Flexing Your Muscles:

Abandoning a Fixed Exchange Rate for Greater Flexibility

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Abstract
We identify 51 instances since 1957 when an economy abandoned a fixed exchange rate for greater flexibility and saw its currency appreciate or remain broadly unchanged. These economies experienced a wide variety of macroeconomic responses. Those with high investment rates and rapidly growing trade experienced declines in growth, while more open economies and countries with more international reserves tended to experience falls in inflation. These patterns have obvious implications for the current economic circumstances and prospects of China.

Keywords: data, empirical, panel, country, fixed, floating, flexible, regime, switch, change, monetary, regression

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1. Introduction

The maintenance of currency pegs by fast-growing emerging markets has become a flash point in discussions of economic policy. Not a few observers concerned for the stability of the international economic and financial system argue that international balance could be better maintained and global financial stability enhanced if emerging markets like China abandoned their pegs in favor of regimes of greater flexibility. In addition, more flexible exchange rates would give emerging markets greater ability to tailor policy to domestic conditions. Where growth is strong and inflation is a problem, currency appreciation would help damp down inflationary pressures and avoid asset bubbles and overheating. It would facilitate efforts in these countries to rebalance away from exports in favor of domestic spending. It would give them an additional instrument – a more flexible exchange rate –with which to cope with volatile capital flows as the capital account of the balance of payments becomes more open.[1] Greater flexibility on the part of countries like China, implying less foreign exchange market intervention, would also slow the accumulation of reserves in the form of U.S. treasury and other advanced-country securities. It would help the United States grow its exports. Insofar as exchange rates fixed at inappropriate levels contributed to global imbalances and thereby helped to plant the seeds for the global financial crisis, this is an issue of not just national but international significance. Thus, not only the IMF but high officials in both the United States and Europe regularly make the case for greater exchange-rate flexibility to emerging markets like China.

Spokesmen for emerging markets counter that abandoning pegs for greater flexibility would damage their growth prospects. Currency stability against the dollar, they argue, has been integral to their successful economic development. Greater variability would make doing international business more difficult, given that banks and enterprises lack experience in dealing with currency fluctuations and the relevant hedging markets are often missing. Rapid currency appreciation might cause export growth to slow. This could precipitate financial problems for firms heavily invested in the production of tradables and, in turn, for their banks. Cut loose from its anchor, the exchange rate could grow dangerously unstable. Asset prices would react badly, compounding these other economic and financial problems. In a period when a majority of the growth of global demand emanates from emerging markets, problems for this set of countries are the last thing the world needs.[2]

Economic theory and logic have been deployed on both sides of this debate. Authors like Chinn (2007) have invoked the Mundell-Fleming model to show how the shift toward a more flexible exchange rate regime, assuming that this is accompanied by currency appreciation, would help countries in China's position to restore internal and external balance. On the other hand, authors like McKinnon and Schnabl (2006) have invoked elasticity pessimism and the specter of deflationary slumps to argue that currency appreciation would do little to correct global imbalances and could lead to falling wages and prices and, in the worst case, a Japanese-style deflationary syndrome. This leads them to conclude that China's adopting a more flexible exchange rate regime would be undesirable.

This arena, populated by competing models and conflicting priors, has not exactly been informed by copious empirical analysis. Evidence on the effects of abandoning currency pegs for greater flexibility has largely been limited to estimates of import and export demand elasticities, which are used to project prospective changes in the net exports of China and other countries on the assumption that the shift in regime will occasion appreciation. (For surveys see Marquez and Schindler 2007 and Garcia-Herrero and Kiovu 2010). McKinnon and Schnabl, to inform their analysis of China, lean on the behavior of macroeconomic variables in the aftermath of Japan's exit from its dollar peg in 1971-73. Using mainly graphical methods, Eichengreen and Masson (1998) study a handful of emerging markets that had voluntarily abandoned currency pegs in favor of regimes of greater flexibility. More recently, Kappler, Reisen, Schularick and Turkisch (2011) have studied 25 substantial nominal and real appreciations, but a number of their observations are step revaluations rather than appreciations that occurred in conjunction with a change in the exchange rate regime.

Our approach is different. We examine a comprehensive data set covering over 200 countries and territories, both developing and advanced, since 1957.[3] We focus on 51 instances where countries abandoned currency pegs for regimes of greater flexibility with a reasonable expectation that their currencies would appreciate.[4] Thus, we consider changes in exchange rate regime in the direction of greater flexibility but rule out cases where the change was followed by sharp currency depreciation. In other words, we are not interested in "crisis" and "speculative attack" cases where a currency peg collapses under pressure, resulting in devaluation or sharp depreciation (having considered these cases elsewhere: see Eichengreen, Rose and Wyplosz 1995).[5,6] Rather, we focus on instances where a country shifts from a fixed

to flexible exchange rate regime and either sees its exchange rate remain relatively unchanged or experiences an appreciation.[7] In spirit, our paper is closest to the Eichengreen and Masson et al. (1998) study (cited above) of exits from pegged exchange rates to greater flexibility. But our sample is larger and, we would argue, our methods are more systematic.

We examine the impact of these events, which we call "flexes," on a range of macroeconomic and financial variables, including GDP growth, export growth, consumption, investment and inflation. We compare the behavior of these variables in the "flexers" and a control group of countries maintaining a pegged exchange rate throughout. We look for and, where necessary, correct for selectivity bias by searching for differences in country circumstances in the period before the flex occurred.[8] Although our set of "treatment cases" is not large, the fact that it is larger and more comprehensive than in earlier studies undertaking similar analyses allows us to utilize more systematic empirical methods.

There is of course no single definition of what constitutes a "flex."   In our benchmark results we consider cases where there was a change in the de facto exchange rate regime in the direction of greater flexibility and the exchange rate either appreciated or remained broadly unchanged (neither appreciated nor depreciated by more than five per cent.)   Fortunately, similar results in fact obtain under a number of alternative definitions of what constitutes "flexing." We then analyze the behavior of a range of macroeconomic and financial variables over the periods three years before and after the change in exchange rate regime. We find similar results when we consider shorter periods. There is less evidence of a significant impact on the variables of interest when we compare longer periods, but this is plausible, since one

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would not expect a change in a nominal variable or in the regime governing its behavior to have implications for real variables over long horizons.[9]

Some of the cases we examine are likely to be dismissed as special. For example, a disproportionate number are clustered around the time of the collapse of the Bretton Woods System; they are therefore not truly independent flexes insofar as they can also be understood as reflecting the U.S. decision to float the dollar and allow it to depreciate. Others occur in developing countries whose historical experience has not attracted much attention. But experience following the collapse of the Bretton Woods System is directly relevant to the future prospects of countries like China, insofar as their decisions to flex could result in the end of the regime that has been widely referred to as Bretton Woods II (Dooley, Folkerts-Landau and Garber 2003).[10] And while the experience of those few low-to-middle-income countries that have appreciated out of fixed exchange rate regimes with limited capital mobility in the past may have not received much prior attention, it is directly relevant to the prospects for middle-income countries contemplating moving to a more flexible exchange rate today, like China. In any case, the advantage of constructing as large a sample as possible is that the supposed special nature of a subset of those cases need not dominate the results.[11,12]

The results reveal a wide range of responses of macroeconomic and financial variables. Another way of putting this is that the very wide dispersion of results makes it hard to identify significant differences in the behavior of the variables of interest before and after flexing, or between the flexers and other countries, in the wake of the event. This suggests that our 51 cases are heterogeneous.

In a subset of cases, however, the decision to flex is followed by a discernible slowdown in the rate of economic growth. Slowdowns are most likely, we show, when the investment ratio is high, consumption, investment, exports and imports are growing rapidly, and money growth is fast. Since we only have 51 observations, confidence intervals tend to be wide, but the finding that slowdowns following flexes tend to occur in high-investment and rapid-export-growth economies is robust across samples and specifications. The implication is that China, where both conditions prevail, may have some basis for worrying about the growth effects of appreciating out of its fixed exchange rate regime.

In a subset of cases, in addition, the decision to flex was followed by a significant decline in the rate of inflation. Slower inflation is most likely, we show, in countries that are relatively open to trade (where the reduction in the rate of import price inflation presumably has the greatest impact) and in countries with high foreign reserves (which had presumably been sterilizing capital inflows with less than complete success prior to the change in exchange rate regime). These results also have obvious implications for China, which is currently characterized by inflation and the other macroeconomic characteristics in question.

Section 2 describes our data, definitions and 51 cases. Section 3 discusses the determinants of flexes and the possibility of selection bias. The main results are in Section 4, which presents event studies and some simple regression analysis. In concluding, section 5 draws out the implications for China and the global-rebalancing debate.   An appendix presents some case studies of flexing that were and were not accompanied by significant growth slowdowns.

2. Data and Definitions

Exchange rate regimes come in many flavors. Many countries, while not attempting to maintain a peg, manage their exchange rates heavily (they may declare a commitment to flexibility but in practice prevent the currency from moving). Others may refrain from intervening but still see their currency display broad stability. Some countries have multiple exchange rates; they may regulate one according to official policy but have a different exchange rate (often on the black market) that moves differently and is used for unofficial transactions.

The first and, in some sense, most important step in our analysis involves identifying shifts from regimes of pegged exchange rates to regimes of greater flexibility. For this purpose we use the Reinhart-Rogoff (2004, hereafter "RR") de facto classification of exchange rate regimes as extended by Reinhart, Rogoff and Ilzetzki. This taxonomy distinguishes 15 exchange rate regimes by degree of flexibility for 218 "countries" (some of which are, in practice, territories) and is available monthly from 1946m1 through 2007m9. In constructing their index, RR utilize information on both official and black market exchange rates. We treat the first four of their categories – no separate legal tender, pre-announced peg or currency board arrangement, pre-announced horizontal band narrower than or equal to +/-2%, and *de facto* peg – as fixed exchange rate regimes.[13] We look for cases where countries moved away from these regimes; there are 119 such departures in the sample.[14]

Of course, there exist a number of alternative classifications of exchange rate regimes. The most prominent, published by the IMF, has been based on government's stated *de jure*

exchange rate policy.[15] But what is of interest here is what officials responsible for exchange

rate policy actually do as opposed to what they say. Similarly, we choose not to use

Shambaugh's (2004) classification, since this relies exclusively on *de jure* exchange rate data

and provides only a coarse classification (peg/no-peg) at an annual frequency. Levy-Yeyati and

Sturzenegger's (2003) categorization incorporates information on movements in both exchange

rates and international reserves, but their data set is annual, begins only in 1974, ends in 2004,

and has a number of missing and inconclusive observations.[16]

We look for cases where countries moved away from these regimes and then

experienced either exchange rate appreciation or at most minor depreciation.[17] Thus, we rule

out cases of devaluation and substantial depreciation – where the change in exchange rate

regime was *forced* by market pressures. These cases of currency crisis and step devaluation

have been studied before, as noted above.

