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

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Abstract

Sudden stops, or large reversals in capital inflows, have been linked to a number of financial crises in emerging market countries. Given their potentially devastating consequences, academics and policymakers have placed great emphasis on analyzing the causes of financial vulnerability. This task has become even more important with increasing financial globalization. A large literature has developed emphasizing the importance of institutions and governance in promoting growth and reducing economic volatility. This paper finds, however, that the effect of government quality on the incidence of costly sudden stops is in fact 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. Eventually, however, improving institutions does reduce the frequency of sudden stops, allowing countries to enjoy the benefits of financial globalization without all the 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.[1] Sudden stops are generally associated with large exchange rate depreciations and financial crises, leading to sharp contractions in investment and output.

The term sudden stop seems to suggest that the reversal in capital flows is not related to any fundamental problem in the crisis country. Sudden stops may result from contagion, changing conditions in industrial countries, or changes in attitudes towards risk on the part of international investors. Indeed, sudden stops often come in bunches, suggesting the presence of contagion, and are often largely unanticipated (Calvo and Reinhart, 2001). Bunching was particularly evident after the Russian 1998 crisis (Calvo and Mishkin, 2003). Argentina, Chile, Colombia, Ecuador and Turkey all experienced sudden stops either in 1998 or 1999. Because a sudden stop involves a significant reduction in credit and therefore a fall in aggregate demand, the ingredients are there for a self-fulfilling crisis (Calvo, et al., 2004).

It would be an over-statement, however, to claim that sudden stops occur irrespective of country heterogeneity. Emerging markets, for example, vary in their degree of domestic liability dollarization, i.e. the domestic component of "Original Sin" (Eichengreen, et al., 2002).

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[1] The phrase "Sudden Stop" was first used by Dornbusch, Goldfajn and Valdes (1995) and has become increasingly popular through the work of Guillermo Calvo (Calvo, 1998; Calvo and Reinhart, 2001). For a comprehensive review of the effects of financial globalization on developing countries, see Prasad, Rogoff, Wei and Kose (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). This process can lead to sharp contractions in output and is one of the reasons why many emerging markets exhibit a "fear of floating" (Calvo and Reinhart, 2002). Although domestic liability dollarization may precipitate self-fulfilling crises and 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., 2003), this phenomenon is not exogenous. 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.

Large fiscal deficits have also been implicated as well in the occurrence of sudden stops (Calvo, 2003). Reckless fiscal policy can result in unsustainable levels of public debt, especially when excessive borrowing from international capital markets is channeled into unproductive government expenditure. When default seems likely, lenders stop lending. This view certainly applies to the Latin American debt crisis in the 1980's but cannot explain the Asian meltdown in which stricken countries had low debt to GDP ratios, nor can it explain the bunching of sudden stops in countries with very different fiscal positions. Nevertheless, lack of fiscal discipline has played a role in crises in the past. In fact, if one considers the prospect of government bailouts of weak banking sectors, the fiscal position was far worse than on paper (Burnside, et al., 2001). In that case, the fiscal view becomes more applicable to the Asian crisis as well.

Thus, while international investors are partially to blame, a country's own macroeconomic policy and its institutions, including its monetary, financial and fiscal institutions, determine its vulnerability to sudden stops. It seems reasonable, therefore, that

improvements in government quality should reduce the incidence of sudden stops. The fact that measures of governance such as corruption have been linked to the share of foreign direct investment in inflows, a more stable source of funding, further suggests that this should be the case (Wei and Wu, 2002). Good institutions have also been linked to the positive effect of capital account liberalization on both financial development (Chinn and Ito, 2002, 2005) and growth (Alfaro, et al., 2003; Arteta, et al., 2001; Klein, 2003, 2005). Prasad et al. (2004) find that institutional quality has a similar effect on the impact of financial globalization on growth and consumption volatility. More generally, good corporate governance, transparency, limited corruption and strong legal and supervisory institutions should reduce vulnerability to crises.

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. As foreign lending becomes a more important source of funding, a capital flow reversal, when it does occur, involves a greater cost. This paper finds that for low levels of government quality, this effect dominates the positive effects of improved governance. 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.

Thus there is an inverted U-shaped relationship between government quality and the incidence of sudden stops. Countries with very poor institutions do not receive large capital inflows relative to GDP so that reversals in capital flows do not cause a major disruption to economic activity. These countries are therefore less likely to experience a recession-inducing sudden stop, even if there is a drop in inflows. 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. "Intermediate" countries may therefore be the most vulnerable to sudden stops that cause contractions in economic activity.

