Contractionary Currency Crashes
In Developing Countries

The 5th Mundell-Fleming Lecture
IMF Annual Research Conference

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Abstract

To update a famous old statistic: a political leader in a developing country is twice as likely to lose office in the 6 months following a currency crash than otherwise. This difference, which is highly significant statistically, holds regardless whether the devaluation takes place in the context of an IMF program. Why are devaluations so costly? Many of the currency crises of the last ten years have been associated with output loss. Is this, as alleged, because of excessive reliance on raising interest rates? More likely it is because of contractionary effects of devaluation. There are various possible contractionary effects of devaluation, but it is appropriate that the balance sheet effect receives the most emphasis. Passthrough from exchange rate changes to import prices in developing countries is not the problem: this coefficient fell in the 1990s, as a look at some narrowly defined products shows. Rather, balance sheets are the problem. How can countries mitigate the fall in output resulting from the balance sheet effect in crises? In the shorter term, adjusting promptly after inflows cease is better than procrastinating by shifting to short-term dollar debt, which raises the costliness of the devaluation when it finally comes. In the longer term, greater openness to trade reduces vulnerability to both sudden stops and currency crashes.

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It is a great honor to be giving this fifth annual Mundell-Fleming lecture.

I will begin by invoking, neither Mundell nor Fleming, but another article from

three decades ago: Richard Cooper's "Currency Devaluation in Developing Countries."

This was one of the few major papers from that period to deal explicitly with the

macroeconomics of developing countries. The weight of our attention has over the last

decade or two shifted more and more away from rich countries and toward developing

countries, whether judged by the caseload of the staff at the International Monetary Fund

or by working papers turned out by scholars in the field of International Finance and

Macroeconomics. In part this reflects the extent to which lower- and middle-income

countries have become increasingly integrated into world financial markets. Twenty

years ago, for example, one would not have wanted to apply the Mundell-Fleming

model's insights regarding international capital mobility to developing countries, because

they didn't have much (capital mobility). Indeed I don't think the phrase emerging

markets even existed then. But after the liberalizations and capital inflows of the early

1990s -- and the crises of the late 1990s -- we are applying to developing countries a wide

variety of models and tools that were originally created with rich countries in mind. And

we have as well created some new models and tools to try to capture what is different

about developing countries.

1. Political Costs of Devaluation

I wish to take as our starting point a widely cited statistic from Cooper (1971, p. 28) that, in the aftermath of devaluations, nearly 30 per cent of governments fell within 12 months, as opposed to 14 per cent in a contemporaneous control group.   This is an impressive fact, as demonstrated by the frequency with which other authors still cite it 33 years later.   I did a citation count: Cooper's article has received 84 citations, with no downward trend over time -- not as high as the two seminal papers that constituted the Mundell-Fleming model and thus gave this lecture its name, but still very healthy for a paper written so long ago.[1]   So I expect to garner a lot of citations myself by updating Cooper's calculation !

1.1 *Updating a statistic on leaders' loss of office*

He took anything over 10% to be a devaluation episode.   But the world changed in the 1970s and 1980s, and depreciations of that magnitude have become commonplace. For a high inflation country, one would not want to say that a new currency crisis occurs every month.   So I use the following definition:[2]

- the devaluation must be at least 25% (on a cumulative 12-month basis)

- it must represent an acceleration of at least 10 percentage points, relative to the rate of depreciation in the 12 months before that.

- it must have been at least three years since the last currency crisis.

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[1] Mundell (1963) and Fleming (1962) received 319 and 257 citations respectively over the same period, 1972-2003.   This probably understates the contribution of the Mundell-Fleming model: many discussions of the model cite other works, or none at all.

By this criterion, looking at a sample of 103 developing countries over the period 1971-2003, we found 188 currency crashes. Of these the identity of the chief executive changed within 12 months of the devaluation 29% of the time. Our standard of comparison is all other 12-month periods: the leader changed 20.2% of the time normally. Thus devaluation increases by an estimated 45% the probability of the executive losing his or her job. The difference is only statistically significant at the 12% level, however.[3]

We then narrowed the window to a half-year. Now the chief executive lost office 22.8 % of the time, as opposed to 11.6 % of the time otherwise. In other words, the currency crash doubles the probability of a change in the top leadership within the following 6 months. This time the difference is statistically significant not only at the 10% or 1% levels, but at the 0.5% level as well.

We also looked at whether the Finance Minister or Central Bank Governor – whoever held the office of the country's Governor of the IMF -- lost his or her job. Here, even using the longer 12-month window (and even with only five years of data [so far]: 1995-99), the effect is statistically significant. In the year following a currency crash, the occupant of this position changed 58.3 per cent of the time. In other years during this period the rate of turnover was 35.8%. So by this measure the finance minister or CB governor was 63% more likely to lose office. The difference is highly significant statistically (at the .0001 level).[4]

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[2] The same as that in Frankel and Rose (1996).
[3] Appendix 1. The source for the identity of the President, Prime Minister, Premier, or other Chief Executive, is http://rulers.org.

Why does devaluation carry such big political costs?[5]   How is it that a strong ruler like Indonesia's Suharto can easily weather 32 years of political, military, ethnic, and environmental challenges, only to succumb to a currency crisis?

1.2. Possible sources of political costs of devaluation

Often these currency crises have been accompanied by sharp recessions. Thus an obvious interpretation, which we will consider further, is that leaders are punished by their constituents when the performance of the economy is poor.   But before proceeding on the assumption that the loss of ministerial jobs is a reflection of unemployment and depressed activity throughout the economy, let us consider the possibility that the costs of a devaluation may be more political than economic. First, there is the possibility that elections cause currency crashes rather than the other way around.   Second, it could be that IMF programs or other austerity programs are unpopular in general, and that the devaluations are an incidental aspect of this.   Third, it could be that the leaders in question have made public promises in advance not to devalue, and that they are punished for breaking these promises regardless of subsequent economic performance.

What do I mean by the first possibility, that elections cause devaluations rather than the other way around?   It is striking, in how many of the major crises of the 1990s, even though trouble began during the run-up to a major regularly scheduled national election, the worst speculative attack and currency crash came soon *after* the election. This describes Mexico 1994, Korea 1997, and Brazil 1998-99. In an earlier era, one

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[4] Appendix 1, Part C.

would have guessed that election-motivated macroeconomic expansion -- the famous political business cycle -- explains the need for a subsequent devaluation.   But that explanation (first-generation models of speculative attacks, if you will[6]) does not fit the experience of the 1990s as well.   Macroeconomic expansion in these election campaigns was limited.[7]

A better explanation is that devaluation is politically costly to leaders, and so in an election year they try to postpone it -- whether to get re-elected,[8] or so that the crash comes on their successors' watch rather than theirs, or out of the hope that something will turn up to improve the balance of payments.   A related hypothesis is that, because a devaluation uses up scarce political capital, it is more likely to be undertaken by a new leader with a strong mandate, especially in a visible crisis, and especially if he can blame it on his predecessor.   Edwards (1994, Table 5) reports that devaluations occur disproportionately often during the first two years after a transfer of government: 77.3% of devaluations among presidential democracies (i.e., those with pre-scheduled elections), and 70.0 % among parliamentary democracies. This is a topic well worth exploring, but not here: my calculations about the frequency with which ministers lose their jobs in the year after a devaluation were careful to start the clock after the devaluation, so that cases

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[5] It might be worth checking whether an equally large loss of reserves results in job loss as often. Such episodes also tend to be unpleasant (often implying monetary contraction and recession, e.g., Argentina in 1995, 1999), but may not carry the same political costs.
[6] Flood and Marion (1999) surveys the literature on generations of models of speculative attack.
[7] The political business cycle literature observes that politicians are sometimes able to fool voters by aggressive macroeconomic expansion preceding the election, with costs borne later. But Brender and Drazen (2004) argue that is a primarily a phenomenon of countries that have only recently made the transition to democracy. Voters eventually learn.

where the devaluation comes soon *after* an electoral change are not included in the statistics.

The second possibility I mentioned is that devaluations are acting as a proxy for unpopular IMF austerity programs or other broad reform packages.   IMF-associated austerity programs have often resulted in popular unrest. For example, riots following food-subsidy cutbacks contributed to the overthrow of President Nimeiri of Sudan in 1985.[9] Lora and Olivera (2004) find that voters punish presidents for pro-market policies and for increases in the rate of inflation, but not for exchange rate policies per se.

One can test the proposition that devaluations are acting as a proxy for unpopular IMF austerity programs by conditioning our previous calculation on the adoption of IMF programs.   We created a dummy variable to represent cases where an IMF program was initiated within 3 months on either side of the devaluation.[10]   The IMF program variable does not seem to raise the frequency of leader job loss, relative to devaluations that did not involve an IMF program.   Thus it is not surprising that conditioning on the IMF dummy variable has no discernible effect on the frequency of leader turnover: 21.05% of the time for the cases with an IMF program, or 21.92% of the time for the ones without. In both cases, it is similar to the overall rate of job loss following devaluations (22.8%) in the complete sample, and is still almost double the 11.6% rate in normal times.

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[8] On governments' incentive to postpone devaluations until after elections, see Stein and Streb (1998, 1999).
[9] Edwards and Santaella (1993) report nine cases of post-devaluation coup attempts, in a study that looks at the role of IMF presence along with various measures of political instability in determining whether devaluations during the period 1950-1971 were economically successful. For a summary of the political consequences of IMF-type austerity programs, see Bienen and Gersovitz (1985).
[10] Whether Standby Agreement, or other. See Appendix 2 for list with dates.

That leaves the third non-economic explanation, that the ministers in question have made public promises in advance not to devalue, and that they feel it necessary to resign or are punished for breaking these promises, regardless of subsequent economic performance. In many cases the commitment to the peg is explicitly reaffirmed by top policy-makers and political leaders in the months immediately prior to the devaluation. Perhaps such ill-fated promises are originally made because the minister is duplicitous, or at least is ignorant of the speculative pressures he or she is up against. More likely they are too attached to the peg psychologically to let go; many of the currency crashes of the 1990s occurred in countries where governments had a lot invested in the peg, because exchange-rate-based stabilizations earlier had been the successful and popular means of ending a 1980s cycle of high inflation, even hyperinflation.

But I think that a still better way to view the public commitments may be as sincere expressions of a strong desire to maintain the peg. The ministers may realize that events could force the abandonment of the peg, if speculative pressures accelerate and it develops that reserves are about to run out, leaving little other option. And they may realize that making an explicit statement beforehand increases the chances that they will have to resign if and when the peg is abandoned. But making the promise is a way of buying a bit of credibility, and buying some time. Specifically it is a device for signaling that their determination to hold the line on the currency is so strong that they are willing to risk sacrificing their jobs.

We selected a sub-sample of 21 cases out of our total set of currency crashes. We chose roughly equal numbers of cases with subsequent premier changes and those

without.[11]   We searched local newspapers for the 30 days preceding the devaluation for statements by government officials that could be construed as commitments not to devalue.   We included assurances even if the language did not read as explicit or ironclad, because these are so often interpreted as promises.   The sample size is small. But we found that when some member of the government (chief executive, finance minister, or central bank governor) had given assurances that there would be no devaluation, and a devaluation did subsequently occur, the probability that the chief executive would lose his or her job within 12 months was 2/3.   Where no such assurances were reported, the frequency of job loss was only 1/3, despite the devaluation. In other words, whatever the credibility benefits of the promise ex ante, it doubles the likelihood that the leader loses office ex post.   If we use the 6-month horizon, then the relative effect is even stronger: the leader is 2 ½ times as likely to be out on the street if the government had made a previous commitment as if it had remained quiet (.5 vs. .2). If we consider only those cases where the chief executive himself is the one to have given the assurances, then the job loss rate becomes 100%.   But there were only two such cases, out of 21. Usually this dangerous task is delegated to a cabinet member. (Details are reported in Appendix 3 for the 12-month horizon, and Appendix 4 for the 6-month horizon.)

Despite this suggestive outcome, to the effect that the "broken promise" effect does indeed matter, it seems unlikely that this is the sole reason for devaluations to result

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[11]   The other major criterion was that the country in question be represented by a comprehensive microfiche files in Harvard's Widener Library of past newspapers, and that the languages of those newspapers be either English, Spanish, or Korean, the languages spoken by the research assistants working on this project [Arabic to soon be added].   Appendices 3 and 4 offer details of these cases.

in turnover at the top. After all, even among those cases where our newspaper search turned up no record of assurances in the month preceding the devaluation -- either from the leader, finance minister, or central bank governor – 20% of the leaders lost office within 6 months of the devaluation anyway, and 33% within 12 months.   This is well above the 11.6% or 20.2% rates, respectively, of job loss in normal times. Evidently the economic effects of devaluation also play an important role.