Constructing this sample requires answering three further questions: how long a

subsequent period, how big an exchange rate change, and exchange rate movements against

what? We examine exchange rate changes over the three months following the change in

regime. This is long enough for the exchange rate change to be unaffected by high-frequency

considerations – transient financial shocks, for example – while retaining our focus on the

aftermath of regime changes. Lengthening and shortening the subsequent period does not

notably change the results. We examine currencies that appreciated by any amount or

depreciated by less than 5 per cent; the latter figure is again arbitrary but reasonable. Again,

imposing slightly larger and smaller values of this threshold do not affect the results. Finally,

we consider official exchange rates against both the U.S. dollar and the SDR.[18]

We review the observations one by one and exclude cases where the RR data set

indicates a regime shift but there was no subsequent change in the official SDR exchange rate.

(Virtually without exception, there was also no change in the official dollar exchange rate in

these cases.) We also exclude a number of questionable observations.[19]

We are then left with 51 cases. These are tabulated in Table 1 along with the three-

month rates of change of the SDR, official dollar rate and parallel market rate (where available).

We see there some prominent cases (Canada in 1970, Germany in 1973) along with a number

of more obscure ones. The earliest flex is Paraguay in 1960, the most recent Malaysia in

2005.[20] Most of these cases have only small changes in the exchange rates we consider.[21] We

use two variants of our default definition of flexes to check for sensitivity. Our first variant

drops (twelve) observations without any appreciation in any exchange rate, while our second

drops (four) observations with large (double-digit) appreciations. Both variants are marked in

the table.

As previously noted, a substantial fraction of our cases (20 out of 51) are clustered

around the collapse of the Bretton Woods System, when other currencies began floating

against the dollar (although there were also flexes in the 1960s, 1980s, 1990s and 2000s).[22] At

some level this is not especially disturbing. The greater flexibility of, inter alia, the German

deutschemark and the Japanese yen in the period after the Bretton Woods System dissolved is

one of the main precedents to which observers point when imagining the consequences of a

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Chinese transition to greater flexibility (and the dissolution of the so-called Bretton Woods II system).[23] Thus it is not inappropriate that our sample should be weighted toward this episode.

3. Selectivity

Below we will ask how macroeconomic and financial variables behave in the wake of a decision to abandon a currency peg in favor of greater flexibility and allow the currency to appreciate or at least not depreciate significantly. A logically prior question, however, is whether the post-exit behavior of our variables is affected by their exceptional behavior in the immediately preceding period. Are our findings for the post-exit period contaminated by selectivity, in other words?

There is good reason to think that countries choosing to move to greater exchange rate flexibility do not do so randomly. An obvious source of selection is country size. Very small open economies tend not to have floating exchange rates.[24] Those with pegged exchange rates are correspondingly less likely to abandon them for greater flexibility. Conditioning on country size when undertaking the kind of analysis conducted here is doubly important, moreover, insofar as the macroeconomic impact of a change in China's exchange rate regime is an obvious subtext of our study and China is located at an extreme of the country-size distribution.

While country size is an obvious source of selectivity, other potential sources are less obvious. For example, it is not obvious that fast growing countries might deliberately decide to flex as opposed to remaining in a fixed exchange rate regime in the hope that the good times

associated with that regime might continue to roll. As a Chinese policy maker well might ask, why mess with success?

We probe further for selectivity bias by examining whether countries that flex differ systematically from other countries in our sample. Since the decision to abandon a pegged exchange rate regime is an event with potentially important medium-term consequences and because the exact timing of the regime change is unimportant in understanding its determinants, we convert our annual data to 3-year averages. (Using 5-year and other similar averages makes little difference for the results.) We then construct a binary variable where a value of unity signifies a flexing during the period and all other observations take on values of zero. We use this as the dependent variable in an encompassing set of probit regressions as a way of examining whether any of the usual suspects register significantly on the right-hand side of the equation.

Since we already know that country size should vary with the exchange rate regime, we include it (along with country and time effects) as a conditioning variables. We are interested in whether there is evidence that other variables of interest affect the likelihood of flexing. If the rate of GDP growth, for example, has a significant effect in this probit model, that would be prima facie evidence of selection bias – that relatively slow or, more plausibly, fast growing countries (depending on the sign of the coefficients) are more likely to flex.

The answer is in Table 2. The top panel displays a set of coefficients from bivariate probit regressions. Our baseline estimates on the left include both fixed time- and random country-specific effects. Almost without exception the variables of interest (GDP growth,

export growth, investment growth, consumption growth, credit growth) do not enter the probit

regressions significantly; the same is true of the real effective exchange rate and different

measures of capital mobility. We interpret this as little evidence of the presence of selection

bias in the relevant sense. While size as proxied by population is systematically associated with

the probability of flexing in the bivariate regressions, this variable is very slowly moving and as

such is not the focus of our analysis.[25] We also provide extensive sensitivity analysis in other

columns of the table, dropping time effects, and also using two different variants of our

measure of exchange rate flexing. However, our essential (non-) results seem robust to these

perturbations of our basic setup. The results are also confirmed in the multivariate results

tabulated in the lower panel of Table 2.

We conclude that when analyzing their consequences, it seems reasonable to ignore the

determinants of flexing (other than country size).

4. Main Results

4.1 Event Studies

We now use an event study approach to examine the behavior of our flexings in more

detail. We use annual data, extracting most of our series from the World Bank's *World

Development Indicators.* The behavior of GDP growth around the time of our 51 flexings, for

example, is shown in the top left panel of Figure 1, starting five years beforehand, continuing

through the event and extending to another five years afterwards. The average (mean) growth

for the flexers is bracketed by +/- 2 standard error deviation confidence bands to give some idea of the spread of the data.

Sixteen macroeconomic and financial variables are shown in Figure 1. We choose these variables to cover a broad range of aspects of the macro-economy, placing special emphasis on those of particular relevance to China (e.g., export growth and the spending shares of consumption and investment).[26]

We compare our 51 flexers with a control group of country-year observations; the medians of our control group are also shown in Figure 1 (with horizontal lines). To construct our control group, we restrict our attention to the years in which flexes occurred. For those years, we then examine the behavior of countries that were not only fixed that year (using our Reinhart-Rogoff criterion) but had been fixed for the previous five years and remained fixed for another five years. Thus our control group consists of long-term fixers who chose *not* to switch their exchange rate regimes, observed at the time of the flexings.

The overwhelming impression is of little change between the periods before and after the event. The reassuring interpretation of this finding is that the negative effects of concern to those who resist the idea that emerging markets like China should abandon their pegs are not evident in similar prior episodes: for the sample as a whole, there is no sign of a significant deceleration in rates of GDP growth, investment growth, or export growth. The average behavior of flexers is also quite close to that of our control group of long-term fixers and is statistically indistinguishable from the latter.

A less reassuring interpretation from the analytical point of view is that there is considerable variation in behavior both before and after the event, making it impossible to identify overall responses. Flexing has occurred under a variety of different circumstances, the argument would go. Heterogeneity makes it impossible to identify subsequent changes in macroeconomic and financial outcomes. The width of the two standard deviation bands relative to the means is consistent with this view.

We can examine this behavior more systematically by regressing each of these variables, with the dependent variable centered on the date of the flex, on its own leads and lags. There is little evidence of unusual behavior in any of these variables in the years prior to the exit. The same is true of the coefficients on the leads: as in Figure 1, where there is little evidence of changes in the behavior of our macroeconomic and financial variables before and after the 51 flexes, there is no evidence of significant changes in the behavior of the key variables after the fact.

This impression is further confirmed by Figure 2, which uses a subset of the 51 flexes. There we restrict the sample to the 32 exits from fixed regimes where the exchange rate appreciated or did not move over the subsequent three months (excluding the modest depreciations). Otherwise, Figure 2 is analogous to Figure 1 in its construction. It is also analogous in its results: there is no evidence for this more restrictive sample of significant changes in the behavior of the key variables.

It is striking to contrast these results with those for step devaluations (as in Cooper 1971 and his successors) and currency events and crises (as in Eichengreen, Rose and Wyplosz 1995

and the related literature). There one tends to find large and well-defined impacts on, inter

alia, growth and inflation and evidence of nonrandom incidence (selectivity) before the fact.

The results here, in contrast, suggest that transitions from pegged exchange rates to regimes of

greater flexibility are, if anything, a more heterogeneous lot.

4.2 A Closer Look

Event studies are intrinsically univariate and may therefore mask significant covariation

among variables. A next step is therefore to examine bivariate correlations. Figure 3 links GDP

growth rates to some key economic conditions around the time of our 51 flexes. In particular,

the evolution in GDP growth rates – how they change from the three years *prior to* our flexes to

the three-year period *subsequent to* the event – is juxtaposed against the behavior of

consumption and investment (averaged over the three years before the flex). We look at these

changes in growth rates and ask whether they are correlated with other potential variables of

interest.

Figure 3 indicates that countries experiencing rapid consumption and investment

growth are more likely to experience slowdowns following the change in exchange rate regime.

Countries with low consumption shares of GDP and high investment shares are similarly likely

to experience slowdowns. While there are some obvious outliers – the observations for Malta

and Kuwait stand out, for example – they do not dictate the results.[27] Figure 4 is the analog to

Figure 3 but for our control group of long-time fixers. The data for the long-term fixers are

cloudy. Evidently, it is not just rapid consumption and investment growth that auger

slowdowns but those conditions in conjunction with the change in exchange rate regime.

Figure 5 is analogous to Figure 3 and portrays the growth effects for economies with rapid export and import growth; such economies are also more likely than those in which exports and imports are growing slowly to experience aggregate growth slowdowns following the change in exchange rate regime. All this points to China as a plausible example of an economy that might expect to see a significant slowdown in the wake of abandoning its peg and allowing its currency to appreciate.

Table 3 reports the regressions corresponding to Figures 3 and 5. The first row shows that growth rates fall in part because of mean-reversion; the coefficient on lagged GDP growth is statistically significant with an economically large effect. The third row confirms that GDP growth is most likely to fall following a flex in economies with high investment rates. A few other pre-conditions come through occasionally but inconsistently, such as low pre-flex consumption growth and high pre-flex export and import growth. Note that the relationship between the post-flex slowdown and import growth is statistically significant at a higher level than that between the post-flex slowdown and export growth. There is also a significant bivariate relationship between pre-flex M2 growth and the post-flex growth slowdown, as if countries experiencing credit booms prior to flexing are more likely to experience subsequent slowdowns. Again, this suggests that the caution of Chinese policy makers' over the consequences of flexing their pegged exchange rate is not entirely unwarranted, though there may be anti-inflationary benefits. A number of other variables, such as the presence or absence of capital controls, which a priori might be expected to condition the impact of flexing on economic growth, show little sign of doing so.

Since lagged GDP growth enters as significantly, we include it as a control variable in the next column, and re-run our regressions as a form of sensitivity analysis. Further robustness checks retain lagged growth as a control but use the two different variants of our definition of flexing tabulated in Table 1. The first variant (at least one exchange rate appreciated after flexing) has a maximum sample size of 39 observations, while the second (no double-digit appreciation) has a maximum sample size of 47 observations. The results obtained using these subsamples are reported in subsequent columns of Table 3. The bottom line is that the essential results are the same.

