

# Do Improvements in Government Quality Necessarily Reduce the Incidence of Costly Sudden Stops?

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## Abstract

Sudden stops have been linked to a number of financial crises in emerging market countries. While a large literature has developed emphasizing the importance of institutions and governance in reducing economic volatility, this paper finds that the effect of government quality on the incidence of sudden stops is non-linear. Initial improvements in governance actually *increase* the incidence of costly sudden stops. A possible explanation is that improved governance encourages capital inflows that can overwhelm banking systems in countries with weak institutions. What is striking is that this result holds for a large number of countries including those with average levels of institutional quality that already receive considerable inflows. Eventually, however, improving institutions does reduce the frequency of sudden stops, allowing countries to enjoy the benefits of financial globalization with fewer risks.

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## **1. Introduction**

The question of why some societies suffer from severe volatility, financial crises and contagion is one of the most critical in international macroeconomics, and there is a growing literature emphasizing the importance of institutions and governance in determining these macroeconomic outcomes (Acemoglu, et al., 2003; Tommasi, 2002). A central part of this question is the effect of institutions on “sudden stops,” or large and sudden reversals in net capital inflows caused by foreigners’ sudden refusal to hold liabilities of the stricken country. Sudden stops are generally associated with large exchange rate depreciations and financial crises, leading to sharp contractions in investment and output.

While international investors are partially to blame, it seems reasonable that institutional quality is a key determinant of the incidence of sudden stops. First, the quality of fiscal and monetary policy is in part determined by a country’s fiscal and monetary institutions. Reckless fiscal policy has been implicated in a number of sudden stops (Calvo, 2003) as it results in unsustainable levels of public debt, especially when excessive borrowing from international capital markets is channeled into unproductive government expenditure. Second, emerging markets vary in their degree of domestic liability dollarization, i.e. the domestic component of “Original Sin” (Eichengreen, et al., 2002; Hausmann and Panizza, 2003). Unhedged foreign-currency-denominated liabilities are a major source of vulnerability for both firms and banks because large depreciations can lead to significant reductions in net worth (Aghion, et al., 2001; De Nicoló, et al., 2005; Mishkin, 1996). Domestic liability dollarization has been shown empirically to increase the probability of a sudden stop (Calvo, et al., 2004) as well as the cost associated with it (Cavallo, 2004; Guidotti, et al., 2004). De Nicoló, et al. (2005) and Honig (2002) find that institutional quality is a key determinant of domestic liability dollarization as it

influences policy credibility and expected relative volatilities of the real exchange rate and domestic inflation. Therefore, countries with good institutions are less likely to experience a recession after a reversal in capital flows and thus have a low frequency of costly sudden stops. Finally, better regulation and supervision of the banking system improves credit allocation and reduces the probability of a capital flow reversal.

There is also evidence to suggest that improved governance reduces vulnerability to crises. Corruption has been linked to the share of foreign direct investment in inflows, a more stable source of funding (Wei and Wu, 2002). Good institutions augment the positive effect of capital account liberalization on both financial development (Chinn and Ito, 2005) and growth (Alfaro, et al., 2003; Arteta, et al., 2001; Klein, 2005). Prasad et al. (2004) find that institutional quality has a similar effect on the impact of financial globalization on growth and consumption volatility.

It is possible, however, that improved governance can *increase* the risk of a costly sudden stop, defined as a reversal in capital flows accompanied by a contraction in output. One reason is that improved governance encourages capital inflows. Alfaro, et al. (2003) find that institutional quality was a key determinant of capital inflows in the period 1971-1998. Countries with better institutions, such as secure property rights and non-corrupt governments, invest more in physical and human capital and use these factors more efficiently, leading to higher returns to lending. In addition, as Fernandez-Arias and Montiel (2003) argue, institutional reforms reduce the perceived risk on domestic investment. As institutional quality improves and foreign lending becomes a more important source of funding, a capital flow reversal, when it does occur, involves a greater cost in terms of reduced investment and production.

This paper finds that for low levels of government quality, this effect dominates the positive effects of improved governance so that initial improvements increase the frequency of sudden stops. A likely explanation is that when institutional quality in the form of bank regulation and supervision is still weak, increased capital inflows will be channeled to firms with weak fundamentals or that assume excessive risk, exacerbating existing problems in the financial system (Ishii and Habermeier, 2002; Bakker and Chapple; 2002). This poses serious risks to bank balance sheets as worsening macroeconomic conditions result in a large share of non-performing loans, thus sowing the seeds of a sudden stop. Greater inflows could also exacerbate fiscal problems by allowing excessive borrowing that is channeled to unproductive government spending.

At the other end of the spectrum, countries with good institutions are better able to handle inflows. Their regulation and supervision of the banking system is far superior and, as mentioned previously, countries with better governance receive more FDI relative to total inflows. They are also less likely to enter a recession if a reversal in capital flows does occur because there is less liability dollarization (Honig, 2002), reducing the probability that they will experience a sudden stop (Calvo and Mishkin, 2003). Denmark, for example, experienced six episodes of significant capital flow reversals between 1982 and 2004, but none caused a contraction in output. Thus there is an inverted U-shaped relationship between government quality and the incidence of sudden stops.<sup>1</sup>

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<sup>1</sup> It is important to distinguish this result from previous work that has found a non-linear relationship between institutions, liberalization and growth/volatility. Ranciere, et al. (2006a) argue that for countries with a moderate degree of contract enforceability, financial liberalization increases the risk of crises although at the same time leads to higher mean growth by allowing financially constrained firms to increase their leverage and increase their investment. Ranciere, et al. (2006b) finds that financial liberalization leads to faster long-run growth, even though it has increased the incidence of twin banking and currency crises. Klein (2005) finds that the effect of capital account openness on growth depends on the level of institutional quality with the same inverted U-shaped relationship. Specifically, capital account liberalization promotes growth when a country has good institutions, but there is not a significant effect of capital account liberalization on growth for countries with either very poor institutions or those

It is important to note that the initial positive slope is not an artifact of the fact that countries with very poor institutions do not receive large capital inflows relative to GDP and therefore cannot have a costly sudden stop. It is certainly true that this observation is consistent with the non-linear relationship found in this paper and is *in part* an explanation for it. Specifically, countries with very poor institutions that do not receive large inflows relative to GDP are unlikely to experience a recession-inducing sudden stop, even if there is a drop in inflows. Meanwhile, advanced countries receive more inflows but are better able to handle them. “Intermediate” countries may therefore be the most vulnerable to sudden stops that cause contractions in economic activity, implying a non-linear relationship. This implies that institutional development in intermediate countries is sufficient to attract capital inflows, but not to prevent large capital outflows or their contractionary effects. This reasoning, however, is only part of the story.

What is more striking is that the non-linear relationship holds even when countries with the worst institutions are excluded. The initial positive relationship between government quality and the incidence of sudden stops holds for a large number of countries in the sample, including those with average institutional quality that receive considerable inflows. Examples include Thailand, Mexico, the Philippines and Brazil. Thus, for a significant range of countries that are already receiving significant foreign capital, improvements in government quality can increase the risk of a sudden stop. The intuition is that even in countries that receive capital inflows and are therefore eligible to have sudden stops, improvements in government quality that generate additional inflows can still increase the risk of sudden stops if the risks inherent in those

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with the very highest quality institutions. Prasad, et al. (2004) show that countries that have undergone financial liberalization at low to moderate levels of governance have experienced an increase in consumption volatility. But none of these papers find that improvements in government quality can increase risk in the short run. Rather, improvements in government quality are unambiguously welfare-enhancing as they unleash the growth-enhancing and volatility-reducing effects of liberalization.

increased inflows outweigh the positive effects of institutional improvement. In other words, institutional improvements have two effects, to increase inflows but also improve how those inflows are allocated, and for low levels of government quality, this paper finds that the first effect dominates. Thus, while it is interesting that a non-linear relationship exists, it is far more significant that the location of the “hump” falls to the right of institutional quality levels of many emerging market countries.<sup>2</sup>

The rest of the paper is organized as follows. Section 2 presents the empirical methodology and the data. Section 3 discusses the results of the estimation while Section 4 describes robustness checks. Section 5 summarizes the findings and draws policy implications.