2. Does Devaluation Necessarily Mean Loss of Output?

As already noted, the most obvious interpretation of why devaluations are so often associated with high political costs is that they are accompanied by painful recessions.[12] But why?   After all, devaluations are supposed to increase competitiveness, increase production and exports of tradable goods, reduce imports, and thereby boost the trade balance, GDP, and employment.   Hence the story of the British Chancellor of the Exchequer "singing in the bath" after the 1992 devaluation of the pound.   Apparently developing countries are different, or at least emerging market countries are.   Figuring out why may amount to figuring out what is the aspect of these countries that most requires us to modify the macroeconomic models standardly applied to advanced economies.

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[12] Another possibility is that, even if there is no negative effect on GDP in the aggregate, the redistributional effects could be politically costly to the leaders.   For example, a devaluation in an African country may benefit small rural coffee and cocoa farmers because the price of their product is determined on world markets; but they tend to have less political power than urban residents, who may be hurt by the devaluation. The problem with this theory is that there are so many examples that go the other way, where the producers of the tradable products (agricultural, mineral, or manufactured) tend to have *more* political power than the producers of nontraded goods.

One can argue that simultaneous monetary and fiscal austerity are the true causes of these declines in economic activity. [Or banking failures, or the sudden stop in foreign lending itself, could be the true causes.] But this misses what, to me, is a key point. According to the standard textbook theories, when a country faces a sudden stop in capital flows, there exists some optimal combination of expenditure-reducing policies (monetary or fiscal contraction) and expenditure switching policies (devaluation) that should accomplish adjustment to external balance (the new balance of payments constraint), without necessarily sacrificing internal balance (i.e., without a recession). Why did all the countries in the East Asia crisis of 1997-98 suffer a sharp loss in output growth regardless of their mix of devaluation and expenditure-reduction?

Consider a graphical representation with the interest rate and exchange rate (price of foreign currency) on the axes, as illustrated in Figure 1a. To satisfy external balance, there is an inverse tradeoff between the two instruments. A devaluation and an increase in the interest rate are each ways of improving the trade balance -- the latter by reducing expenditure -- and so the more you have of one the less you need of the other. (If external balance is defined as equilibrium in the overall balance of payments, including the capital account along with the trade balance, the relationship is still downward-sloping, since a devaluation and an increase in the interest rate are both ways of making domestic assets more attractive to global investors.) To satisfy internal balance, the tradeoff is traditionally considered to be upward-sloping. An increase in the interest rate reduces the domestic demand for domestic goods, while a devaluation increases the net foreign demand for domestic goods; if you have more of one, you also need more of the other, to prevent excess supply or excess demand. The existence of two independent

instruments implies the possibility of attaining both targets simultaneously, at the intersection of the internal and external balance schedule. In the aftermath of an adverse shock in the foreign sector, for example, the right combination of devaluation and monetary contraction will restore balance of payments equilibrium while maintaining real economic growth.

This is not always the way things actually work.[13] By now we have had enough experience with crises in emerging markets that the traditional framework needs to be modified. The simple generalization seems to be that most developing countries that are hit by financial crises go into recession. The reduction in income is the only way of quickly generating the improvement in the trade balance that is the necessary counterpart to the increased reluctance of international investors to lend. External balance is a jealous mistress that can only be satisfied if internal balance is left to go wanting.

Critics of the IMF say that the recessions are the result of Fund policies, specifically the insistence on austerity in country rescue programs. [14]   Some can be interpreted as arguing that there should have been more expenditure switching, and less expenditure reduction; that the mix of a lower interest rate combined with a devaluation would successfully maintain internal balance. But many of the devaluations in East Asia and elsewhere were very large as it was. The critics often make the point that high interest rates are not in practice especially attractive to foreign investors because they may carry increased probability of default (and associated recession). This is true. But in my view it is not the most important correction in the traditional framework. Even if

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[13] Paul Krugman, "Latin America's Swan Song," formerly at http://web.mit.edu/krugman/www/swansong.html.

interest rates do not have as big a positive effect on the capital account as our earlier models of high financial integration suggested, so that the graphical relationship may be flatter, I believe that the sign of the effect is still the same. Even if higher interest rates have no effect at all on capital inflows, their effect on the balance of payments still goes the same way, due to the effect on spending. One cannot normally attract many investors by *lowering* interest rates. Therefore the external balance line still slopes downward. Claims that high rates are damaging to the real economy willfully ignore the lack of an alternative, if the external balance constraint is to be met.

Where the traditional framework needs most to be modified is the relationship giving internal balance, not that giving external balance. By now the evidence seems strong that devaluation is contractionary, at least in the first year, and perhaps in the second as well. We have long been aware of various potential contractionary effects of devaluation in developing countries. The same 1971 Cooper article that tallied job losses among ministers also listed six ways in which devaluation could be contractionary. By 1990, a total of ten such effects had been identified in textbooks.[15]

Until the currency crashes of the 1990s, a mainstream view had been that any negative effects from a devaluation were before long offset by the positive effect of stimulus to net exports, so that by the second year, when the latter had gathered strength, the overall effect on output had turned positive.[16] Now however, one must judge the negative effects stronger than we thought, and the positive effects weaker. Calvo and

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[14] E.g., Radelet and Sachs (1998); and Furman and Stiglitz (1998).
[15] E.g., the 5th through 9th editions of Ronald Caves, Jeffrey Frankel, and Ronald Jones, World Trade and Payments, 2002.

[16] Edwards (1986) and Kamin (1988).

Reinhart (2001), for example, calculate that exports do not increase at all after a devaluation, but rather are down for the first 8 months. The export side, at least, was supposed to be unambiguously positive. Apparently production is sometimes derailed by corporate financial distress, absence of trade credit, and increased costs of imported inputs, even when the production is for the purpose of export. Imports fall sharply; indeed crisis-impacted countries have for this reason experienced sharp increases in their trade balances beginning as soon as two or three months after the crisis. But this is clearly a response to the unavailability of finance and collapse of income and spending, not to relative prices. In other words, it is expenditure-reduction, not expenditure-switching.

If devaluation is contractionary, then the internal balance line slopes down, not up (as illustrated in Figure 1b). Moreover the slope may be disturbingly similar to the slope of the external balance line. It is hard to see where the two intersect, if they intersect at all. This means that it is hard to see what combination of policy instruments, if any, can simultaneously satisfy both internal and external balance, after an adverse shock has shifted the latter outward. The depressing conclusion is that there is no escape from recession. All policy instruments work via reduction in income in the short run -- devaluation, fiscal contraction, and monetary contraction. [Even structural policy reform, such as insisting that bad banks go under, may have a negative effect on economic activity in the short run.]

Is the targets-and-instruments framework then no longer useful? I think that the framework is still relevant during the period after a terms-of-trade shock or reversal in capital flows (as reflected in a peaking of reserves), but before the speculative attack hits

(as reflected in a very sharp devaluation, loss in reserves, or increase in interest rates). It can be hard to identify such an interval, especially at the time. But I have in mind the interval of a year or so preceding December 2001 in Argentina, July 1997 in East Asia, December 1994 in Mexico. I call this the period of procrastination, for reasons that will become clear below.

3. Why is Devaluation Often Contractionary?

Of the many possible contractionary effects of devaluation that have been theorized, which are in fact responsible for the recessionary currency crashes of the 1990s? Several of the most important contractionary effects of an increase in the exchange are hypothesized to work through a corresponding increase in the domestic price of imports, or of some larger set of goods. Indeed, rapid passthrough of exchange rate changes to the prices of traded goods is the defining assumption of the "small open economy model," which was thought to apply fairly well to emerging market countries. The contractionary effect would then follow, in any of several ways: the higher prices of traded goods would, for example, reduce real money balances or real wages of workers[17], or increase costs to producers in the non-traded goods sector.[18]

These mechanisms were not much in evidence in the currency crashes of the 1990s. The reason is that the devaluations were not passed through to prices for higher imports, for domestic competing goods, or to the CPI in the way that the small open

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[17] Diaz-Alejandro (1963) pointed to a transfer of income from (low-saving) urban workers who consume traded goods, to (high-saving) rich owners of agricultural land
[18] Increased costs to producers of non-traded goods could come from either higher costs of imported inputs like oil, or higher labor costs if wages are indexed to the cost of living (e.g., Corbo, 1985, in the context of Chile in 1981).

economy model had led us to believe.   The failure of high inflation to materialize in

East Asia after the 1997-98 devaluations, or even in Argentina after the 2001 devaluation,

was good news -- a surprise that perhaps to some extent compensated for the

unexpectedly sharp recessions.   But it calls for some investigation.

3.1 The decline in exchange rate passthrough in developing countries

Conventional wisdom has long been that passthrough is slower or less complete in

large industrialized countries than in small developing countries.   A number of authors

have pointed out a further decline during the 1990s in the passthrough coefficient among

industrialized countries.   But most of the many econometric studies of passthrough, even

those that examine a recent decline in the passthrough coefficient, have focused on prices

of imports into industrialized countries, rather than into developing countries.   Taylor

(2001) proposed that a decline in passthrough of exchange rate changes into the CPI in

the 1990s was due to a lower inflationary environment, and looked at US data. Gagnon

and Ihrig (2001) extended this claim to a sample of 11 industrialized countries. Otani,

Shiratsuka, and Shirota (2003) found a similar decline in passthrough for imports into

Japan. Campa and Goldberg (2001) again found a decline in the coefficient in the 1990s,

but attributed it to changing commodity composition more than to a less inflationary

environment.[19] Their data set again consists solely of industrialized countries.

Only a few studies include lower-income countries. Choudhri and Hakura (2001)

extend to a sample of 71, including developing countries, the finding that a low-inflation

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[19] It has been pointed out at least since Knetter (1993) that differences in passthrough
coefficients could be attributable to differences in the composition of the price index,

environment reduced passthrough to the CPI in the 1990s. Borensztein and De Gregorio (1999) and Goldfajn and Werlang (2000), study the low passthrough of recent large devaluations in developing countries.[20] But these are all studies of influences on aggregate price measures, the CPI in particular, not on import prices. Few studies concentrate on imports of specific goods into developing countries. The difference is important because effects on price indices vs. prices of specific imports are really two distinct conceptions of the word "passthrough." It is even more important because, as in the rich country context, some authors have claimed that what appears to be slow or incomplete passthrough in developing countries can really be attributed to changes in composition with regard to product varieties. [21]

Table 1, taken from Frankel, Parsley and Wei (2004), reports estimates for passthrough to prices of narrowly defined retail imports. Notice, first, confirmation of the conventional wisdom that passthrough has historically been higher in developing countries than in rich countries. As of the beginning of our sample period, 1990, the coefficient was .3 for rich countries and .8 for developing countries, with the difference highly significant statistically. (Figure 2b illustrates the numbers on average during our sample period.) That these numbers fall below 1.0 cannot be attributed to compositional effects, as the 8 goods are defined very narrowly: a roll of color film, a carton of Marlboro cigarettes, an issue of *Time* magazine, a bottle of Cointreau, etc. Theories of

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rather than to differences in passthrough that would show up for narrowly-defined commodities.

[20] References to some further studies are given in Frankel, Parsley and Wei (2004).

[21] Burstein, Eichenbaum and Rebelo (2002) attribute the low observed passthrough in general price indices to the disappearance from consumption of newly expensive import goods, and their replacement in the indices by inferior local substitutes. No doubt this is indeed an important effect.

slow or incomplete passthrough can be divided according to what sort of arbitrage barrier

they posit as blocking the enforcement of the law of one price: barriers to international

trade such as tariffs and transportation costs, or local costs of distribution and retail.   Our

results supplies support for both sorts.   Bilateral distance is a statistically significant

determinant of the ECM term; that is, higher transport costs lead to slower passthrough

to import prices.   At the same time, a higher wage – the largest component of local

distribution and retail costs – also shows up as a significant negative determinant of the

passthrough coefficient.[22]   Both determinants apply to rich and poor countries alike.

Size does not appear as a determinant in most of our results: small countries do not

experience more passthrough than large, a very surprising finding in light of "pricing to

market" theories (i.e., price discrimination by sellers).