While the aforementioned results are statistically significant, are the economic effects large? Consider the effect of the investment/GDP ratio, which takes on a coefficient of approximately -0.2. Its average level or our sample is around 22%, with a standard deviation of around 9%. A one standard deviation decline around the mean is therefore associated with a decline in the average annual rate of growth of .2*9% = 1.8%. While Chinese growth is high, its investment is also an extraordinarily high ratio of GDP; a decline of two standard deviations is not unthinkable (from its current level in excess of 40%). This would be a non-trivial economic effect on growth of around -3.5%; cataclysmic for an OECD country, though perhaps not for China.

The small number of available observations limits our ability to run multivariate regressions controlling for these country characteristics simultaneously. A few simple multivariate regressions, reported in Table 4a, however suggest that the most robust determinants of the change in GDP growth are a high investment rate and high import growth

before the change in exchange rate regime. Table 4b is an analog that shows these results are insensitive to the inclusion of lagged real GDP growth as a control.

What of other consequences of flexes? Figure 6 is an analog to Figures 3 and 5 but focuses on (anti-)inflationary effects. Where Figures 3 and 5 for growth suggest that the change in this variable is a function mainly of domestic policies and conditions, Figure 6 suggests that the change in inflation depends more heavily on the external side of the economy. Inflation is more likely to fall when reserves had been high as a share of M2 or GDP, indicating a difficulty in completely sterilizing the effects of reserve accumulation. This result is strong and robust. It will resonate with those who think that China should contemplate greater currency flexibility and exchange rate appreciation in its fight against inflation.

Inflation is also more likely to fall in economies that are more open to trade, plausibly reflecting the moderating impact of flexing on import price inflation. One somewhat anomalous finding is that countries with current account deficits appear to be more likely to experience a decline in inflation than countries with surpluses; this result, however, is heavily driven by one observation.[28]

The regressions in Table 5 also confirm that the partial correlations for reserves are statistically significant at standard confidence levels. Countries with more reserves, which had presumably been intervening more heavily to prevent their exchange rate from moving (and appreciation) are more likely to experience a decline in inflation after flexing.

Finally, we examine whether the period after flexing is more likely to be punctuated by financial crises than the period before. We use three measures each for both banking and

currency crises, as constructed by previous investigators (Bordo et at 2001, Kaminsky and

Reinhart 1999, Demirguc-Kunt and Detragiache 2005, and Jeanne 2007). Table 6 shows

tabulations of the number of crises and placid periods for both the (five) years before and after

flexes, together with chi-square tests for equality across the periods. There is no evidence of a

significant relationship for either banking or payments crises. It therefore seems reasonable to

conclude that flexes are not associated with a significant increase in crisis incidence.[29]

5. Conclusion

Fast-growing emerging markets remain reluctant to abandon their pegged exchange

rates in favor of regimes of greater flexibility. This includes fast-growing emerging markets, for

whom conventional wisdom suggests that greater flexibility may mean currency appreciation

and anti-inflationary benefits. At one level their reluctance is understandable: in many cases,

pegging the exchange rate has served them well for many years. But at another level it is

increasingly clear that the policy has outlived its usefulness. The main factor feeding their

reluctance to move is fear of the unknown – that abandoning their pegged exchange rates for a

regime of greater flexibility will have uncertain consequences for rates of growth of GDP,

exports and the like. And policy makers, like investors, are not fond of uncertainty.

These issues tending to be debated in an empirical vacuum, actual evidence on the

macroeconomic and financial consequence of flexing would have considerable value. We have

therefore assembled a data base of 51 such cases of shifts to regimes of greater exchange rate

flexibility, excluding large depreciations by construction. While this is a comprehensive

approach to the available data, in the end our results are nonetheless limited by the fact that we only have 51 observations of interest. Many of these changes in regime took place in smaller countries and in periods of limited capital mobility. Other observations are clustered around the time of the collapse of the Bretton Woods System, when countries abandoned their dollar pegs for greater flexibility. All these are reasons for caution when attempting to generalize our results to current circumstances. Our findings should be taken more cautiously still insofar as none of our analysis is structural.

We find strikingly little evidence of major macroeconomic effects – little support in other words for the view that flexing is likely to be a disaster. At the same time, it is possible to pinpoint the circumstances in which the decision to move to greater flexibility is likely to be followed by a significant economic slowdown. Slowdown-prone economies tend to be those with exceptionally low consumption and high investment rates. They are economies where exports and domestic credit have been growing rapidly. In other words, they are economies with Chinese characteristics.

These findings suggest that China may have good reason to be cautious about not moving away from its peg to the dollar. But they also point to the kind of policy reforms – rebalancing away from exports, attaining a better balance between domestic consumption and investment, stabilizing the growth of credit – that the country should pursue in order to prepare the way for its eventual adoption of a more flexible exchange rate.

Table 1. 51 Flexes with Three-Month Exchange Rate Changes

Country	Year	SDR	$	Parallel $
Australia	1974	1%	-2%	-3%
Botswana	1980	-2%	-1%	
Canada	1970	-2%	-2%	-1%
Costa Rica[a]	1963	0%	0%	-1%
Costa Rica	1971	0%	0%	1%
Finland	1973	4%	-7%	-6%
France	1971	0%	-8%	-2%
Germany[b]	1973	0%	-10%	-10%
Germany[a]	1969	0%	0%	0%
Greece	1966	0%	0%	-4%
Haiti[a]	1985	2%	0%	0%
Hong Kong	1972	-1%	-1%	-2%
Iran[a]	1974	0%	0%	0%
Iraq	1982	-2%	0%	-4%
Ireland	1979	0%	-2%	0%
Israel	1970	0%	0%	-2%
Italy[a]	1973	3%	3%	0%
Jamaica[a]	1983	0%	0%	0%
Japan	1973	-2%	-2%	-1%
Kuwait	1975	-2%	2%	1%
Liberia	1998	-2%	-5%	0%
Libya	1971	0%	0%	-11%
Lithuania	2003	-1%	-2%	
Malawi	1973	-2%	-2%	-14%
Malaysia	2005	-2%	0%	
Malaysia[a]	1975	1%	0%	0%
Malta	1972	3%	3%	
Mauritania	1974	-1%	-1%	0%
Mexico	1976	1%	1%	-7%
Morocco[a]	1973	2%	2%	1%
Mozambique	2004	-5%	-5%	
Nepal	1978	3%	0%	-21%
Netherlands	1971	-3%	-3%	-3%
New Zealand	1973	-9%	-9%	-5%
Nicaragua[a]	1993	4%	1%	4%
Paraguay[a]	1960	0%	0%	0%
Peru[a]	1967	0%	0%	0%
Philippines	1970	1%	1%	-4%
Portugal[b]	1973	-12%	-12%	-12%
Singapore	1973	-1%	-1%	-6%
South Africa[b]	1972	0%	-10%	-8%
Spain	1974	-3%	-3%	-3%
Sri Lanka[a]	1968	0%	0%	1%
Sri Lanka	1990	4%	1%	-2%
Suriname	1974	-1%	0%	-2%
Sweden[b]	1973	-10%	-10%	-11%
Switzerland	1973	-1%	-1%	-1%
Tunisia	1974	3%	3%	-3%
Turkey	1961	0%	0%	-4%
Turkey	1972	0%	0%	-1%
UK	1972	5%	5%	-2%

The observations tabulated are for countries that have exited a fixed exchange rate regime (RR<5) to a more flexible exchange rate regime and have subsequently either a) appreciated or b) depreciated less than 5% over the next three months. Subsequent SDR, dollar, and parallel dollar depreciation rates tabulated on the right; further description available in the text. Exchange rates quoted as domestic price of foreign exchange, so that negative values indicate exchange rate appreciation. "Variant 1" observations without any appreciation marked by "a"; "Variant 2" observations without appreciations>10% marked by "b".

Table 2. Determinants of Flexes

A. Bivariate

Lags of:			Variant 1	Variant 2
GDP Growth	.33	.20	.47	.39
Consumption/GDP	.16	.04**	.23	.05**
Investment/GDP	.07*	.21	.14	.02**
Government spending/GDP	.71	.29	.83	.99
Rate of change of GDP deflator	.44	.08*	.42	.43
Consumption growth	.95	.91	.95	.26
Investment growth	.34	.65	.37	.25
Government Spending growth	.62	.10	.58	.79
Domestic Credit growth	.66	.90	.70	.68
M2 growth	.60	.34	.64	.68
Reserves/M2	.39	.41	.49	.74
Reserves/GDP	.27	.78	.29	.10*
Trade/GDP	.74	.06*	.63	.51
Current Account/GDP	.23	.87	.23	.84
Export growth	.32	.19	.23	.27
Import growth	.54	.26	.60	.41
Log Population	.00***	.00***	.00***	.00***
Log Real Effective Exchange Rate	.66	.78	.66	.92
Chinn-Ito Measure of Capital Mobility	.92	.52	.82	.57
Edwards Measure of Capital Mobility	.86	.43	.87	.40
Time Fixed Effects	Y	N	Y	Y
Country Random Effects	Y	Y	Y	Y

P-values for hypothesis that coefficients from panel probit regressions =0; one/two/three asterisk(s) indicates that the coefficient is significantly different from zero at the .10/.05/.01 significance level. Regressand = 1 if flexing occurred during three year period, = 0 otherwise. Regressors are three-year averages of lagged variables in left column. Intercepts included but not recorded. Each cell represents a separate regression.

B. Multivariate

Lags of:			Variant 1	Variant 2
Consumption/GDP	-.002 (.007)	-.012* (.006)	-.002 (.007)	-.006 (.008)
Investment/GDP	-.004 (.012)	.001 (010)	-.001 (.012)	.010 (.012)
GDP Inflation	-.005 (.008)	-.016* (.009)	-.005 (.008)	-.006 (.012)
Chinn-Ito Measure of Capital Mobility	-.062 (.402)	-.441 (.326)	-.100 (.414)	.215 (.458)
Log Population	.103 (.064)	.004 (.051)	.088 (.064)	.100 (.01)
Trade/GDP	.003 (.003)	-.004 (.003)	.004 (.003)	.003 (.003)
Effects	Time + Random Country Effects	Random Country Effects Only	Time + Random Country Effects	Time + Random Country Effects

Coefficients (standard errors in parentheses) from panel probit regressions; one/two/three asterisk(s) indicates that the coefficient is significantly different from zero at the .10/.05/.01 significance level. Regressand = 1 if flexing occurred during three year period, = 0 otherwise. Regressors are three-year averages of lagged variables in left column. Intercepts included but not recorded. Each column represents a separate regression.

