

# In Search of the Macroeconomic Effects of Capital Account Liberalization

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October 1998

(Preliminary and incomplete, comments welcome)

*Empirical evidence on the macroeconomic benefits of capital account liberalization is scarce. This paper considers two popular explanations of this phenomenon: (i) that any benefits of capital account liberalization are offset by the greater volatility it brings; and (ii) that the benefits of capital account liberalization can only be realized in countries with sound institutions and policies. Neither of these explanations withstands empirical scrutiny.*

The financial turmoil in East Asia has given new prominence to the debate over the merits of capital account liberalization versus stronger restrictions on international capital movements. On the one hand, prominent economists such as Paul Krugman have argued in favour of capital controls as a means to “buy time” during periods of speculative pressures (Krugman (1998)), and Dani Rodrik has gone so far as to provocatively entitle a recent paper “Who Needs Capital Account Convertibility?” (Rodrik (1998)). On the other hand, the International Monetary Fund is actively taking steps towards enshrining full capital account convertibility in its Articles of Agreement, citing the benefits to the world economy in the form of enhanced opportunities for risk diversification, a more efficient global allocation of investment, and a valuable external discipline on domestic macroeconomic policies.

It is somewhat surprising that, despite the often heated debate over the effects of capital controls and the benefits of their removal, there is little empirical evidence in support of the proposition that they have significant real effects on macroeconomic outcomes. In a recent survey of the theoretical and empirical literature, Dooley (1996) notes that capital controls have helped to drive a wedge between domestic and foreign interest rates, but otherwise that “..there is no evidence that controls have enhanced

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<sup>1</sup> I am grateful to Gian-Maria Milesi-Ferretti and Dennis Quinn for kindly providing data on capital controls in electronic form.

domestic welfare in a manner suggested by theory”.<sup>2</sup> Similarly, Grilli and Milesi-Ferretti (1995) and Rodrik (1998) find no significant association between capital controls and long-run growth and investment in large cross-sections of countries. At best, there is some evidence in favour of the idea that financial openness provides external discipline, in the sense that Grilli and Milesi-Ferretti (1995) find that inflation is lower in more financially open economies, although this finding is not confirmed by Rodrik (1998).

A few more recent studies place capital account liberalization in a somewhat better light. Quinn (1997) finds that the *change* in an index of financial openness over 1960-1989 is correlated with growth over the same period in a cross-section of countries, while Henry (1997) presents evidence that opening stock markets to foreign participation in a sample of developing countries is associated with subsequent investment booms. Although these results appear to point to the benefits of capital account liberalization, an endogeneity problem clouds the interpretation of the results: to the extent that capital account liberalization itself is either (i) more likely to occur in good times than in bad, or (ii) positively correlated with other growth-enhancing policies, it is difficult to separate out the direct effects of liberalization itself.<sup>3</sup>

This paper considers two possible explanations why the empirical evidence on the macroeconomic effects of capital account liberalization has been so elusive. First, foes of capital account liberalization often argue that the removal of capital controls leaves countries more vulnerable to sudden and destabilizing reversals in capital flows. As stressed by Radelet and Sachs (1998) in the case of the recent crisis in Asia, these reversals can be spectacularly large: in 1997 the five Asian countries hardest hit by the crisis experienced a reversal of private capital inflows of more than \$100 billion, or more than 10 percent of their combined GDP. If such extreme reversals are more likely in

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<sup>2</sup> There is also some evidence that capital controls have succeeded in altering the composition of flows (Johnston and Ryan (1994)). However, it is far from clear whether these changes are real, or whether they simply consist of a “relabelling” of flows across categories in response to restrictions on certain categories of inflows or outflows.

<sup>3</sup> Quinn (1997) does address the second concern, by first including a few “core” growth determinants in his regressions (initial income, investment, population growth and secondary-school enrollment rates), and by performing an extreme-bounds analysis of the robustness of his results to the inclusion of government consumption, political instability and regional dummies. However, the results appear to depend substantially on the sample period considered, and are not robust to alternative measures of financial openness.

financially open economies, and moreover if they are much larger than can be justified by the rational reallocation of investment in response to changes in domestic productivity, financially open regimes may experience significantly higher volatility than closed regimes. To the extent that greater volatility depresses investment and/or growth (Pindyck and Solimano (1993), Ramey and Ramey (1995)), any benefits of capital account liberalization may be well be offset by the greater volatility it brings.

Second, even advocates of capital account liberalization recognize that liberalization can expose the vulnerabilities of a weak domestic financial system (see for example Garber (1998)). To the extent that capital account liberalization places pressures on weak domestic banks, and to the extent that adequate prudential supervision is absent, liberalization can encourage individually rational but socially harmful activities such as excessive risk-taking and “gambling for redemption” which can culminate in full-blown and costly banking crises. As a result, any benefits of capital account liberalization may easily be obscured by the costs of the greater financial fragility it brings, especially in economies with poorly-regulated financial sectors. More generally, one might expect the benefits of capital account liberalization to be more pronounced in countries characterized by a sound macroeconomic framework and strong institutions. If this is the case, the lack of strong empirical evidence on the benefits of capital account liberalization may simply be due to the fact that previous research has not considered the role of policies and institutions in intermediating the effects of capital account liberalization on growth or investment.<sup>4</sup>

This paper undertakes a systematic examination of these two hypotheses, using a combination of cross-sectional and event-study analysis covering a large sample of developed and developing countries. My primary interest is in the medium- to long-run macroeconomic benefits of capital account liberalization, as summarized by its effects on growth, investment and inflation. I do not consider the equally-interesting question of

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<sup>4</sup> An interesting examination of these issues in the context of domestic financial liberalization may be found in Demirguc-Kunt and Detragiache (1998), who study the effects of interest rate liberalization on financial development and growth. They find that financial liberalization tends to lead to banking crises, although less so in countries with sound institutions. Nevertheless, liberalization also improves financial depth, and in countries with sufficient financial repression, the growth benefits of greater financial depth dominate the growth costs of banking crises, resulting in a net positive growth impact of domestic financial liberalization.

the role of capital controls in mitigating the adverse effects of financial crises.<sup>5</sup> I first verify the generally weak link between these key macroeconomic indicators and several measures of financial openness. I then consider the empirical evidence that financial openness is associated with higher volatility, which is a necessary first step in the argument that the benefits of capital account liberalization are offset by the greater volatility it brings. Although there is some evidence that capital account liberalization is associated with a shift in the composition of a country's external obligations towards more short-term liabilities, there is surprisingly little evidence that an array of measures of volatility is systematically higher in financially open economies than in closed ones, casting doubt on the first argument. Finally I construct a number of indicators of the strength of the financial system, financial regulation, and quality of policies and institutions, and examine the role of these factors in mediating the relationship between financial openness and macroeconomic outcomes. Here again, statistically significant evidence that capital account liberalization is successful in countries with good policies and institutions is scarce.

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<sup>5</sup> On this, see Eichengreen, Rose and Wyplosz (1996), who provide empirical evidence from a sample of developed countries that controls have some effect, in the sense that the behaviour of macroeconomic variables around crisis episodes during which capital controls were in place was significantly different from non-control episodes, with worse fiscal and monetary outcomes in the presence of controls. However, they find that capital controls do not reduce the probability of speculative attacks themselves.

## 2. Measuring Financial Openness

Measuring financial openness is difficult. The cross-country analysis in this paper relies on three alternative and not entirely satisfactory measures. I first consider data on the presence of controls on payments in respect of capital account transactions as reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. This source covers all IMF member nations over the period 1966-1995.<sup>6</sup> The disadvantages of this binary indicator are well-known. In particular, it measures the *presence* rather than the *intensity* of controls, and moreover it measures controls on residents, rather than non-residents. Despite these weaknesses, this indicator is generally thought to be correlated with the presence of capital controls in general, and it has been widely used in the literature. A further advantage is that this data is available on an annual basis for a large number of countries.