## 2. Empirical Methodology

### 2.1 The effect of institutions on the incidence of sudden stops<sup>3</sup>

To estimate the effect of government quality on the frequency of sudden stops, I estimate the following Poisson model for count data using annual data from 1984-2004:

$$\#SuddenStops_i = \beta_0 + \beta_1 \overline{GovQual}_{i,t} + \beta_2 \overline{GovQual}_{i,t}^2 + \gamma \overline{MacroControls}_{i,t} + \varepsilon_{i,t} \quad (1)^4$$

The dependent variable is the number of sudden stops that country “i” experiences during the sample period. The Poisson regression model has been used to analyze discrete data with

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<sup>2</sup> This result introduces an important caveat to the finding that improving institutions reduces economic volatility (Acemoglu, et al., 2003).

<sup>3</sup> In order to conclude that improvement in institutions can, for some countries, increase the incidence of sudden stops by encouraging capital inflows, it is first necessary to establish a causal link from institutions to inflows. This result has been established by Alfaro, et al. (2003). I nevertheless confirm their results by regressing capital inflows, defined as foreign direct investment and portfolio investment (% of GDP), on a measurement of government quality and a number of control variables from the literature on the determinants of capital inflows (see for example Alfaro, et al., 2003). Because the results are similar, I do not report them here although they are available upon request.

<sup>4</sup> Data on capital flows necessary to define sudden stops are available before 1984, but the measures of government quality from the *International Country Risk Guide* are only available beginning in 1984. However, because a relatively large number of sudden stops associated with the Latin American debt crises occurred in the early 1980’s, I include any sudden stops occurring in 1982-1983 in the count. Given the lack of variation over time in the government quality variables, this is unlikely to be problematic.

large numbers of zeros and a limited number of values (the largest number of sudden stops during the sample period is four). Because this variable is time-invariant, I average the observations for each country over time to focus on cross-country variation. I choose to analyze the number of sudden stops over a twenty year period as opposed to a simple binary dependent variable indicating whether country “i” experienced a sudden stop in year “t”. There are a number of reasons for doing this. First, the second approach ignores cross-country variation in the *frequency* of sudden stops. It is important to know why some countries experienced three or four sudden stops while others experienced only one. Second, given the problems with standard models of crises and the inability of most leading-indicator variables to accurately predict events, the explanatory power of a probit regression is not high. This is especially true of the government quality variable that shows little variation over time and is therefore unlikely to explain individual crisis episodes. For example, variation in government quality cannot explain why Argentina suffered a crisis in 2001 but not in 2000. This paper, therefore, focuses on cross-country variation in the frequency of sudden stops.<sup>5</sup>

Although I emphasize the Poisson regression, I also estimate a probit model where the observations vary by country and year. The probit specification avoids the problem with the Poisson mean-regression, namely that a country with a high level of reserves, for example, in one decade and a low level in the next is treated the same as a country with constant reserves throughout the sample period (although this is not a significant problem for government quality which displays little variation over time). Not surprisingly, the government quality variable is

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<sup>5</sup> The goal of this paper, therefore, is not to add a variable to the literature on predicting financial crises, (Demirgüç-Kunt and Detragiache, 1999; Eichengreen and Rose, 1997; Frankel and Rose, 1996; Kaminsky and Reinhart, 1999) as government quality does not display the kind of variation necessary for an early warning signal. It should be noted of course that a significant cross-sectional relationship does not necessarily imply the same relationship will hold within countries over time.

less able to explain both within and cross-country variation in sudden stops than it is able to explain solely cross-country variation, although the results are still generally significant.

### 2.1.1 Defining Sudden Stops

Defining what constitutes a sudden stop is obviously key to this analysis. A sudden stop is a large and unexpected fall in net capital inflows (i.e. a reduction in the financial account surplus) that is accompanied by a reduction in the current account deficit and a contraction in output. To operationalize this notion, I follow the algorithm in Frankel and Cavallo (2004) to classify observations as sudden stops, updating their data through 2004. A sudden stop is a situation in which at a year “t,” the fall in the financial account surplus (from period “t-1”) of country “i” exceeds twice the standard deviation of the financial account surplus; the current account deficit falls by any amount either in “t” or in “t+1”; and GDP per capita falls by any amount either in “t” or in “t+1.”<sup>6</sup> The requirement that GDP per capita fall is necessary because in some cases, a decline in the financial account surplus may be the natural result of a positive terms of trade shock that provides an additional source of funding (Calvo, et al., 2004). More importantly, however, this restriction limits attention to *costly* sudden stops, which is of far greater interest.<sup>7</sup>

Using this definition, there are 85 sudden stops between 1982 and 2004 in a sample of 154 countries, which constitutes 2.7% of the yearly observations in the dataset. A list of sudden

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<sup>6</sup> Requiring that the fall in the financial account surplus is at least two standard deviations below its sample mean did not affect the classification.

<sup>7</sup> If I drop the restriction that the reversal in capital inflows must be accompanied by a contraction in output, the non-linear relationship no longer holds. The reason is that without this restriction, episodes in which advanced economies have experienced reversals, but without recessions, will be counted as sudden stops. As shown in Table 1, eliminating the GDP restriction yields a far larger number of identified sudden stops. The mean is now slightly more than one sudden stop per country during the sample period. Using this definition of sudden stops, for example, Denmark has six sudden stops during the sample period but zero using the default definition. In addition, countries with weak institutions that do not receive many capital inflows now have more classified episodes of sudden stops as a result of the low volatility of their inflows. I do not find this definition particularly interesting since analyzing the determinants of reversals in capital flows that cause recessions, as opposed to those that do not, is more relevant for policy-makers in emerging market countries that have suffered from these episodes.

stops is provided in the appendix. Not surprisingly, these episodes occur during crisis periods such as the Latin American debt crisis of the early 1980's, the 1992-1993 European Monetary System crises, the 1997-1998 Asian crises, and the spate of developing country crises in the late 1990's and onward.<sup>8</sup> As shown in Table 1, 19% of all sudden stops occurred in Asia; 9% in Europe (none in Eastern Europe); 33% in Latin America and North America; and 14% in the Middle East; 25% in Africa respectively. 18% of the sudden stops occurred in industrial countries.

