica	68%	CostaRica	65%	Coted'Ivoire	76%
Thailand	67%	Portugal	63%	Rwanda	73%
Korea,Rep,	64%	Denmark	63%	Nicaragua	71%
Morocco	62%	Norway	62%	Chad	66%
Poland	62%	Uruguay	61%	Senegal	64%
Bangladesh	61%	Greece	61%	Germany	64%
Lesotho	60%	NewZealand	58%	Mali	62%
PapuaNewGuir	56%	Nigeria	57%	SierraLeone	60%
Indonesia	56%	Ecuador	57%	Italy	55%
Brazil	53%	Israel	56%	Ethiopia	55%
Australia	52%	Hungary	55%	France	54%
Egypt	50%	Honduras	55%	Swaziland	53%
United States	50%	Guatemala	55%	Benin	51%
Philippines	45%	CongoRep	53%	Panama	50%
Spain	13%	Pakistan	29%	Philippines	5%
Rwanda	13%	Nicaragua	27%	United States	5%
ElSalvador	11%	Colombia	27%	Indonesia	4%
France	11%	BurkiFaso	27%	Egypt	4%
CostaRica	10%	SierraLeone	26%	Poland	4%
Jamaica	8%	Benin	26%	Lesotho	4%
Italy	8%	Mali	24%	SouthAfrica	4%
Coted'Ivoire	7%	India	22%	PapuaNewGuir	3%
Zimbabwe	6%	Senegal	22%	Morocco	3%
Panama	6%	Chad	19%	Malaysia	2%
Swaziland	5%	Coted'Ivoire	18%	Chile	2%
Niger	5%	Luxembourg	18%	India	2%
Germany	5%	Lebanon	16%	NewZealand	2%
Netherlands	4%	Zimbabwe	16%	Korea,Rep,	2%
Cameroon	4%	Rwanda	14%	Pakistan	2%
Comoros	3%	Comoros	13%	Israel	1%
Nicaragua	2%	Niger	9%	Lebanon	0%
Singapore	1%	Cameroon	8%	Japan	0%
Luxembourg	0%	China	6%	Thailand	0%
Guinea-Bissau	0%	Guinea-Bissau	0%	China	0%

Source: model predictions

4. CONCLUSION

In this paper, we brought together several features of the current policy debate on exchange-rate regime choice, namely the existence of a continuous range of exchange rate regimes, the needs for real exchange-rate adjustment in any exchange-rate regime, the existence of shocks to the financial account and of an interest-rate channel, the importance of the impact of exchange-rate variations on prices, and the need for a commitment technology to ensure the credibility of any exchange rate regime. We end with a "road map" which helps clarify Jeffrey Frankel's assessment that "no single currency regime is right for all countries at all times" (1999). On this road map, there is some room for intermediate regimes provided that trade shocks and shocks to the capital account are not prominent, and that the interest-rate channel is not too powerful.

These theoretical results are broadly supported by Logit estimations carried out on a large cross-country sample before and after the 1997-1998 currency crises. However the empirical results suggest that the pass-through effect tends to dominate the needs to accommodate trade shocks, favoring hard pegs rather than flexible regimes in the case of relatively open economies; and that exchange-rate regimes have generally not been consistent with the degree of capital account liberalization over the past. Finally, they show that political instability is detrimental to hard pegs but not to intermediate regimes.

The predictions of the model in terms of highest probability between a free float, a soft peg and a hard peg, reproduce the observed hollowing out of officially intermediate regimes between the two periods, and individual predictions allow to identify countries which have departed from average behavior.

Some important issues were not addressed in this paper. First, we treat every country in isolation, while it has been increasingly recognized that the regional environment and trading partners exchange rate regime choice do matter.[23] Also, we do not discuss how to organize the transition between regimes so that it takes place without disruption.[24] Finally, we do not explore the possibility that some of the factors favoring hard pegs, such as partial dollarization and interest rate sensitivity (not to mention trade invoicing and the market for currency hedging), may be endogenous to the exchange rate regime.

[23] See Ito et al. (1998), Bénassy-Quéré and Coeuré (2000) or Braga de Macedo et al. (2001). Here we only consider regional monetary cooperation as a means of commitment.

[24] See the study by Eichengreen et al. (1998) for the particular case of exits from fixed to floating.