It is important to distinguish this result from previous work that has also found non-linear effects of institutional quality on growth or volatility. 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 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 neither of these papers finds that improvements in government quality can actually be

harmful in the short run. Rather, improvements are government quality are unambiguously positive as they unleash the growth-enhancing and volatility-reducing effects of liberalization.

It is also 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 and therefore cannot have a sudden stop. First, this initial positive relationship holds for a large number of countries in the sample, including those with average institutional quality that receive considerable inflows. Second, the size of the reduction in net inflows necessary to classify a sudden stop in a particular year is determined *relative* to the standard deviation of capital flows for that particular country. In fact, if we just focus on changes in capital flows as an indicator of sudden stops ignoring falls in output, it is easier for these countries to have episodes classified as sudden stops. The reason is that if they do not receive many inflows, it is possible that the volatility of inflows is low so that minimal changes in the capital account are classified as sudden stops. However, defining sudden stops as episodes of capital flow reversals that *also* cause a fall in output can generate the inverted U-shaped relationship, as described above.

I therefore consider alternative definitions of sudden stops that do not require capital flow reversals to be accompanied by recessions. Nevertheless, 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. Furthermore, the result that initial improvements in institutions may increase a country's vulnerability introduces an important caveat to the finding that improving institutions reduces economic volatility (Acemoglu, et al., 2003). This is an important result as it suggests the need for controls on capital inflows in countries with weak regulatory and supervisory institutions. This will ensure that the benefits of initial improvements in institutions, in the form of a higher

share of FDI in inflows or better prudential regulation and supervision for example, are not outweighed by the risk inherent in the increased capital inflows that those improvements generate.

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. Section 4 summarizes the findings and draws policy implications.

2. Empirical Methodology

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:

$$\# SuddenStops_i = \beta_0 + \beta_1 \overline{GovQual}_{i,t} + \beta_2 \overline{GovQual}_{i,t}^2 + \gamma^{'} \overline{MacroControls}_{i,t} + \overline{\varepsilon}_{i,t} \qquad (1)$$

The dependent variable is the number of sudden stops that country "i" experiences during the sample period. 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 20 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 4 sudden stops while others experienced only 1. 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. 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. For completeness, however, I estimate a probit model in Table 4 where the observations vary over country and year. Not surprisingly, the government quality variable is less able to explain both within and cross-country variation in sudden stops than it is able to explain solely cross-country variation. This paper, therefore, focuses on cross-country variation in the frequency of sudden stops.

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.

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." 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. More importantly, however, this restriction limits attention to *costly* sudden stops, which is of far greater interest.

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 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. 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.

The main results are robust to the use of different algorithms. For example, I require that the fall in the FA surplus lies at least two standard deviations below its sample mean. This had no effect on the classification of sudden stops. As discussed earlier, however, the restriction that GDP contracts could potentially have an impact on the significance of the government quality variable. As we will see, eliminating this restriction in fact makes the government quality variable insignificant. 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.

This paper focuses on sudden stops as measures of crisis 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. That is not to say that these alternative measures of crisis are unrelated. While large current account reversals after sudden stops can be avoided by drawing down international reserves, and current account reversals can occur in the absence of a sudden stop, the two often come hand in hand. Edwards (2004) finds that nearly half the countries subject to a sudden stop also faced a current account reversal, while nearly 23% of countries with reversals also experienced a sudden stop. Calvo, et al. (2004) find that both large depreciations and current account reversals occurred after a sudden stop.

The regressor of interest is the composite government quality variable. There are a number of reasons to think that government quality affects the likelihood of a sudden stop. First, countries with good institutions implement more credible monetary and fiscal policy. This should reduce the probability that international lenders will suddenly become unwilling to hold the liabilities of those countries. Irresponsible fiscal policy has also resulted in a number of sudden stops as public debt levels become unsustainable and default seems likely.

Second, improvements in government quality reduce liability dollarization (De Nicoló, et al., 2005; Honig, 2002). The presence of liability dollarization implies that large reversals in capital flows, which are often associated with significant exchange rate depreciations, will depress investment and output. The depreciation increases the value of the liabilities of firms who borrow in dollars. Firms that earn revenue in local currency will therefore have a currency mismatch and will suffer a significant deterioration of their balance sheets. Banks who lend to

firms in dollars are not necessarily spared as lending in dollars only replaces currency risk with dollar loan default risk. 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 sudden stops. Furthermore, expansionary monetary policy necessary to combat the recessionary effects of a sudden stop is more effective in low dollarization environments in which policymakers do not have to worry that a depreciation will harm firm and bank balance sheets.