### 2.1.2 Institutional Quality Variable

The composite government quality variable, *GovQual*, is based on several variables from the *International Country Risk Guide*. These variables were chosen as reasonable proxies for aspects of government quality that might affect capital inflows. They proxy for the degree to which contracts are enforced, corruption, risk of expropriation and government effectiveness. Data are available from 1984-2004. The composite variable is a simple average of these variables. *Bureaucracy Quality* (range 0-4) measures institutional strength and quality of the bureaucracy as well as autonomy from political pressure. Higher scores also indicate that the bureaucracy has the ability to operate without drastic changes in policy when governments change. *Corruption* (range 0-6) within the political system measures the extent to which government officials are able to assume positions of power through patronage rather than ability

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<sup>8</sup> This paper focuses on sudden stops as indicators of crises as opposed to currency crises (Frankel and Rose, 1996; Kaminsky and Reinhart, 1999) or current account reversals (Milesi-Ferretti and Razin, 2000; Edwards, 2004). Sudden stops have become more frequent as capital has become more mobile. Calvo (1999) argues that many of the recent crises were caused by credit shocks in international financial markets and therefore crises should be defined by sharp swings in capital flows as opposed to large exchange rate depreciations or current account reversals that may be more affected by policy choices than sudden stops. Hutchison and Noy (2006) define sudden stops as joint currency crisis and capital flow reversal episodes and find that only half of the currency crises in their sample occurred simultaneously with capital flow reversals. As a robustness check, I estimate the Poisson model for the number of currency crises over the sample period, using the procedure developed in Frankel and Rose (1996) to define currency crises. The results are quite similar. The same non-linear relationship holds and is significant in most of the specifications.

and to which they can be influenced by illegal payments. Finally, *Law and Order* (range 0-6) assesses the strength and impartiality of the legal system and popular observance of the law. Higher scores also indicate well functioning political institutions, implying that this variable should be able to account for sound policy as well. As a robustness check, I look at the effect of the variables individually.<sup>9</sup>

Whereas institutional quality is a measure of the quality of the framework supporting financial (and other) markets, financial depth is a direct measure of the quality of financial markets themselves. More developed financial markets should channel resources more efficiently, leading to a lower probability of a sudden stop for a given level of capital inflows. Again, however, more developed financial markets should encourage capital inflows indicating a possible non-linear relationship between financial market development and the probability of a sudden stop. I therefore estimate equation (1) using indicators of financial market development, in particular the development of the banking sector and the stock market (Beck, et al., 2000). These include the ratio of M2 to GDP, the stocks-traded turnover ratio defined as the total value of shares traded during the year divided by the average market capitalization for the year, the total value of stocks traded (% of GDP), domestic credit to the private sector (% of GDP) and credit provided by the banking sector (% of GDP).

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<sup>9</sup> I also used the database built by Kaufmann, et al., (2003) which contains similar variables that measure government effectiveness, the rule of law and corruption. While the coefficients indicate the same non-linear relationship, they are not significant at standard confidence levels. One explanation is that their database only includes data from 1996, 1998, 2000, and 2002 whereas the ICRG data goes back to 1984. Because the paper attempts to explain sudden stops starting in 1982, this more recent data may be inappropriate. Although institutional quality does not vary significantly over time, there is still within-country variation. Examples include countries in Asia and Latin America that have ended dictatorships in the 1990's as well as moderate improvements in the rule of law starting in the mid-1980's in East Asia, Latin America, the Middle East, and Africa. Furthermore, because the Kaufmann, et al., (2003) data begin only in the late 1990's, there is a greater risk of reverse causality than in the ICRG data.

### 2.1.3 Other Regressors

I include a number of macro control variables that affect the probability of a country experiencing a sudden stop based on the developing empirical literature on this subject (Calvo, et al., 2004; Frankel and Cavallo, 2004). First, I include variables to control for balance sheet effects that determine whether a reversal in capital flows will result in an output contraction. Balance sheet effects, therefore, determine whether any given episode of capital flow reversal will be classified as a sudden stop. These variables are also included because anything that increases the cost associated with a reversal may also increase the probability of the reversal occurring in the first place along the lines of a self-fulfilling crisis story. The ratio of foreign liabilities of deposit money banks to M1 measures external liability dollarization of the financial system.<sup>10</sup>

In addition, countries that trade recover more quickly from the output loss following a sudden stop (Guidotti, et al., 2004). Moreover, the more open the economy, the smaller will be the required real currency depreciation following a sudden stop (Calvo, et al., 2002). The coefficient of openness, however, is ambiguous. A weakening in a country's export markets could trigger a sudden stop, so that an open economy is more vulnerable. Frankel and Cavallo (2004) and Calvo, et al. (2004), however, find that openness to trade is in fact associated with fewer sudden stops. In an unreported regression, I control for capital account openness using the IMF's binary indicator of capital account openness although the variable was insignificant. Using Quinn's more refined measure of capital account restrictions that assumes values between 0 and 1, I find similar results.

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<sup>10</sup> In an unreported regression I include a measure of domestic liability dollarization, the ratio of dollar deposits to total deposits in the banking system. Although this variable significantly reduces the sample size, the results were similar. I also include the ratio of trade to GDP to proxy for the extent to firms earn revenue in dollars and therefore the ability of banks to hedge dollar deposits by making dollar loans. Results were similar when I use the ratio of exports to GDP.

Calvo, et al. (2004) argue that real exchange rate change necessary for current account adjustment in the presence of a sudden stop is linked to the size of the current account deficit prevailing before the sudden stop materializes. Given the effects of real exchange rate depreciations in the presence of liability dollarization on balance sheets, output and the ability to repay, the probability of a sudden stop is an increasing function of the current account deficit and the degree of liability dollarization.<sup>11</sup> Similarly, Edwards (2004) finds that the probability of experiencing a current account reversal increases with the size of the pre-existing current account deficit. I therefore include the ratio of the current account deficit to GDP.<sup>12</sup>

The log of GDP per capita controls for the level of economic development. Its inclusion ensures that the government quality variable is not simply picking up the effects of the level of development. I also include the log of reserves in months of imports as countries with a higher stock of reserves have a lower probability of experiencing a sudden stop and are better able to finance a current account deficit.<sup>13</sup> The ratio of foreign direct investment to GDP is included as a measure of the stability of capital flows since bank lending or portfolio investment is partially driven by market sentiment and therefore more volatile than direct investment.

Calvo (2003) emphasizes the importance of public sector debt as a determinant of capital flow reversals. I therefore include the ratio of public debt to GDP. I use both data from the *World Development Indicators* as well as the database on central government debt used in

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<sup>11</sup> Calvo, et al., (2005) expand this analysis and study the effects of sudden stops and balance sheet effects on relative price volatility, in particular the ratio of the wholesale price index to the consumer price index. This ratio may be preferable to the real exchange rate in that it better captures the domestic behavior of the price of tradables vis-à-vis that of non-tradables following depreciations resulting from sudden stops.

<sup>12</sup> In an unreported regression I control for the exchange rate regime using the Reinhart and Rogoff (2003) regime classification although the variable was insignificant.

<sup>13</sup> Results were similar using the ratio of foreign reserves to the current account surplus and the ratio of net international reserves to GDP.

Jaimovich and Panizza (2006). The results were similar.<sup>14</sup> I also include a measure of external debt that includes both the public and private sector.

Finally, to test that hypothesis that improvements in government quality can increase the frequency of sudden stops by encouraging speculative inflows, I include capital inflows (% of GDP) as a regressor. If the hypothesis that improvements in government quality can increase the risk of crises by encouraging capital inflows, then the inclusion of this variable should eliminate the upward sloping portion of the inverted U-shaped relationship and leave only the downward sloping part. In other words, the inclusion of this variable should make the linear *GovQual* coefficient insignificant. As discussed in the results section, I find that this is the case.

### 3. Empirical Results

Before turning to the estimation of equation (1), I first present graphical evidence of the hypothesized non-linear relationship. Figure 1 is a scatter plot of the incidence of sudden stops and the average level of *GovQual* for each country over the sample period. None of the countries with values of *GovQual* below two have multiple sudden stops while the majority that experience multiple episodes have higher values of *GovQual* between two and three. Above values of *GovQual* of four, very few countries experience a single sudden stop.<sup>15 16</sup>

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<sup>14</sup> The main results were also robust to the inclusion of the government's foreign debt to GDP, total debt service as a % of exports, and the rate of growth of domestic credit (as a % of GDP) which captures the effect of rapid growth in private sector credit on sudden stops.