   For present purposes, the important point is that the passthrough coefficient fell

significantly in the course of the 1990s, and that the speed of decline was twice as fast

among developing countries as among rich (.051 per year as compared to .025).[23]   The

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[22] Table 1 applies only to prices of retail imports.   But other results reported in Frankel,
Parsley and Wei (2004) supply further evidence that both kinds of arbitrage barriers are
operative.   On the one hand, passthrough is incomplete even for the prices of these
imported commodities at dockside, which suggests that local distribution costs cannot be
the only barrier to arbitrage – transport costs, tariffs, and other trade barriers must matter
as well.   In support of this conclusion, distance has an important effect, either reducing
or slowing passthrough, at all four stages -- dockside imports, retail, competitors' prices,
and the CPI.   On the other hand, passthrough behavior for retail imports is more like
behavior for local substitutes than it is like imports at the dock, which suggests that tariffs
and transportation costs cannot be the only barrier to arbitrage – local distribution matters
too. In support of this conclusion, higher wages have a strong negative effect on
passthrough to the local competitors' prices and the CPI.
[23] Taken literally, the estimated trend is strong enough to bring the passthrough
coefficient to zero by 2006.   This conclusion may to some extent be an artifact of the
assumption of a linear trend that should not be extrapolated.   But when we try a
different functional form that allows the effect of time to asymptote to zero (the

speed of passthrough, which is estimated in the form of an ECM term, also shows a significant trend for developing countries (not for rich).

One might wonder if this estimated decline in the passthrough coefficient during the 1990s is an indirect reflection of an asymmetry whereby passthrough of depreciation is greater than of appreciation, or a threshhold effect whereby large devaluations result in proportionately less passthrough, or the result of contemporaneous weakness in demand. We have found in extensions that the answer is "no;" the trend remains even after controlling for the big devaluations.[24]

One would expect passthrough to prices of domestically produced goods or the general CPI to be (even) lower than to prices of imports. Our paper also reports results for other local price measures, and this is indeed the pattern they show. (See Figure 2a). Tariffs and distance both contribute significantly to low passthrough to the CPI. But passthrough to prices of local substitutes and to the CPI both show the same downward trends over the sample period as passthrough to import prices. The difference in coefficient trends between poor and rich countries is even greater for passthrough to the CPI than it is for import prices. This is important, in the present context, because most of the potential contractionary effects of devaluation require that passthrough extend

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reciprocal of time), we get a similar result: the passthrough coefficient falls most of the way to zero during the sample period.

[24]   The threshold effect, while significant, goes the wrong way: changes in the exchange rate above 25% are found to have proportionately larger passthrough effects, not smaller.   We have found no sign that an output gap has a significant effect on passthrough to import prices.   We did find strong evidence of asymmetry. In fact we cannot reject the hypothesis that appreciation is not passed through at all, suggesting downward price rigidity.   This is an interesting finding. But the significant downward trend in the passthrough coefficient remains.

beyond just import prices, to include also passthrough to locally produced goods or the CPI.

What can we say about the reasons for the decline in passthrough? As noted, one hypothesis proposed by others is declining long-run inflation rates. This factor turns out to be particularly relevant in the case of explaining the downward trend in passthrough to developing country CPIs.

Another possible explanation for the trend is rising labor costs in retail and distribution. In Table 1 wages are visible (under equation 8) as a significant determinant of passthrough to retail import prices. But the suggestion that changes in wages help explain the trend in passthrough is supported here only for the rich, not the developing countries. The wage hypothesis turns out to be particularly relevant in the case of explaining the downward trends in passthrough either to the prices of local substitutes or to the CPI (reported in Frankel, Parsley and Wei, 2004). Controlling for wages reverses an estimated tendency for passthrough to the CPI to decline as country income per capita grows. A possible interpretation is that the role of distribution and retail costs in pricing to market becomes increasingly important as countries achieve higher incomes, due to the Balassa-Samuelson-Baumol effect.

In any case, most of the decline in passthrough remains unexplained, despite the many contributing factors we estimated.[25] The strongest conclusion is simply that

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[25] Another variable we looked at is long-run exchange rate variability. Here the influence could go either way. On the one hand, if exchange rate variability is another sign of monetary instability, like the inflation rate, it might be thought to contribute to faster passthrough; there is some support for this effect in the case of import prices in developing countries, as reported in Table 1 (and also for local competitors' prices, not reported here). On the other hand Froot and Kemperer (1989), Krugman (1989) and Taylor (2000) have suggested that when exchange rate fluctuations are largely transitory,

incomplete passthrough is another respect in which developing countries have become a bit more like rich countries, for whatever reason.

3.2 The balance sheet effect

If the contractionary effects that rely on passthrough to higher goods prices are not the explanation for the recessions that followed many of the 1990s devaluations, then what is? On the list of contractionary channels, the balance sheet effect is the one that has dominated in terms of attention from researchers, and I think appropriately so. Domestic banks and firms had large debts denominated in foreign currencies, particularly in dollars, which they might have been able to service at the previous exchange rate, but which they had trouble servicing after the price of foreign exchange had gone up sharply. The results were lay-offs and bankruptcies.[26]

Cavallo, Kisselev, Perri and Roubini (2002) provide empirical evidence of the output cost associated to the balance sheet effect. Their Figure 3 is most impressive. Looking at the experience of the 1990´s they show that countries entering a crisis with high levels of foreign debt tend to experience large real exchange rate overshooting (devaluation in addition to the long run equilibrium level) and large output contractions.

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passthrough is lower, an effect that is supported in the case of passthrough to the CPI in developing countries. Indeed, an increase in exchange rate variability in the late 1990s can apparently explain fully the significant downward trend in the speed of adjustment of the CPI. (For rich countries, the effects of exchange rate variability are quite different; Table 1, for example, shows that the Froot-Kemperer-Krugman-Taylor hypothesis is supported for imports into rich countries.)

[26] The analytical literature on balance sheet effects and output contraction includes, but is not limited to: Kiyotaki and Moore (1997), Krugman (1999), Aghion, Banerjee and Bacchetta (2000), Cespedes, Chang and Velasco (2003, 2004), Chang and Velasco (1999), Caballero and Krishnamurty (2002), Christiano, Gust and Roldos (2002), Dornbusch (2001), and Mendoza (2002).

Similarly, Guidotti, Sturzenneger and Villar (2003) find evidence that liability

dollarization worsens output recovery after a sudden stop in capital inflows.

It is easier to point out the problem of "mismatch" -- between the currency of

denomination of a country's debts and the currency that its firms earn -- than it is to

identify a remedy or even a cause.   It is not enough to instruct firms to avoid dollar debts

or to hedge them, because international investors are not very interested in lending to

these countries in their own currencies, for understandable reasons.   The result of

following a rule to avoid borrowing in foreign currency would thus be to borrow less in

total (which admittedly might not be such a bad outcome).   Eichengreen and Hausmann

(1999) have made the inability to borrow in local currencies famous under the name

"original sin." The phrase is meant to imply that the problem is not the fault of the

countries themselves.[27]

4. How Might Debtors Mitigate Contractionary Currency Crashes?

One need not dismiss the charge that international financial markets discriminate

against developing countries in a number of ways in order to discuss respects in which

debtors have some responsibility for their own fate.   Let us consider two. One respect is

short-run, and one is long-run.

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[27] One school of thought is that the choice of a adjustable peg regime, or other
intermediate exchange rate regime, leads to dangerously high unhedged foreign-currency
borrowing. It is argued that a floating regime would force borrowers to confront the
existence of exchange rate risk, and thereby reduce unhedged foreign-currency borrowing
(e.g., Eichengreen, 1999, p. 105.)   This sounds like an argument that governments
should introduce gratuitous volatility, because private financial agents underestimate risk.

4.1 Shifts on balance sheet during the "procrastination phase"

The short-run question over which countries have some control arises during the interval that I have called the period of procrastination. When foreign investors lose their previous enthusiasm for financing a country's current account deficit, the national policy makers must decide whether to adjust, or to wait. Typically they wait. As a result, even countries that had previously managed to keep dollar-denominated debt relatively low, tend to switch the composition of their debt in that direction during the year or so preceding the ultimate currency crash.

A prime example is Mexico during the course of 1994. As already noted, international enthusiasm for investing in Mexico began to decline after the beginning of the year the authorities clung to the exchange rate target and delayed adjustment, in the hopes circumstances would turn around. Most obviously, during much of the year they ran down reserves. But an important second mechanism of delay was to placate nervous investors by offering them tesobonos (short-term dollar linked bonds) in place of the peso bonds (Cetes) that they had previously held. Figure 4 shows the dramatic increase in dollar-linked debt during the year leading up to the peso crisis of December 1994. It seems likely that the magnitude of the Mexican recession in 1995 stemmed, not just from the adverse balance sheet effects that have been so frequently noted, but particularly from the adverse *shift* in balance sheets that took place during the course of 1994. A third

But the model of Chang and Velasco (2004) does it with rational expectations over uncertainty.

mechanism of delay was a shift toward shorter maturities, illustrated in Figure 5.[28]   And the fourth has already been noted, an explicit commitment to defend the peg.

These mechanisms are part of a strategy that is sometimes called "gambling for resurrection." What they have in common, beyond achieving the desired delay, is helping to make the crisis worse when it does come, if it comes.[29]   It is harder to restore confidence after a devaluation if reserves are near zero and the ministers have lost personal credibility.   Further, if the composition of the debt has shifted toward the short term, in maturity, and toward the dollar, in denomination, then restoring external balance is likely to wreak havoc with private balance sheets regardless the combination of increases in interest rate versus increases in exchange rate.

The lesson? Adjust sooner rather than later (which is admittedly easier said than done).

4.2 Openness to trade reduces vulnerability to currency crashes

One final question concerns an aspect of the structure of the economy that can be influenced by policy but only in the long-run: the degree of integration with respect to international trade. Broadly speaking, there are two opposing views on the relationship between a country's openness and whether it is prone to sudden stops or currency crashes. The first view is that openness makes a country more vulnerable to sudden stops. A

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[28] E.g., Broner, Lorenzoni, and Schmukler (2004).
[29] This helps explain why the ratio of short-term foreign debt to reserves appears most so often and so robustly in the literature on early warning indicators for currency crashes. Examples include Berg, Borensztein, Milesi-Ferreti, and Pattillo (1999), Frankel and Rose (1996), Frankel and Wei (2004, Table 2), Goldstein, Kaminsky and Reinhart (2000), Mulder, Perrelli and Rocha (2002), Rodrik and Velasco (2000), and many other references given in those papers.

country highly integrated into world markets is more exposed to shocks coming from abroad. The second view is that countries that are open to international trade are *less* vulnerable to sudden stops. If the ratio of trade to GDP is structurally high, it is easier to adjust to a cut-off in international financing of a given magnitude. I will describe a new test of the relationship between trade openness and vulnerability to sudden stops to help choose between the two hypotheses. Such tests have been done before, but usually without taking into account the possible endogeneity of trade. The incremental contribution here is to use the gravity instrument for trade openness -- which aggregates geographically-determined bilateral trade across a country's partners -- to correct for the possible endogeneity of trade.

The view that trade openness makes countries more vulnerable to crises comes in a number of forms. One variant is that a weakening in a country's export markets is sometimes the trigger for a sudden stop in capital flows, so that a high-trade country is more vulnerable. Another variant notes that sudden stops in finance often extend to a loss in trade credit -- especially for imports, but sometimes also even for exports -- and that the resulting shrinkage in trade is more painful if trade was a larger share of the economy to begin with. A third variant says that *financial* openness raises vulnerability to sudden stops, and openness to trade in practice goes hand in hand with openness to financial flows.[30] In the limiting case, a country that is in autarky with respect to trade must have a net capital account of zero due to the balance of payments adding up constraint.

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[30] For example because much trade needs multinational corporations, who in turn need to be able to move money across national borders; or because it is harder to enforce capital controls if trade is free. Aizenman (2003), and Aizenman and Noy (2004).

Regardless the specific reasoning, the notion that globalization leads to crises is a generalization that appeals to many.

The view that openness to trade makes countries *less* vulnerable also comes with a number of different specific mechanisms that have been proposed. Eaton and Gersovitz (1981) and Rose (2002) argue that the threatened penalty of lost trade is precisely the answer to the riddle "why do countries so seldom default on their international debts?" Strong trade links are statistically correlated with low default probabilities. International investors will be less likely to pull out of a country with a high trade/GDP ratio, because they know the country is less likely to default. A higher ratio of trade is a form of "giving hostages" that makes a cut off of lending less likely.

Another variant of the argument that openness reduces vulnerability takes as the relevant penalty in a crisis the domestic cost of adjustment, i.e., the difficulty of eliminating a newly-unfinanceable trade deficit. The argument goes back at least to Sachs (1985, p.548). He suggested that Asian countries had been less vulnerable to dislocations than Latin American countries in the international debt crisis of the 1980s -- despite similar debt/GDP ratios -- because they had higher export/GDP ratios. The relatively worse performance observed in Latin America was due to the lower availability of export revenue to service debt. More recently, Guidotti et. al. (2004) make a similar point by providing evidence that economies that trade more recover fairly quickly from the output contraction that usually comes with the sudden stop, while countries that are more closed suffer sharper output contraction and a slower recovery.