The government quality variable enters both linearly and as a quadratic term. The intuition, as described above, is that improvements in institutions lead to an increase in capital inflows. The reason is that countries with better institutions, such as secure property rights and non-corrupt governments, invest more in physical and human capital, use these factors more efficiently, and achieve a higher level of income (Alfaro, et al., 2003).[2] However, large capital inflows can lead to risky lending if they are intermediated by a banking system that is not regulated and supervised properly. Large shares of non-performing loans, for example, can lead to sudden capital withdrawals as investors quickly lose confidence in borrowers' ability to repay. Thus institutional improvement can increase the frequency of sudden stops by encouraging inflows. Eventually, however, institutional improvement does reduce the incidence of sudden stops as the benefits of increased ability to handle inflows outweigh the risks posed by greater inflows. This suggests a non-linear relationship.

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, risk of expropriation and government effectiveness. Data are available from 1984-2004. *Bureaucracy Quality* (range 0-4) measures institutional strength and

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[2] See North (1981, 1994), Hall and Jones (1999), Acemoglu, Johnson and Robinson (2001, 2002).

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 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.

In addition, 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, although this variable does not tell us to what extent these liabilities are matched with foreign assets.

I also include a measure of domestic liability dollarization, the ratio of dollar deposits to total deposits in the banking system. While this variable does not provide a complete picture of currency risk since dollar liabilities can be hedged with dollar loans or through the use of forward contracts, it may be a good approximation since dollar loans to firms that earn revenue

in local currency do not provide the same hedge as loans to firms that earn revenue in dollars. Similarly, forward contracts with other domestic banks or firms who earn revenue in local currency do not affect a country's aggregate net foreign exposure. Moreover, as Eichengreen and Hausman (1999) point out, hedging opportunities with foreigners are limited as they are usually unwilling to sell dollars forward in exchange for domestic currency because of the "Original Sin" of emerging markets. The extent to which firms earn revenue in dollars, therefore, determines the risk posed by liability dollarization and as a consequence, the probability of a sudden stop. I include the ratio of trade to GDP to measure openness as a regressor.

In addition, countries that trade more recover more quickly from the output loss following a sudden stop (Guidotti, et al., 2003). 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. The former paper uses the gravity equation for trade openness to deal with potential endogeneity in estimating this relationship.

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. 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.

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 a number of alternative variables that indicate the level of international reserves, including the log of reserves in months of imports, the ratio of foreign reserves to the current account surplus and the ratio of net international reserves to GDP. 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. 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. I include the rate of growth of domestic credit (as a percent of GDP) as rapid growth in private sector credit might increase the probability of a sudden stop.

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 also include the ratio of the government's foreign debt to GDP, a measure of external debt that includes both the public and private sector, and total debt service as a % of exports. Finally, I control for the size of net inflows as a percent of GDP.

Before discussing the results, the issue of possible endogeneity of the government quality variable must be addressed. 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 within

country variation in government quality, however, suggests this is not a serious problem. Moreover, running a regression on the means as in equation (2) alleviates this problem. 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 (2) 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.

3. Empirical Results

Table 2 presents results for the estimation of equation (2). 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 only the government quality variables are included. The coefficients of both *Govqual* and *Govqual-squared* are generally significant at the 5% level and always significant at the 10% level, suggesting a strong inverted U-shaped relationship between government quality and the frequency of sudden stops.[3] In fact, *Govqual* is insignificant when included without the quadratic term, further revealing a non-linear relationship. Further calculations reveal that

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[3] The standard deviation of *Govqual* is close to one (approximately 1.2), so a one-unit increase also represents an increase in one standard deviation.

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. It should be noted that this relationship holds in the cross-section but we should not necessarily infer that it holds within countries over time.

This relationship is robust to the inclusion of a number of macro control variables.[4] 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. What is surprising is the lack of statistical and economic significance of the macro control variables. These results suggest 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.

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-squared* is positive, then greater trade openness shifts the hump to the left. I also include interaction terms with measures of capital

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[4] When the last two macro control variables are added, *Govqual* and *Govqual-squared* become insignificant although they are almost significant at the 10% level. The sample size is also considerably smaller.

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.

Table 3 presents results for the estimation of equation (2) but with an alternative dependent variable that does not require a reversal in capital flows to be accompanied by a fall in GDP in order for such an episode to be classified as a sudden stop. The coefficients of both the linear and quadratic government quality terms are now insignificant. As discussed previously, this result follows from intuition. Specifically, advanced countries are now much more likely to have capital flow reversals classified as sudden stops since these episodes do not tend to lead to contractions in output. Using this definition of sudden stops, for example, Denmark has six sudden stops during the sample period but zero using the default definition.