<sup>15</sup> The graph is similar when broken down by region except for Eastern Europe where none of the countries experienced sudden stops. Part of the reason is that the transition economies were not in existence for half of the sample period and are therefore have less time to experience one or more sudden stops. The graph is also similar when the data are broken up by decades.

<sup>16</sup> As can be seen from the figure, there are only three countries (Chile, Mexico and Turkey) with three or more sudden stops during the sample period, all of which have roughly average levels of institutional quality. If I omit these countries, the point estimates in the Poisson regression still imply an inverted U-shaped relationship although the coefficients are no longer significant. However, while the Poisson estimates are now insignificant, the probit estimates are still significant implying a non-linear relationship between *GovQual* and the *probability* of a sudden stop. Moreover, while I am omitting only 3 countries, these countries account for 12% of the sudden stops in the sample (10 out of 85), so I am removing a fairly large percentage of the crisis episodes. Given that sudden stops are

Table 2 presents results for the estimation of equation (1). The dependent variable is the number of sudden stops that country “i” experiences during the period 1982-2004. The government quality variable reduces the sample size from 154 countries to 122. All regressions contain region dummy variables although the coefficients are not shown. The standard errors are robust to heteroskedasticity. In the first column, results are presented for the regression when the government quality variables are included without the macro control variables. The coefficients of both *Govqual* and *Govqual*<sup>2</sup> are generally significant at the 5% level and always significant at the 10% level, suggesting an inverted U-shaped relationship between government quality and the frequency of sudden stops, although the coefficients are never jointly significant at the 5% level.<sup>17 18</sup> In fact, *Govqual* is insignificant when included without the quadratic term, further revealing a non-linear relationship. Further calculations reveal that improvements in government quality only begin to reduce the incidence of sudden stops at average levels of government quality, approximately 3 on a scale from 0-6. An improvement in government quality from 0 to 3 increases the number of sudden stops by approximately .70. This suggests that for a large range of countries, the increased capital inflows that improvements in government quality generate increase the probability of experiencing a sudden stop more than the corresponding improvements in prudential regulation and supervision reduce it.

In fact, the relationship still holds even when omitting countries with the very worst institutional values. Specifically, excluding countries with values of government quality below 1.5 (approximately 1.5 standard deviations below the mean) still yields significant results. This

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rare events to begin with, it is important that the only countries with three or more sudden stops are those with average levels of institutional quality, not those with the worst institutions.

<sup>17</sup> The standard deviation of *Govqual* is close to one, so a one-unit increase also represents an increase in one standard deviation.

<sup>18</sup> The model without any of the control variables is accurate 60% of the time in predicting whether a country experiences zero or one or more sudden stops during the sample period.

indicates that the non-linear relationship is not just a result of the fact that countries with the worst institutions do not receive large inflows relative to GDP and therefore cannot suffer from capital flow reversals.

This relationship is robust to the inclusion of a number of macro control variables. It is important to note that the importance of government quality is robust to the inclusion of GDP per capita, implying that *Govqual* is not just picking up the effects of the level of development.<sup>19</sup> The lack of statistical and economic significance of the macro control variables is noteworthy. While one might be inclined to conclude that institutions matter more than policy and that once government quality is accounted for, macro policy has little residual influence on the frequency of sudden stops, this is most likely not the case. Because the macro variables, which show significant variation over time and could help to explain individual crisis episodes, are averaged over the twenty year sample period in the cross-sectional analysis, their effect is likely to be underestimated. In the panel analysis presented later, many of these variables are significant.<sup>20</sup>

In the last column I include capital inflows as a % of GDP. The inclusion of this variable makes the linear *GovQual* coefficient insignificant at the 10% level, which implies that only the downward sloping portion of the inverted U-shaped relationship remains.<sup>21</sup> This result is consistent with the argument that improvements in government quality can increase the frequency of sudden stops by encouraging capital inflows. Once inflows are controlled for,

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<sup>19</sup> When I include government quality and GDP per capita, as linear and quadratic terms, both show an inverted U-shaped relationship with the incidence of sudden stops although neither relationship is significant at standard confidence levels. However, the non-linear relationship between government quality and sudden stops is almost significant at the 10% level. Given the causal effect of institutions on the level of development (Acemoglu et al. 2001), the effect of government quality is more accurately portrayed when the square of GDP per capita is not included.

<sup>20</sup> In fact, there is some time variation in institutional quality, especially in transition economies and select countries in Latin America and Asia that have ended dictatorships in the 1990's. This suggests that the estimated coefficients may understate the true effect of government quality as well.

<sup>21</sup> Although the inclusion of capital inflows shrinks the sample, this is not the cause of the drop in significance of *GovQual* (if I run the model without inflows but limit the sample to countries with data on inflows, *GovQual* is still significant).

improvements in government quality should unambiguously reduce the frequency of sudden stops. Furthermore, the drop in significance of *GovQual* is much larger if I control for portfolio inflows as opposed to total capital inflows (which includes foreign direct investment and portfolio inflows). A likely explanation is that portfolio flows are far more likely to reverse suddenly than FDI. Therefore, including portfolio inflows is a better control for the channel through which improvements in government quality can increase the risk of sudden stops.

In order to determine whether certain policies move the “hump” to the left so that for lower values of government quality, the relationship with sudden stops is downward sloping, I interact in unreported regressions both the linear and quadratic government quality variable with variables that affect both the probability and cost of capital flow reversals. For example, greater trade openness should reduce the cost associated with a reversal. If the interaction term with *GovQual* is negative and the interaction with *GovQual*<sup>2</sup> is positive, then greater trade openness shifts the hump to the left. I find, however, that the interaction terms are insignificant. I also include interaction terms with the IMF’s measure of capital account openness. The stimulative effect of improvements in government quality on inflows should be greater with more open capital accounts, thereby shifting the hump to the right. If true, this would imply that capital controls should accompany institutional improvements until a certain level of institutional quality is reached and it is safe to open the capital account. I find, however, that the interaction terms are insignificant. Nonetheless, there still may be merit to this policy implication since the IMF measure fails to account for the scope and effectiveness of capital controls and is therefore an imperfect measure of capital account restrictions. Interactions with measures of liberalization based on the volume of inflows were also insignificant, although these too are imperfect

measures since there are numerous determinants of capital flows aside from capital account restrictions.

Finally, I estimate a probit model analyzing the probability that country “i” will experience a sudden stop in year “t.” The panel results are presented in Table 3. The macro variables are lagged to mitigate endogeneity problems. The standard errors are Huber–White robust and are clustered to correct for serial correlation within countries. The coefficients of the government quality variables, while still significant, are less significant than in Table 3.<sup>22</sup> An F test of the joint significance of the linear and quadratic government quality variable yields a similar conclusion. The coefficients are jointly significant at the 5% level in two of the ten specifications. The greater difficulty of institutional quality to predict sudden stops in a given year is not surprising. Based on these coefficients, improvements in government quality (from a 0 to a 3 where 3 is the mean) increase the probability of a sudden stop by approximately 5 percentage points. Only at that point do further increases reduce the likelihood of a sudden stop. Finally, the macro variables are more significant than in the cross-sectional analysis. This is not surprising given that the macro variables of the countries that experienced sudden stops are averaged in the cross-sectional analysis and therefore their effect is downplayed. Larger CA surpluses, higher levels of development and a larger share of FDI in GDP tend to reduce the probability of a sudden stop. Greater levels of foreign liabilities and external government debt tend to increase the probability of a sudden stop.<sup>23</sup>

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<sup>22</sup> As a robustness check, I include year dummies as well. The linear government quality term, while always positive, is now insignificant in all specifications, although p-values of approximately 0.15 are at least suggestive of an initial upward sloping relationship. The quadratic term, however, is often significantly negative at the 10% level. The inverted U-shaped relationship therefore seems to hold although is less significant. A possible explanation for the reduced significance is that year dummies can account for contagion effects that may be correlated with government quality.