As a second indicator, I employ a measure of financial openness developed by Quinn (1997). He constructs a more quantitative indicator of controls by assigning numerical scores to various aspects of the country descriptions of rules governing capital account transactions reported in the IMF Annual Report on Exchange Arrangements and Exchange Restrictions.<sup>7</sup> The advantage of this measure is that it provides information on the intensity of controls, and moreover covers controls on non-residents as well as residents. Unfortunately, this measure is available only for 64 countries, and at present only for 1958, 1973 and 1988.

Finally, I use data on actual capital inflows and outflows as an "outcome" indicator of financial openness, analogous to the practice of using trade volumes as a measure of trade openness. In particular, I construct the sum of the inward and outward

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<sup>6</sup> I am grateful to Gian Maria Milesi-Ferretti for kindly providing this data in electronic form. The format of the Report changed in 1996, providing greater detail on the nature of capital controls, but is unfortunately not comparable to previous years. Some authors have used data on the presence of export surrender requirements and multiple exchange rates available in earlier volumes of this Report as proxies for capital controls.

<sup>7</sup> I am grateful to Dennis Quinn for kindly providing this data.

foreign direct investment, portfolio investment and other investment items in the financial account of the balance of payments, as a share of GDP.<sup>8</sup>

Figure 1 plots the frequency distribution of the three measures of financial openness, where the first and third measures are averaged over all years for which data is available between 1985 and 1997.<sup>9</sup> Of the 117 countries in my sample for which IMF data on capital controls is available, 77 countries report capital controls in every year, 20 in no years, and for only 20 countries is there any time-series variation in this indicator over the 1985-97 period. The two other measures of financial openness exhibit much greater cross-sectional variation in the smaller sets of countries for which data is available (64 and 94 countries, respectively). Figure 2 plots the bivariate relationships between these three variables. Although the three indicators measure the same broad concept of financial openness, they are far from perfectly correlated with each other, with pairwise correlations ranging from 0.32 to 0.73. To the extent that the lack of perfect correlation between these indicators reflects the fact that they capture different aspects of financial openness, it will be useful to consider all three indicators of openness.

I complement the cross-country analysis by examining a number of capital account liberalization episodes. These events are defined in terms of the IMF's indicator variables for capital controls, as follows: for all countries for which data is available, I identify liberalization episodes as years that are *preceded* by five consecutive years of capital controls, and are *followed* by five consecutive years of no controls. In addition, I include several countries which removed capital controls in the 1990s but do not fit the basic definition since we do not have data on the absence of controls for five years following these liberalization episodes. I then compare the behaviour of variables of interest before liberalization with their behaviour following liberalization. In addition, I consider episodes of imposition of capital controls, since such episodes will also provide

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<sup>8</sup> One can always refine this simple volume-based measure of openness by instead measuring openness as gross flows in excess of what is predicted by the basic structural characteristics of the source and recipient economies (similar to the approach of measuring trade openness as residuals from an empirical Heckscher-Ohlin model, see Leamer (1988), or from a gravity model, see Frankel and Romer (1996)).

<sup>9</sup> Throughout the paper, I only compute averages of variables if at least six annual observations are available. As a result, the sample excludes many of the recently-independent states of the former Soviet Union, as well as several countries in Eastern Europe. I further restrict the sample to those countries with populations greater than 1 million.

information on the within-country variation in macroeconomic variables of interest in response to the imposition, rather than the lifting, of capital controls. In particular, I symmetrically define “closing” episodes as five years of no controls followed by five years of controls. This methodology yields 28 liberalization episodes and 14 “closing” episodes, and are listed in Table 1.

Both the cross-sectional and the event-study methodology employed in this paper are plagued by the problem that capital controls are not exogenous. It is useful to distinguish between two sources of this endogeneity problem. The first is that policymakers may impose capital controls in response to cyclical fluctuations. In general it is difficult to sign the direction of the bias that this creates. If countries relax controls in “good” times and impose them in “bad” times, one would expect to find a spuriously large positive effect of liberalization on “goods” such as growth or investment.<sup>10</sup> Similarly, if countries tend to react to periods of highly volatile capital flows with capital controls, one might be lead to the conclusion that capital account liberalization reduces the volatility of capital flows. However, the results of Cardoso and Goldfajn (1997) for Brazil suggest that the endogeneity bias could also go the other way. They find that in Brazil, capital controls were procyclical, tightening during booms and relaxing during periods of distress. In this case, the endogeneity bias is likely to obscure any beneficial effects of capital controls on growth, for example.

A second source of endogeneity is that capital controls may be correlated with other fundamental determinants of growth, investment and inflation. For example, Grilli and Milesi-Ferretti (1995) observe that countries with small public sectors and relatively independent central banks are less likely to impose capital controls, as measured by the IMF’s indicator variables. To the extent that small public sectors and independent central banks have a direct beneficial impact on growth and/or inflation, it is easy to overstate the benefits of capital account liberalization on these variables.

As always, it is difficult to adequately address the problem of endogeneity. The advantage of the cross-sectional approach is that by concentrating on long-run averages of variables over periods of ten years or more, the results are less likely to be tainted by

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<sup>10</sup> This point is noted by Rodrik (1998) in defense of his (uninstrumented) results.

the type of cyclical endogeneity emphasized by Cardoso and Goldfajn (1997). However, the results are much more susceptible to the second source of endogeneity bias, since it is virtually impossible to control for all of the other determinants of growth which may also be correlated with capital controls. As a crude correction for this problem, I use lags of the relevant financial openness measures as instruments for current financial openness.<sup>11</sup> Given that measures of financial openness are quite persistent over time, past openness is strongly correlated with current openness. However, to be a valid instrument, lagged financial openness must only be correlated with current outcomes through its effect on current openness. To the extent that the correlation between current and lagged financial openness is attributable to unobservable and relatively time-invariant country characteristics, this assumption will of course not be valid.

On the other hand, the advantage of the event-study method is that it relies only on within-country variation around liberalization episodes. In this way, the problems of endogeneity associated with unobservable time-invariant country characteristics that are correlated with capital controls is mitigated. However, the results are more susceptible to the problem of cyclical endogeneity of capital controls. Finding suitable instruments for policy is even more difficult, especially given that lagged policy over short horizons is an even less convincing instrument than in the cross-sectional analysis. As important, the relatively small number of event-study episodes for which data on relevant variables is available is very small, so that any estimation procedure which attempts to control for this will have serious degrees-of-freedom problems. Given these constraints, the event study analysis is very simple, and consists of simple non-parametric tests based on the direction of changes in variables of interest around these episodes, and the results should be interpreted with caution.

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<sup>11</sup> A more satisfactory and also more ambitious way to treat the problem of endogeneity would be to simultaneously estimate two equations describing the determinants and the effects of capital account liberalization (for an example in the context of trade liberalization, see Treffer (1993)).

### 3. Financial Openness and Macroeconomic Outcomes

In this section, I document the relationship between financial openness and growth, domestic investment and inflation. Before delving into the empirical evidence, it is worth considering carefully the predictions of theory for the effects of capital account liberalization on these variables. Proponents of capital account liberalization point to three benefits: (i) improved opportunities for risk diversification through international risk-sharing arrangements; (ii) a more efficient global allocation of investment, and (iii) greater discipline on domestic policymakers (see for example Mathieson and Rojas-Suarez (1993), Quirk and Evans (1995), Eichengreen and Mussa (1998), Fischer (1998)). The links between the first two benefits and investment and growth are not immediate. Greater opportunities for risk sharing as a result of capital account liberalization need not raise domestic investment, since risk sharing implies that both capital inflows and capital outflows will increase as foreigners and domestic residents diversify their portfolios of assets. In any case, the gains from international risk sharing have been estimated to be very small, on the order of less than two percent of lifetime income (Tesar and Werner (1995)), so that the associated inflows and outflows and hence also the net effects are likely also to be small.<sup>12</sup> Nevertheless, it is possible that improved opportunities for diversification enable agents to undertake riskier projects with commensurately higher returns, resulting in higher domestic GDP growth (Obstfeld (1994), Acemoglu and Zilibotti (1997)).

Similarly, it is not immediately obvious that the efficient global allocation of investment argument implies higher investment and/or growth in a given country which removes capital controls. In particular, standard models of international portfolio choice suggest that investment should increase only in liberalizing countries where risk-adjusted returns exceed the world average, as world stocks of capital are reallocated towards countries with higher returns. In countries with low risk-adjusted returns, investment will decrease as stocks of capital are reallocated away from low-return countries.