Finally, I estimate a probit model analyzing the probability that country "i" will experience a sudden stop in year "t." The results are presented in table 4. 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. Although I refer to "coefficients," I actually report dF/dx, the change in the probability of a particular exchange rate regime given a change in the regressors, evaluated at the mean of the regressors. OLS results were almost identical. The coefficients of the government quality variables, while still significant, are less significant than in Table 2.[5] 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

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[5] As a robustness check, I include year dummies as well. The linear government quality term, while always positive as in Table 2, 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 ten percent level. The inverted U-shaped relationship therefore seems to hold although is less significant.

of a sudden stop. Finally, 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, external government debt and net inflows tend to increase the probability of a sudden stop.

4. Conclusion

This paper finds a significant non-linear relationship between government quality and the cross-country frequency of sudden stops. Initial improvements in institutions tend to increase the probability of a costly capital flow reversal. A likely explanation is that government quality is a significant determinant of the level of capital flows and therefore the degree of the 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.

This result suggests the importance of capital controls and the proper sequencing of financial liberalization. Opening the capital account before sufficient institutional quality is

attained poses serious risks. Weak financial regulation and supervision coupled with large capital inflows is a dangerous combination. When inflows are channeled to risky investments, financial liberalization only exacerbates the problem. Furthermore, when reversals do occur, their effect is augmented because of greater liability dollarization in weak institution countries. Although the results in this paper 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 without all the risks.

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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	1.551	1.540	1.529	1.551	1.660	1.650	2.185	3.085	3.179
	(1.79)*	(2.16)**	(2.10)**	(2.11)**	(2.16)**	(2.26)**	(2.26)**	(2.20)**	(1.52)	(1.58)
GovQual squared	-0.219	-0.266	-0.260	-0.259	-0.245	-0.257	-0.257	-0.347	-0.565	-0.594
	(1.73)*	(2.12)**	(2.00)**	(2.00)**	(1.94)*	(1.99)**	(2.00)**	(2.19)**	(1.40)	(1.48)
Foreign liabilities/ M1 (%)		-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0.002	0.002
		(2.20)**	(2.02)**	(2.04)**	(1.65)*	(1.74)*	(1.74)*	(2.08)**	(0.61)	(0.64)
Trade/GDP (%)			-0.000	-0.000	-0.000	-0.001	-0.001	-0.004	-0.004	-0.000
			(0.08)	(0.05)	(0.04)	(0.34)	(0.41)	(0.85)	(0.49)	(0.04)
CA/GDP (%)				0.004	0.014	0.019	0.021	-0.003	0.026	0.002
				(0.22)	(0.60)	(0.81)	(0.85)	(0.05)	(0.38)	(0.03)
log real GDP per capita					-0.143	-0.142	-0.141	-0.042	0.218	0.152
					(0.69)	(0.74)	(0.73)	(0.17)	(0.48)	(0.32)
log total reserves months of imports						-0.155	-0.161	0.005	0.023	0.093
						(0.81)	(0.81)	(0.02)	(0.08)	(0.27)
FDI/GDP (%)							0.010	0.033	0.114	0.111
							(0.25)	(0.31)	(0.88)	(0.87)
Govt. Debt /GDP (%)								0.006	-0.001	-0.003
								(1.61)	(0.23)	(0.52)
External debt /GDP (%)									0.011	0.011
									(1.23)	(1.22)
Net Inflows /GDP(%)										-0.045
										(0.79)
Constant	-1.891	-2.324	-2.33	-2.313	-1.333	-1.269	-1.232	-2.938	-5.928	-5.658
	(1.85)*	(2.19)**	(2.24)**	(2.24)**	(0.90)	(0.92)	(0.91)	(1.37)	(1.46)	(1.38)
Observations	122	109	108	108	106	105	105	74	57	57
Pseudo *R*-square	0.12	0.14	0.14	0.14	0.15	0.15	0.15	0.19	0.25	0.25

Robust z statistics in parentheses

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

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Table 3

Poisson Estimation - Effect of Government Quality on Frequency of Sudden Stops: using alternative sudden stop criteria