Table 3. Bivariate Impact of Various Factors on Change in GDP Growth Rate, Flexes

Three-year lagged averages of:		add lag of growth	Variant 1, growth lagged	Variant 2, growth lagged
GDP Growth	-.54** (-4.5)			
Consumption /GDP	0.05 (0.6)	.05 (0.9)	.05 (0.9)	.06 (0.9)
Investment /GDP	-0.26*** (-3.9)	-.18*** (2.7)	-.17** (-2.5)	-.18** (-2.4)
Government spending /GDP	0.10 (1.3)	.07 (1.1)	.07 (1.1)	.06 (0.9)
Consumption growth	-0.3** (-2.5)	-0.1 (-0.4)	-.08 (-0.4)	.03 (0.1)
Investment growth	-0.21*** (-3.7)	-.15 (-1.2)	-.14 (-1.0)	-.18 (-1.4)
Government Spending growth	-0.08 (-0.5)	.11 (0.7)	.11 (0.8)	.48** (2.1)
Inflation	-0.09 (-0.6)	-.14 (-1.1)	-.16 (-1.2)	-.29 (-1.4)
Domestic Credit growth	-0.05 (-0.8)	.00 (0.0)	.00 (0.0)	.02 (0.2)
M2 growth	-0.15** (-2.3)	-.07 (-1.0)	-.09 (-1.1)	-.10 (-0.8)
Reserves/M2	0.00 (0.0)	.02 (1.0)	.02 (0.9)	.02 (0.7)
Reserves/GDP	-0.02 (-0.4)	.02 (0.6)	.03 (0.7)	.03 (0.5)
Trade/GDP	0.01 (1.1)	.02* (1.7)	.02 (1.6)	.02* (1.8)
Current Account /GDP	-0.02 (-0.2)	-.04 (-0.6)	-.03 (-0.5)	.05 (0.5)
Export growth	-0.10* (-1.7)	-.03 (-0.5)	-.03 (-0.4)	-.07 (-0.9)
Import growth	-0.17*** (-3.0)	-.07 (-0.9)	-.06 (-0.7)	-.10 (-1.0)
Real Effective Exchange Rate	.19 (2.9)	.03 (0.2)	.04 (0.2)	n/a
Chinn-Ito Measure of Capital Mobility	.37 (-0.7)	.28 (1.2)	.56** (2.2)	.42 (1.3)
Edwards Measure of Capital Mobility	.49 (0.1)	1.6 (0.5)	2.1 (0.5)	2.33 (0.6)

Coefficients from bivariate OLS regressions, with robust t-statistics recorded in parentheses; one/two/three asterisk(s) indicates that the coefficient is significantly different from zero at the .10/.05/.01 significance level. Regressand: three year post-flex GDP growth rate – three year pre-flex GDP growth rate. Regressors are three-year averages of lagged variables in left column. Intercepts included but not recorded. Maximum of 51 observations (tabulated in Table 1). Each cell represents a separate regression.

Table 4a. Multivariate Impact of Various Factors on Change in GDP Growth Rate, Flexes

Three-year lagged averages of:									Variant 1	Variant 2
Consumption /GDP	0.00 (0.0)									
Investment /GDP	-.25*** (2.9)		-.15* (1.8)			-.22** (2.0)	-.20** (2.5)	-.18** (2.4)	-.18** (2.3)	-.16* (1.8)
Government spending /GDP	0.07 (1.1)									
Consumption growth		-.22 (0.8)								
Investment growth		-.15 (1.3)	-.15** (2.1)							
Government Spending growth		0.13 (0.7)								
Inflation				-.14 (0.8)						
Domestic Credit growth				0.17* (1.9)		0.04 (0.7)				
M2 growth				-.32** (2.5)		0.00 (0.0)				
Reserves/M2				0.0 (0.7)						
Reserves/GDP				-.11 (1.5)						
Trade/GDP					0.02 (1.3)					
Export growth					-.08 (1.6)					
Import growth					-.16*** (2.9)	-.10 (1.4)	-.12 (1.5)	-.12* (1.8)	-.10 (1.5)	-.12 (1.4)
Observations	44	32	34	31	38	27	35	38	34	29
R^2	0.37	0.21	0.31	0.29	0.19	0.30	0.31	0.27	.27	.20

Coefficients from multivariate OLS regressions (one for each column), with absolute robust t-statistics recorded in parentheses; one/two/three asterisk(s) indicates that the coefficient is significantly different from zero at the .10/.05/.01 significance level. Default regressand: three year post-flex GDP growth rate – three year pre-flex GDP growth rate. Regressors are three-year averages of lagged variables in left column. Intercepts included but not recorded. Maximum of 51 observations (tabulated in Table 1).

Table 4b. Adding Lagged GDP Growth Rate, Flexes

Three-year lagged averages of:									Variant 1	Variant 2
Consumption /GDP	.02 (.4)									
Investment /GDP	-.16* (1.9)		-.15* (1.8)		-.20 (1.7)	-.19** (2.2)	-.15* (.1.9)		-.15* (1.8)	-.15 (1.5)
Government spending /GDP	.05 (.9)									
Consumption growth		-.16 (.6)								
Investment growth		-.12 (.9)	-.13 (1.0)							
Government Spending growth		.14 (.7)								
Inflation				-.20 (1.1)						
Domestic Credit growth				.15* (2.0)		.05 (.8)				
M2 growth				-.24* (2.0)		.02 (.8)				
Reserves/M2				.02 (.5)						
Reserves/GDP				-.06 (1.0)						
Trade/GDP					.02 (1.5)					
Export growth					-.04 (.7)					
Import growth					-.07 (.9)	-.06 (.7)	-.08 (1.4)	-.06 (.8)	-.05 (.6)	-.11 (1.1)
Observations	44	32	34	31	38	27	35	38	34	29
R^2	.45	.22	.32	.37	.27	.32	.32	.29	.29	.21

Coefficients from multivariate OLS regressions (one for each column), with absolute robust t-statistics recorded in Coefficients from multivariate OLS regressions (one for each column), with robust t-statistics recorded in parentheses; one/two/three asterisk(s) indicates that the coefficient is significantly different from zero at the .10/.05/.01 significance level. Regressand: three year post-flex GDP growth rate – three year pre-flex GDP growth rate. Regressors are three-year averages of lagged variables in left column. Intercepts and lagged real GDP growth included but not recorded. Maximum of 51 observations (tabulated in Table 1).

Table 5. Impact of Various Factors on Change in Inflation Rate, Flexes

Three-year lagged averages of:	Coefficient	add lag of inflation	Variant 1, inflation lagged	Variant 2, inflation lagged
Inflation	-.52** (2.7)			
Consumption /GDP	0.06 (0.5)	.08 (1.0)	.08 (1.0)	.13 (.08)
Investment /GDP	-0.08 (-0.6)	-.09 (.7)	-.09 (.7)	-.08 (.5)
Government spending /GDP	0.00 (0.0)	.06 (.3)	.08 (.5)	.06 (.3)
Consumption Growth	-0.18 (-0.6)	-.12 (.6)	-.15 (.8)	-.17 (.5)
Investment growth	-0.10 (-0.6)	-.04 (.3)	-.09 (.7)	-.06 (.3)
Government Spending growth	-0.19 (-0.5)	-.18 (.9)	-.20 (1.0)	-.5** (2.2)
Domestic Credit growth	0.00 (0.0)	.03 (.3)	.02 (.3)	.09 (.8)
M2 growth	-0.05 (-0.3)	.15 (1.1)	.19 (1.3)	.10 (.6)
Reserves/M2	-0.07** (-2.2)	-.07** (2.7)	-.07** (2.5)	-.06** (.2.7)
Reserves/GDP	-0.09** (-2.0)	-.10*** (2.7)	-.11*** (2.8)	-.08** (.04)
Trade/GDP	-0.03* (-1.8)	-.04* (2.0)	-.04* (1.9)	-.05** (2.5)
Current Account /GDP	0.33** (2.2)	.10 (.9)	.13 (1.1)	.08 (.7)
Export growth	-0.07 (-0.8)	-.04 (.5)	-.05 (.7)	-.10 (1.4)
Import growth	-0.02 (-0.1)	.07 (.5)	.03 (.2)	-.00 (.0)
Real Effective Exchange Rate	-.32 (1.3)	-.13 (1.0)	-.13 (1.0)	n/a
Chinn-Ito Measure of Capital Mobility	-.54 (.7)	-.96 (1.1)	-.64 (.6)	-.90 (1.2)
Edwards Measure of Capital Mobility	-4.0 (1.0)	-6.88* (2.0)	-5.1 (4.3)	-9.47*** (2.8)

Coefficients from bivariate OLS regressions, with absolute robust t-statistics recorded in parentheses; one/two/three asterisk(s) indicates that the coefficient is significantly different from zero at the .10/.05/.01 significance level. Regressand: three year post-flex inflation rate – three year pre-flex inflation rate. Regressors are three-year averages of lagged variables in left column. Intercepts included but not recorded. Maximum of 51 observations (tabulated in Table 1). Each cell represents a separate regression.

Table 6. Five Years before and after Flexes

A. Banking Crises

	Before Exits	After Exits	Total
Non-Crises	10	18	28
Crises	6	3	9
Total	16	21	37

Test of Equality: $\chi^2(1)$ = 2.7; p-value = .1. Crises taken from World Bank.

	Before Exits	After Exits	Total
Non-Crises	93	132	225
Crises	1	4	5
Total	94	136	230

Test of Equality: $\chi^2(1)$ = .9; p-value = .3. Crises taken from Bordo et al.

	Before Exits	After Exits	Total
Non-Crises	22	42	64
Crises	0	1	1
Total	22	43	65

Test of Equality: $\chi^2(1)$ = .5; p-value = .5. Crises taken from Kaminsky and Reinhart.

B. Foreign Exchange Crises

	Before Exits	After Exits	Total
Non-Crises	83	123	206
Crises	11	13	24
Total	94	136	230

Test of Equality: $\chi^2(1)$ = .3; p-value = .6. Crises taken from Bordo et al.

	Before Exits	After Exits	Total
Non-Crises	21	39	60
Crises	1	4	5
Total	22	43	65

Test of Equality: $\chi^2(1)$ = .5; p-value = .5. Crises taken from Kaminsky and Reinhart.

	Before Exits	After Exits	Total
Non-Crises	46	47	93
Crises	0	1	1
Total	46	48	94

Test of Equality: $\chi^2(1)$ = 1.0; p-value = .3. Crises taken from Jeanne.