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APPENDIX A

EXCHANGE RATE REGIME CHOICE: DISINFLATION, STABILIZATION, AND CREDIBILITY

Consider a small, open economy. The exchange rate regime is the result of a trade-off between price stability and demand stability in the short run (period 1) and in the long run (period 2) under the constraint that the regime is time-consistent .

Main features of the model

In the long run (Period 2), prices are fully flexible and the real exchange rate balances the current account. The exchange rate regime is therefore neutral for the real economy and the only difference between a fixed and a floating regime is the amount of price adjustment. In the short run (Period 1), prices are sticky; they only partially react to the nominal exchange-rate variation. This pass-through effect captures pricing to market, imported inflation/disinflation, short term wage indexation and/or the degree of de facto dollarization. All shocks are permanent and observed as from Period 1: the model is thus deterministic. The two periods are linked both forward by rational expectations in Period 1 of Period 2 exchange rate, and backward by an inflation reputation effect (meaning that Period 1 inflation has a lasting impact). Finally, Period 3 represents the long run steady state as anticipated from Period 2.

The authorities choose for each period an optimal degree of exchange rate flexibility, after the realization of permanent shocks to the economy, which everybody can observe. They can use the real exchange rate as an instrument in order to stabilize short run aggregate demand, but to a certain extent only, depending on how much they weight price stability. They face a commitment problem which they can solve by putting in place a commitment technology such as a currency board, a political commitment, a regional arrangement or a particular central banking design. In the model, the cost of reneging the commitment is proportional to the rise in exchange-rate flexibility.

The real economy

The real side of the economy is described by three equations (with t = 1,2):

$$y_t = b_t - a\, r_t + u \qquad a > 0 \tag{1}$$

$$b_t = n\,(q_t + v) \quad n > 0 \tag{2}$$

$$r_t = E_t q_{t+1} - q_t + w \tag{3}$$

Equation (1) gives aggregate demand y_t as the sum of the trade account b_t and of domestic demand, the latter depending on the real interest rate r_t and on a permanent domestic demand shock u.

Equation (2) gives the trade account b_t as a function of the (log-) real exchange rate q_t and of a permanent foreign demand shock v. n is the openness ratio: the more open the country,

the larger the impact of a foreign demand shock, and the larger the stabilizing role of the real exchange rate.

Equation (3) is the financial account equilibrium condition. It relates the real interest rate r_t to the expected real exchange rate depreciation and to a shock w on the country risk premium. $E_t q_{t+1}$ is the real exchange rate which is rationally expected in period t for period t+1. As shocks are permanent and already observed in period 1, we have $E_1 q_2 = q_2$ and $E_2 q_3 = q_2$ (the real exchange rate is constant in the long run).

- In the ***long run***, the real exchange rate adjusts to balance the trade account; aggregate demand only depends on domestic demand and interest rate shocks:

  $q_2 = -v$,

  $r_2 = w$,

  $y_2 = u - aw$.

- In the ***short run***, the real exchange rate can adjust to stabilize output (in a flexible exchange-rate regime); or it can stay constant (fixed exchange-rate regime with price stickiness); or it can be somewhere in between (intermediate regime). Let $\tilde{q}_1$ be the "shadow" flexible exchange rate in Period 1, i.e. the real exchange rate that would stabilize output in a flexible regime. We have $\tilde{q}_1 = -(u-aw)/(a+n)-v$. This means that the shadow flexible exchange rate depreciates ($\tilde{q}_1$ rises) in the case of a negative demand shock or of a positive interest rate shock. Let g_1 be the actual degree of exchange rate adjustment allowed by the authorities in Period 1 ($0 \leq g_1 \leq 1$). We have:

  $q_1 = g_1 \tilde{q}_1 = g_1 [- v + (aw - u)/(a + n)]$

  $q_2 - q_1 = - (1-g_1)v + g_1 (u - aw)/(a + n)$.

  $r_1 = g_1 u/(a+n) - (1-g_1)v + (1-ag_1/(a+n))w$

  $y_1 = (1- g_1)x$.