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<sup>12</sup> Interestingly, Lewis (1997) does find suggestive evidence that risk sharing is higher in countries without capital controls (according to the IMF measure), in the sense that consumption is less correlated with income in countries without controls. Moreover, Lewis (1996) points out

Perhaps the most straightforward argument is the one for policy discipline, particularly with respect to monetary and fiscal policy. As discussed by Grilli and Milesi-Ferretti (1995), since capital controls limit domestic residents' ability to hold foreign currencies, they also limit their ability to avoid inflation taxes, which in turn may impart an expansionary bias to monetary policy. Similarly, to the extent that capital controls can enforce lower domestic interest rates, they lower the cost of domestic borrowing and hence may impart an expansionary bias to (debt-financed) public expenditures.

### **Cross-Sectional Results**

For the cross-sectional analysis, I in turn regress each variable of interest on each of the financial openness measures in turn, and a set of control variables. The dependent variables are real per capita GDP growth, real per capita GNP growth, gross domestic investment as a fraction of GDP, and the logarithm of the average annual CPI inflation rate, all over the period 1985-1997. The control variables consist of averages over 1985-1997 of the logarithm of per capita GDP at PPP, population growth and secondary school enrollment rates, and a set of regional dummies. I estimate these regressions using ordinary least squares (OLS), and also instrumenting for financial openness using its own average value over the previous ten years 1975-1984 as an instrument (IV).<sup>13</sup>

The results are presented in Table 2. Throughout the paper, I adopt the following convention for reporting results. To conserve on space, I report only the coefficients on the relevant financial openness variables, and not the set of control variables. If neither the OLS nor the instrumental variables results are statistically significant at the 10 percent level or better, I report only the sign of the estimated OLS coefficient. Significant OLS coefficient estimates are reported in regular font, and significant IV coefficient estimates are reported in bold font. In case where both the OLS and IV results are reported, only the IV results are reported, and are indicated with an asterisk.

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that the gains from international risk sharing are substantially larger when one considers the cross-country variation in stock returns.

<sup>13</sup> Averages are taken over years for which data is available. I exclude all observations which are not based on at least five annual data points.

The results in Table 2 are generally consistent with those existing in the literature. There is very little evidence that growth or investment are higher in more financially open economies. Only using the final volume indicator of financial openness are the OLS results for GDP growth positive and statistically significant. The evidence in favour of the policy discipline argument is slightly better. In all cases, the sign of the effect is negative, with more open economies having lower inflation. However, only in the full sample and using the IMF measure of openness are the results robust to instrumenting for the possible endogeneity of capital controls.

Before giving up entirely on the investment and growth results, it is worth considering two possibilities. The first is that, as noted above, one should only expect that investment and growth might increase in countries with risk-adjusted returns greater than the world average. Measurement of risk-adjusted returns presents a host of difficulties. An alternative approach is to use information on a country's international investment position as an indicator of a country's attractiveness to investment relative to the rest of the world. In particular, one would expect that in high-return countries, foreigners' claims on domestic assets will exceed residents' claims on foreign assets.<sup>14</sup> Unfortunately, such data is also difficult to come by for a large sample of countries. Instead, I use flow data on the average balance on the financial account of the balance of payments over 1985-1997 as a rough proxy for the stock of net claims, and interact this variable with the three measures of financial openness.

The results of this extension are reported in the first half of Table 3, and are somewhat more favourable to the idea that capital account liberalization is growth enhancing. Using the IMF measure of openness, the coefficient on the interaction between openness and this proxy for returns is statistically significant in both the full sample and the OECD sample, and also after instrumenting for the possible endogeneity of policy. That is, the growth impact of financial openness is larger in countries that are net capital importers. However, the results do not hold using the two alternative measures of policy, and do not appear to operate through the effect of liberalization on investment. In fact, the estimated coefficient on the interaction between financial

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<sup>14</sup> See for example Kraay and Ventura (1997) for a world equilibrium model in which develops this idea.

openness and returns is significant in only one specification, and often both openness and its interaction actually enter negatively, although insignificantly so.

A second possibility is that capital account liberalization affects the level, but not the growth rate, of income and production. To assess this possibility, I regress per capita GDP growth and GNP growth (i.e. the *change* in the log-level of income) over 1985-1997 on the *change* in financial openness over the same period, and the same set of control variables as before. These results are reported in the bottom half of Table 3 using the IMF and volume measures of openness only, since I only have one observation on the Quinn measure in the 1985-97 period. The results are not very supportive of the hypothesis that liberalization has level effects on income. In contrast to the results of Quinn (1997), I find that in no case is the *change* in financial openness according to these measures over the past decade is significantly related growth.

### **Event Study Results**

I now turn to the sample of liberalization and closing events defined earlier. For each dependent variable of interest, I compute the effect of capital account liberalization as the difference between its average value in the three years immediately following each liberalization episode relative to its average value in the three years before the liberalization episode. For closing episodes, I symmetrically define the effect of liberalization on a variable as its average value in the three years *prior* to the closing episode minus its average value in the three years following the closing episode. Since there are many missing values in the data, the three year window is chosen to ensure a reasonably large number of events while still relying on some degree of averaging to smooth cyclical fluctuations in the data. I then summarize the effects of liberalization by counting the number of episodes in which each variable increases. The first four columns of Table 4 report the number of episodes in which the indicated variable increases and decreases, and the median increase and decrease. To assess the significance of the results, the final column tests the natural null hypothesis of no effect of capital account liberalization, by reporting the p-value of a test that the proportion of increases is equal to the number of decreases.

The event study results corroborate the cross-sectional evidence, in the sense that capital account liberalization does not appear to have much of a statistically significant effect on growth, investment and inflation. Although capital account liberalizations are followed by higher per capita GNP growth in 18 out of 31 cases, and higher GDP growth in 22 out of 36 cases, these proportions are not significantly different from one-half at conventional significance levels. Investment increases following 22 out of 35 episodes, and inflation decreases in 22 of 37 episodes. Again, although the direction of these effects accords with the benefits of capital account liberalization, the effects are not statistically very significant. Finally, as noted earlier, the problem of cyclical endogeneity of controls is likely to be particularly acute in this event-study analysis, so that the results should be interpreted with particular caution.

In summary, there is little evidence, either within or across countries, that the absence of capital controls is significantly associated with higher growth or investment, or lower inflation. In the following sections, I consider whether this lack of evidence can be ascribed either to the greater volatility liberalization brings, or to the absence of supporting policies and institutions.

## **4. Financial Openness and Volatility**

In this section, I consider the hypothesis that the apparent absence of a strong positive relationship between capital account liberalization and “goods” such as growth or investment can be attributed to the offsetting negative effects of the greater uncertainties that capital account liberalization brings. In particular, it is often argued that the removal of capital controls leaves economies more susceptible to sudden reversals in capital flows, as dramatically illustrated by several East Asian economies in 1997-98. This may be because the removal of capital controls results in a shift in the composition of external obligations towards more short-term and easily-reversible forms of finance, perhaps because such forms of flows were previously restricted. It may also be because in the final stages of capital account liberalization, controls on outflows are relaxed, making it easier for domestic and foreign capital to flee a country in the case of a crisis. Whatever the exact reason for the increase in volatility, it is plausible that this has negative effects on investment and/or growth which obscure any direct beneficial impact of liberalization.

I consider the evidence on financial openness and volatility in three steps. I first consider the argument that capital account liberalization leads to a shift in the maturity composition of external obligations. There is some modest evidence that this is the case, with financially open economies owing relatively more short-term bank debt, and receiving less foreign direct investment relative to other forms of capital. I next examine whether short-term debt flows and non-FDI inflows are in fact more volatile than long-term debt and FDI inflows, and again find modest evidence that this is the case. Finally, however, I find that despite this shift in the composition of external obligations towards more volatile forms, the overall volatility of both inflows and net flows is not significantly higher in financially open economies. This can be understood by noting that (i) the magnitude of the change in the composition of flows of liberalization is not particularly large, and (ii) the correlation between short-term and long-term flows is weak enough that the diversification gains from a shift towards short-term obligations outweigh the greater volatility of short-term flows.