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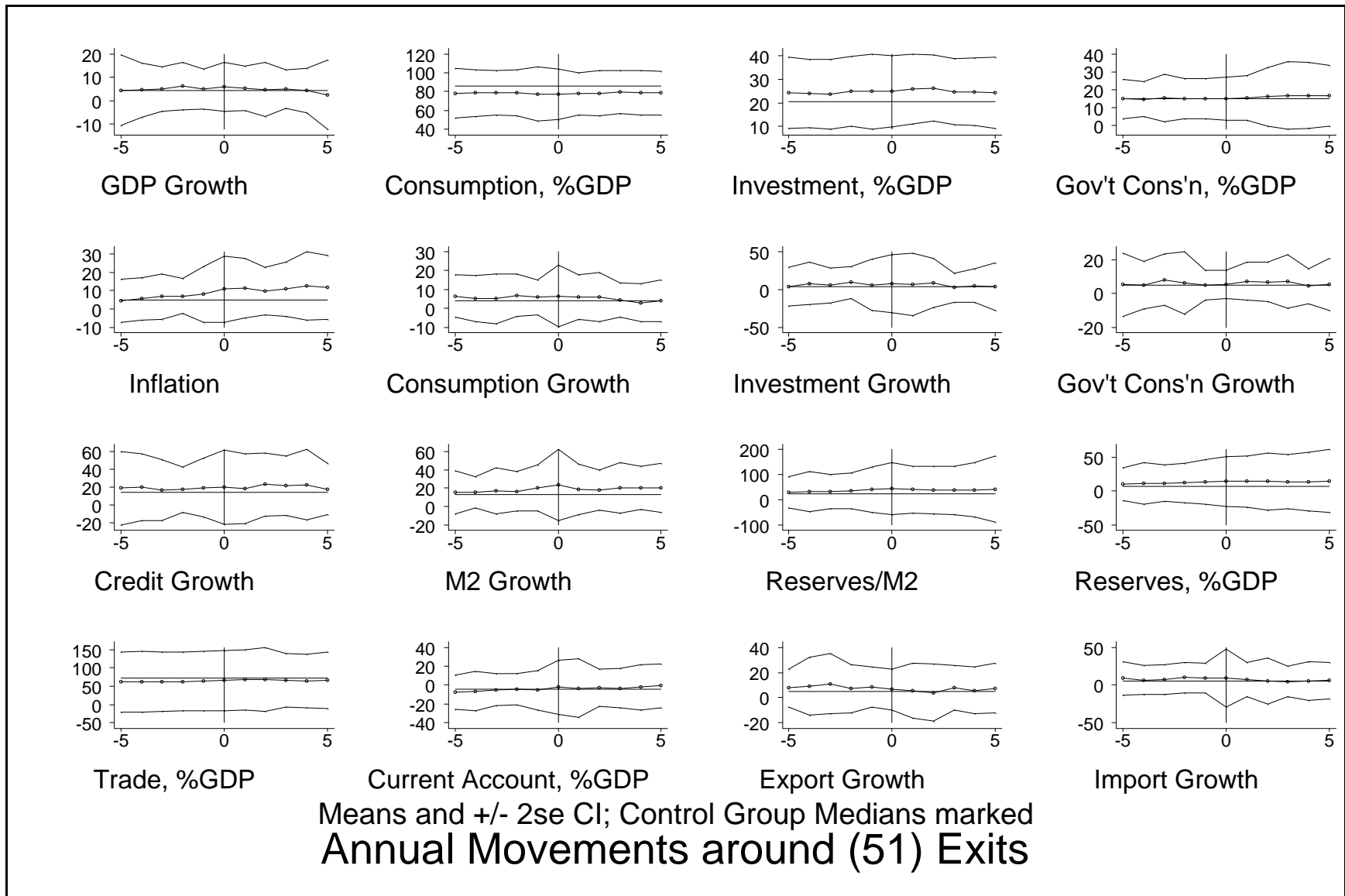
Figure 1: Default Event Study

Means and +/- 2se CI; GDP series spliced.