Consider first a country that faces a given cut-off in financing, and must adjust without nominal or real exchange rate flexibility. The adjustment must then come

through a reduction in spending. To achieve a $1 billion improvement in the trade balance, the contraction has to be $ ($1/m$) billion, where m is defined as the marginal propensity to import (in a Keynesian model) or the share of spending that falls on tradable goods (in a tradable/nontradable model). The lower is m, the more painful the adjustment. Whether output itself falls depends, of course, primarily on whether wages and prices are flexible. But even in a full-employment world, sharp reductions in consumption are not enjoyable.

Consider, second, a country that does have the option of nominal and real exchange rate flexibility. In traditional textbook models, if the adjustment is achieved in part through nominal and real depreciation, rather than exclusively through expenditure-reduction, the country can accommodate the tougher new financing constraint without necessarily suffering a recession. This is true even if a relatively large devaluation is required to generate the necessary improvement in the trade balance. But since the emerging market crises of 1994-1998, as we have already noted, economists have increasingly emphasized the contractionary balance sheet effect: if the country's debts are denominated in foreign currency, the balance sheets of the indebted banks and corporations are hit in proportion to the devaluation. If the economy is starting from a high ratio of trade to GDP the necessary devaluation need not be large, and therefore the adverse balance sheet effect need not be large. But if the economy is not very open to trade to begin with, the necessary devaluation, and the resulting balance sheet impact and recession, will all be large. Again we arrive at the result that whether the necessary adjustment will be large and painful depends inversely on openness.

The balance sheet version of the openness story is modeled formally by Calvo, Izquierdo, and Talvi (2003) and Cavallo (2004). Both have in mind the example of Argentina, which has traditionally had a low ratio of trade to GDP, and has suffered some of the worst sudden stops.[31] But the hypothesis that openness to trade reduces a country's vulnerability to sudden stops transcends any one formal model, causal link, or country example. The same is true of the opposing hypothesis, that openness *raises* a country's vulnerability. It would be useful to be able to choose empirically between the two competing hypotheses.

I will report new results -- from Cavallo and Frankel (2004) -- for two questions. (1) What is the effect of openness on vulnerability to "sudden stops" implemented by a probit model measuring the probability of a sudden reduction in the magnitude of net capital inflows, following closely the definition of Calvo, Izquierdo and Mejia (2003). (2) What is the effect of openness on vulnerability to "currency crashes," implemented by a probit model representing the probability of a sudden devaluation, following the definitions of crisis episodes in Frankel and Rose (1996) and Frankel and Wei (2004), which is based on the exchange market pressure variable defined as the percentage depreciation plus percentage loss in foreign exchange reserves. In addition to looking at the probability of a sudden stop or currency crisis, we also examined the subsequent output loss as measured in Frankel and Wei (2004).

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[31] Others who have argued that Argentina's low trade/GDP ratio helps explain why it was such a victim of the global sudden stop after 1999 include Calvo, Izquierdo, and Mejia (2003), Calvo and Talvi (2004), Desai and Mitra (2004) and Treasury Secretary Paul O'Neill, who once said it was unsurprising the Argentines had lost the confidence of investors because they don't export anything.

There is no reason, a priori, why something (openness) that makes the consequences of sudden stops better (less contractionary devaluations) should also necessarily make them less frequent. Or that something that makes the consequences worse should also make them more frequent. Indeed some theories are based on the notion that the worse the consequences, the less often it will happen. But in our results the effects turn out to go the same way, regardless which concept of performance is used.

Calvo, Izquierdo and Mejia (2003) and Edwards (2004a, b) are among the empirical papers that find that openness to trade is associated with fewer sudden stops. On the other hand, Milesi-Ferretti and Razin (1998, 2000) find that openness helps trigger crises and/or sharp reversals of the current account. Most of these papers use the trade/GDP ratio as the measure for openness to trade.

A critic might argue that the trade/GDP ratio is endogenous. One way in which trade openness could be endogenous is via income: countries tend to liberalize trade barriers as they grow richer -- in part because their mode of public finance gradually shifts from tariff revenue to income or VAT taxes. A second way is that trade liberalization could be part of a more general reform strategy driven by pro-globalization philosophy or "Washington Consensus" forces. Other aspects of such a reform program, such as privatization, financial liberalization, or macroeconomic stabilization might affect the probability of crises, and yet an OLS regression analysis might inappropriately attribute the effect to trade. A third way that trade openness could be endogenous is that experience with crises -- the dependent variable -- may itself cause liberalization, via an IMF program. Or it might have the opposite effect, if a country's response to a crash is disenchantment with globalization and the Washington Consensus. A fourth way in

which trade openness could be endogenous is through the feedbacks between trade and financial openness.[32]

How can the endogeneity of trade be addressed? We use gravity estimates to construct an instrumental variable for trade openness, the methodology developed by Frankel and Romer (1999), in the context of the effect of trade on growth, and updated in the Frankel and Rose (2002) dataset.

The results reported in Table 2 show that openness reduces vulnerability to sudden stops rather than increasing it.[33]   Not only does this relationship hold up when we move from OLS to instrumental variables, but it appears stronger. The degree of trade openness is a powerful predictor of these capital account shocks: moving from Argentina's current trade share (approximately .20 of GDP) to Australia's average trade share (approximately .30 of GDP), reduces the probability of a sudden stop by 32%. The results for openness are the same when we seek to explain currency crashes. Trade protectionism does not "shield" countries from the volatility of world markets as proponents might hope. On the contrary, less trade openness leads to greater vulnerability to sudden stops and currency crashes. In fact out of the set of controls we tried, openness is the only variable that is virtually always statistically significant.[34]

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[32] Aizenman (2003) shows in the setting of a simple model how more commercial openness increases the effective cost of enforcing financial repression, rendering financial openness a by-product of greater trade integration. Similarly, one could potentially think of a reverse causality process, whereby for example, greater financial openness may reduce the cost of trade credit and encourage FDI, and both adjustments may facilitate more commercial trade. Aizenman and Noy (2004) empirically investigate the presence of two-way feedbacks between financial and trade integration.

[33] A more complete set of results is reported in Cavallo and Frankel (2004).

[34] The current account deficit as a share of GDP is always highly significant in the probit regressions to determine sudden stops, and liability dollarization is sometimes; but not in the currency crash equation.   The reserve/import ratio is always highly significant in the

4.3 Conclusion

That is two ways of seeking to minimize vulnerability to sudden stops, devaluations, and associated economic contractions: keeping balance sheets strong by avoiding a shift to short-term dollar debt as a means of procrastination, and keeping the economy open to trade. We began this lecture by noting the frequency with which political leaders and ministers lose office after a devaluation. But seeking to hold on to political viability is presumably the precise reason why governments often procrastinate, why they feel they have to postpone adjustment to balance of payments deficits, and instead run down reserves, shorten the maturity of the debt, and borrow in dollars. So the openness strategy may be the most robust option, politically as well as economically.

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currency crash regression, and sometimes foreign debt/GDP and nominal exchange rate rigidity, but not so in the first equation.

Figure 1a

Attaining internal and external balance: Traditional version

(price of foreign exchange)

Other Expenditure-Switching Policy

overheating

internal balance

recession

surplus

deficit
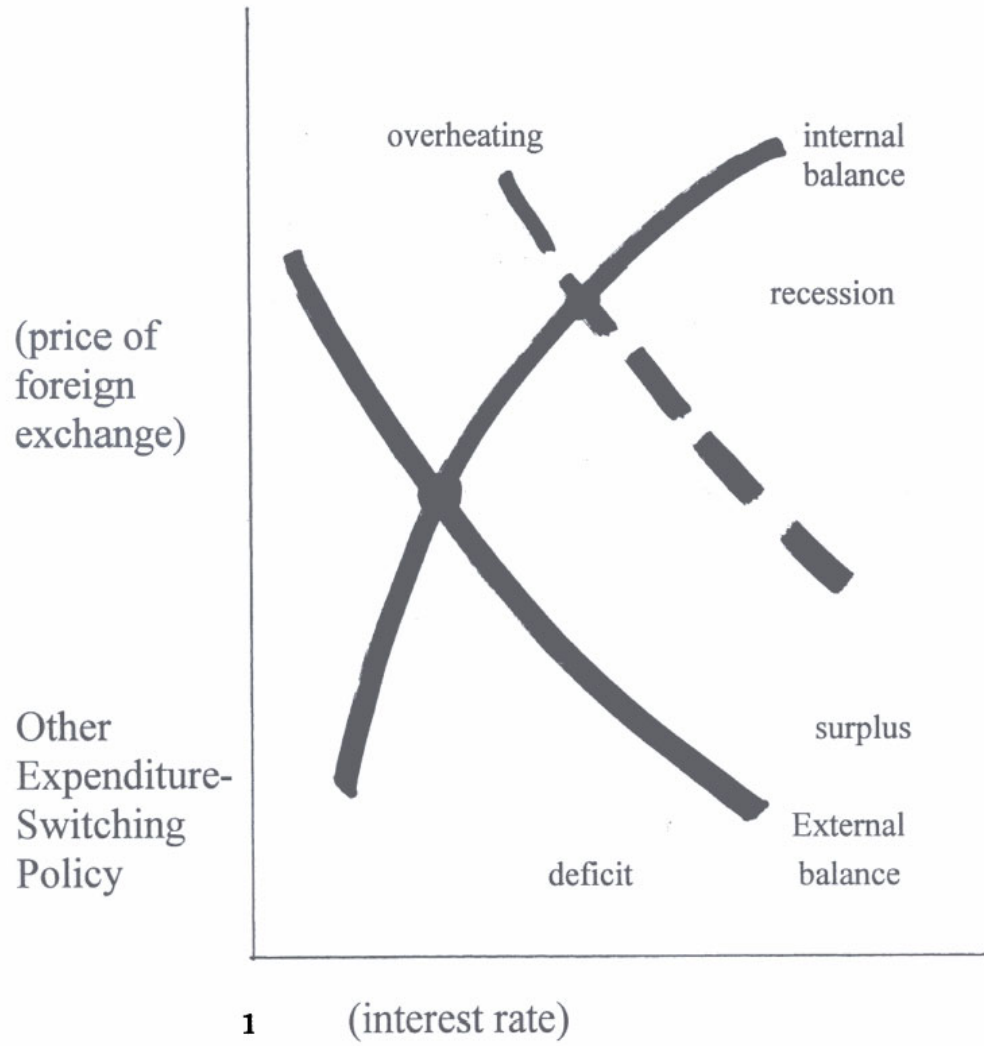
External balance

1 (interest rate)

or other expenditure-reducing policy

**Attaining internal and external balance:
When devaluation is contractionary**

E

(price of
foreign
exchange)

Or
Other
Expenditure-
Switching
Policy

External
balance

recession

internal
balance

i   (interest rate)
or other expenditure-reducing policy

Table 1: Passthrough coefficient for developing countries, though historically below that for rich countries, declined during the 1990s.   Source: Frankel, Parsley, and Wei (2004).