### **Cross-Sectional Evidence**

In order to test the hypothesis that capital account liberalization is associated with a shift in the maturity composition of a country's external obligations, one would ideally like to have data on the stock of a country's total external obligations by instrument and by maturity. Unfortunately, such data is not available for the large number of countries studied here. Instead, I rely on two different and less comprehensive indicators. First, data on the maturity of bank lending by country is available for a large set of primarily developing countries. In particular, the Bank for International Settlements (1998) reports data on the stock of bank lending from a group of developed countries (the "reporting area") to countries outside the reporting area. This source disaggregates lending by maturity, and twice-yearly time series by country are available since 1985. As a summary indicator of the composition of borrowing, I use the year-end stock of debt with maturity less than or equal to one year as a share of total debt outstanding.

In addition, I use data on flows of different categories of assets to proxy for changes in the composition of stocks of underlying assets. In particular, I use balance of payments data on the difference between non-FDI and FDI inflows as a share of GDP as a proxy for the change in composition of the stock of external obligations over these two categories. This proxy has the advantage of being available for a larger set of countries and for more years than the BIS data, and moreover covers a broader range of assets.

Figure 3 plots these two measures of the composition of external obligations against the IMF measure of openness. There is a clear positive relationship between the fraction of bank lending that is short term and financial openness, with the fraction of short-maturity bank lending roughly 5-10% higher in financially open economies. Similarly, there is a weak but perceptible negative relationship between financial openness and the importance of FDI inflows relative to other forms of capital inflows, with financially open economies relying more heavily on non-FDI forms of capital inflows. More formally, Table 5 reports the results of regressions of these indicators of the composition of external liabilities on the three measures of financial openness and the same set of control variables considered above. The positive relationship between the share of short-term debt and the IMF measure of openness is statistically significant, and survives both the inclusion of control variables and instrumentation for the possible

endogeneity of capital controls. There is also weaker evidence in support of the idea that financially open economies receive proportionately less FDI, with statistically significant negative OLS (but not IV) coefficient estimates.

For this modest shift in the composition of external obligations to raise the volatility of overall flows, it must be the case that short-term flows are more volatile than long-term flows. However, as noted by Dooley, Claessens and Warner (1995), this need not necessarily be the case. A useful illustration of this point can be found in more detailed data on the composition of bank lending to the three Asian economies hardest hit by the recent financial crisis (Table 6). The first three columns show the stock of debt owed to BIS reporting area banks at end-December 1996, end-June 1997 and end-December 1997, disaggregated by maturity for Indonesia, Korea and Thailand. The remaining columns report the percentage changes in these stocks over the indicated periods. All three countries experienced striking reversals in the flow of bank lending, with the stock of outstanding bank debt roughly constant in Indonesia and actually declining by about \$10 billion in Korea and Thailand in the second half of 1997. However, it is interesting to note that the composition of the adjustment was quite different in the three countries. In Korea, more than the total decline in debt outstanding was due to the decline in short-term debt, while long-term debt outstanding actually increased slightly. In Thailand, on the other hand, the burden of adjustment was equally shared between short- and long-term debt, with both falling by about 15 percent. In Indonesia, short-term debt outstanding actually increased, while long-term debt outstanding fell. This cursory look at a particular episode of interest gives some indication that the classification of lending as short-term or long-term need not particularly be informative as to the likelihood that this lending will be reversed.

In light of this, it is useful to determine systematically whether or not capital flows commonly thought of as being “short-term” are in fact more volatile and less persistent than “long-term” flows. I summarize the volatility and persistence of different types of capital inflows by computing the within-country standard deviation and first-order autocorrelation of these annual flows for each country over the period 1985-1997. Table 7 reports the sample means and standard deviations of the estimated coefficients, and the p-values associated with a test of the null hypothesis that the standard deviations and autocorrelations are equal across categories of flows. Short-term debt flows are in

fact somewhat more volatile and less persistent than long-term debt flows, although the magnitude of the difference is not very large, and is statistically significant only for the autocorrelations. In the case of FDI versus non-FDI inflows, the differences are more pronounced, with the standard deviation of portfolio inflows and other inflows being one-and-a-half and three times larger than that of FDI inflows.

Given that there is modest evidence that capital account liberalization causes a shift in the composition of external obligations, and that short-term flows are at least somewhat more volatile than long-term flows, does this imply that financially open countries should experience greater volatility of capital flows? Not necessarily, since to the extent that short-term and long-term flows are uncorrelated (or even negatively correlated, if they are substitutes), an increase in the share short-term obligations may actually reduce the volatility of overall inflows, as overall inflows become more diversified. In particular, it is straightforward to show that if short-term obligations are small relative to long-term obligations, and if short-term flows are sufficiently uncorrelated with long-term flows, an increase in the share of short-term obligations can reduce the overall volatility of inflows.<sup>15</sup> A similar argument can be made with respect to the persistence of flows.

In light of this ambiguity, it is worth examining directly the empirical evidence on the relationship between the financial openness and the volatility and persistence of overall capital flows. I do this in the top two panels of Table 8, which reports the coefficient on financial openness in regressions of various measures of volatility and persistence of capital flows on financial openness and the same set of control variables as before. I first consider the standard deviation and autocorrelation of the growth rate in the stock of bank lending reported by the BIS, as well as that of total financial account

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<sup>15</sup> To see this, consider a simple example in which the total debt of a country,  $D$ , consists of long-term and short-term debt,  $D=L+S$ . The growth rate of total debt (a measure of proportionate capital inflows) is simply a weighted average of short-term and long-term capital inflows, i.e.  $gD=xgS+(1-x)gL$ , where  $x$  is the share of short-term debt in total debt and  $gY$  denotes the growth rate in variable  $Y$ . Conditional on the stocks of liabilities, the variance of overall capital inflows ( $V$ ) is a quadratic in  $x$  and depends on the variance of short-term flows ( $V_S$ ), the variance of long-term flows ( $V_L$ ) and the correlation between the two ( $R$ ), i.e.  $V=x^2V_S+(1-x)^2V_L+2x(1-x)(V_SV_L)^{1/2}R$ . It is straightforward to show that the volatility of overall inflows is always increasing in  $x$  only if the volatility of short-term flows relative to long-term flows is large enough, i.e.  $V_S/V_L>R^2$ . In general, however, the variance of overall inflows will be a U-shaped function of  $x$ , first declining and then increasing.

inflows and the financial account balance as a share of GDP as reported by the IMF. There is very little evidence of any statistically significant relationship between these measures of volatility and persistence and financial openness. If anything, the evidence for the standard deviation of flows suggests that the volatility of capital flows is lower rather than higher in more financially open economies.

A final possibility is that in “normal times”, capital controls have little effect, but that in periods of distress, capital controls serve to protect countries against wild fluctuations or sudden reversals in flows. To the extent that the results in Table 8 reflect the effects of capital controls in “normal times”, they may obscure the true value of capital controls during periods of distress. To assess this possibility, I construct some non-standard measures of the variability in net capital flows, and ask whether these are significantly higher in financially open economies. First, to capture abrupt and prolonged reversals in capital flows, I define “floods” and “droughts” as three consecutive years of financial account deficits that are three percentage points larger (smaller), i.e. more negative (more positive) than the average financial account balance as a share of GDP over the previous five years.<sup>16</sup> To capture large but transitory swings in capital flows, I also identify “spikes” as years in which the financial account balance as a share of GDP is three percentage points larger than its average over the previous five years, but within one percentage point of its previous average for the next three years. These definitions result in 47 cases of floods, 38 droughts, and 58 spikes during the period 1985-1997. I then regress the average number of floods, droughts and spikes per country over this period on measures of financial openness and the same set of control variables as before. These results are in the bottom panel of Table 8, and again are not particularly strong. If anything, there is some evidence that floods are less likely in more financially open economies according to the IMF measure, suggesting that capital account liberalization in fact has a stabilizing effect on capital inflows.