Annual Movements around (32) Depreciation-Free Exits
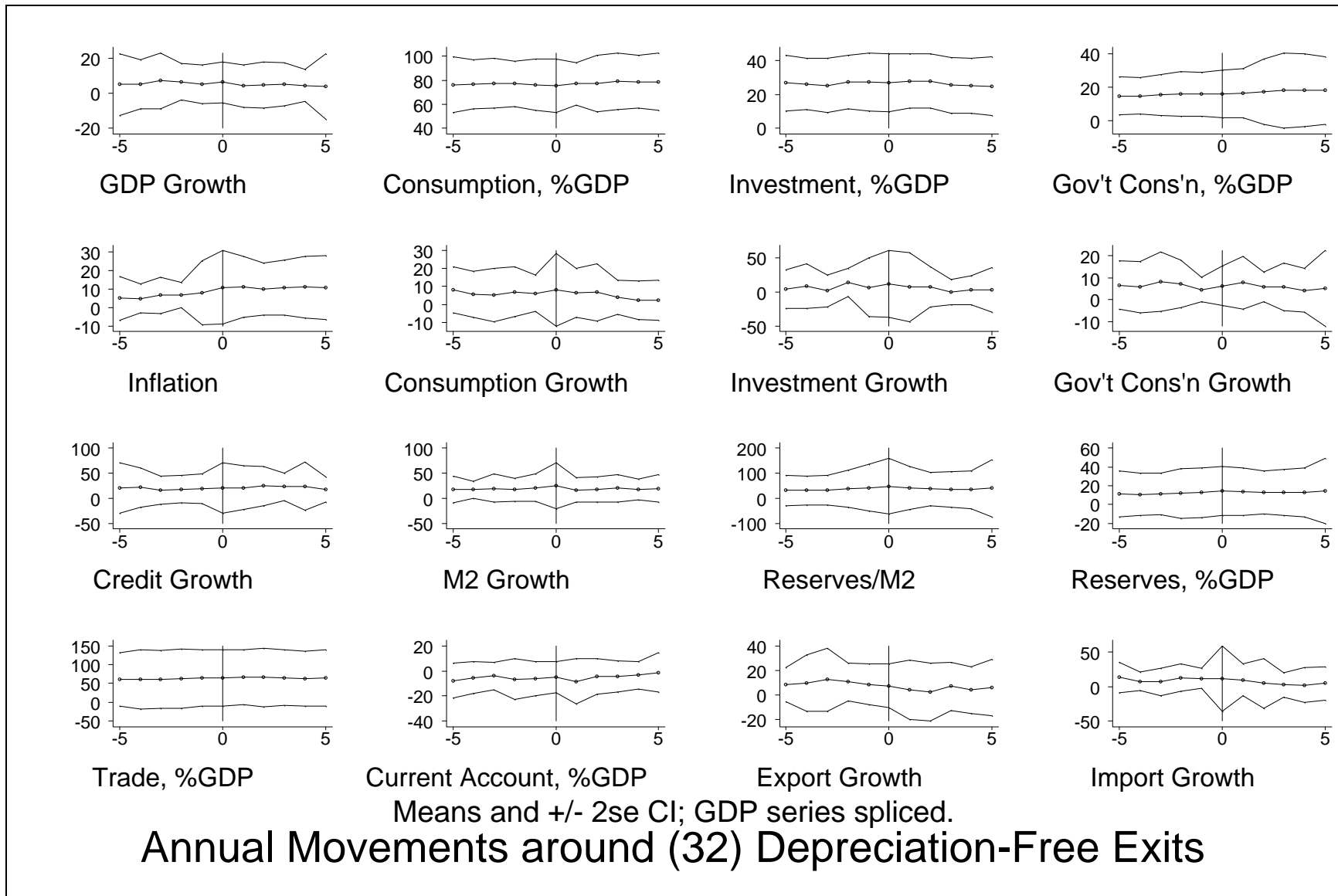
Figure 2: Event Study, Sensitivity Analysis
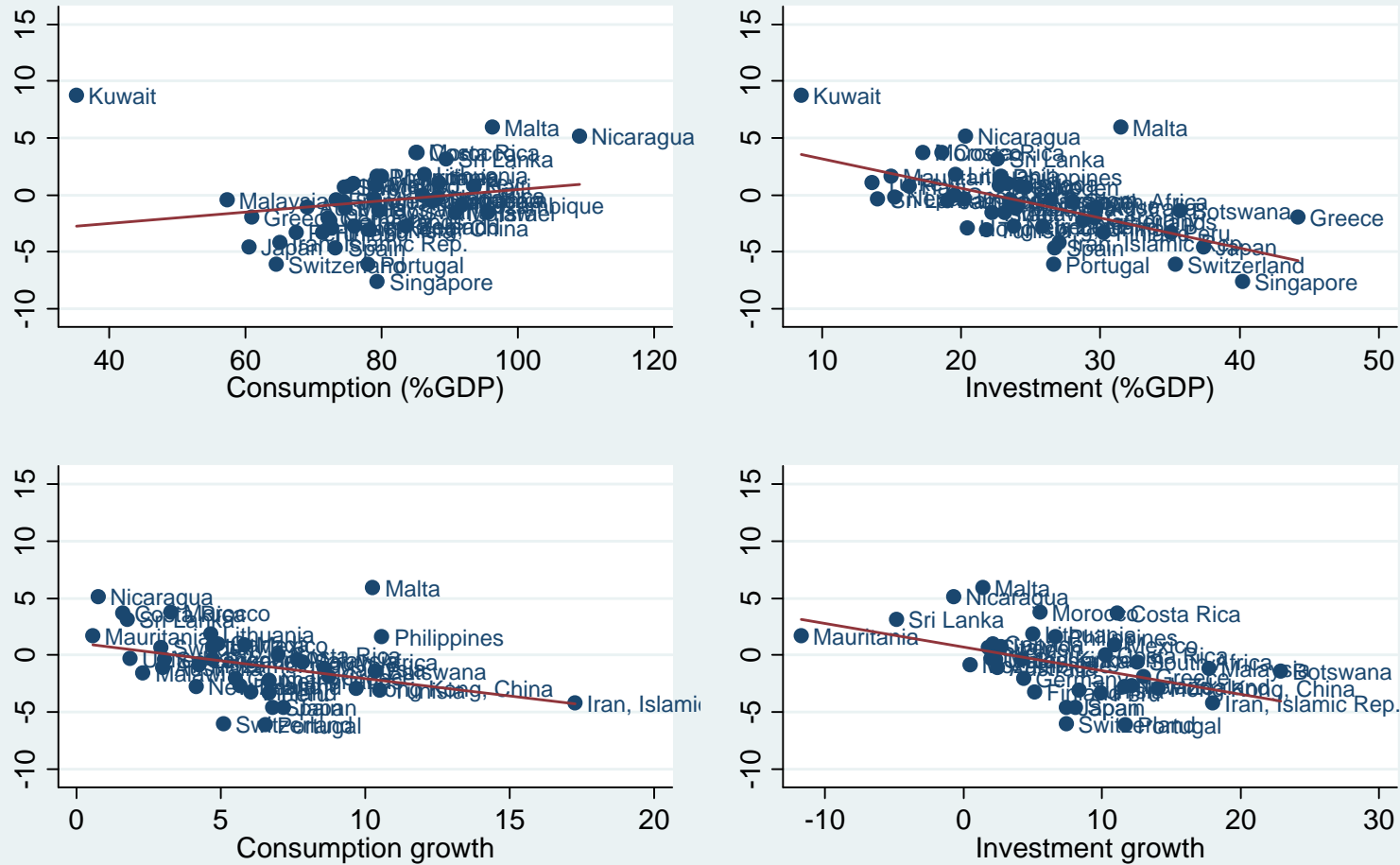
Figure 3: Growth Rate Scatterplots
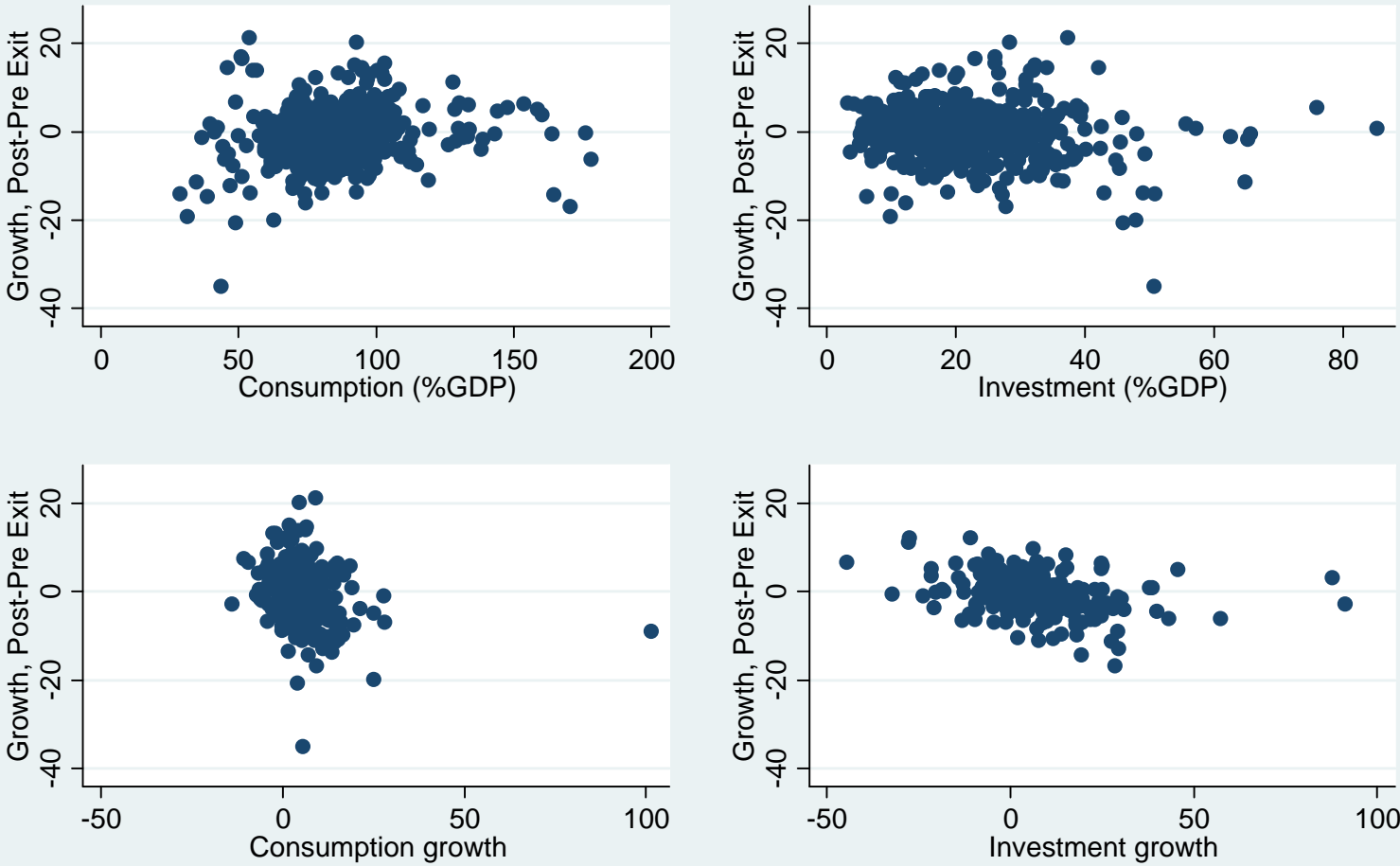
Figure 4: Growth Rate Scatterplots for Control Group of Long-Term Fixers
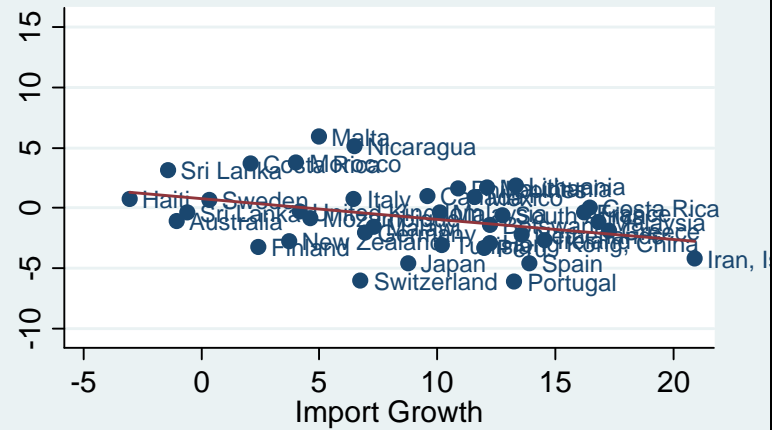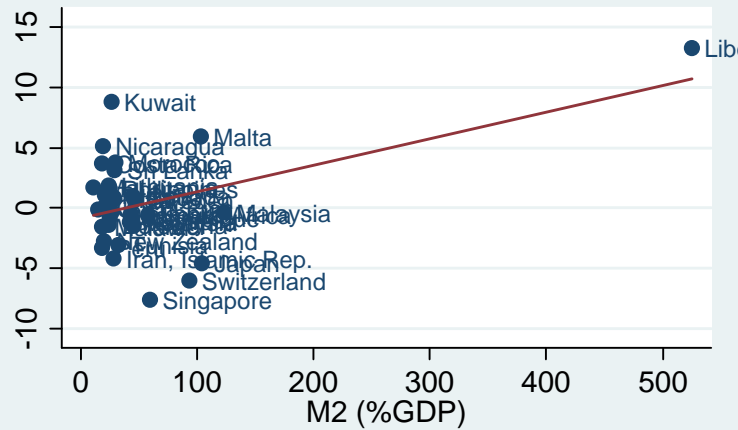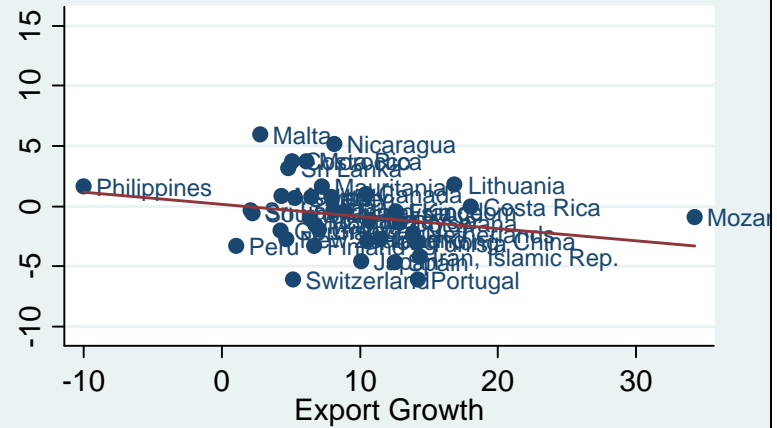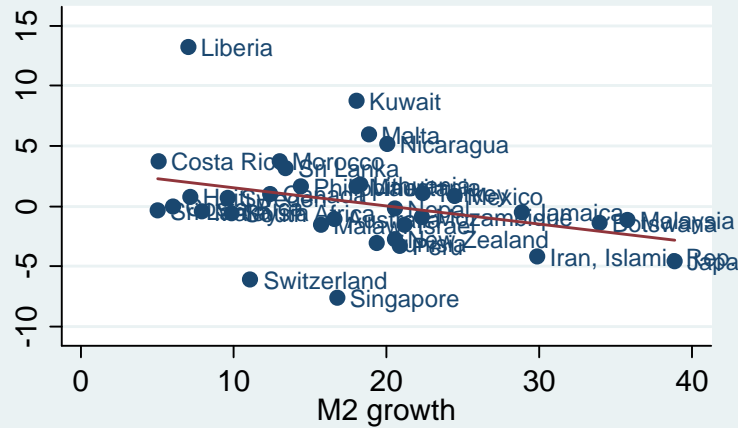
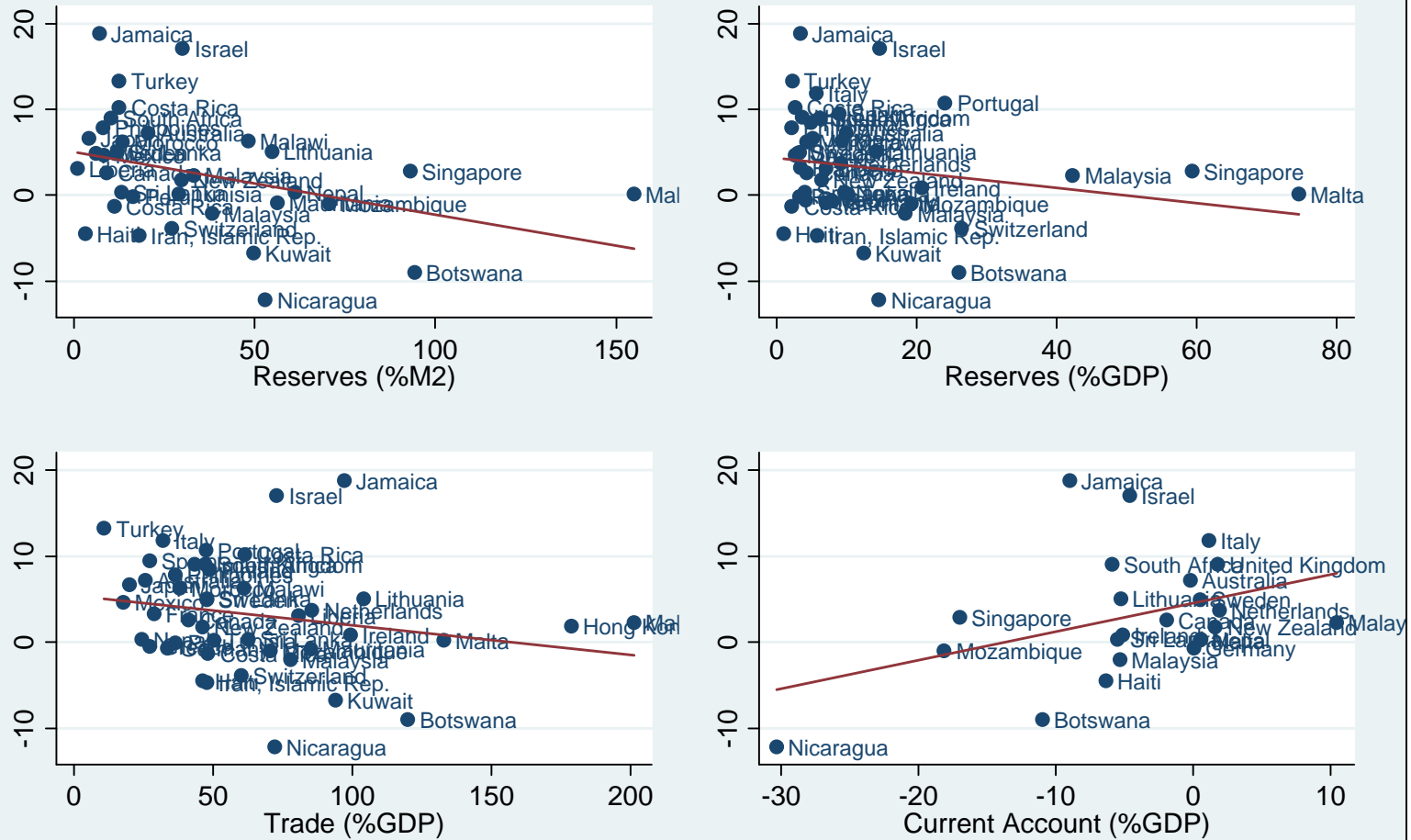**Figure 5: More Growth Rate Scatterplots**