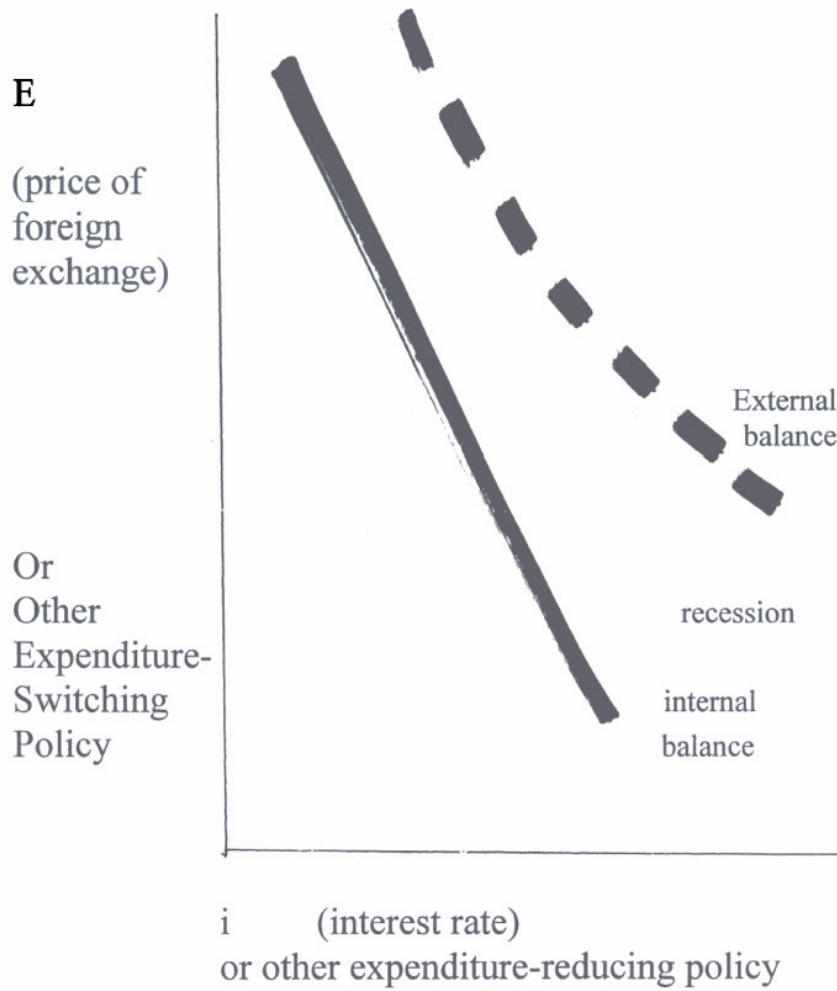|		Equation 1		Equation 2		Equation 8	
		Rich	Δ Dev.	Rich	Δ Dev.	Rich	Δ Dev.
change in	exchange rate	0.133 ***	0.365 ***	0.310 ***	0.496 ***	2.489 **	-1.607
		(0.031)	(0.045)	(0.075)	(0.101)	(1.144)	(1.595)
change in	exporter's price	0.108 ***	-0.052	0.108 ***	-0.023	0.082 ***	-0.069
		(0.025)	(0.042)	(0.025)	(0.042)	(0.028)	(0.062)
(delta s)*	trend			-0.025 ***	-0.026 **	-0.014	-0.046 **
				(0.009)	(0.013)	(0.012)	(0.019)
(delta s)*	log[per capitaRGDP(importer) /					-0.022	-0.050
	per capitaRGDP(exporter)]					(0.034)	(0.048)
(delta s)*	tariff levels					-0.431	0.368
						(0.265)	(0.314)
(delta s)*	log distance					-0.029	0.049
						(0.048)	(0.091)
(delta s)*	log[RGDP(importer)/RGDP(exporter)]					0.016	0.029
						(0.030)	(0.044)
(delta s)*	log real wage ($)					-0.019 *	0.017
						(0.010)	(0.013)
(delta s)*	long term inflation					2.135	-1.781
						(1.871)	(1.884)
(delta s)*	long term exchange rate variability					-2.262	0.890
						(4.932)	(5.112)
(delta s)*	US Importer dummy					-0.442 **	
						(0.190)	
	Error Correction term (ECM)	-0.093 ***	-0.017 *	-0.091 ***	-0.105 ***	-0.129	-0.347
		(0.008)	(0.010)	(0.016)	(0.025)	(0.264)	(0.337)
ECM*	trend			0.000	0.011 ***	0.001	0.006
				(0.002)	(0.003)	(0.002)	(0.004)
ECM*	log[per capitaRGDP(importer) /					-0.005	0.008
	per capitaRGDP(exporter)]					(0.007)	(0.015)
ECM*	tariff levels					-0.040	0.052
						(0.061)	(0.066)
ECM*	log distance					0.032 ***	-0.001
						(0.011)	(0.024)
ECM*	log[RGDP(importer)/RGDP(exporter)]					0.003	-0.005
						(0.006)	(0.013)
ECM*	log real wage ($)					0.016	-0.020
						(0.015)	(0.023)
ECM*	long term inflation					-0.083	0.019
						(0.267)	(0.271)
ECM*	long term exchange rate variability					0.152 *	-0.433 ***
						(0.087)	(0.134)
ECM*	US Importer dummy					-0.053	
						(0.061)	
	# of Observations	5677		5677		3250	
	Adjusted R-squared	0.305		0.324		0.294	

* = 10%,   ** = 5%,   and   *** = 1%   levels of significance.

Developing country coefficient: values in the "Δ Dev." column can be added to estimates in column labelled "Rich".
XRATE CHANGES LT ABS (100%) ONLY
Rich countries = high income countries
Average Tariffs

Figure 2a: Passthrough is greatest for prices of imports at dock, but less for retail and CPI

Source: Frankel, Parsley & Wei (2004) – effect within one year

Exchange Rate Passthrough
to Domestic Prices
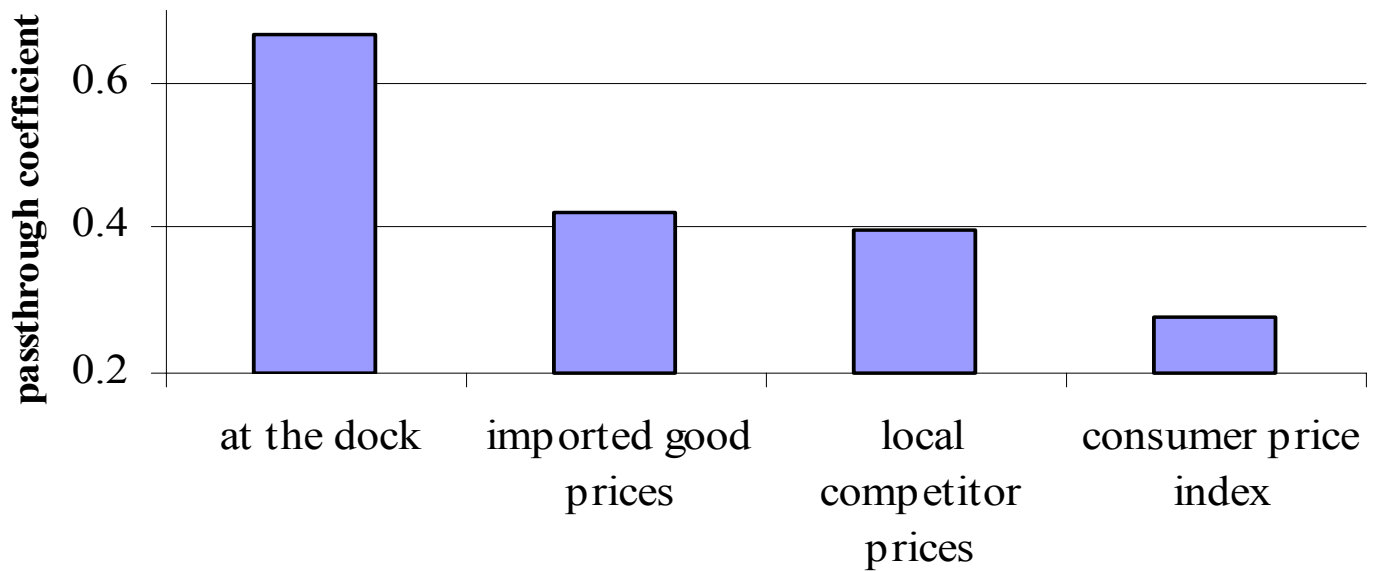
Figure 2b

Passthrough for less developed countries > for rich, historically.

Source: Frankel, Parsley & Wei (2004) – effect within one year

Passthrough and Income
(Average 1990-2001)
(Country Grouping Based on World Bank Classification)

Bar chart. Y-axis: passthrough coefficient, 0 to 0.7. Low Income: ~0.57 (12 countries). Middle Income: ~0.47 (36 countries). High Income: ~0.08 (28 countries).
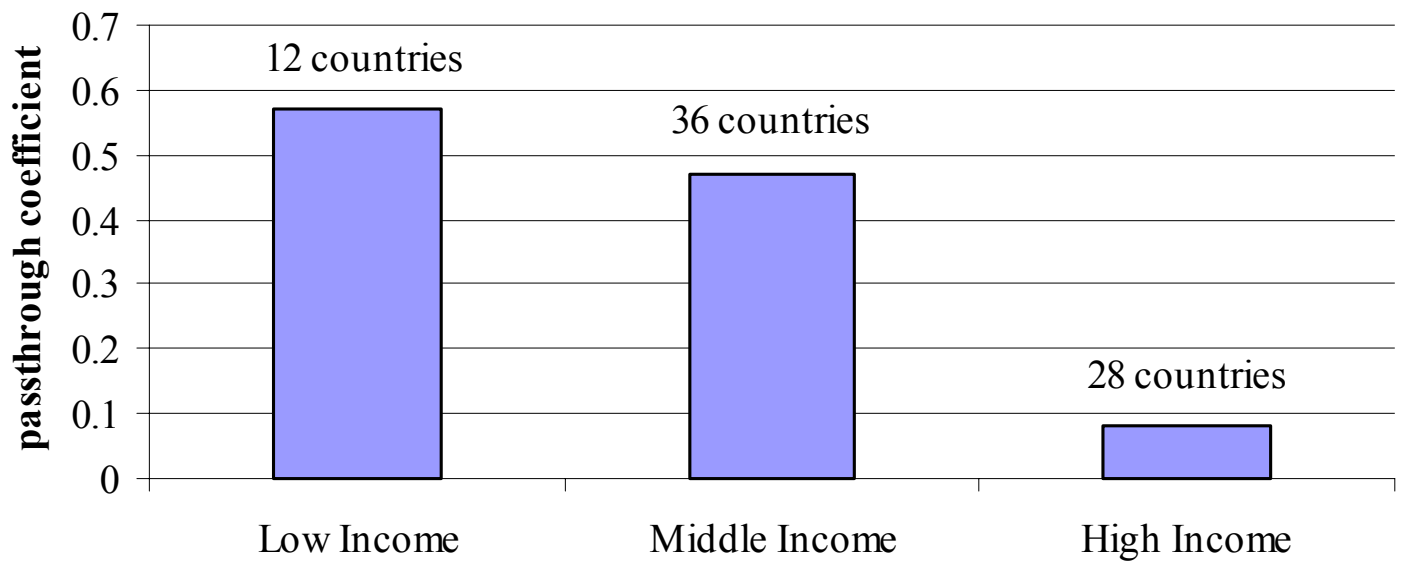
Loss in output in crises depends on foreign-denominated debt times real devaluation

Source: Michele Cavallo, Kate Kisselev, Fabrizio Perri, & Nouriel Roubini, "Exchange Rates Overshooting and the Costs of Floating," NYU, March 2002.