### **Event-Study Evidence**

I now consider briefly the evidence on the volatility and persistence of overall flows in the sample of liberalization and closing events defined previously. In light of the

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<sup>16</sup> To avoid double-counting these episodes, I exclude all episodes preceded by the same type of episode in any of the three previous years.

earlier arguments that changes in the composition of obligations are a poor indicator of changes in the volatility of total flows, in the event study analysis I focus exclusively on the reduced-form relationship between financial openness and the volatility of overall flows. In particular, for countries for which data are available, I compute the standard deviation and first-order autocorrelation of the financial account balance in constant 1990 US dollars, using quarterly data for the three years preceding and the three years following liberalization. Given the small number of liberalization events, and the even smaller number of events around which quarterly data is available, the sample consists of only twelve events.<sup>17</sup> In this limited sample, the results are quite similar to the cross-sectional evidence from a large sample of countries. Table 9 reveals that in only seven out of twelve liberalization episodes, the standard deviation of flows increases, while the autocorrelation of flows decreases in only six out of twelve cases. This suggests that in this sample of episodes, there is little evidence that the volatility of flows increases or the persistence of flows decreases as a result of capital account liberalization.

In summary, the empirical evidence is not particularly sympathetic to the often-heard view that capital account liberalization exposes countries to greater volatility, which in turn offsets any of the benefits liberalization may bring. In particular, although financially open economies do tend to (modestly) rely on shorter-term sources of finance, which in turn are (modestly) more volatile, there is little evidence that the volatility of total inflows is significantly higher in financially-open economies.

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<sup>17</sup> I switch to quarterly data in order to have a reasonable number of time series observations immediately before and after liberalization episodes on which to base estimates of volatility and persistence.

## **5. Interactions Between Financial Openness and Policy**

In this section I consider the empirical evidence for the hypothesis that the relationship between financial openness and “goods” such as growth and investment is intermediated by the quality of the institutional and policy environment. In particular, it is often argued that the benefits of capital account liberalization can only be realized provided that there is a supportive policy environment in place, which can mitigate the adverse effects of excessive risk-taking and “gambling for redemption” that can easily occur as a weak financial system is exposed to foreign competition through liberalization. To assess the relevance of this hypothesis for capital account liberalization, I reconsider the analysis of Section 3, allowing the effect of financial openness to depend on policies and institutional quality. In the cross-sectional regressions, I introduce an interaction term between financial openness and eight measures of policy, as well as allowing the policy and institutional variables to have a direct effect on outcomes. In the event study analysis, I partition the liberalization events into those with relatively “good” and relatively “poor” policies, and ask whether the probability that liberalization raises growth or investment, or lowers inflation, is higher in the former group than in the latter.

### **Measures of Policies and Institutions**

I consider two sets of indicators. The first four indicators concern the strength of the financial sector, and are intended to capture the idea that capital account liberalization is more likely to succeed in countries with strong and/or well-regulated financial sectors. I employ two measures of financial depth, M2/GDP and domestic credit to the private sector as a share of GDP. There is by now a considerable body of evidence suggesting that these variables are good proxies for the level of financial development and are significantly correlated with economic growth (Levine (1997)). However, the extent of the financial system need not be a good indicator of its strength. Accordingly, I also consider one minus the average number of banking crises per year, as identified by Caprio and Klingebiel (1997) and Demirguc-Kunt and Detragiache (1997), as an ex-post indicator of the strength of the financial sector. Finally, a recurring theme in the literature on capital account liberalization is the importance of a sound regulatory framework as a supporting policy. Although I am unaware of any direct

measures of the quality of prudential regulation that are available on a systematic basis across countries, a reasonable proxy may be found in the work of Barth, Caprio and Levine (1998). For a sample of 45 developed and developing countries, these authors compile an index of the restrictiveness of bank regulation by examining whether “non-traditional” banking activities such as securities dealing and insurance are permitted for banks in the mid-1990s.<sup>18</sup>

To capture the idea that the broader policy and insitutional environment also affects the outcome of capital account liberalization, I also consider a set of four indicators of the overall policy and insitutional environment. Following Burnside and Dollar (1997), I construct an indicator of the quality of overall macroeconomic policy as a weighted average of fiscal deficits and inflation.<sup>19</sup> I also use (one minus) the logarithm of one plus the black market premium as an indicator of the (absence of) domestic distortions. Finally, I use the indices of the absence of corruption and the quality of the bureaucracy compiled by ICRG as indicators of the broader institutional environment.

### **Cross-Sectional Results**

To assess the importance of policy and institutions in the relationship between financial openness and growth, investment and inflation, I regress the average over 1985-1997 of each of these variables on a measure of financial openness, a measure of policy/institutions, and the interaction between the two, and also the same set of control variables as before. To control for the possible endogeneity of both financial openness and the policy/institutions variables, I also instrument for these using their averages over 1975-1984 as instruments where possible.<sup>20</sup> The results are presented in Tables 10-12, corresponding to the three measures of financial openness (IMF, Quinn and volume). In

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<sup>18</sup> A priori, it is unclear whether more or less restrictive regulation according to this index is likely to enhance the effectiveness of capital account liberalization. Interestingly, Barth, Caprio and Levine (1998) find that more restrictive regulation actually raises, rather than lowers, the probability of banking crises.

<sup>19</sup> Specifically, this index is defined as 5 times the central government deficit as a share of GDP less the inflation rate, where the weights are drawn from Burnside and Dollar (1997).

<sup>20</sup> Lags are not available for the bank regulation index and the corruption and bureaucracy indices. Also, I do not report results for the effects of the aggregate macro policy indicator in the inflation regressions, as the macro policy indicator itself includes inflation and hence is by construction correlated with inflation.

each table, the rows correspond to the eight regressions which in turn use each of the eight measures of policy discussed above. The columns are divided into three blocks, corresponding to the effects of liberalization on growth, investment and inflation, respectively. Within each block, I report the coefficient on financial openness, the indicated policy/institutional variable, and the interaction between the two. As before, I do not report the coefficients on the control variables, and I follow the same convention of reporting significant OLS coefficients in regular font, and significant IV coefficient estimates in bold, while for insignificant estimates I report only the sign of the OLS estimates.

Consider first the direct effects of financial openness. The addition of policies and the interaction of policies with openness does not substantively change the simple results of Section 3. In particular, there only appears to be a consistently positive effect of openness on growth using the volume measure of financial openness, and this is rarely robust to instrumenting for the endogeneity of policy. Financial openness also rarely has a direct positive effect on investment. Most troubling is the finding that the reasonably strong negative relationship between inflation and financial openness is substantially diminished by the inclusion of measures of policy. Financial openness rarely has a direct negative effect on inflation, no matter which measure of policy or openness is used.

The direct effects of the policy and institutional variables are generally of the right sign, although they are not as consistently statistically significant as one might like. Measures of financial depth and the absence of corruption are among the most robust, and enter significantly in the growth equations using the IMF and volume measures of financial openness. However, the policy and institutional variables are rarely significant in the equations for investment and inflation.

Finally, the evidence on the interaction between policy and financial openness is perhaps most surprising. This interaction term is almost never significant in the equations for investment and inflation, casting doubt on the notion that liberalization raises investment or lowers inflation in countries with goods policies and institutions. Moreover, the OLS (but not IV) estimates are often significantly *negative* in the growth equation. That is, the evidence seems to suggest that if anything, the growth impact of

capital account liberalization is weaker, rather than stronger, in countries with better policies and institutions. For example, in the case of corruption and the IMF measure of financial openness (the second-last row in Table 10), the results suggest that a change in financial openness from fully closed (0) to fully open (1) in a relatively corrupt country with a corruption score of 2 will raise growth by 2.6 percent, while in a relatively clean country with a score of 5, it will *lower* growth by almost 2 percent.

## Event-Study Results

To conclude this section, I briefly consider the evidence on the role of policies and institutions in the sample of liberalization and closing events. I capture the role of institutions and policies in intermediating the effects of liberalization as follows. For each of the indicators of policies/institutions, I divide the sample of events into “good” and “bad” at the median value of that indicator during the three years prior to the event. I then ask whether the probability that liberalization leads to an increase in growth, investment or inflation is significantly different in the “good” and “bad” policies/institutions subsamples.