- *Fee float ($g_1 = 1$)*. In case of a negative demand shock (**u** or $\mathbf{v < 0}$) or of a rise in the risk premium ($\mathbf{w > 0}$), the real exchange rate depreciates in the short run to stabilize aggregate demand; in case of a foreign demand shock ($\mathbf{v < 0}$), the real exchange rate then remains at this depreciated level which ensures a balanced current account. For both other shocks, the real exchange rate appreciates back to its initial level in the long run. Since it is expected, this appreciation lowers the real interest rate in the short run, which helps to stabilize aggregate demand. Hence, the real exchange rate adjustment stabilizes aggregate demand in the short run through both the trade channel and the interest rate channel.

- ***Fixed peg*** (***$\gamma_1 = 0$***). In case of a negative shock on domestic demand (***$\mu < 0$***) or of a positive shock on the risk premium (***$\omega > 0$***), the real exchange rate stays constant in both periods and aggregate demand is not stabilized. However in case of a negative foreign demand shock (***$\nu < 0$***), the real exchange rate has to depreciate in the long run. Since this depreciation is expected by the market, the real interest rate rises in the short run, which accentuates the fall in aggregate demand. Hence a fixed peg is especially costly for a country facing large foreign demand shocks, since the expectation of an inevitable real exchange-rate adjustment in the long run will destabilize aggregate demand in the short run, while having a fixed peg makes no difference compared to a flexible regime for long-run aggregate demand.

Nominal variables

The breakdown of real exchange rate movements between nominal exchange rates and prices depends on the nature of the exchange-rate regime and on the intensity of the exchange-rate pass-through. Let $q_t = s_t - p_t$ where s_t is the nominal exchange rate and p_t the price level, both in logarithms.

- In the ***short run***, the price level adjusts to the nominal exchange rate up to a pass-through coefficient ***μ***: one can think of ***μ*** as describing the degree of *de facto* dollarization (i.e. the proportion of transactions denominated in a foreign currency), the proportion of imported inputs and/or wage indexation. The nominal exchange rate moves so as to let the real exchange rate adjust in the required proportion ***γ_1***:

$$p_1 = \mu s_1 \qquad 0 \le \mu \le 1 \tag{4}$$

$$s_1 = \frac{\gamma_1 \tilde{q}_1}{1-\mu} \tag{5}$$

  The larger the pass-through, the more volatile nominal variables, meaning that exchange rate flexibility yields more price instability in highly indexed or dollarized economies: demand stabilization through exchange-rate flexibility is more costly in terms of price instability.

- In the ***long run***, the nominal exchange rate can only account for a proportion ***γ_2*** of the real exchange rate adjustment and price adjustment therefore accounts for the remaining ***$(1-\gamma_2)$***. In addition, we suppose that nominal variables keep a memory of what happened in the short run through a reputation (or disinflation credibility) effect:

$$p_2 - p_1 = -(1-\gamma_2)(q_2 - q_1) + \eta s_1 \qquad 0 < \eta < 1 \tag{6}$$

$$s_2 - s_1 = \gamma_2(q_2 - q_1) + \eta s_1 \tag{7}$$

  Note that exchange rate movements are the only source of price movements in the short run, as in a standard open-economy version of the Barro-Gordon framework, but not in the long run, because the real exchange rate can adjust through a change in the price level. This setting is consistent with the monetary view of the balance of

payments in a fixed exchange rate regime, where current account surpluses generate inflation through reserve accumulation.

- In a ***fixed peg*** ($\gamma_1 = \gamma_2 = 0$), real exchange rate adjustment in the long run is achieved through price adjustment. In case of a negative shock to foreign demand ($v < 0$), the real exchange rate remains constant in the short run, but long-run depreciation is achieved through deflation. Hence, a fixed exchange rate does not guarantee price stability in the long run. This result captures an important feature of recent emerging market crises (e.g. the deflation observed in HongKong after the 1997 crisis). It contrasts with conventional extensions of the Barro-Gordon framework, which always assume PPP.
- In a ***free float*** ($\gamma_1 = \gamma_2 = 1$), real exchange rate adjustment in the long run is realized through nominal exchange rate adjustment, inflation in period 2 being determined by the amount of depreciation in period 1. For instance, a negative domestic demand shock ($u < 0$) is accommodated by a nominal exchange rate depreciation in the short run; in the long run, the real exchange rate appreciates back to its initial level through nominal appreciation while the short run depreciation feeds both inflation and nominal depreciation. If such reputation effect is low (for instance, if price expectations are forward looking), the flexible regime insulates the long run from the short run while allowing demand stabilization in the short run. Conversely, refraining from depreciating the currency in the short run yields no benefit in terms of inflation in the long run.