Dependent variable: number of sudden stops per country: 1982-2004										
GovQual	-0.237	-0.086	-0.129	-0.176	-0.007	0.105	0.109	0.172	0.988	0.910
	(0.46)	(0.14)	(0.20)	(0.27)	(0.01)	(0.16)	(0.17)	(0.19)	(0.65)	(0.61)
GovQual squared	0.041	0.015	0.028	0.033	0.036	0.023	0.024	-0.011	-0.147	-0.133
	(0.45)	(0.13)	(0.23)	(0.27)	(0.30)	(0.19)	(0.19)	(0.07)	(0.49)	(0.46)
Foreign liabilities/ M1 (%)		-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0.001	0.002
		(1.71)*	(1.81)*	(1.90)*	(1.42)	(1.54)	(1.57)	(1.75)*	(0.50)	(0.58)
Trade/GDP (%)			0.001	0.002	0.002	0.002	0.002	-0.001	-0.006	-0.004
			(0.48)	(0.63)	(0.87)	(0.66)	(0.70)	(0.15)	(0.95)	(0.58)
CA/GDP (%)				0.015	0.029	0.034	0.033	0.047	0.110	0.093
				(0.96)	(1.34)	(1.65)*	(1.59)	(1.08)	(1.49)	(1.24)
log real GDP per capita					-0.219	-0.223	-0.224	-0.170	-0.093	-0.139
					(1.09)	(1.17)	(1.17)	(0.66)	(0.22)	(0.33)
log total reserves months of imports						-0.137	-0.132	0.037	0.050	0.102
						(0.95)	(0.88)	(0.24)	(0.24)	(0.43)
FDI/GDP (%)							-0.008	0.097	-0.005	-0.008
							(0.26)	(1.22)	(0.04)	(0.07)
Govt. Debt /GDP (%)								0.006	0.012	0.011
								(2.50)**	(1.91)*	(1.64)
External debt /GDP (%)									-0.000	-0.000
									(0.00)	(0.03)
Net Inflows /GDP(%)										-0.035
										(0.88)
Constant	0.652	0.471	0.345	0.42	1.617	1.667	1.647	1.217	-0.429	-0.093
	(0.82)	(0.54)	(0.39)	(0.48)	(1.07)	(1.16)	(1.15)	(0.56)	(0.12)	(0.03)
Observations	122	109	108	108	106	105	105	74	57	57
Pseudo *R*-square	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.11	0.13	0.13

Robust z statistics in parentheses

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

Table 4
Probit Estimation - Effect of Government Quality on Probability of Sudden Stop

Dependent variable: binary indicating sudden stop in country "i" in year "t"										
GovQual	0.025	0.035	0.036	0.034	0.031	0.032	0.032	0.049	-0.007	-0.003
	(1.58)	(2.00)**	(1.92)*	(2.02)**	(1.68)*	(1.69)*	(1.69)*	(1.51)	(0.36)	(0.65)
GovQual squared	-0.005	-0.007	-0.007	-0.006	-0.007	-0.007	-0.007	-0.008	0.003	0.001
	(1.71)*	(2.13)**	(2.03)**	(2.16)**	(2.15)**	(2.14)**	(2.12)**	(1.58)	(0.83)	(1.17)
Foreign liabilities/ M1 (%)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		(1.81)*	(0.50)	(0.37)	(0.15)	(0.23)	(0.07)	(3.60)***	(2.84)***	(3.30)***
Trade/GDP (%)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			(0.28)	(1.25)	(1.82)*	(1.79)*	(1.84)*	(1.87)*	(2.36)**	(3.24)***
CA/GDP (%)				-0.002	-0.002	-0.002	-0.002	-0.005	-0.003	-0.001
				(3.96)***	(4.34)***	(3.46)***	(3.11)***	(3.93)***	(3.35)***	(2.20)**
log real GDP per capita					0.015	0.015	0.015	-0.007	0.003	0.001
					(2.21)**	(2.17)**	(2.17)**	(0.78)	(0.39)	(0.22)
log total reserves months of imports						-0.001	-0.002	0.004	0.004	0.001
						(0.34)	(0.43)	(0.60)	(0.83)	(0.38)
FDI/GDP (%)							0.001	-0.001	-0.002	-0.001
							(0.83)	(0.39)	(2.24)**	(1.96)*
Govt. Debt /GDP (%)								0.000	0.000	0.000
								(0.97)	(2.47)**	(1.30)
External debt /GDP (%)									0.000	0.000
									(1.87)*	(0.95)
Net Inflows /GDP(%)										0.001
										(3.53)***
Observations	2194	1870	1812	1812	1737	1702	1701	443	336	336
Pseudo *R*-square	0.02	0.03	0.02	0.07	0.08	0.07	0.07	0.25	0.35	0.45

Robust z statistics in parentheses

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

Appendix A

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
Sudden Stop Variables - 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.
Government Quality Variables	
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.
Control Variables	
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.
Short term debt (% of total external debt)	Short-term debt (% of total external debt): Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. 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
Net Capital Flows (% of GDP)	Financial Account Balance as % of GDP. Source: IFS 78bjd.
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.

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 dIvoire	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