The results of this simple exercise are reported in Table 13. The rows of the table correspond to the same eight indicators of policy considered above. The columns are divided into three panels, corresponding to the effects of liberalization on growth, investment and inflation respectively. For each policy/institutional variable and for each outcome, I report the number of cases in which the outcome increased and decreased in the “good” and “bad” policies/institutions subsample. To assess the significance of the results, I perform a chi-squared test of independence of the rows and columns, and report the p-value associated with the null hypothesis of independence.

The most intriguing feature of this table is the contrast between the results for growth and investment. For growth, I almost never reject the null hypothesis that the quality of policies/institutions is independent of the change in growth around each event. In contrast, the quality of policies/institutions is significantly correlated with the change in investment in five out of seven cases, in the sense that investment is significantly *more* likely to increase in countries with *bad* policies/institutions than in *good* countries. At first

glance, this may appear puzzling as it seems to suggest that the benefits of higher investment due to capital account liberalization tend to accrue to countries with bad policies and/or institutions. However, one can also interpret these results as indicative of the importance of strong policies/institutions in mitigating the tendency of capital account liberalizations to be followed by investment booms reflecting misplaced euphoria or speculative bubbles in the liberalizing country.

## 6. Conclusions

In this paper, I have considered two possible explanations for the lack of strong empirical evidence of the macroeconomic benefits of capital account liberalization: (i) that the benefits of liberalization are obscured by the greater volatility it brings, and (ii) that the benefits of liberalization can only be realized in a supportive policy and institutional environment. There is little evidence that the volatility of capital flows is systematically higher in financially open economies, casting doubt on the first argument. With respect to the second argument, there is little evidence that interacting financial openness with measures of policies and institutions leads to significantly stronger empirical evidence on the effects of liberalization.

Where do these results, or rather, non-results, leave us? Logically, there are two possibilities. The first is that existing measures of capital account liberalization and/or the requisite supporting policies are poor, so that the estimated effects of liberalization will be biased towards zero. The second is simply that the beneficial impacts of capital account liberalization on growth, investment and inflation are too small to be distinguished from zero, given existing data. This is not to say that capital account liberalization has no merit at all, but only that it does not appear to have measureable first-order effects on key macroeconomic outcomes such as growth, investment and inflation.

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**Table 1: Capital Account Liberalization and “Closing” Events**

<b>Liberalizations</b>		<b>Closings</b>	
Indonesia	1969	Philippines	1969
Guatemala	1973	Argentina	1970
Malaysia	1973	Peru	1970
Iran	1974	Afghanistan	1974
Netherlands	1975	Costa Rica	1974
Peru	1978	Iran	1978
Singapore	1978	Nicaragua	1978
Uryguay	1978	Guatemala	1980
United Kingdom	1979	Honduras	1980
Japan	1979	Bolivia	1981
Australia	1984	Mexico	1982
New Zealand	1984	Peru	1984
Bolivia	1986	Venezuela	1984
Denmark	1988	Liberia	1985
Guatemala	1989		
France	1990		
Italy	1990		
Austria	1991		
Finland	1991		
Gambia	1991		
Ireland	1992		
Argentina	1993		
Honduras	1993		
Peru	1993		
Spain	1994		
Estonia	1994		
Latvia	1994		
Trinidad and Tobago	1994		

**Table 2: The Effects of Capital Account Liberalization on Growth, Investment and Inflation:  
Cross-Sectional Evidence**

	Full Sample			Non-OECD Sample		
	IMF	Quinn	Volume	IMF	Quinn	Volume
Real Per Capita GNP Growth	-	+	+	+	+	-
Real Per Capita GDP Growth	-	+	0.070 0.034	-	+	0.113 (0.052)
Gross Domestic Investment/GDP	-	-	-	+	-	+
log(Inflation)	<b>-1.320*</b> <b>(0.595)</b>	-0.764 (0.327)	-4.760 (2.690)	-	-0.794 (0.433)	-

Table reports coefficient on indicated measure of financial openness in a cross-sectional regression of the indicated variable on financial openness, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. All variables are annual averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported.

**Table 3: The Effects of Capital Account Liberalization on Growth, Investment and Inflation:  
Extensions**

	IMF	Full Sample Quinn	Volume	IMF	Non-OECD Sample Quinn	Volume
<b>Interactions with Returns</b>						
Real Per Capita GDP Growth						
Coefficient	+	-	0.075 (.037)	+	+	0.112 (.054)
Interaction with Returns	<b>1.76</b> <b>(1.053)</b>	.058 (.025)	-	<b>1.024</b> <b>(0.427)</b>	-	-
Gross Domestic Investment/GDP						
Coefficient	-	-	-	-	+	+
Interaction with Returns	-	+	3.44 (1.631)	-	+	+
<b>Level Effects</b>						
Real Per Capita GNP Growth	-	n/a	+	+	n/a	-
Real Per Capita GDP Growth	-	n/a	+	+	n/a	-

The top half of the table reports coefficients on indicated measure of financial openness and its interaction with a proxy for returns in a cross-sectional regression of the indicated variable on financial openness, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. The bottom half of the table reports the coefficients on the change in the indicated measure of financial openness. All variables are annual averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported.

**Table 4: The Effects of Capital Account Liberalization on Growth, Investment and Inflation:  
Evidence from Liberalization and Closing Events**

	Increases		Decreases		P-Value for test of Ho: Prob[Increases]=0.5 against two-sided alternative
	Number	Median	Number	Median	
Real Per Capita GNP Growth	18	0.021	13	-0.029	0.36
Real Per Capita GDP Growth	22	0.025	14	-0.032	0.17
Gross Domestic Investment/GDP	22	0.053	13	-0.023	0.12
log(Inflation)	15	0.049	22	-0.065	0.24

Table reports the number of liberalization (closing) events in which the average of the indicated variable over the three years immediately after (before) liberalization (closing) increased or decreased relative to its average value in the three years immediately before (after) liberalization (closing). Liberalization and closing episodes are as defined in the text.

**Table 5: Financial Openness and the Composition of Financial Flows**

	IMF	Quinn	Volume
Share of short-term debt in total debt outstanding to banks in BIS reporting area	<b>0.131*</b> <b>(.076)</b>	0.084 (.025)	-
Stock of inward FDI as share of stock of total inward investment	-	0.062 (.025)	-
Inward FDI/GDP - (Inward Portfolio + Inward Other)/GDP (All Countries)	-	+	-0.494 (0.065)
Inward FDI/GDP - (Inward Portfolio + Inward Other)/GDP (Developing Countries)	-	-	-0.571 (0.132)

Table reports coefficient on indicated measure of financial openness in a cross-sectional regression of the indicated variable on financial openness, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. All variables are averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported.

**Table 6: The Composition of Debt During Crises**

**Stock of Debt Owed to BIS Reporting Area Banks**

	(Billions USD)			Percent Changes		
	Dec-96	Jun-97	Dec-97	Dec-96	Jun-97	Dec-97
Indonesia						
Short-Term	34.2	34.7	35.4		1.2	2.1
Long-Term	21.3	24.1	23.0		13.1	-4.4
Total	55.5	58.7	58.4		5.8	-0.6
Korea						
Short-Term	67.5	70.2	59.5		4.0	-15.3
Long-Term	32.4	33.3	34.7		2.5	4.5
Total	100.0	103.4	94.2		3.5	-8.9
Thailand						
Short-Term	45.7	45.6	38.8		-0.3	-14.9
Long-Term	24.4	23.8	20.1		-2.6	-15.8
Total	70.1	69.4	58.9		-1.1	-15.2

Source: Bank for International Settlements (1998).