The optimal exchange-rate regime

The monetary authorities minimize a quadratic loss function which depends on aggregate demand and inflation variability in both periods. When announcing an exchange rate regime in Period 1, they have to convince the market that they will not renege on their commitment. They do so by putting in place a commitment technology which can take the form of central bank independence or of a currency board, for instance. Changing regimes bears a reputation cost C, in the tradition of escape clause models. The cost $C = \theta(\gamma_2 - \gamma_1)$ depends on the amount of added flexibility and on a parameter $\theta > 0$. Moving from a fixed peg to a free float will bear a higher cost than moving from a fixed peg to a crawling peg. The loss function is $L = L_1 + \beta E_1 L_2$ with:

$$L_1 = 0.5\left(y_1^2 + \lambda p_1^2\right) \qquad \text{(assuming } p_0 = 0\text{)} \tag{8}$$

$$L_2 = 0.5\left(y_2^2 + \lambda (p_2 - p_1)^2\right) + \theta\left(\gamma_2 - \gamma_1\right) \tag{9}$$

The commitment technology

The optimization program is first solved for Period 1 under the hypothesis that the exchange rate regime will be the same for both periods: $\gamma_1 = \gamma_2 = \gamma$. Then, the proper commitment technology θ is defined so as to ensure the credibility of the regime, in the sense that re-optimizing in Period 2 would not lead to a regime change. Given Period 1 exchange rate regime γ_1, the optimal Period 2 regime γ_2^* is derived from the minimization

of Period 2 loss function.[25] Finally, equalizing γ_2^* to $\gamma_1 = \gamma$ in the first order condition yields the degree of commitment θ: Assuming that the three shocks (u, v and w) are orthogonal[26], we have:

$$\theta = \lambda(1-\gamma)\left[(1-\gamma)^2 + \frac{h\gamma}{1-m}\right]v^2 + \frac{\lambda\gamma^2}{(\alpha+n)^2}\left[1-\gamma-\frac{h}{1-m}\right]\left(u^2+\alpha^2 w^2\right) \qquad (10)$$

- In close-to-the-corners regimes, we have $\gamma(1-\gamma)\sim 0$, ($\gamma\sim 0$ or $\gamma\sim 1$), hence:

$$\theta = \lambda\left[(1-\gamma)^3 v^2 - \frac{\gamma^2 h}{(1-m)(\alpha+n)^2}\left(u^2+\alpha w^2\right)\right] \qquad (10')$$

  Unsurprisingly, there is no need for a commitment ($\theta = 0$) if monetary authorities do not care about inflation ($\lambda = 0$). In this case, they unambiguously choose a free floating regime ($\gamma = 1$) which will provide demand stabilization in the short run while being neutral in the long run, and there is no incentive to move towards more flexibility in Period 2.

  In the general case where $\lambda > 0$, the necessary commitment is negative ($\theta < 0$, meaning that an incentive is needed in order to fix the exchange rate) for a free float ($\gamma \sim 1$). For a peg ($\gamma \sim 0$), the commitment depends on the amount of foreign demand shocks. In the extreme case where there are no foreign demand shocks ($v^2 = 0$), there is no incentive for abandonning the peg in Period 2 since no real exchange-rate adjustment is required in the long run. Conversely, if foreign demand shocks are prominent, there is high incentive to use the nominal exchange rate to alleviate the price adjustment in Period 2, which reduces the credibility of a fixed peg.

It is important to note that an intermediate regime such as a crawling peg or a fluctuation band ($0 < \gamma < 1$) is not necessarily more credible *per se* than a fixed peg: the required commitment depends on the relative amount of foreign demand shocks and of other shocks, and on the amount of the reputation effect (see Eq. 10). We now look in more detail into the relation between exchange rate flexibility γ and the required degree of commitment θ.