<sup>23</sup> Frankel and Cavallo (2004) and Calvo, et al., (2004) estimate a similar probit model. For the most part, the results are similar. All three papers find that larger CA surpluses and increased trade reduce the probability of a sudden stop, and foreign exchange reserves and FDI/GDP are generally insignificant. Calvo, et al., (2004) also find that

## 4. Robustness Tests

### 4.1 Endogeneity

It is possible that a sudden stop will provide incentives to reduce corruption and improve the rule of law in order to prevent such reversals in the future, generating reverse feedback in the estimation. This bias reduces the chances of observing a negative relationship between government quality and the incidence of sudden stops. The lack of significant within country variation in government quality, however, suggests this is not a serious problem although there have been some institutional changes, especially in emerging market countries. Another potential issue is that reported values for the institutional quality measures after the occurrence of a sudden stop might be biased downwards as a result of a change in perception, even if no change in government quality has occurred. This is consistent with the downward-sloping portion of the inverted U-shaped relationship between *GovQual* and the frequency of sudden stops although not with the initial upward-sloping portion. Taking means of the observations over time as in equation (1) should mitigate this potential problem since this reporting bias should diminish over time and would have a negligible effect when sudden stops occur near the end of the sample period. Nevertheless, to minimize possible feedback, I delete three years of observations following a crisis and then take averages of the remaining data before estimating the Poisson model. The results were virtually identical.<sup>24</sup> Finally, I instrument government quality with European settler mortality rates (Acemoglu, et al., 2001).<sup>25</sup> The government quality

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government debt/GDP has a small or insignificant effect. Frankel and Cavallo (2004) find similar effects for the level of development and foreign liabilities.

<sup>24</sup> In the probit estimation where the observations vary over country and year, there are two possible methods of addressing reverse causality. First, I lag the macro variables in the base specification reported in Table 3. Although I report results for unlagged values of *GovQual*, results were not surprisingly similar when the variable was lagged. Second, deleting three years of observations after each crisis did not significantly affect the results.

<sup>25</sup> I instrument *GovQual*<sup>2</sup> with the square of settler mortality. This is only valid, however, if settler mortality is statistically independent from the disturbance. However, if Z is only known to be uncorrelated with the disturbance, then one instrument is not sufficient. Therefore, these results should be interpreted with caution.

variable is not insignificant although this is solely a result of the much smaller sample size (approximately 50% fewer observations) when using the settler mortality variable. Specifically, when I perform the regular estimation without instruments, the coefficients are insignificant if I limit the sample to countries with data on settler mortality.

#### **4.2 Alternative Institutional Variables**

As an alternative to *GovQual*, which is a measure of general institutional quality, I use one of the various measures of financial development in the estimation of equation (1) and test for a similar non-linear relationship. These include the ratio of M2 to GDP, the stocks-traded turnover ratio, the total value of stocks traded (% of GDP), domestic credit to the private sector (% of GDP) and credit provided by the banking sector (% of GDP). The coefficients of both the linear and quadratic term are either small or insignificant. Thus the non-linear relationship only holds for measures of general institutional development, not institutions solely related to the financial system. There are a couple of possible explanations. First, financial market development does not necessarily capture the quality of financial institutions. Second, it is possible that improvements in financial institutions have the same two effects as improvements in overall government quality, namely that they encourage capital inflows but also improve the allocation of those inflows, but, in the case of financial institutions, these effects are offsetting.<sup>26</sup>

#### **4.3 Separating Institutional Variables**

I also estimate equation (1) separating *GovQual* into its components: *Bureaucracy Quality*, *Corruption* and, *Law and Order*. When the variables were included individually, *Law and Order* was insignificant although the coefficients indicated the same non-linear relationship.

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<sup>26</sup> In contrast, the inverted U-shaped relationship between government quality and sudden stops implies that for low levels of government quality, the first effect dominates while for high levels, the second effect dominates.

To this point, I have assumed that institutions that attract capital inflows, such as low corruption, and institutions related to finance-specific development can be captured by the same variable, either *GovQual* or one of the financial development variables. In this section I include *GovQual* to capture general institutional development as a predictor of sudden stops and interact it with the financial development variables that capture institutions related to the financial system. The risks of general institutional development in terms of encouraging capital inflows thereby increasing the frequency of sudden stops should be muted when the financial sector is more developed. I therefore expect a negative coefficient on the interaction term. Table 4 presents the results. For the first four measures of financial development, the coefficient of the interaction term is either significant at standard confidence levels or close to it. The negative interaction term along with the insignificant coefficient of *GovQual* indicate that when the financial system is developed, improvements in government quality unambiguously reduce the incidence of sudden stops.

## **5. Conclusion**

This paper finds some evidence of a non-linear relationship between government quality and the cross-country frequency of sudden stops. Initial improvements in institutions tend to increase the incidence of costly capital flow reversals. A likely explanation is that government quality is a significant determinant of the level of capital flows and therefore the degree of international trading of financial assets. While capital flow reversals can occur in countries with poor institutions, their effect is limited since international borrowing is significantly limited by foreigners' willingness to lend. As institutions improve, this willingness increases and capital inflows take on a larger role in funding domestic investment. At this point, sudden stops become

costly. In a certain range, therefore, improvements in government quality can actually contribute to financial vulnerability. It is important to note that this range encompasses a large number of countries, including many with average levels of institutional quality that receive large inflows. Eventually however, improving institutions does reduce the frequency of a costly sudden stop, as evidenced by the low incidence of such events among the advanced economies, for example. Even when capital flow reversals do occur, they are not necessarily detrimental because of limited liability dollarization in countries with sound institutions.

The existing literature on the proper sequencing of liberalization argues that liberalization should be postponed until institutions are strong. This paper makes a different point that improving institutions moves a country closer to *de facto* liberalization by increasing capital inflows, thereby increasing risk. However, while the results reveal that improving institutions does not always reduce financial vulnerability and can actually increase it, they also indicate that this is only a temporary phenomenon and that improving governance will eventually allow countries to enjoy the benefits of financial globalization with fewer risks.