**Table 7: Volatility and Persistence of Categories of Financial Flows**

	Mean	Standard Deviation	P-value for Equal Means
<b>Standard Deviation of:</b>			
Annual Growth in ST Debt Stocks	0.353	0.202	
Annual Growth in LT Debt Stocks	0.328	0.197	0.210
Annual FDI Inflows as Share of GDP	0.009	0.009	
Annual Portfolio Inflows as Share of GDP	0.015	0.015	
Annual Other Inflows as Share of GDP	0.032	0.018	0.000
<b>Autocorrelation of:</b>			
Annual Growth in ST Debt Stocks	-0.043	0.326	
Annual Growth in LT Debt Stocks	0.053	0.358	0.004
Annual FDI Inflows as Share of GDP	0.425	0.351	
Annual Portfolio Inflows as Share of GDP	0.310	0.401	
Annual Other Inflows as Share of GDP	0.339	0.319	0.074

**Table 8: Financial Openness and the Volatility and Persistence of Total Capital Flows**  
**Cross-Sectional Evidence**

	Full Sample			Non-OECD Sample		
	IMF	Quinn	Volume	IMF	Quinn	Volume
<b>Standard Deviations:</b>						
Annual growth in Total Bank Lending	-	-	-0.709 (0.244)	-	-	-0.762 (0.249)
Annual Inflows as Share of GDP	+	-	-	-	-	-0.39 (0.189)
Annual Net Flows as Share of GDP	-	-	-0.111 (0.048)	+	+	-
<b>Autocorrelations:</b>						
Annual growth in Total Bank Lending	-	+	+	-	+	+
Annual Inflows as Share of GDP	+	-	+	-	-	-
Annual Net Flows as Share of GDP	-	-	+	-	-	+
<b>Non-Standard Measures of Volatility of Net Flows:</b>						
Incidence of "Floods"	<b>-0.038*</b> <b>(0.018)</b>	-	-	<b>-0.038</b> <b>(0.021)</b>	-	-
Incidence of "Droughts"	-	+	-	+	+	-
Incidence of "Spikes"	+	-	+	+	+	0.241 (0.101)

Table reports coefficient on indicated measure of financial openness in a cross-sectional regression of the indicated volatility measure on financial openness, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. All variables are averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported.

**Table 9: Financial Openness and the Volatility and Persistence of Flows:  
Event Study Evidence**

	Increases		Decreases		P-Value for test of Ho: Prob[Increases]=0.5 against two-sided alternative
	Number	Mean	Number	Mean	
Standard Deviation of Real Financial Account Balance	7	0.159	5	-0.169	0.56
Autocorrelation of Real Financial Account Balance	6	0.407	6	-0.276	1.00

Table reports the number of liberalization (closing) events in which the average of the indicated variable over the three years immediately after (before) liberalization (closing) increased or decreased relative to its average value in the three years immediately before (after) liberalization (closing). Liberalization and closing episodes are as defined in the text.

**Table 10: Financial Openness, Policies and Institutions  
(Cross-Sectional Evidence, IMF Measure of Openness)**

	Growth			Investment			Inflation		
	Openness	Policy	Openness x Policy	Openness	Policy	Openness x Policy	Openness	Policy	Openness x Policy
<b>Strength of Financial Sector</b> M2/GDP	+	0.61 (.021)	-0.06 (.032)	-	+	-	+	+	-
Domestic Credit to Private Sector/GDP	+	0.35 (.013)	-0.041 (.021)	-	0.141 (.061)	-	-	-	-
Index of Restrictiveness of Bank Regulation	+	+	-	+	+	-	-	-	-
1-Average Number of Banking Crises per Year	-	-	+	-0.077 (.035)	-	+	-2.347 (.610)	+	1.867 (.698)
<b>Quality of Policy Environment</b> Macroeconomic Stability	-	0.001 (.0004)	-	-0.04 (0.021)	+	-	n/a	n/a	n/a
1-ln(Black Market Premium)	-0.015 (.007)	+	-0.009 (.005)	-	+	-	-	-	<b>-1.634</b> <b>1.858</b>
Absence of Corruption	<b>0.056</b> <b>0.034</b>	<b>0.007</b> <b>(.004)</b>	<b>-0.015</b> <b>-0.008</b>	+	<b>0.024</b> <b>(012)</b>	<b>-0.048</b> <b>(024)</b>	-	+	-
Quality of Bureaucracy	+	+	<b>-0.013</b> <b>(.007)</b>	-	+	-	-	-	-

Table reports coefficient on financial openness, the indicated measure of policy, and the interaction between the two in a cross-sectional regressions of growth, investment and inflation on these variables, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. All variables are averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported. The results for macroeconomic stability and inflation are not reported as the macroeconomic stability index includes -1 times the inflation rate, and so is correlated with inflation by construction.

**Table 11: Financial Openness, Policies and Institutions  
(Cross-Sectional Evidence, Quinn Measure of Openness)**

	Growth			Investment			Inflation		
	Openness	Policy	Openness x Policy	Openness	Policy	Openness x Policy	Openness	Policy	Openness x Policy
<b>Strength of Financial Sector</b>									
M2/GDP	+	+	-0.016 (.008)	-	+	-	-	+	-
Domestic Credit to Private Sector/GDP	+	+	-0.014 (.007)	-	0.148 (.073)	-	+	+	-
Index of Restrictiveness of Bank Regulation	+	+	-	+	0.047 (.027)	-	+	+	-
1-Average Number of Banking Crises per Year	+	+	+	-	+	-	-0.803 (.472)	-	+
<b>Quality of Policy Environment</b>									
Macroeconomic Stability	-	+	-	-	-	+	n/a	n/a	n/a
1-In(Black Market Premium)	-	+	-	-	-	-	-0.598 (.346)	-	-
Absence of Corruption	+	-	+	+	+	-	+	+	-
Quality of Bureaucracy	-	-		-	+	-	-	-	-

Table reports coefficient on financial openness, the indicated measure of policy, and the interaction between the two in a cross-sectional regressions of growth, investment and inflation on these variables, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. All variables are averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported. The results for macroeconomic stability and inflation are not reported as the macroeconomic stability index includes -1 times the inflation rate, and so is correlated with inflation by construction.

**Table 12: Financial Openness, Policies and Institutions  
(Cross-Sectional Evidence, Volume Measure of Openness)**

	Growth			Investment			Inflation		
	Openness	Policy	Openness x Policy	Openness	Policy	Openness x Policy	Openness	Policy	Openness x Policy
<b>Strength of Financial Sector</b>									
M2/GDP	0.169 (.076)	0.46 (.024)	-0.297 (.156)	+	+	-	-	-	+
Domestic Credit to Private Sector/GDP	0.189 (.045)	0.033 (.015)	0.225 (.055)	+	0.231 (.114)	-	-	-	+
Index of Restrictiveness of Bank Regulation	-	-	+	1.024 (.486)	0.026 (.015)	-581 (.241)	-	-	-
1-Average Number of Banking Crises per Year	0.101 (.052)	+	-	+	+	-	-	+	+
<b>Quality of Policy Environment</b>									
Macroeconomic Stability	+	+	-	+	-	+	n/a	n/a	n/a
1-ln(Black Market Premium)	-	+	-0.073 (.024)	+	+	-	-	-	-
Absence of Corruption	0.539 (.101)	0.004 (.002)	-0.095 (.021)	+	+	-	+	0.396 (.240)	-4.686 (2.330)
Quality of Bureaucracy	0.352 (.110)	+	-0.055 (.021)	-	+	-	-	-	+