Figure 3. Contractionary effects of balance sheet effects
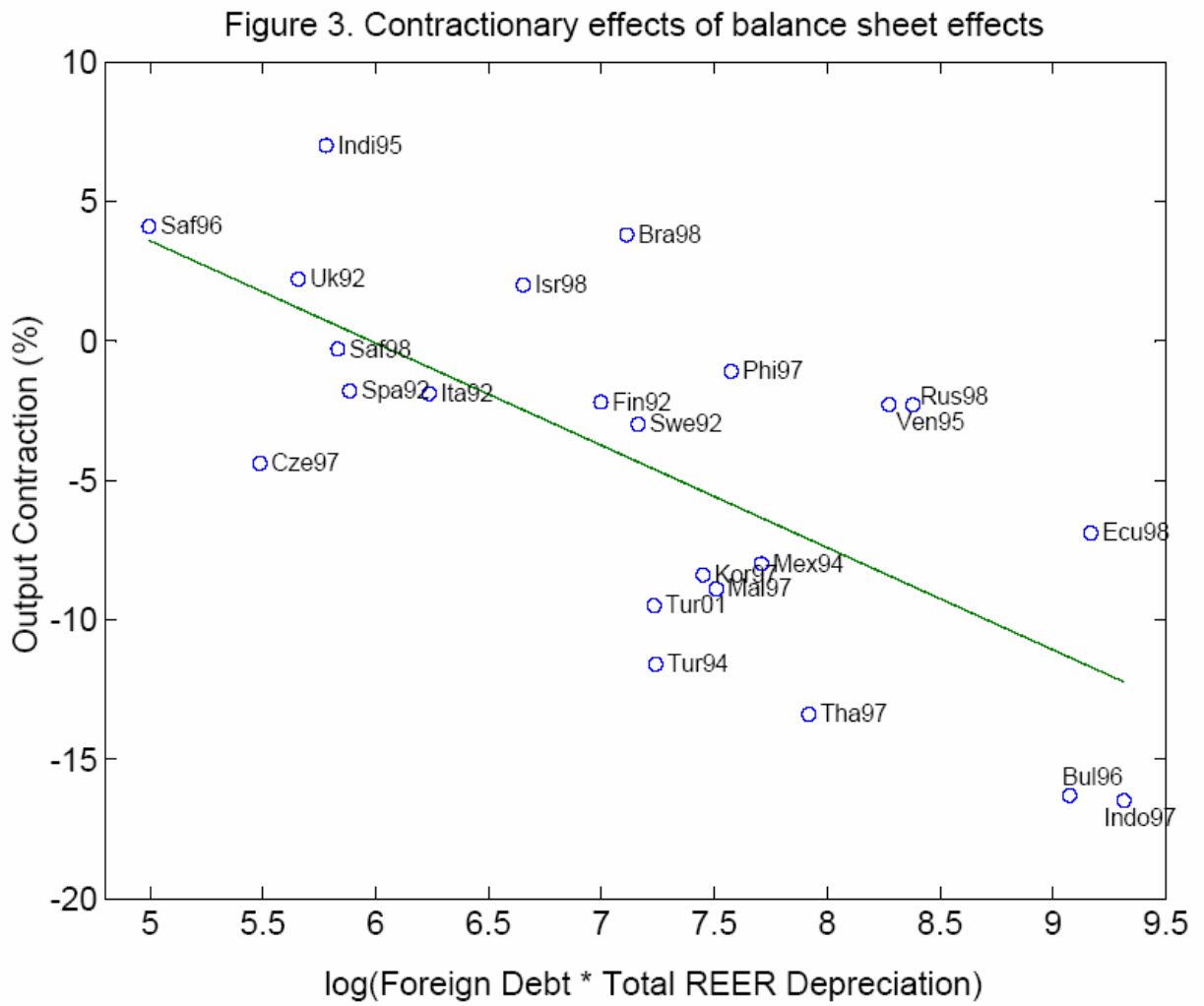
Figure 4. Evolution of Mexican Debt According to Currency Denomination: 1992-95
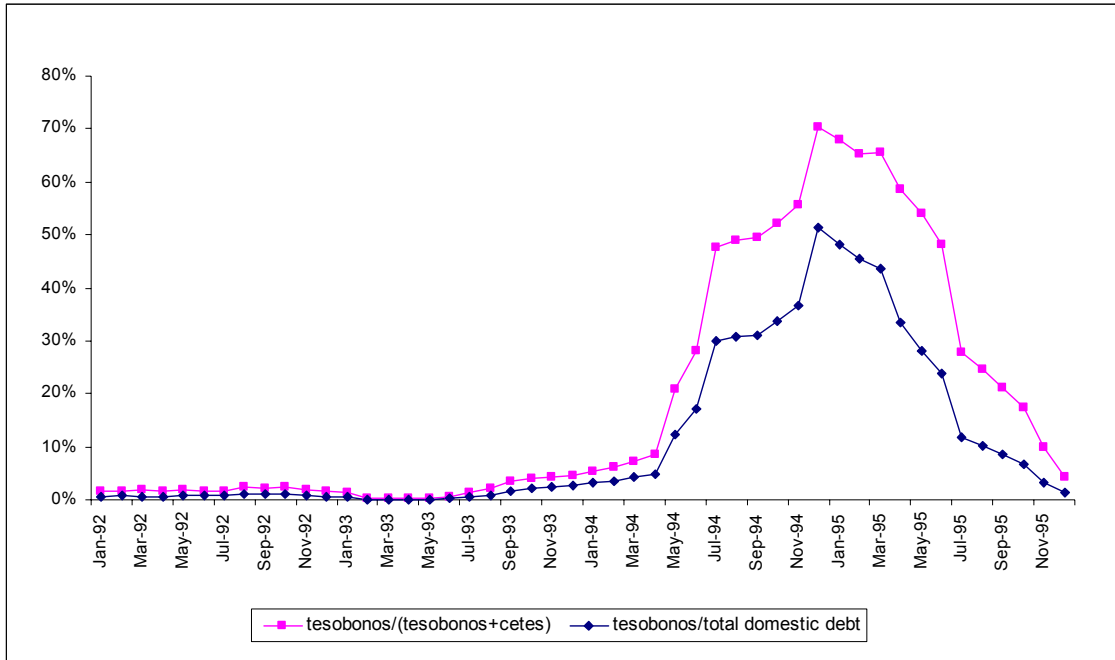
Data source: Mexican Ministry of Finance and Public Credit.

Figure 5. Evolution of Mexican Debt According to Maturity: 1992-95
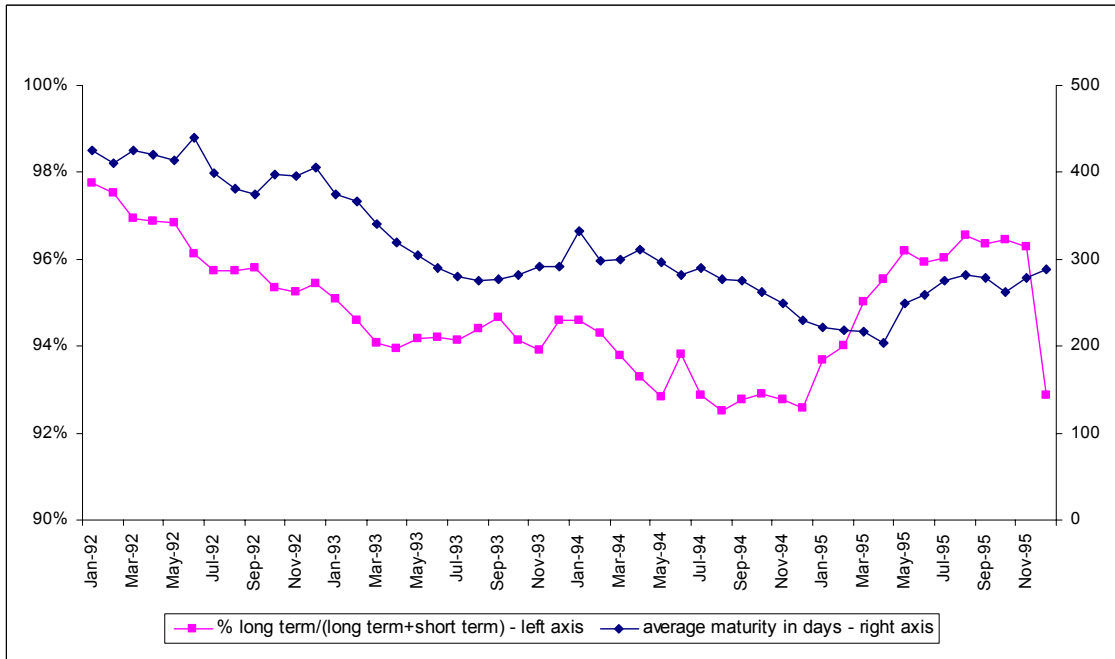
Data source: Mexican Ministry of Finance and Public Credit.

Table 2:

Effect of openness (trade/GDP) on vulnerability to sudden stops and currency crashes

Source: Cavallo and Frankel (2004)

	To predict sudden stops (Calvo et al definition)		*To predict currency crashes* (Frankel & Wei, 2004 definition)	
	Ordinary probit	IV	Ordinary probit	IV
Trade openness $_t$	**-0.53** (0.259)**	**-2.45** (0.813)**	**-0.57** (0.269)**	**-1.73** (0.918)*
Foreign Debt/GDP $_{t-1}$	**-0.080** (0.217)	**0.196** (0.275)	**0.23** (0.231)	**0.59** (0.373)
Liability Dollarization$_{t-1}$	**0.316** (0.195)	**0.591** (0.256)**	**0.027** (0.249)	**0.18** (0.234)
Exchange rate rigidity			**0.13** (0.094)	**0.22** (0.113)*
CA/GDP $_{t-1}$	**-4.068** (1.297)**	**-7.386** (2.06)***	**-0.272** (1.392)	**0.66** (1.455)
ln Reserves in Months of Imports $_{t-1}$			**-0.26** (0.082)***	**-0.37** (0.099)***
Constant	**-2.544** (0.63)***	**-1.73** (0.723)**	**-0.99** (0.749)	**0.304** (0.786)
Obs.	**778**	**1062**	**557**	**841**

Robust standard errors reported in parenthesis.
*** Statistically Significant at 1%
** Statistically Significant at 5%
* Statistically Significant at 10%
Estimation performed with regional dummies and year fixed effects.
IV is the gravity-based instrumental variable for trade openness from Frankel-Romer (1999) and Frankel-Rose (2002).

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Appendix 1: Currency Crashes and Frequency of Changes of Leaders

A. 1- Year Horizon, Change in Premier or Chief Executive

   1) All Countries

	12- months period following a devaluation	All other 12-month periods
Change observed	55 (29.3 %)	887 (21.7%)
No change observed	133 (70.7%)	3209 (78.3%)
Total	188	4096

       P-value for the difference is **0.196.**

   2) Developing Countries

	12- months period following a devaluation	All other 12-month periods
Change observed	55 (29.3 %)	675 (20.2%)
No change observed	133 (70.7%)	2673 (79.84%)
Total	188	3348

       P-value for the difference is **0.123.**

   3) Graph of number of episodes of devaluations and number of premier changes over time

Number of currency crash episodes and premier changes across the world (1970-2003)
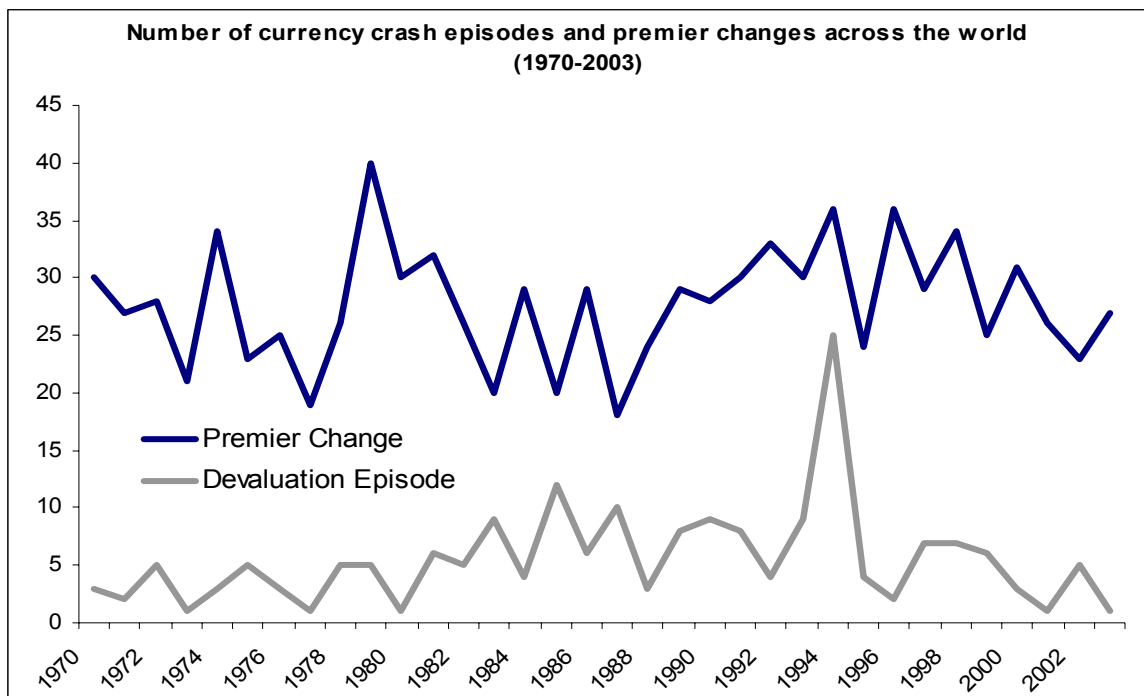
B. 6-Month Horizon, Change in Premier or Chief Executive

Developing Countries (sample =103)

	6-month period following a devaluation	All other 6-month periods
Change observed	43 (22.8 %)	812 (11.6%)
No change observed	146 (77.3%)	6192 (88.4%)
Total	189	7004

P-value for the difference is **0.003**.

```
                    Ho: mean(normal) - mean(deval) = diff = 0

  Ha: diff < 0                Ha: diff != 0                 Ha: diff > 0
   t =  -3.127                 t =  -3.127                   t =  -3.127
  P < t =   0.0014            P > |t| =   0.0028            P > t =   0.9986
```

C. 1-year horizon, Change in Finance Minister or Central Bank Governor

The data pertain to the IMF Board of Governors Membership from 1995-1999, inclusive.