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Figure 1: Frequency of Sudden Stops and Government Quality

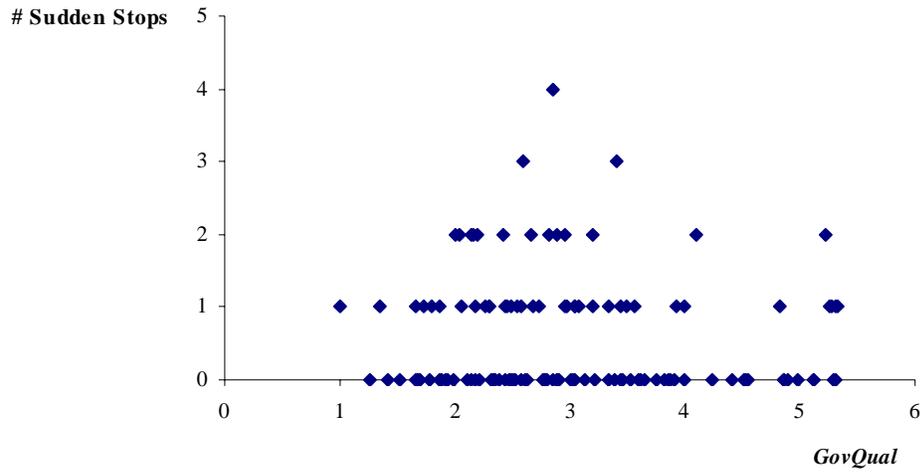


Table 1

Summary statistics for sudden stops: 1982-2004

## Regional breakdown using default sudden stop measure

|                    | No. Countries | No. Sudden Stops | Percentage |
|--------------------|---------------|------------------|------------|
| Africa             | 43            | 21               | 25         |
| Asia               | 51            | 15               | 19         |
| Europe             | 36            | 8                | 9          |
| Western Hemisphere | 39            | 28               | 33         |
| Middle East        | 14            | 18               | 14         |
| Industrial         | 26            | 15               | 18         |

## Different measures of number of sudden stops per country

|                    | No. Countries | Mean | Std. Dev. | Min. | Max. |
|--------------------|---------------|------|-----------|------|------|
| Default measure    | 154           | 0.55 | 0.76      | 0    | 4    |
| No GDP restriction | 154           | 1.02 | 1.09      | 0    | 6    |

Table 2  
Poisson Estimation - Effect of Government Quality on Frequency of Sudden Stops

| Dependent variable: number of sudden stops per country: 1982-2004 |                   |                    |                    |                    |                   |                    |                    |                   |                    |                    |
|---|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| GovQual   | 1.250<br>(1.79)*  | 1.551<br>(2.16)**  | 1.540<br>(2.10)**  | 1.529<br>(2.11)**  | 1.551<br>(2.16)** | 1.660<br>(2.26)**  | 1.650<br>(2.26)**  | 1.600<br>(2.10)** | 1.408<br>(1.70)*   | 1.245<br>(1.55)    |
| GovQual squared   | -0.219<br>(1.73)* | -0.266<br>(2.12)** | -0.260<br>(2.00)** | -0.259<br>(2.00)** | -0.245<br>(1.94)* | -0.257<br>(1.99)** | -0.257<br>(2.00)** | -0.248<br>(1.88)* | -0.267<br>(1.91)*  | -0.253<br>(1.95)*  |
| Foreign liabilities/<br>MI (%)                                    |                   | -0.000<br>(2.20)** | -0.000<br>(2.02)** | -0.000<br>(2.04)** | -0.000<br>(1.65)* | -0.000<br>(1.74)*  | -0.000<br>(1.74)*  | 0.000<br>(1.40)   | 0.001<br>(1.40)    | 0.001<br>(1.83)*   |
| Trade/GDP (%)   |                   |                    | -0.000<br>(0.08)   | -0.000<br>(0.05)   | -0.000<br>(0.04)  | -0.001<br>(0.34)   | -0.001<br>(0.41)   | 0.011<br>(0.42)   | -0.028<br>(0.56)   | -0.090<br>(1.42)   |
| CA/GDP (%)  |                   |                    |                    | 0.004<br>(0.22)    | 0.014<br>(0.60)   | 0.019<br>(0.81)    | 0.021<br>(0.85)    | -0.002<br>(0.51)  | -0.005<br>(0.88)   | -0.008<br>(1.55)   |
| log real GDP<br>per capita  |                   |                    |                    |                    | -0.143<br>(0.69)  | -0.142<br>(0.74)   | -0.141<br>(0.73)   | -0.196<br>(1.01)  | 0.073<br>(0.28)    | 0.433<br>(1.56)    |
| log total reserves<br>months of imports                           |                   |                    |                    |                    |                   | -0.155<br>(0.81)   | -0.161<br>(0.81)   | -0.033<br>(0.14)  | 0.045<br>(0.15)    | 0.290<br>(0.99)    |
| FDI/GDP (%)   |                   |                    |                    |                    |                   |                    | 0.010<br>(0.25)    | 0.036<br>(0.69)   | 0.239<br>(2.18)**  | 0.410<br>(2.30)**  |
| Govt. Debt<br>/GDP (%)  |                   |                    |                    |                    |                   |                    |                    | -0.002<br>(0.95)  | -0.006<br>(2.19)** | -0.014<br>(2.71)** |
| External debt<br>/GDP (%)   |                   |                    |                    |                    |                   |                    |                    |                   | 0.002<br>(0.53)    | 0.017<br>(2.01)**  |
| Inflows of capital<br>/GDP (%)                                    |                   |                    |                    |                    |                   |                    |                    |                   |                    | -0.120<br>(1.11)   |
| Constant  | -1.891<br>(1.85)* | -2.324<br>(2.19)** | -2.33<br>(2.24)**  | -2.313<br>(2.24)** | -1.333<br>(0.90)  | -1.269<br>(0.92)   | -1.232<br>(0.91)   | -0.662<br>(0.48)  | -1.693<br>(0.94)   | -4.598<br>(2.07)** |
| Observations  | 122               | 109                | 108                | 108                | 106               | 105                | 105                | 89                | 81                 | 68                 |
| F test for <i>GovQual</i> <sup>a</sup>                            | 0.20              | 0.10               | 0.11               | 0.11               | 0.10              | 0.07               | 0.07               | 0.10              | 0.16               | 0.11               |
| Pseudo R-square   | 0.12              | 0.14               | 0.14               | 0.14               | 0.15              | 0.15               | 0.15               | 0.16              | 0.19               | 0.27               |

Robust z statistics in parentheses. Ratios expressed in percentage terms.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

a. p-value for joint significance of *GovQual* and *Govqual squared*

Table 3  
 Probit Estimation - Effect of Government Quality on Probability of Sudden Stop