Figure 6: Inflation Rate Scatterplots

Appendix: Selected Country Cases

Canada 1970

After more than a decade of floating, the Canadian dollar was pegged to the U.S. dollar at C$1.08 in 1962. In the wake of this decision, the economy then experienced an extended expansion. After a slight deceleration in 1967, activity picked up again in 1968 and 1969. Buoyed by exports to the United States, growth in these two years averaged 4.5.

Toward the end of 1968, U.S. growth then began slowing. With exports to the U.S. accounting for 70 per cent of Canada's exports, slower U.S. growth found reflection in Canada in the second half of 1969. Despite this, however, the Canadian economy continued to expand. Rising inflation spurred the Bank of Canada under Governor Louis Rasminsky to adopt more restrictive monetary policies starting in 1968. But capital inflows associated with relatively attractive interest rates of close to 8 per cent put further upward pressure on inflation.

Growth then decelerated further, to 2.4 per cent in 1970. The softening of domestic demand came mainly from the slower growth of durable goods spending (on new cars, new homes, and plant and equipment). Less demand meant slower import growth and more domestic production available for export – a stronger current account, in other words. In 1970, for the first time since 1952, Canada recorded a surplus. Exports grew by 10 per cent in real terms in 1970. Another change in 1970 was that much of this growth was in exports not to U.S. but to other OECD countries. Capital inflows combined by this current account surplus to put upward pressure on the Canadian dollar. Intervention to limit currency appreciation caused reserves to rise by US$1.1 billion.

This combination of circumstances made currency appreciation the obvious way of countering inflation. The decision to float the currency was taken in May of 1970. The Canadian dollar appreciated by 4 per cent in June; by September, cumulative appreciation had reached 6.4 per cent. By the end of 1970 the exchange rate had risen to US$ 0.989 per C$; and by the first quarter of 1971 the C$-US$ exchange rate came close to parity.

The float had the desired impact on inflation. Consumer prices rose by 3.3 per cent in 1970, down from an annual average of 4.1 per cent over the previous three years. And, notwithstanding the appreciation, 1971 through 1973 was again a period of strong growth. The driving force behind the expansion was now the domestic sector; foreign trade, influenced by currency appreciation, played less of a role. Private fixed investment strengthened, rising by nearly 12 per cent in 1973.

After the strong current surpluses of 1970-1971, the current account moved back into deficit with the appreciation of the Canadian dollar. That deficit was financed by strong capital inflows, both short and long term. As a result – and despite the current account deficit – there was again upward pressure on the exchange rate. By April 1974 the Canadian dollar had appreciated to US$ 1.0443 from the parity level in early 1972.

Spain 1973

Spain is an example of a country where flexing in 1974 was followed by a sharp deceleration in growth, which averaged fully 4.3 per cent less in the three years following the event than in the three before.

The instability of policies in the years surrounding the event arguably had a lot to do with this. Then decade preceding the end of the fixed exchange rate had seen sharp cyclical fluctuations. The government alternated between contractionary and expansionary policies in a not entirely successful effort to balance growth and inflation. A mid-1968 devaluation of the peseta then set off a feverish expansion which led to overheating of the economy. The government first reduced subsidies in an effort to moderate the boom in 1969, but returned thereafter to expansionary policies designed to goose investment and demand (increasing directed bank credit, reducing interest rates, providing tax-credits for capital expenditures, and boosting public spending). 1972 saw strong recovery but also rising inflation.

All the while, however, Spain ran persistent current account surpluses. Exports grew faster than in other neighboring European countries. In addition, there was a surge in tourism receipts and of remittances from Spaniards working abroad.

Spain was also a net importer of capital. Roughly two-thirds of inflows were foreign direct investment and purchases of land and buildings, one-third business borrowing. The net effect was a large accumulation of foreign reserves. But efforts to sterilize the impact of inflows were incompletely effective: inflation rose to 8 per cent in 1972. This then fed through into wages, which rose by 20 per cent, causing inflation to accelerate to 14 per cent in 1973.

Surpluses on current and capital account made flexing the obvious way of addressing the inflation problem. In February 1973, the authorities decided to maintain the parity of peseta against the SDR rather than devaluing along with the dollar. From Feb 13th the central rate for peseta against the dollar was set at 58.0263 pesetas instead of 64.4737.[30]

But the now stronger exchange rate, combined with higher oil prices and growing political uncertainty, resulted in a significant slowdown in growth, which fell from 7.5 per cent in 1970-73 to 2.7 per cent in 1973-76 and 2.4 per cent in 1977.[31] Public consumption was the only component of GDP that remained relatively steady over the period.

The external accounts weakened after 1973. While some of this may have been due to the flex, there was also a role for the deterioration in the terms of trade associated with the oil shock and global recession. Invisible income also declined starting in 1974. Thus, Spain's flexing was unfortunately timed, coinciding as it did with the end of a period of catch-up growth, rising political uncertainty, and an oil shock that led to sharply slower growth worldwide.

Sweden 1973

Swedish growth was sluggish from 1970 through 1973. The slowdown began in the second half of 1970; weakness on the domestic front reflected slow growth of both private and public consumption. Fixed investment rose, but more slowly than forecast.

1970 also saw a current account deficit, reflecting rapid rates of stock building with a high import content. Also contributing to the weaker external balance were abnormally high levels of expenditure on tourism. In 1971 domestic demand then slumped. Following the record deficit of 1970, 1971-1973 was a period of persistent balance of payments surpluses – surpluses that helped to prevent a larger drop in output and employment.

The economy stabilized in 1971-2, growing at an average annual rate of about 1 per cent. That slow output growth was accompanied by rising unemployment and additional spare

capacity. Reversing the trend of 1969-70, stock building declined and, given the high import content of inventories, import growth slowed. Real private consumption fell due primarily to a sharp rise in savings ratio.[32]

After the record current deficit of 1970, the balance of payments strengthened. 1971-2 saw substantial surpluses on current account and capital inflows. For the first time since 1951, Sweden recorded a trade surplus owing to the rapid growth of commodity exports.   Early 1973 then saw a further increase in reserves resulting from both higher capital imports and a sustained increase in the current surplus.

But the Swedish authorities considered the current account surplus to be temporary. They worried that the strong external position was being achieved at the expense of a relatively high rate of unemployment and underutilization of resources at home. On December 21, 1971, in response to the Smithsonian Agreement, they therefore pegged the krona at a rate of SKr4.8129 per USD, a 1 per cent reduction from its previous value in terms of gold. A few days later the government decided to avail itself of wider margins.

The currency then strengthened in 1972. By the time of the downward float of the pound sterling in May 1972, it had appreciated of 2.1 per cent on a nominal effective basis since December 1971. Effective February 15, 1973, the authorities then set the central rate of krona at SKR 4.56 per USD.[33] The krona depreciated by 5 per cent in relation to gold (and therefore other European countries) while appreciating by 5.5 per cent relative to the dollar.[34]

1973 was a year of disappointing growth. Against a forecast of 5 per cent, real GDP grew by only 3.4 per cent. Consumption grew slowly; real gross fixed investment stagnated; and

stocks fell further. The current balance improved further, reflecting weak domestic demand.

Inflation accelerated from 6 per cent in 1972 to 7 per cent in 1973, reflecting the effects of the

oil shock, but remained subdued by the standards of other OECD countries.

The economy then expanded in 1974, reflecting stronger domestic demand, even while

other developed countries experienced a marked slowdown. The contrast reflected

expansionary fiscal measures were undertaken to compensate for the income loss from the oil-

price induced deterioration in the terms of trade. As a result, gross fixed investment,

consumption and stock formation all grew faster. The improvement in domestic demand along

with weaker demand abroad and higher oil prices caused exports to fall short of forecasted

levels; and the current account surpluses of the previous year swung to a deficit.

Prior to the decision to flex the exchange rate, the external sector expanded at the

expense of its domestic demand; post flotation, public policies boosted domestic demand and

private investment at the expense of its foreign trade. Then in 1976 and 1977, while domestic

demand and employment remained robust in response to expansionary measures, the external

position deteriorated further. Initially the commodity price boom that benefitted Sweden was

counteracted through reductions in indirect taxes and increased subsidies. But eventually the

inflation rate, which was lower than the OCED average in preceding years, rose above the OECD

average rate in 1977 (to 11.5 per cent). Since 1975 unit labor costs had also grown at high rates

and were far above those in competitor countries. This made it harder for Sweden to turn

around its growing current deficits. Business fixed investment which had declined somewhat in

1975 declined even more during 1976 and 1977, with manufacturing investment showing a

sharper decline. By 1977 industrial production was in its fourth straight year of decline; and as capacity utilization dropped and the stock-support scheme was phased out, inventory formation was negative in 1976.

Thus, Sweden appears to be a case where not just the change in exchange rate regime but changes in other policies shaped the subsequent development of internal and external balance.

Malaysia 1973

Through the 1960s the Malaysian dollar (the ringitt from 1968) was pegged to the pound sterling.[35] The currency was also used by Singapore and Brunei under an interchangeability agreement.

Through 1971 the ringitt's parity rate was M$3.06 per pound sterling. The collapse of the Bretton Woods System then led sterling to be floated and the Sterling Area to be dismantled. At this point Malaysia decided to replace sterling with the US dollar as its reference currency. The rate for the Malaysian dollar was set at M$2.82/USD with a fluctuation band of +/-2.25%.

When after six months dollar volatility then rose further, the ringitt was revalued to M$2.54/USD. In the face of continuing uncertainty in foreign exchange markets and in an attempt to control inflation, the government allowed the ringgit to float upwards in June 1973; it quickly appreciated by some 5 per cent, with the central banking intervening only to ensure orderly market conditions.[36] In September 1975, in order to maintain stable exchange rates, it

was then decided that exchange rate would be managed relative to a basket comprised of currencies of the countries that were Malaysia's principal trading partners.