	When a devaluation occurred	All Years
Change of Governor observed	14 (58.3%)	212 (35.8%)
No change of Governor observed	10 (41.7%)	380 (64.1%)
Total	24	592

The t test below indicates that the probability of the IMF governor of a country changing is 1.63 times larger when there was a currency crash. This difference is highly significant.

```
         Ho: mean(normal) - mean(deval) = diff = 0

  Ha: diff < 0                Ha: diff != 0                 Ha: diff > 0
    t =  -3.5567                t =  -3.5567                  t =  -3.5567
  P < t =   0.0008           P > |t| =   0.0016            P > t =   0.9992
```

D. Change in Premier, Controlling for start of an IMF program (within 3 months on either side of currency crash)

The table summarizes the statistics of devaluations, job loss and IMF programs in the 1990s and 2000's:

	Premier change occurred within 6 mo.	Premier change did not occur within 6 mo.	Total
Cases with an IMF program	4 (21.05%) (20.00%)	15 (78.95%) (20.83%)	19
Cases without an IMF program	16 (21.92%) (80.00%)	57 (78.08%) (79.17%)	73
Total	20	72	92

The t-test below compares the **probability that devaluation leads to a premier change within 6 months when there is an IMF program** (21%) with the **probability of a premier change occurring within 6 months (in general)**. The P-value is much larger, at 20%.

```
               Ho: mean(normal) - mean(devalIMF) = diff = 0

  Ha: diff < 0                  Ha: diff != 0                  Ha: diff > 0
    t =  -0.8781                  t =  -0.8781                    t =  -0.8781
 P < t =   0.196          P > |t| =   0.391           P > t =   0.804
```

Comparing IMF and non-IMF devaluation cases, and the probability with which each leads to a change of leader within 6 months, shows that there is no significant difference between the two groups.

```
Two-sample t test with unequal variances
            Ho: mean(devalnoIMF) - mean(devalIMF) = diff = 0

   Ha: diff < 0                  Ha: diff != 0                  Ha: diff > 0
     t =   0.0803                  t =   0.0803                    t =   0.0803
  P < t =   0.5317         P > |t| =   0.9366          P > t =   0.4683
```

When comparing the probability that **devaluation *without* an IMF program leads to a change of leader within 6 months** with the probability of premier change occurring within 6 months under normal circumstances, we find the former is significantly higher than the latter.

```
Two-sample t test with unequal variances
Ho: mean(normal) - mean(devalnoIMF) = diff = 0

   Ha: diff < 0                  Ha: diff != 0                  Ha: diff > 0
     t =  -1.901                   t =  -1.901                     t =  -1.901
  P < t =   0.031          P > |t| =   0.061           P > t =   0.969
```

Appendix 2 : IMF country programs, with dates of approval

country	begin	appryr	comamt	drawnamt	Comments
ALBANIA	Stand-By	8/26/1992	20	13.12	Cancelled prior to expiration date 8/25/93. Replaced by ESAF on 7/14/1993.

ALGERIA	Stand-By	6/3/1991	300	225	
ALGERIA	Stand-By	5/27/1994	457.2	385.2	Cancelled.
ALGERIA	EFF	5/22/1995	1169.28	1169.28	
ARGENTINA	Stand-By	7/29/1991	780	292.5	Cancelled prior to expiration date of 6/30/92.
ARGENTINA	EFF	3/31/1992	4020.25	4020.25	Extended from 3/30/95 to 4/30/95 and then to 3/30/96. Approved amount increased.
ARGENTINA	Stand-By	4/12/1996	720	613	
ARGENTINA	EFF	2/4/1998	2080	0	At time of approval, purchase schedule decided through 11/98.
ARGENTINA	Stand-By	3/10/2000	10585.5	3834.3	
ARMENIA	Stand-By	6/28/1995	43.88	13.5	Cancelled prior to expiration of 6/27/96.
AZERBAIJAN	Stand-By	11/17/1995	58.5	58.5	
AZERBAIJAN	EFF	12/20/1996	58.5	53.24	Extended from 12/19/99 to 3/19/2000.
BELARUS	Stand-By	9/12/1995	196.28	50	
BRAZIL	Stand-By	1/29/1992	1500	127.5	
BRAZIL	Stand-By	12/2/1998	10419.84	7869.15	Amounts exclude SRF drawing of SDR 2.6 b.
BRAZIL	Stand-By	9/14/2001	2193	0	
BULGARIA	Stand-By	3/15/1991	279	279	Followed by another stand-by on 4/17/1992.
BULGARIA	Stand-By	4/17/1992	155	124	Approved after expiration of 3/15/91 stand-by.
BULGARIA	Stand-By	4/11/1994	139.48	116.24	Approved amount increased in 9/94.
BULGARIA	Stand-By	7/19/1996	400	80	Cancelled prior to expiration date of 3/18/98. Replaced by another stand-by on 4/11/97.
BULGARIA	Stand-By	4/11/1997	371.9	371.9	Replaced the 6/19/96 stand-by.
BULGARIA	EFF	9/25/1998	627.62	523	
CAMEROON	Stand-By	12/20/1991	28	8	
CAMEROON	Stand-By	3/14/1994	81.06	21.91	Followed by another stand-by on 9/27/95.
CAMEROON	Stand-By	9/27/1995	67.6	28.2	Approved after expiration of 3/14/94 stand-by.
CENTRAL AFRICAN REPUBLIC	Stand-By	3/28/1994	16.48	10.71	
CHAD	Stand-By	3/23/1994	16.52	10.32	
COLOMBIA	EFF	12/20/1999	1957	0	
CONGO, REP OF	Stand-By	8/27/1990	27.98	4	
CONGO, REP OF	Stand-By	5/27/1994	23.16	12.5	
COSTA RICA	Stand-By	4/8/1991	33.64	25.64	Extended from 4/7/92.
COSTA RICA	Stand-By	4/19/1993	21.04	0	
COSTA RICA	Stand-By	11/29/1995	52	0	
COTE D'IVOIRE	Stand-By	9/20/1991	82.75	33.1	
CROATIA	Stand-By	10/14/1994	65.4	13.08	
CROATIA	EFF	3/12/1997	353.16	28.78	
CROATIA	Stand-By	3/19/2001	200	0	Precautionary arrangement.
CZECH REPUBLIC	Stand-By	3/17/1993	177	70	
CZECHOSLOVAKIA	Stand-By	1/7/1991	619.5	619.5	Extended from 3/6/92. Followed by another stand-by 4/3/92.
CZECHOSLOVAKIA	Stand-By	4/3/1992	236	36	Cancelled prior to expiration date 4/2/93 (Czechoslovakia ceased to exist on 1/1/93).
DOMINICAN REPUBLIC	Stand-By	8/28/1991	39.24	39.24	Followed by another stand-by on 7/9/1993.
DOMINICAN REPUBLIC	Stand-By	7/9/1993	31.8	16.8	
ECUADOR	Stand-By	12/11/1991	75	18.56	
ECUADOR	Stand-By	5/11/1994	173.9	98.9	Approved amount increased in 11/94. Cancelled prior to expiration date 3/31/96.
ECUADOR	Stand-By	4/19/2000	226.73	113.35	
EGYPT	Stand-By	5/17/1991	234.4	147.2	Extended from 11/30/92 .
EGYPT	EFF	9/20/1993	400	0	
EGYPT	Stand-By	10/11/1996	271.4	0	Precautionary arrangement.
EL SALVADOR	Stand-By	8/27/1990	35.6	0	
EL SALVADOR	Stand-By	1/6/1992	41.5	0	Followed by another stand-by 5/10/93.
EL SALVADOR	Stand-By	5/10/1993	47.11	0	Approved after expiration of 1/6/92 stand-by. Extended from 3/9/94. Amount increased 11/94.
EL SALVADOR	Stand-By	7/21/1995	37.68	0	
EL SALVADOR	Stand-By	2/28/1997	37.68	0	Extended from 4/27/98.

EL SALVADOR	Stand-By	9/23/1998	37.68	0	
ESTONIA	Stand-By	9/16/1992	27.9	27.9	Followed by another stand-by 10/27/93.
ESTONIA	Stand-By	10/27/1993	11.63	11.63	Approved after expiration of 9/16/92 stand-by. Followed by another stand-by on 4/11/95.
ESTONIA	Stand-By	4/11/1995	13.95	0	Approved after expiration of 10/27/93 stand-by. Followed by another stand-by on 7/29/1996.
ESTONIA	Stand-By	7/29/1996	13.95	0	Approved after expiration of 4/11/95 stand-by.
ESTONIA	Stand-By	12/17/1997	16.1	0	Precautionary arrangement.
ESTONIA	Stand-By	3/1/2000	29.34	0	Precautionary arrangement.
GABON	Stand-By	9/30/1991	28	4	
GABON	Stand-By	3/30/1994	38.6	38.6	
GABON	EFF	11/8/1995	110.3	60.67	Extended from 11/7/98 to 3/7/99.
GABON	Stand-By	10/23/2000	92.58	13.22	
GEORGIA	Stand-By	6/28/1995	72.15	22.2	Cancelled prior to expiration date 6/27/96.
GUATEMALA	Stand-By	12/18/1992	54	0	
HAITI	Stand-By	3/8/1995	20	16.4	
HONDURAS	Stand-By	7/27/1990	30.5	30.5	Extended from 7/26/91.
HUNGARY	Stand-By	3/14/1990	159.21	127.37	Cancelled prior to expiration date 3/13/1991
HUNGARY	EFF	2/20/1991	1114	557.23	Cancelled prior to expiration date 2/19/94.
HUNGARY	Stand-By	9/15/1993	340	56.7	
HUNGARY	Stand-By	3/15/1996	264.18	0	
INDIA	Stand-By	1/18/1991	551.93	551.93	
INDIA	Stand-By	10/31/1991	1656	1656	
INDONESIA	Stand-By	11/5/1997	8338.24	3669.12	Approved under Fund's emergency procedures. Access increased 7/15/98. Cancelled prior to expiration date 11/4/2000.
INDONESIA	EFF	8/25/1998	5383.1	3797.7	Prior SBA cancelled, replaced by EFF. EFF to cover remaining period of SBA Cancelled before expiration date 11/5/00, replaced by EFF on 2/4/00.
INDONESIA	EFF	2/4/2000	3638	851.15	
JAMAICA	Stand-By	3/23/1990	82	82	Followed by another stand-by on 6/28/91.
JAMAICA	Stand-By	6/28/1991	43.65	43.65	Extended from 6/30/92.
JAMAICA	EFF	12/11/1992	109.13	86.75	Extended from 12/10/95 to 2/24/96 and 3/16/96.
JORDAN	Stand-By	2/26/1992	44.4	44.4	Extended from 8/25/93.
JORDAN	EFF	5/25/1994	189.3	130.32	Approved amount increased in 9/94 and 2/95. Cancelled prior to expiration date 5/24/1997. Replaced by another EFF 2/9/96.
JORDAN	EFF	2/9/1996	238.04	202.52	Approved amount increased from 200.8 in 2/97.
JORDAN	EFF	4/15/1999	127.88	36.54	
KAZAKHSTAN	Stand-By	1/26/1994	123.75	74.25	Extended from 1/25/95. Followed by another stand-by 6/5/95.
KAZAKHSTAN	Stand-By	6/5/1995	185.6	185.6	Approved after expiration of 1/26/94 stand-by.
KAZAKHSTAN	EFF	7/17/1996	309.4	154.7	
KAZAKHSTAN	EFF	12/13/1999	329.1	0	
KOREA	Stand-By	12/4/1997	15500	14412.5	Approved under Fund's emergency procedures.
KYRGYZ REPUBLIC	Stand-By	5/12/1993	27.09	11.61	
LATVIA	Stand-By	9/14/1992	54.9	54.9	Followed by another stand-by on 12/15/93.
LATVIA	Stand-By	12/15/1993	22.88	9.15	Approved after expiration of 9/14/92 stand-by. Followed by another stand-by on 4/21/1995.
LATVIA	Stand-By	4/21/1995	27.45	0	Approved after expiration of 12/15/93 stand-by. Followed by another stand-by on 5/24/96.
LATVIA	Stand-By	5/24/1996	30	0	Approved after expiration of 4/21/95. Followed by another stand-by on 10/10/1997.
LATVIA	Stand-By	10/10/1997	33	0	Approved after expiration of 5/24/96 stand-by. Precautionary arrangement.
LATVIA	Stand-By	12/10/1999	33	0	Precautionary arrangement.
LATVIA	Stand-By	4/20/2001	33	0	Precautionary arrangement.
LESOTHO	Stand-By	9/23/1994	8.37	0	Cancelled. Replaced by another stand-by 7/31/95.
LESOTHO	Stand-By	7/31/1995	7.17	0	Approved after expiration of 9/23/94 stand-by. Followed by another stand-by on 9/23/96.
LESOTHO	Stand-By	9/23/1996	7.17	0	Approved after expiration of 7/31/95 stand-by.