| Dependent variable: binary indicating sudden stop in country "i" in year "t" |                     |                     |                     |                     |                     |                     |                     |                     |                     |                      |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| GovQual  | 0.411<br>(1.58)*    | 0.609<br>(2.00)**   | 0.603<br>(1.92)*    | 0.670<br>(2.02)**   | 0.611<br>(1.68)*    | 0.614<br>(1.69)*    | 0.619<br>(1.69)*    | 0.279<br>(0.59)     | 0.450<br>(0.94)     | 2.245<br>(2.64)***   |
| GovQual squared  | -0.077<br>(1.71)*   | -0.113<br>(2.13)**  | -0.110<br>(2.03)**  | -0.119<br>(2.16)**  | -0.130<br>(2.15)**  | -0.131<br>(2.14)**  | -0.131<br>(2.12)**  | -0.080<br>(1.06)    | -0.118<br>(1.48)    | -0.412<br>(3.23)***  |
| Foreign liabilities/<br>M1 (%)   |                     | 0.000<br>(1.81)*    | 0.000<br>(0.50)     | 0.000<br>(0.37)     | 0.000<br>(0.15)     | 0.000<br>(0.23)     | 0.000<br>(0.07)     | 0.000<br>(0.22)     | 0.000<br>(1.75)*    | 0.001<br>(3.51)***   |
| Trade/GDP (%)  |                     |                     | 0.000<br>(0.28)     | -0.002<br>(1.25)    | -0.003<br>(1.82)*   | -0.003<br>(1.79)*   | -0.004<br>(1.84)*   | -0.002<br>(0.83)    | 0.001<br>(0.38)     | -0.003<br>(0.94)     |
| CA/GDP (%)   |                     |                     |                     | -0.041<br>(3.96)*** | -0.045<br>(4.34)*** | -0.042<br>(3.46)*** | -0.040<br>(3.11)*** | -0.084<br>(3.54)*** | -0.120<br>(4.58)*** | -0.240<br>(5.73)***  |
| log real GDP<br>per capita   |                     |                     |                     |                     | 0.296<br>(2.21)**   | 0.298<br>(2.17)**   | 0.295<br>(2.17)**   | 0.253<br>(1.57)     | 0.218<br>(1.38)     | 0.625<br>(2.83)***   |
| log total reserves<br>months of imports                                      |                     |                     |                     |                     |                     | -0.027<br>(0.34)    | -0.035<br>(0.43)    | 0.147<br>(1.25)     | 0.265<br>(1.77)*    | 0.451<br>(2.77)***   |
| FDI/GDP (%)  |                     |                     |                     |                     |                     |                     | 0.017<br>(0.83)     | 0.012<br>(0.35)     | -0.044<br>(1.12)    | -0.035<br>(0.89)     |
| Govt. Debt<br>/GDP (%)   |                     |                     |                     |                     |                     |                     |                     | -0.004<br>(1.74)*   | -0.002<br>(1.37)    | -0.003<br>(1.38)     |
| External debt<br>/GDP (%)  |                     |                     |                     |                     |                     |                     |                     |                     | -0.005<br>(2.15)**  | -0.009<br>(2.77)***  |
| Inflows of capital<br>/GDP (%)   |                     |                     |                     |                     |                     |                     |                     |                     |                     | 0.000<br>(1.64)      |
| Constant   | -2.502<br>(6.06)*** | -2.718<br>(5.83)*** | -2.696<br>(5.83)*** | -2.849<br>(5.39)*** | -5.04<br>(4.35)***  | -5.00<br>(4.25)***  | -4.941<br>(4.20)*** | -4.522<br>(3.04)*** | -4.671<br>(2.91)*** | -12.041<br>(5.43)*** |
| Observations   | 2194                | 1870                | 1812                | 1812                | 1737                | 1702                | 1701                | 1207                | 1090                | 764                  |
| F test for <i>GovQual</i> <sup>a</sup>                                       | 0.23                | 0.10                | 0.13                | 0.09                | 0.05                | 0.06                | 0.06                | 0.17                | 0.08                | 0.00                 |
| Pseudo R-square  | 0.02                | 0.03                | 0.02                | 0.07                | 0.08                | 0.07                | 0.07                | 0.15                | 0.21                | 0.29                 |

Robust z statistics in parentheses. Ratios expressed in percentage terms.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

a. p-value for joint significance of *GovQual* and *Govqual squared*

Table 4

Poisson Estimation - Effect of Government Quality on Frequency of Sudden Stops - Interaction Effects

| Dependent variable: number of sudden stops per country: 1982-2004 |                  |                   |                    |                  |                  |
|---|------------------|-------------------|--------------------|------------------|------------------|
| GovQual   | 0.118<br>(0.52)  | 0.134<br>(0.70)   | 0.245<br>(1.30)    | -0.097<br>(0.29) | -0.095<br>(0.28) |
| GovQual*M2/GDP(%)   | -0.003<br>(1.55) |                   |                    |                  |                  |
| GovQual*Credit to<br>Private Sector (% of GDP)                    |                  | -0.002<br>(1.92)* |                    |                  |                  |
| GovQual*Domestic Credit from<br>Banking Sector (% of GDP)         |                  |                   | -0.003<br>(2.14)** |                  |                  |
| GovQual*Stocks total/GDP(%)                                       |                  |                   |                    | -0.002<br>(1.49) |                  |
| GovQual*Stocks turnover(%)  |                  |                   |                    |                  | 0.000<br>(0.21)  |

Robust z statistics in parentheses. Ratios expressed in percentage terms.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Coefficients of control variables not shown

## Appendix

Below I list the variables and sources used. The data is annual and it covers the period 1984–2004.

Table A1

| Variable  | Description and Source  |
|---|---|
| <i>Sudden Stop Variable</i> - based on:               |   |
| Financial Account                                     | net sum of direct investment (78bdd plus 78bed), portfolio investment (78bfd plus 78bgd), financial derivatives (78bwd plus 78bxd), and other investment (78bhd plus 78bid). Source: IFS 78bjd.   |
| Current Account Balance                               | Current account, n.i.e. (78ald) is the sum of the balance on goods, services and income (78aid), plus current transfers, n.i.e.: credit (78ajd), plus current transfers: debit (78akd) (i.e., 78aid, plus 78ajd, plus 78akd). Source: IFS 78ald.  |
| GDP per capita growth (annual %)                      | GDP per capita growth (annual %): Annual percentage growth rate of GDP per capita based on constant local currency. Source: WDI.  |
| <i>Government Quality Variables</i>                   |   |
| Bureaucracy Quality                                   | Bureaucratic Quality, scale of 0-4. Source: International Country Risk Guide, published by The PRS group.   |
| Corruption  | Corruption in Government, scale of 0-6. Source: International Country Risk Guide, published by The PRS group.   |
| Law and Order   | Measures law and order tradition, scale of 0-6. Source: International Country Risk Guide, published by The PRS group.   |
| <i>Financial Market Development Variables</i>         |   |
| M2 (% of GDP)   | Money and quasi money (M2) as % of GDP: comprises the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. Source: WDI.   |
| Stocks traded, total value (% of GDP)                 | Total value of stocks traded as percent of GDP. Source: WDI.  |
| Stocks traded, turnover ratio %                       | The total value of shares traded during the year divided by the average market capitalization for the year. Average market capitalization is calculated as the average of the end-of-year values for the current year and the previous year. Source: WDI.   |
| Credit to private sector (% of GDP)                   | Domestic credit to private sector (% of GDP): refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. Source: WDI. |
| Domestic credit provided by banking sector (% of GDP) | Domestic credit provided by banking sector (% of GDP): includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available. Source: WDI.    |
| <i>Macro Variables</i>                                |   |
| Trade (% of GDP)                                      | Exports plus Imports divided by GDP. Source: IFS and WDI.   |
| Foreign Liabilities/M1 (%)                            | Foreign Liabilities of Deposit Money Banks/M1 (%). Source: IFS 26c/34.  |
| Current Account (% of GDP)                            | Current Account Balance as % of GDP. Source: IFS and WDI.   |
| Log Real GDP per capita                               | Log of GDP per capita (constant 2000 US\$). Source: WDI.  |
| Total Reserves in Months of Imports                   | This item shows reserves expressed in terms of the number of months of imports of goods and services which could be paid for. Source: WDI.  |
| FDI (% of GDP)  | Foreign direct investment, net inflows (% of GDP). Source: IFS and WDI.   |