If $h > 3(1-m)$, i.e. in the case of strong reputation effects and/or high pass-through, $\theta(\gamma)$ is a concave function which reaches a maximum for an intermediate regime (not for a fixed peg). If $h < 3(1-m)$, $\theta(\gamma)$ can be either decreasing (hence with a maximum in γ=0) or a non-linear function with a maximum at some points between 0 and 1, thus for some intermediate regimes. The latter case applies when foreign demand shocks are prominent. It can be noted that foreign demand shocks make a stronger commitment necessary for all kinds of pegs. The reason is that limiting the exchange-rate depreciation in case of a negative shock (v<0) leads to deflation in Period 2, which monetary authorities may try to avoid by allowing more flexibility in the exchange rate. To some extent, reputation effects

[25] Remember that aggregate demand in Period 2 does not depend on the exchange rate regime.

[26] For the sake of simplicity, our model is deterministic. In reality, the monetary authorities need to anticipate the various sources of shocks u, v and w before choosing the exchange-rate regime γ.

and pass-through mechanisms dampen the credibility problem by creating inherited inflation from Period 1 (limited) depreciation, hence allowing real exchange-rate depreciation in period 2 without a fall in prices.[27]

Optimal degree of exchange-rate flexibility

We finally assume that monetary authorities commit so that the exchange-rate regime is consistently credible, i.e. $\gamma_1 = \gamma_2 = \gamma$. The optimal degree of flexibility is given by:

$$\underset{\gamma}{Min}\, L = L_1 + \beta E_1 L_2 \qquad (11)$$

- Assuming that all shocks are orthogonal we get the following derivative:

$$\frac{\partial L_1}{\partial \gamma} = \left[-(1-\gamma) + \frac{\gamma \lambda}{(\alpha+\nu)^2}\left(\frac{\mu}{1-\mu}\right)^2 \right] \left[\sigma_u^2 + (\alpha+\nu)^2 \sigma_v^2 + \alpha^2 \sigma_w^2 \right] \qquad (12)$$

For ***a very short sighted government*** ($\beta = 0$), the optimal exchange-rate regime is thus:

$$\gamma_0^* = \frac{1}{1 + \left(\frac{\lambda}{(\alpha+\nu)^2}\right)\left(\frac{\mu}{1-\mu}\right)^2} \qquad (14)$$

We can check that γ_0^* is bounded by 0 (fixed peg) and 1 (free floating). Not surprisingly, a government with low aversion to inflation (λ small) will choose a flexible regime (γ close to 1). This will also be the choice if there is little pass-through (μ low), or if foreign demand shocks have a great impact on the short run economy either directly (ν large) or through the real interest rate (α high). Conversely, a short-sighted government will try to stabilize its exchange rate if it cares inflation, suffers from high pass-through but appears relatively immune to foreign demand shocks and interest-rate variations.

[27] Symmetrically, reputation effects and pass-through reduce Period 2 inflation in case of a positive trade shock in the context of a soft peg. The analysis of θ as a function of γ is available upon request to the authors.

- With $\gamma(1-\gamma) \sim 0$, i.e. $\gamma \sim 0$ or $\gamma \sim 1$, we also have:

$$\frac{\partial L_2}{\partial \gamma} = \lambda \left[-2(1-\gamma)^3 + \gamma \left(\frac{h}{1-m} \right)^2 \left(\frac{x}{a+n} \right)^2 \right] \tag{13}$$

For ***a very patient government*** ($\beta \to \infty$), the optimal exchange-rate regime is such as:

$$\boxed{\frac{(1-\gamma_\infty^*)^3}{\gamma_\infty^*} = \frac{1}{2} \left(\frac{h}{1-m} \right)^2 z^2} \quad \text{with } z^2 = 1 + \frac{u^2 + a^2 w^2}{(a+n)^2 v^2} \tag{15}$$

Note that this formula only applies to close-to-the-corners regimes ($\gamma \sim 0$ or $\gamma \sim 1$). It can be concluded that a high reputation effect (h) or a high degree of pass through (m) will be consistent with a close-to-fixity regime ($\gamma \sim 0$) provided the government is patient. This is because refraining from letting the exchange rate adjust in the first period will yield high benefits in terms of price stability in the second period while stabilization losses of the first period are not weighted. This prescription is enhanced if domestic demand shocks (u^2) or shocks to the risk premium (w^2) dominate foreign demand shocks ($(a+n)^2 v^2$). On the contrary, a country which is mainly vulnerable to foreign demand shocks will prefer a more flexible regime because such regime will avoid adjusting the real exchange rate through price adjustment in the long run. Hence a distinction must be made between the pass-through effect (which favors a peg) and the vulnerability to foreign demand shocks (which favors a float). This distinction is not easy in small, open economies. Finally, the relative impact of capital account shocks (w^2) and trade shocks ($(a+n)^2 v^2$) is crucial: the rising role of the former relative to the latter would seem to favor more stable exchange-rate regimes. A patient government will prefer a flexible regime ($\gamma \sim 1$) if foreign shocks are prominent, inflationary memory is low and exchange-rate pass-through is weak.