LITHUANIA	Stand-By	10/21/1992	56.93	56.93	Followed by another stand-by on 10/22/93.
LITHUANIA	Stand-By	10/22/1993	25.88	5.18	Approved after expiration of 10/21/92 stand-by. Cancelled prior to expiration date of 3/21/95.
LITHUANIA	EFF	10/24/1994	134.55	134.55	
LITHUANIA	Stand-By	3/8/2000	61.8	0	Precautionary arrangement.
LITHUANIA	Stand-By	8/30/2001	86.52	0	Precautionary arrangement.
MACEDONIA (FYR)	Stand-By	5/5/1995	22.3	22.3	
MACEDONIA (FYR)	EFF	11/29/2000	24.115	1.15	
MALAWI	Stand-By	11/16/1994	15	12.72	
MEXICO	Stand-By	2/1/1995	12070.2	8758.02	Extended from 8/15/96. Initial amount approved 2/1/95 and increased 6/30/95.
MEXICO	Stand-By	7/7/1999	3103	1939.5	
MOLDOVA	Stand-By	12/17/1993	51.75	51.75	Followed by another stand-by on 3/22/95.
MOLDOVA	Stand-By	3/22/1995	58.5	32.4	Approved after expiration of 12/17/93 stand-by.
MOLDOVA	EFF	5/20/1996	135	87.5	
MONGOLIA	Stand-By	10/4/1991	22.5	13.75	Extended from 10/3/92.
MOROCCO	Stand-By	7/20/1990	100	48	
MOROCCO	Stand-By	1/31/1992	91.98	18.4	
NICARAGUA	Stand-By	9/18/1991	40.86	17.03	
NIGER	Stand-By	3/4/1994	18.6	11.1	
NIGERIA	Stand-By	1/9/1991	319	0	
NIGERIA	Stand-By	8/4/2000	788.94	0	
PAKISTAN	Stand-By	9/16/1993	265.4	88	Cancelled prior to expiration date 9/15/1994. Replaced by an EFF/ESAF in 2/94.
PAKISTAN	EFF	2/22/1994	379.1	123.2	EFF and parallel ESAF replaced by a stand-by approved by Board 12/13/95. Three purchases made under EFF. Cancelled on 12/13/95 prior to expiration.
PAKISTAN	Stand-By	12/13/1995	562.59	294.69	Extended from 3/31/97. Amount increased 12/17/96.
PAKISTAN	EFF	10/20/1997	454.92	113.74	This EFF approved along with an ESAF.
PAKISTAN	Stand-By	11/29/2000	465	150	
PANAMA	Stand-By	2/24/1992	74.17	54.57	Extended from 12/23/93. Amount decreased from 93.68 in 12/93.
PANAMA	Stand-By	11/29/1995	84.3	84.3	Approved amount increased from 69.8.
PANAMA	EFF	12/10/1997	120	40	
PANAMA	Stand-By	6/30/2000	64	0	
PERU	EFF	3/18/1993	1018	642.69	This arrangement followed by another EFF 7/1/96.
PERU	EFF	7/1/1996	300.2	160.5	Approved amount increased
PERU	EFF	6/24/1999	383	0	Precautionary arrangement.
PERU	Stand-By	3/12/2001	128	0	Precautionary arrangement.
PHILIPPINES	Stand-By	2/20/1991	334.2	334.2	Extended from 8/19/92 to 12/31/92 and 3/31/93. Amount includes augmentation of 70.
PHILIPPINES	EFF	6/24/1994	791.2	791.2	Arrangement extended from 6/23/97 to 7/23/97, 12/31/97 and 3/31/98. Access increased 7/18/97. Followed by another Stand-by on 4/1/98.
PHILIPPINES	Stand-By	4/1/1998	1020.79	545.66	Approved after expiration of 6/2494 EFF. Extended from 3/31/2000 to 6/30/2000. Then extended to 12/31/00.
POLAND	Stand-By	2/5/1990	545	357.5	
POLAND	EFF	4/18/1991	1224	76.5	Cancelled prior to expiration date of 4/17/94.
POLAND	Stand-By	3/8/1993	476	357	Extended from 3/7/94.
POLAND	Stand-By	8/5/1994	333.3	283.3	Approved amount increased in 10/94, then decreased to 333.3 in 9/95.
ROMANIA	Stand-By	4/11/1991	380.5	318.1	Followed by another stand-by on 5/29/92.
ROMANIA	Stand-By	5/29/1992	314.04	261.7	Approved after expiration of 4/11/91 stand-by.
ROMANIA	Stand-By	5/11/1994	320.5	94.27	Extended from 12/10/95 and cancelled prior to expiration date 4/24/97. Replaced by another stand-by 4/22/97.
ROMANIA	Stand-By	4/22/1997	301.5	120.6	Replaced the 5/11/94 stand-by.
ROMANIA	Stand-By	8/5/1999	400	139.75	Extended from 3/31/2000 to 5/31/2000. Then extended to 2/28/2001.

RUSSIAN FEDERATION	Stand-By	8/5/1992	719	719	
RUSSIAN FEDERATION	Stand-By	4/11/1995	4313.1	4313.1	Cancelled prior to expiration date 4/10/96.
RUSSIAN FEDERATION	EFF	3/26/1996	13206.57	5779.71	Arrangement terminated on 3/26/99 prior to 3/25/2000 end date
RUSSIAN FEDERATION	Stand-By	7/28/1999	3300	471.43	
SENEGAL	Stand-By	3/2/1994	47.56	30.91	Cancelled prior to expiration date 3/1/95.
SLOVAK REPUBLIC	Stand-By	7/22/1994	115.8	32.15	
SRI LANKA	Stand-By	4/20/2001	200	103.35	Precautionary arrangement.
TAJIKISTAN	Stand-By	5/8/1996	15	15	
THAILAND	Stand-By	8/20/1997	2900	2500	
TRINIDAD & TOBAGO	Stand-By	4/20/1990	85	85	Approved after expiration of 1/13/89 stand-by.
TURKEY	Stand-By	7/8/1994	610.5	460.5	Extended from 9/7/95. Amount increased 4/95.
TURKEY	Stand-By	12/22/1999	8676	2843.8	
UKRAINE	Stand-By	4/7/1995	997.3	538.65	Followed by another stand-by on 5/10/96.
UKRAINE	Stand-By	5/10/1996	598.2	598.2	Approved after expiration of 4/7/95 stand-by. Extended from 2/9/97.
UKRAINE	Stand-By	8/25/1997	398.92	181.33	
UKRAINE	EFF	9/4/1998	1919.95	712.15	Approved amount increased 5/27/1999. Arrangement extended to 8/15/2002.
URUGUAY	Stand-By	12/12/1990	94.8	9	
URUGUAY	Stand-By	7/1/1992	50	15.97	
URUGUAY	Stand-By	3/1/1996	100	0	Followed by another stand-by on 6/20/97.
URUGUAY	Stand-By	6/20/1997	125	114.2	Approved after expiration of 5/1/96 stand-by.
URUGUAY	Stand-By	3/29/1999	70	0	Precautionary arrangement.
URUGUAY	Stand-By	5/31/2000	150	0	Precautionary arrangement. Only one purchase made as BOP position strengthened, creating pressure on public spending and sending program off track.
VENEZUELA	Stand-By	7/12/1996	975.65	350	Cancelled prior to extended date 12/31/94 (original date was 10/5/94).
VIETNAM	Stand-By	10/6/1993	145	108.8	
ZIMBABWE	EFF	1/24/1992	340.8	71.2	EFF cancelled prior expiration date 1/23/1995.
ZIMBABWE	EFF	9/11/1992	114.6	86.9	
ZIMBABWE	Stand-By	6/1/1998	130.65	39.2	
ZIMBABWE	Stand-By	8/2/1999	141.36	24.74	

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Appendix 3 (1-year horizon):
In a sample of currency crashes, chief executives were twice as likely to lose their jobs over the subsequent 12 months if their government had said it would not devalue (2/3) as if it had not said so (1/3).

A. Promises by Premiers, Finance Ministers, Central Bank Governors

    1) Summary Table

	Changes in Premier	No Changes in Premier	Frequency of Change in Premier	Total Case Studies
Promise	4	2	2/3	6
No Promise	5	10	1/3	15
Total	9	12		21

    2) Background Table 1 (Changes in Premier)

Country	Month of Devaluation	Date of Premier Change	Presence of Promise (by whom)	Newspaper (Date of Report)
Argentina	03/75	03/24/75	No	La Prensa
Argentina	04/81	12/11/81	No	La Prensa
Argentina	04/89	07/08/89	Yes (CB Governor)	La Prensa (03/31/89) [1]
Argentina	01/02	01/02/02	Yes (Premier)	La Prensa (12/27/01) [2]
Korea	12/97	02/25/98	No	Maeil Business Daily
Mexico	09/76	12/01/76	No	El Excelsior
Mexico	02/82	12/01/82	Yes (Premier & CB governor)	El Universal (02/06/82) [3]
Sierra Leone	08/97	03/10/98	No	Sierra Leone News
Venezuela	02/02	04/13/02	Yes (CB governor)	El Diario (02/08/02) [4]

[1] Central Bank Governor Jose Machinea denied yesterday that it is under study modifications to the exchange rate markets and announced a monetary policy tightening through a strong increase in the interest rates in order to stop the increase of the dollar.

[2] We don't want to be slaves, said the president (Alberto Rodriguez Saa) during an effusive speech at the CGT. There he made transcendental announcements that there will not be neither devaluation nor dollarization and there will be a new third currency, the "argentinian" supported by the governmental real state.

[3] In a vibrant announcement the president(Jose Lopez Portillo) pointed out the most important aspects of the strategy to follow…The peso will keep floating and to compensate for its floating path it has been set compensatory tariff and license system. Romero Kolbeck(Banco de Mexico director) denied the rumor of a devaluation, the peso will keep floating… "There is no chance for a devaluation for our currency and therefore the floating scheme will keep going, said Gustavo Romero Kolbeck. If these rumors were true, that a devaluation is being structured then I wouldn't be here right now" said a smiling Romero Kolbeck. The famous quotation that Lopez Portillo would "defend the peso like a dog" was not contemporaneously reported in the newspaper.

4) Castellanos (president Central Bank of Venezuela) claimed that the decision of the government to address the fiscal problem of the country and develop other public initiatives will allow the exchange rate policy to keep defending the Bolivar.

3) Background Table 2 (No Changes in Premier)

Country	Month of Devaluation	Date of Premier Change	Presence of Promise (by whom)	Newspaper (Date of Report)
Chile	07/71	09/11/73	No	El Mercurio
Chile	03/75	03/11/90	No	El Mercurio
Chile	07/85	03/11/90	No	El Mercurio
Kenya	04/93	12/30/02	Yes (Finance Minister)	Daily Nation (03/23/93) [1]
Nigeria	10/86	08/26/93	No	Daily Times
Nigeria	03/92	08/26/93	No	Daily Times
Peru	06/76	07/28/80	No	El Comercio
Peru	12/87	07/28/90	Yes (Finance Minister)	El Comercio (11/27/87) [2]
Uganda	06/81	07/27/85	No	Uganda Times
Uruguay	03/72	07/13/76	No	El Dia
Uruguay	11/82	02/12/85	No	El Dia
Zambia	10/85	11/02/91	No	Zambia Daily Mail

1) The Kenyan government went back to forex control. It rejected all IMF rules; Finance Minister Musalia Mudavadi said that Kenyan economy could no longer absorb further devaluation of the shilling. (Nonetheless, devaluation occurred on April 21st).

2) Saberbein (Minister of the economy and finance) said that the devaluation would be progressive *next year*. The exchange rate or the price of dollar would move along with wholesale prices during *the next year* as a clear export-supporting policy, for the aim is keep growing fostering external sector. (Despite Saberbein's statement the devaluation actually took place December 15th).

B. Promises by Premiers

1) Summary Table

	Changes in Premier	No Changes in Premier	Frequency of Change in Premier	Total Case Studies
Promise	2	0	2/2	2
No Promise	7	12	7/19	19
Total	9	12		21

2) Background Table 1 (Changes in Premier) and
3) Background Table 2 (No Changes in Premier) same as above

Appendix 4 (half-year horizon):
In a sample of currency crashes, chief executives were 2 ½ times as likely to lose their jobs over the subsequent 6 months if their government had said it would not devalue (1/2) as if it had not said so (1/5).

A. Promises by Premiers, Finance Ministers, Central Bank Governors

   1) Summary Table

	Changes in Premier	No Changes in Premier	Frequency of Change in Premier	Total Case Studies
Promise	3	3	1/2	6
No Promise	3	12	1/5	15
Total	6	15		21

2) Background Table 1 (Changes in Premier) and
3) Background Table 2 (No Changes in Premier) same information as above.

B. Promises by Premiers

   1) Summary Table

	Changes in Premier	No Changes in Premier	Frequency of Change in Premier	Total Case Studies
Promise	1	1	1/2	2
No Promise	5	14	5/19	19
Total	6	15		21

   2) Background Table 1 (Changes in Premier) and
   3) Background Table 2 (No Changes in Premier) same information as above.