|  |   |
|--|---|
| Government Debt (% of GDP)                       | Central government debt, total (% of GDP). Source: WDI.   |
| External Debt (% of GDP)                         | External debt, total (DOD, current US\$) % of GDP: Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Data are in current U.S. dollars. Source: WDI.                       |
| Government Foreign Debt (% of GDP)               | Data for outstanding foreign debt relate to the direct and assumed debt of the central government and exclude loans guaranteed by the government. Source: IFS 89a.  |
| Foreign Exchange Reserves (% of CA or GDP)       | Total reserves minus gold (current US\$): Total reserves minus gold comprise special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities. Gold holdings are excluded. Source: IFS 1dd and WDI.  |
| Growth in Claims on Private Sector (% of GDP)    | Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. Source: IFS and WDI.   |
| Total Debt Service (% of exports)                | Total debt service is the sum of principal repayments and interest actually paid in foreign currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF. Exports of goods and services includes income and workers' remittances. Source: WDI.   |
| Dollar Deposits                                  | Foreign currency deposits of residents held in domestic banks. Source: IMF Country Reports.   |
| Open Capital Account                             | Dummy variable indicating an open capital account. Source: IMF's Annual Report on Exchange Arrangements and Exchange Restrictions   |
| Quinn  | 0-4 scale of capital account liberalization (in half-point increments), reported as a percentage of 100. Converted to 0-1 scale in this paper. Five years (1959, 1973, 1982, 1988, 1997) publicly available for 71 countries. 1950-99 available for 22 OECD countries. Source: (Quinn, 1997).   |
| Exports (% of GDP)                               | Exports divided by GDP. Source: IFS and WDI.  |
| Real GDP   | GDP in 2000 dollars. Source: IFS and WDI.   |
| Growth in Real GDP                               | Annual percentage change of real gross domestic product. Source: WDI.   |
| Central bank foreign exchange reserves (% of M1) | Central bank foreign exchange reserves as percent of M1. Source: IFS.   |
| Growth in Domestic Credit %                      | Annual percentage change in domestic credit. Source: IFS.   |
| Inflation %                                      | Annual percentage change in Consumer price index. Source: IFS and WDI.  |
| Exchange Rate Regime                             | Source: Reinhart and Rogoff (2003) course classification  |
| Inflows of capital/GDP (%)                       | Capital inflows (sum of foreign direct investment and portfolio inflows) divided by GDP. IFS, lines 78bed+78bgd divided by WDI GDP (current US\$).  |
| School enrollment                                | School enrollment, secondary (% gross). Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Source: WDI. |
| Inflation Volatility                             | Standard deviation of inflation divided by average inflation rate.  |
| World Interest Rate (%)                          | Average of short-term interest rates from the US, Germany, Japan, France, and the UK (IFS line 60b).  |

Table A2  
Sudden Stops

| Country           | No. SS | Year       | Country              | No. SS | Year       | Country                  | No. SS | Year           |
|-------------------|--------|------------|----------------------|--------|------------|--------------------------|--------|----------------|
| Albania           | 0      |            | Greece               | 0      |            | Norway                   | 0      |                |
| Algeria           | 1      | 90         | Grenada              | 0      |            | Oman                     | 2      | 87, 99         |
| Angola            | 0      |            | Guatemala            | 0      |            | Pakistan                 | 0      |                |
| Antigua & Barbuda | 0      |            | Guinea               | 0      |            | Panama                   | 1      | 00             |
| Argentina         | 1      | 01         | Guinea-Bissau        | 1      | 86         | Papua New Guinea         | 0      |                |
| Armenia           | 0      |            | Guyana               | 0      |            | Paraguay                 | 0      |                |
| Aruba             | 0      |            | Haiti                | 1      | 02         | Peru                     | 2      | 83, 99         |
| Australia         | 0      |            | Honduras             | 0      |            | Philippines              | 2      | 97, 98         |
| Austria           | 0      |            | Hungary              | 0      |            | Poland                   | 0      |                |
| Azerbaijan        | 0      |            | Iceland              | 1      | 01         | Portugal                 | 2      | 92, 03         |
| Bahamas           | 0      |            | India                | 0      |            | Romania                  | 0      |                |
| Bahrain           | 0      |            | Indonesia            | 1      | 97         | Rwanda                   | 1      | 94             |
| Bangladesh        | 0      |            | Iran                 | 0      |            | Samoa                    | 1      | 94             |
| Barbados          | 1      | 82         | Ireland              | 0      |            | Sao Tome & Principe      | 0      |                |
| Belarus           | 0      |            | Israel               | 1      | 88         | Saudi Arabia             | 0      |                |
| Belize            | 0      |            | Italy                | 0      |            | Senegal                  | 0      |                |
| Benin             | 1      | 83         | Jamaica              | 0      |            | Seychelles               | 1      | 01             |
| Bolivia           | 1      | 82         | Japan                | 0      |            | Sierra Leone             | 0      |                |
| Botswana          | 0      |            | Jordan               | 2      | 92, 93     | Singapore                | 0      |                |
| Brazil            | 1      | 02         | Kenya                | 0      |            | Slovak Republic          | 0      |                |
| Bulgaria          | 0      |            | Kiribati             | 0      |            | Slovenia                 | 0      |                |
| Burkina Faso      | 1      | 89         | Korea                | 1      | 97         | Solomon Islands          | 1      | 98             |
| Burundi           | 0      |            | Kuwait               | 0      |            | South Africa             | 0      |                |
| Cameroon          | 2      | 88, 90     | Kyrgyz Republic      | 0      |            | Spain                    | 1      | 92             |
| Canada            | 1      | 82         | Lao P.D.R.           | 0      |            | Sri Lanka                | 0      |                |
| Cape Verde        | 1      | 90         | Latvia               | 0      |            | St. Kitts and Nevis      | 0      |                |
| Chile             | 3      | 82, 83, 98 | Lesotho              | 1      | 99         | St. Lucia                | 0      |                |
| China             | 0      |            | Libya                | 0      |            | St. Vincent & Grenadines | 0      |                |
| Colombia          | 2      | 98, 99     | Lithuania            | 0      |            | Sudan                    | 0      |                |
| Comoros           | 1      | 88         | Madagascar           | 0      |            | Suriname                 | 1      | 92             |
| Congo, Rep. of    | 2      | 84, 96     | Malawi               | 0      |            | Swaziland                | 1      | 99             |
| Costa Rica        | 1      | 96         | Malaysia             | 1      | 97         | Sweden                   | 1      | 91             |
| Cote d'Ivoire     | 0      |            | Maldives             | 0      |            | Switzerland              | 0      |                |
| Croatia           | 0      |            | Mali                 | 0      |            | Syria                    | 1      | 89             |
| Cyprus            | 0      |            | Malta                | 1      | 00         | Tanzania                 | 0      |                |
| Czech Republic    | 0      |            | Mauritania           | 0      |            | Thailand                 | 1      | 97             |
| Denmark           | 0      |            | Mauritius            | 0      |            | Togo                     | 0      |                |
| Dominica          | 1      | 01         | Mexico               | 3      | 82, 94, 95 | Tonga                    | 1      | 89             |
| Dominican Rep.    | 2      | 02, 03     | Moldova              | 0      |            | Trinidad and Tobago      | 1      | 94             |
| Ecuador           | 2      | 83, 99     | Mongolia             | 2      | 90, 91     | Tunisia                  | 0      |                |
| Egypt             | 1      | 90         | Montserrat           | 0      |            | Turkey                   | 4      | 91, 94, 98, 01 |
| El Salvador       | 0      |            | Morocco              | 1      | 95         | Uganda                   | 0      |                |
| Estonia           | 0      |            | Mozambique           | 0      |            | Ukraine                  | 1      | 98             |
| Ethiopia          | 2      | 82, 91     | Myanmar              | 0      |            | United Kingdom           | 0      |                |
| Fiji              | 1      | 99         | Nepal                | 1      | 01         | United States            | 0      |                |
| Finland           | 1      | 91         | Netherlands          | 0      |            | Uruguay                  | 1      | 02             |
| France            | 0      |            | Netherlands Antilles | 0      |            | Vanuatu                  | 0      |                |
| Gabon             | 0      |            | New Zealand          | 2      | 88, 98     | Venezuela                | 1      | 94             |
| Gambia            | 1      | 82         | Nicaragua            | 1      | 86         | Yemen                    | 1      | 94             |
| Germany           | 1      | 01         | Niger                | 0      |            | Zambia                   | 1      | 90             |
| Ghana             | 0      |            | Nigeria              | 1      | 99         | Zimbabwe                 | 1      | 83             |