CONCLUSION

The main conclusions of the model are the following:

- When monetary authorities weight inflation variability against output variability, the optimal exchange rate regime is typically an intermediate one. The optimal degree of exchange rate flexibility depends on the structure of the economy, the nature of the shocks it faces, and the preferences of authorities.
- All things being equal, the following patterns will tend to favor less exchange rate flexibility: a higher aversion to inflation and/or a longer time horizon; a higher degree of pass-through (for instance in the case of a *de facto* dollarized economy or in an economy with high dependence on imported inputs or flexible wage contracts); a more persistent inflationary reputation; an aggregate demand less reactive to real interest rates, for instance due to lower indebtedness or longer debt contracts. Also, harder pegs are more likely to be chosen by economies facing shocks to domestic demand or to interest rates than by economies facing shocks on foreign demand.

- The authorities face a commitment problem when they choose an exchange rate regime. This problem can be addressed by increasing ex-ante the cost of changing regimes. It turns out that a fixed peg does not necessarily require a stronger commitment than an intermediate regime such as a crawling peg or a band. Soft pegs are especially difficult to maintain in countries facing relatively large foreign demand shocks, because there is a strong incentive for the authorities to use the nominal exchange rate to alleviate the role of prices in real exchange-rate adjustment in the long run. To some extent, however, reputation effects and pass-through mechanisms can alleviate the commitment problem of a soft peg in countries facing large foreign demand shocks, because inherited inflation reduces the case for deflation after a negative foreign demand shock.

On the whole, the model attributes the "fear of floating" to strong pass-through effects and to the magnitude of capital account shocks relatively to trade shocks. It also attributes the hollowing out of intermediate regimes to rising world demand shocks and to a higher vulnerability of the economies to interest rate variations, which make it more difficult to commit to a given exchange-rate regime.

APPENDIX B

Definition of variables and data sources

Variable	Definition	Source
IMF	Official regime at end 1996 or 1999	IMF, Exchange Arrangements and Exchange Restrictions, yearbook xx+1
BQCPRE	Official/de facto regime according to BQC before 97-98 crisis	Bénassy-Quéré, A., and B. Coeuré (2001), "On the identification of de facto currency baskets" http://www.cepii.fr/anglaisgraph/pagepers/Webabq/ongoing.htm.
BQCPOST	Official/de facto regime according to BQC after 97-98 crisis	Bénassy-Quéré, A., and B. Coeuré (2001), "On the identification of de facto currency baskets" http://www.cepii.fr/anglaisgraph/pagepers/Webabq/ongoing.htm.
CAPC	Capital controls index at end 1996 or 1999, calculated over at least 7 of the 9 capital controls items	IMF, Exchange Arrangements and Exchange Restrictions, yearbook xx+1
OPEN	Openness ratio in 1996 or 1999 (exports/GDP in %)	World Bank, World Development Indicators, 2001.
DOL	Dollarization ratio, last year available (1995). Foreign currency deposits/broad money, in %.	Balino, T., A. Bennett, and E. Borensztein (1999), Monetary Policy in Dollarized Economies, IMF Occasional Paper, 171.
POL	Number of changes in the dominant party over 1990-1994	Political Handbook.
IND	Share of industry in value added (%), 1996 or 1999	World Bank, World Development Indicators, 2001.
M2	M2/GDP ratio in %., 1996 or 1999	World Bank, World Development Indicators, 2001.
DEBT	total debt/GDP at end 1996 or 1999 (domestic+foreign debt) for OECD countries: public debt ratio.	World Bank, World Development Indicators, 2001 OECD