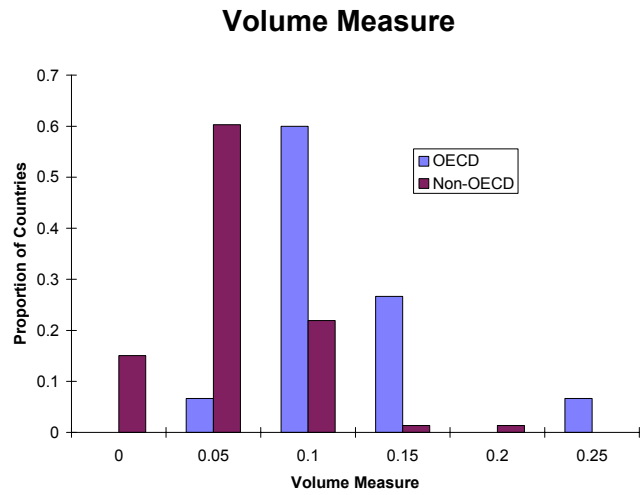
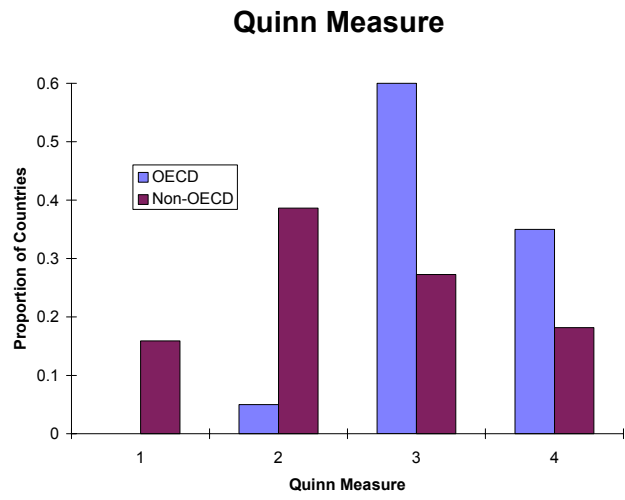
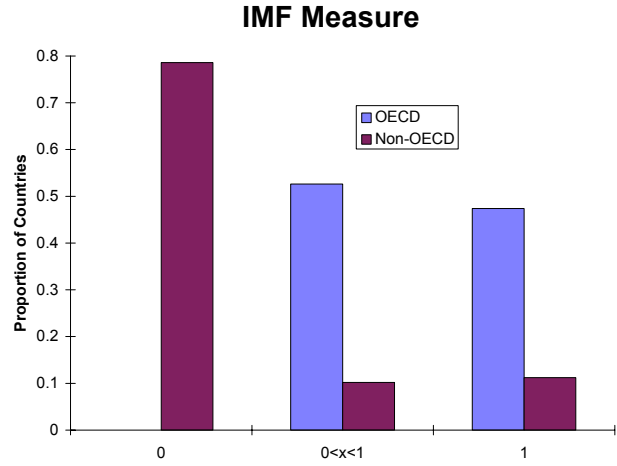
Table reports coefficient on financial openness, the indicated measure of policy, and the interaction between the two in a cross-sectional regressions of growth, investment and inflation on these variables, per capita GDP at PPP, secondary school enrollment rates, population growth and a set of regional dummies. All variables are averages over 1985-1997. OLS coefficient estimates are reported if significant at the 10 percent or better level. IV coefficient estimates are reported in bold if significant at the 10 percent or better level. Coefficients that are significant in both the OLS and IV cases are indicated with a star. If neither OLS nor IV coefficient estimates are significant, only the sign of the estimated OLS coefficient is reported. The results for macroeconomic stability and inflation are not reported as the macroeconomic stability index includes -1 times the inflation rate, and so is correlated with inflation by construction.

**Table 13: Financial Openness, Policies and Institutions  
(Event-Study Evidence)**

		Growth			P-value for Null of Independence	Investment			P-value for Null of Independence	Inflation		P-value for Null of Independence
		Increase	Decrease			Increase	Decrease			Increase	Decrease	
<b>Strength of Financial Sector</b> M2/GDP	Good	8	9	0.041	7	10	0.004	6	11	0.826		
	Bad	13	3		15	2		7	11			
Domestic Credit to Private Sector/GDP	Good	9	8	0.238	7	10	0.010	7	11	1.000		
	Bad	13	5		15	3		7	11			
Index of Restrictiveness of Bank Regulation	Good	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		
	Bad	n/a	n/a		n/a	n/a		n/a	n/a		n/a	
1-Average Number of Banking Crises per Year	Good	2	1	0.837	1	2	0.268	0	3	0.136		
	Bad	20	13		21	11		15	19			
<b>Quality of Policy Environment</b> Macroeconomic Stability	Good	10	6	0.829	9	7	0.465	8	9	0.486		
	Bad	10	7		11	5		6	11			
1-ln(Black Market Premium)	Good	7	9	0.119	6	9	0.006	7	9	0.619		
	Bad	12	5		14	2		6	11			
Absence of Corruption	Good	3	6	0.157	2	7	0.004	2	7	0.906		
	Bad	6	3		8	1		2	8			
Quality of Bureaucracy	Good	3	5	0.343	1	7	0.001	2	6	0.719		
	Bad	6	4		9	1		2	9			

Table reports the number of liberalization (closing) events in which the average of the indicated variable over the three years immediately after (before) liberalization (closing) increased or decreased relative to its average value in the three years immediately before (after) liberalization (closing), dividing the sample at the median level of the indicated policy variable. Liberalization and closing episodes are as defined in the text. The P-values are for a chi-squared test of the null hypothesis that the direction of the change in the dependent variable is independent of the classification of policy as "good" or "bad". Results are not reported for the bank regulation variable as it is not available in time series form.

**Figure 1: Distribution of Alternative Measures of Financial Openness**



**Figure 2: Correlations Between Alternative Measures of Financial Openness**

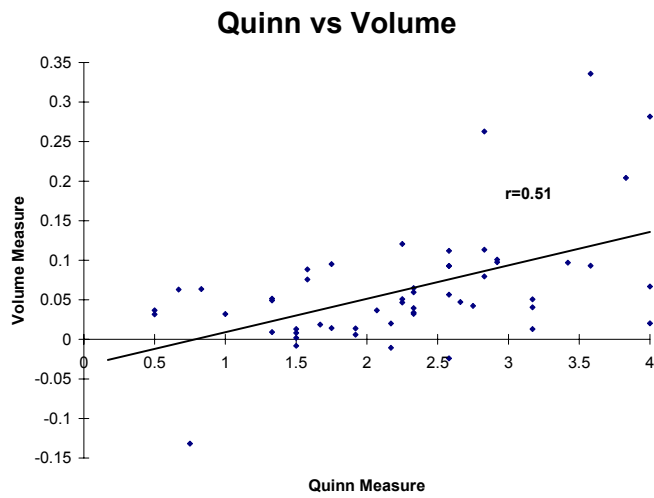
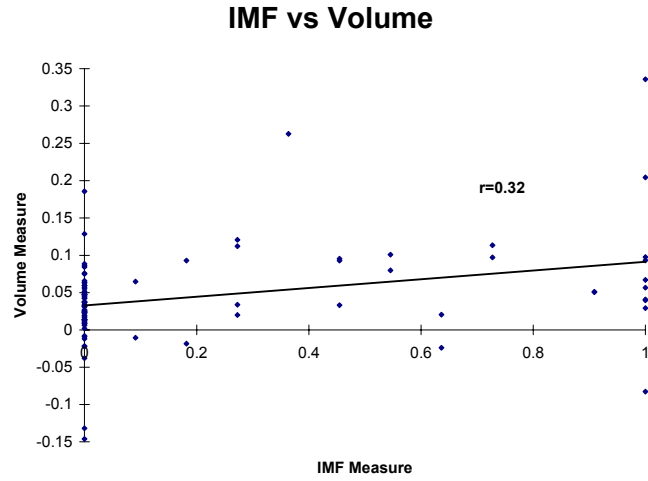
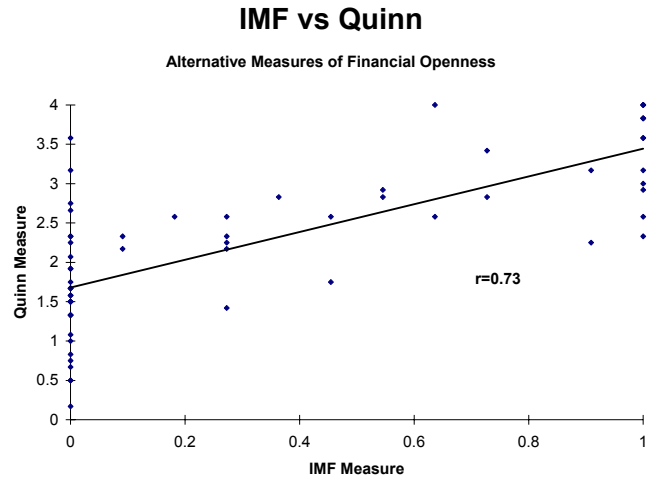


Figure 3: Financial Openness and The Composition of Financial Flows