The context for these decisions was a period of strong expansion, interrupted temporarily by a slowdown in 1971. Strong growth made currency appreciation a logical instrument with which to fight inflation. Shortly after the first OPEC oil shock, the ringgit was revalued to limit the inflationary impact on the economy. In May 1973 the government enacted the Banking Act to provide the Bank Negara Malaysia (BNM) with greater flexibility in use of policy to promote monetary stability. Malaysia severed its financial ties with Singapore and Brunei by ending the interchangeability agreement. Groundwork was then laid for the establishment of a separate Malaysian stock and commodity exchange.[37]

At this point the Malaysian government decided to float the currency on a managed basis.[38] Inflation had surged from 3% in 1972 to more than 10% in 1973. Given relatively strong growth and the stimulus derived from strong commodity prices, the authorities opted for a more restrictive monetary policy, which was made possible by de-linking the currency from the dollar.[39] Inflation having averaged 17.4% in 1974, the rate of price increase then slowed to 12% in 1974. In 1975 consumer price inflation then slowed further to 4.5%.

The strong external position was the other thing that made floating the currency a logical response to the inflation problem. Exports surged in 1973, rising by 51 per cent from the year before. Strong recovery of the industrial world and large price increases for commodities were the major reasons for this growth. While the cyclical downswing in the OECD countries in 1974 caused export volumes to stagnate, strong increases in commodity prices boosted export

revenues by 42 per cent. The current account once again moved into deficit but strong net capital inflows, especially for the corporate sector, keeping the balance of payments in surplus overall.

Gross fixed investment and domestic demand both grew in 1976 but more slowly than external demand. Inflation was again contained, with consumer prices rising by less than 3 per cent in 1976 (with help from more slowly rising food prices). That happy outcome was repeated for four additional years, with inflation regularly below 5 per cent.

But the persistence in the worldwide slowdown and growing external imbalances of OECD countries meant that the high growth in exports could not be sustained over the following years. Exports growth rates remained relatively subdued at 13-15 per cent in 1977-1978 (down from 42 per cent in 1976). As in previous years, agricultural products continued to be the leading source of export earnings. The share of rubber, traditionally the economy's leading export, declined steadily, and was replaced by petroleum as the leading commodity export (thanks to high oil prices).

Appendix Table A1: List of Reinhart-Rogoff Countries and Territories

Afghanistan	Albania	Algeria	Amer. Samoa
Andorra	Angola	Anguilla	Antigua & Barbuda
Argentina	Armenia	Aruba	Australia
Austria	Azerbaijan	Bahamas	Bahrain
Bangladesh	Barbados	Belarus	Belgium
Belize	Benin	Bermuda	Bhutan
Bolivia	Bosnia & Herzegovina	Botswana	Br. Virgin Isl.
Brazil	Brunei	Bulgaria	Burkina Faso
Burundi	Car	Cambodia	Cameroon
Canada	Cape Verde	Cayman Isl.	Chad
Channel Isl.	Chile	China	Colombia
Comoros	Congo, PDR	Congo, Rep.	Cook Isl.
Costa Rica	Cote d'Ivoire	Croatia	Cuba
Cyprus	Czech Rep.	Czechoslovakia	Denmark
Djibouti	Dominica	Dominican Rep.	Ecuador
Egypt	El Salvador	Equatorial Guinea	Eritrea
Estonia	Ethiopia	Faeroe Isl.	Fiji
Finland	France	French Guyana	French Poly.
Gabon	Gambia	Georgia	Germany
Germany, East	Ghana	Gibraltar	Greece
Greenland	Grenada	Guadeloupe	Guam
Guatemala	Guinea	Guinea Bissau	Guyana
Haiti	Honduras	Hong Kong	Hungary
Iceland	India	Indonesia	Iran
Iraq	Ireland	Isle of Man	Israel
Italy	Jamaica	Japan	Jordan
Kazakhstan	Kenya	Kiribati	Korea
Korea, North	Kuwait	Kyrgyz Rep.	Lao
Latvia	Lebanon	Lesotho	Liberia
Libya	Liechtenstein	Lithuania	Luxembourg
Macao	Macedonia	Madagascar	Malawi
Malaysia	Maldives	Mali	Malta
Marshall Isl.	Martinique	Mauritania	Mauritius
Mayotte	Mexico	Micronesia	Moldova
Monaco	Mongolia	Montenegro	Morocco
Mozambique	Myanmar	N. Mariana Isl.	Namibia
Nepal	Netherlands	Netherlands Antilles	New Caledonia
New Zealand	Nicaragua	Niger	Nigeria
Niue	Norway	Oman	Pakistan
Palau	Panama	Papua new Guinea	Paraguay
Peru	Philippines	Poland	Portugal
Puerto Rico	Qatar	Reunion	Romania

Russia	Rwanda	Samoa	San Marino
Sao Tome& Principe	Saudi Arabia	Senegal	Serbia
Seychelles	Sierra Leone	Singapore	Slovak Republic
Slovenia	Solomon Isl.	Somalia	South Africa
Soviet Union	Spain	Sri Lanka	St. Kitts & Nevis
St. Lucia	St. Vincent & Gren.	Sudan	Suriname
Swaziland	Sweden	Switzerland	Syria
Taiwan	Tajikistan	Tanzania	Thailand
Togo	Tonga	Trinidad & Tobago	Tunisia
Turkey	Turkmenistan	Turks and Caicos	UAE
UK	USA	Uganda	Ukraine
Uruguay	Uzbekistan	Vanuatu	Venezuela
Vietnam	Vietnam, D.R.	Virgin Isl.	West Bank & Gaza
Yemen	Yemen, A.R.	Yemen, D.R.	Yugoslavia
Zaire	Zambia	Zimbabwe	

Endnotes

[1] The argument in the literature is that more currency flexibility introduces a healthy element of uncertainty useful for slowing carry-trade-related flows. In addition, currency appreciation in the period when capital is flowing in dampens the tendency toward domestic overheating, while depreciation crowds in external demand when capital flows turn around and domestic demand softens.

[2] Or so it is argued.

[3] Hereafter "countries."

[4] Or at least not depreciate noticeably.

[5] Nor are we concerned with discrete devaluations (and revaluations) not accompanied by a change in the regime in the direction of greater flexibility. Revaluation cases are considered in the Kappler, Reisen, Schularick and Turkisch (2011) study cited above, while a large literature starting with Cooper (1971) studies the impact of discrete devaluations.

[6] In some sense, we are interested in investigating the symmetry of appreciating and depreciating switches out of fixed exchange rate regimes. We note that the international community plays lip-service to the idea that appreciating and depreciating exits should be treated symmetrically; the principle is, for instance, explicitly mentioned in Article IV Section 4 of the IMF's original articles of agreement.

[7] Again we have China in mind. In other words, we construct the sample this way because we think this is how China is likely to navigate the transition to greater flexibility: by allowing the exchange rate to fluctuate more freely – perhaps in both directions – but not by going for a sharp step appreciation.

[8] Merriam Webster's on line dictionary defines the term as "bending especially repeatedly."

[9] The literature studying the link between the exchange rate regime and economic growth, which is necessarily concerned with these long-horizon effects, does not provide much support for the hypothesis that some exchange rate regimes are better than others from a long-term growth perspective. See inter alia Ghosh, Gulde and Wolf (2003).

[10] In recognition of its de facto resemblance to the original Bretton Woods System.

[11] We check for influential outliers in what follows.

[12] An alternative option, suggested by Steinar Holden, is to acknowledge that there are few big appreciations out of fixes, and instead examine big appreciations that did not accompany a switch in the exchange rate regime. We leave this task to future researchers.

[13] The other eleven regimes are: pre announced crawling peg; pre announced crawling band that is narrower than or equal to +/-2%; de facto crawling peg; de facto crawling band that is narrower than or equal to +/-2%; pre announced crawling band that is wider than or equal to +/-2%; de facto crawling band that is narrower than or equal to +/-5%; moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time); managed floating; freely floating; freely falling; and dual market in which parallel market data is missing.

[14] We exclude cases where a country moved away from its fix and began to "freely fall" in an inflationary spiral. We also exclude observations where a dual market existed but parallel market data is missing.

[15] For most of its history. Construction of this index differs somewhat now.

[16] All of which are disadvantages for our purposes.

[17] We exclude cases where a country moved away from its fix and began to "freely fall" in an inflationary spiral. We also exclude observations where a dual market existed but parallel market data is missing.

[18] We use IFS data for end of period exchange rates, "ae" for the price of an American dollar and "aa" for the price of a SDR. It would be desirable to look also at real effective exchange rates. Unfortunately these data are available for only a small subset (five) of the relevant observations.

[19] Details are available online at http://faculty.haas.berkeley.edu/arose/.

[20] China in 2005 is not counted as a flex because Reinhart and Rogoff do not code it as a regime change.

[21] Some onlookers believe that the Chinese Yuan would appreciate considerably if allowed to float freely.

[22] We describe the background and context for a few of these cases in the appendix below.

[23] See our reference to the work of McKinnon and Schnabl (2006) above.

[24] Indeed they sometimes do not have any national money at all; Rose (2011).

[25] In other words, its significance in these regressions is not relevant to the question at hand. This said, that this variable enters significantly is also reassuring in the sense that they indicate that our methodology is capable of finding significant effects of economic variables on exchange rate regime transitions, so long as they are truly relevant.

[26] We have also examined a range of other variables with comparably weak results.

[27] And in some cases they work against the conclusion in the text.

[28] That for Nicaragua in 1993.

[29] Recall that we are considering exits up rather than the more conventional regime collapses followed by currency crashes.

[30] When the dollar appreciated in March-April and then depreciated in June-July, the Spanish authorities opted to follow the dollar. Thereafter they considered the depreciation of peseta excessive and widened the limits for central bank intervention, moving them closer to the lower edge of IMF fluctuation band.

[31] This period coincided with the first oil shock, but the latter was not the entire story: Spanish GDP growth rates during the latter period were only slightly higher than OECD average growth rate whereas in the past they used to considerable higher than average OECD rates.

[32] From 3.5 per cent in 1970 to 5.8 per cent in 1971-72. However, business fixed investment responded to the strong pro-investment measures implemented by the government and fluctuated counter-cyclically in 1971-1972.

[33] Equivalent to 0.161549 grams of gold per SKr.

[34] Sweden then joined the Snake in March 1973. As a result the krona was stable against the German mark for the next two years.

[35] "Pegging the Ringitt Against the US dollar", Abdul Latib Talib.

[36] And to avoid excessive fluctuations in the value of the ringitt away from the M$2.50-M$2.60 per US dollar range.

[37] Mainly for rubber.

[38] "Money and Banking in Malaysia", Bank Negara Malaysia, 1989, pages 50-51.

[39] The government also adopted more restrictive fiscal and credit policies, including export taxes, credit growth ceilings and fiscal restraints.