APPENDIX C

Robustness: logit estimations on the same sample

Table C1 : Baseline model

	Estimations				$dP(Y_i=s)/dX_i$			
	Official regimes		De facto regimes		Official regimes		De facto regimes	
	1996	1999	Before crises	after crises	1996	1999	before crises	After crises
$P(Y_i=0\|X_i)$ free float								
Const.	-	-	-	-	.064	-.481	-.007	-0.214
OPEN	-	-	-	-	-.007	-.008	-.006	-0.008
DEBT	-	-	-	-	.037	-.018	.025	0.079
CAPC	-	-	-	-	-.107	.237	-.250	-0.100
IND	-	-	-	-	.000	.014	.006	0.008
M2	-	-	-	-	.004	.004	-.001	0.001
$P(Y_i=1\|X_i)$ soft peg								
Const.	-.619	2.044	.065	2.653	-.153	-.026	-.038	-.152
	(.642)	(.131)	(.973)	(.153)				
OPEN	**.033**	**0.038**	**.084**	**.116**	.001	.002	-.001	.002
	(.080)	**(.029)**	**(.051)**	**(.010)**				
DEBT	-.301	.033	-.410	**-1.472**	-.063	-.018	-.049	-.188
	(.399)	(.933)	(.368)	**(.005)**				
CAPC	-.104	**-1.555**	**3.509**	1.696	-.249	-.195	-.102	.151
	(.898)	**(.068)**	**(.023)**	(.194)				
IND	.034	-.051	-.085	**-.096**	.015	.003	.009	.010
	(.367)	(.152)	(.153)	**(.099)**				
M2	-.009	-.013	.020	-.009	.003	.002	.007	.004
	(.378)	(.196)	(.238)	(.463)				
$P(Y_i=2\|X_i)$ hard peg								
Const	.422	**4.204**	.471	**4.560**	-.090	.508	.044	.367
	(.833)	**(.007)**	(.852)	**(.028)**				
OPEN	**.084**	**0.058**	**.137**	**.142**	.007	.006	.006	.007
	(.000)	**(0.003)**	**(.003)**	**(.002)**				
DEBT	.044	0.231	-.169	**-.613**	.026	.036	.023	.109
	(.899)	(.546)	(.733)	**(.050)**				
CAPC	**3.221**	-1.210	**6.535**	1.165	.357	-.041	.352	-.051
	(.016)	(.546)	**(.001)**	(.403)				
IND	**-.120**	**-.129**	**-.218**	**-.194**	-.015	-.017	-.015	-.018
	(.018)	**(.002)**	**(.002)**	**(.002)**				
M2	**-.066**	**-.044**	-.038	**-.040**	-.007	-.006	-.006	-.005
	(.003)	**(.004)**	(.151)	**(.023)**				
Log-likelihood	-70.6	-83.17	-50.7	-62.0	-	-	-	-
Nb of observations	91	91	91	91	-	-	-	-

P-values in parenthesis.

Table C2 : Estimation on the same sub-sample: results with political instability

	Estimations				$dP(Y_i=s)/dX_i$			
	Official regimes		De facto regimes		Official regimes		De facto regimes	
	1996	1999	before crises	after crises	1996	1999	before crises	after crises
$P(Y_i=0\|X_i)$ free float								
Const.	-	-	-	-	-.087	-.600	-.044	-.317
OPEN	-	-	-	-	-.006	-.006	-.009	-.010
DEBT	-	-	-	-	.006	-.067	.033	.135
CAPC	-	-	-	-	.024	.357	-.202	-.094
IND	-	-	-	-	-.002	.012	.007	.009
M2	-	-	-	-	.005	.005	-.000	.002
POL	-	-	-	-	.108	.115	.046	.029
$P(Y_i=1\|X_i)$ soft peg								
Const.	-.159	2.461	.380	2.725	-.242	-.173	-.278	-.398
	(.915)	(.112)	(.884)	(.190)				
OPEN	.028	**.031**	**.158**	**.131**	.001	.002	.003	.005
	(.205)	**(.095)**	**(.025)**	**(.006)**				
DEBT	-.093	.293	-.636	**-2.295**	-.032	-.010	-.058	-.296
	(.820)	(.573)	(.308)	**(.001)**				
CAPC	-.415	**-1.979**	**3.510**	2.116	-.145	-.130	.091	.372
	(.646)	**(.045)**	**(.052)**	(.133)				
IND	.039	-.044	-.115	-.085	.014	.005	.005	.010
	(.362)	(.313)	(.165)	(.153)				
M2	-.010	-.014	.019	-.014	.005	.003	.011	.005
	(.419)	(.250)	(.357)	(.360)				
POL	-.554	-.355	-.754	.193	-.048	.087	.020	.200
	(.231)	(.476)	(.335)	(.797)				
$P(Yi=2\|X_i)$ hard peg								
Const.	3.801	**7.386**	4.182	**8.704**	.171	.774	.322	.716
	(.264)	**(.001)**	(.309)	**(.002)**				
OPEN	**.083**	**.049**	**.215**	**.152**	.006	.004	.006	.005
	(.009)	**(.032)**	**(.004)**	**(.002)**				
DEBT	.255	.768	-.301	-.499	.027	.077	.024	.161
	(.586)	(.169)	(.653)	(.228)				
CAPC	1.171	**-3.024**	**4.574**	.785	.283	-.227	.111	-.278
	(.514)	**(.019)**	**(.056)**	(.643)				
IND	**-.118**	**-.156**	**-.255**	**-.249**	-.014	-.017	-.013	-.020
	(.067)	**(.005)**	**(.010)**	**(.001)**				
M2	**-.129**	**-.067**	**-.107**	**-.075**	-.008	-.008	-.010	-.007
	(.018)	**(.005)**	**(.062)**	**(.006)**				
POL	-1.080	**-.733**	1.487	**-1.915**	-.059	-.202	-.066	-.229
	(.169)	**(.013)**	(.150)	**(.043)**				
Log-likelihood	-54.8	-62.5	-34.3	-41.8	-	-	-	-
Nb of observations	76	76	76	76	-	-	-	-

P-values in parenthesis.

APPENDIX D

Predictions of the logit model

	IMF96	Logit 96	IMF99	Logit 99
Argentina	2	1	2	2
Australia	0	1	0	0
Bangladesh	1	0	1	0
Benin	2	2	2	2
Bolivia	0	1	1	1
Brazil	1	1	0	0
BurkiFaso	2	1	2	0
Cameroon	2	2	2	2
Canada	0	1	0	1
Chad	2	2	2	2
Chile	1	1	0	0
China	1	1	1	0
Colombia	1	1	0	2
Comoros	2	2	2	2
CongoRep	2	2	2	1
CostaRica	1	1	1	1
Coted'Ivoire	2	2	2	2
Denmark	1	1	1	1
DominicanRep	1	1	1	1
Ecuador	1	1	2	1
Egypt	1	1	1	0
ElSalvador	1	1	1	1
Ethiopia	0	0	1	2
France	1	1	2	2
Gabon	2	1	2	1
Germany	1	1	2	2
Greece	1	0	1	1
Guatemala	0	0	1	1
Guinea-Bissau	2	2	2	2
Honduras	1	1	1	1
Hungary	1	1	1	1
India	0	0	0	0
Indonesia	1	1	0	0
Israel	1	1	1	1
Italy	1	1	2	2
Jamaica	0	1	1	2
Japan	0	0	0	0
Jordan	1	1	1	1
Korea,Rep,	1	1	0	0
lebanon	0	0	0	0

	IMF96	Logit 96	IMF99	Logit 99
Lesotho	1	1	1	0
Luxembourg	1	1	2	2
Malaysia	1	1	1	1
Mali	2	2	2	2
Mauritius	1	1	0	1
Mexico	0	1	0	2
Morocco	1	1	1	0
Nepal	1	1	1	2
Netherlands	1	1	2	1
NewZealand	0	1	0	1
Nicaragua	1	2	1	2
Niger	2	2	2	2
Nigeria	1	1	1	1
Norway	1	1	1	1
Pakistan	0	0	0	0
Panama	2	1	2	2
PapuaNewGuinea	0	1	0	0
Philippines	0	1	0	1
Poland	1	1	0	0
Portugal	1	1	2	1
Rwanda	0	2	0	2
Senegal	2	2	2	2
SierraLeone	0	2	0	2
Singapore	1	1	1	1
SouthAfrica	0	1	0	0
Spain	1	1	2	1
SriLanka	1	1	1	2
Swaziland	2	2	1	2
Thailand	1	1	0	0
Togo	2	2	2	1
TrinidadandTobago	0	1	0	1
Turkey	1	1	1	1
United States	0	0	0	0
Uruguay	1	1	1	1
Venezuela	1	1	1	2
Zimbabwe	0	2	1	2

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