Sudden Stops of Capital Flows and Currency Crises: Evidence from Asia

Mehdi Yazdani
Department of Economics, University of Isfahan, Isfahan, Iran

Seyed Komail Tayebi
Department of Economics, University of Isfahan, Isfahan, Iran

Charles Harvie
School of Economics, University of Wollongong, Wollongong, Australia

Abstract:
A sudden stop of capital flows or capital account reversals has become the central issue in analyzing financial crises in many contemporary economies. Sudden stops can be characterized by sharp reversals in capital inflows, large declines in output, and steep collapses in real asset prices (Mendoza and Smith, 2009). In almost all recent crises capital account reversals amounting to more than 10% of an afflicted country’s GDP have occurred (Calvo and Reinhart, 1999 and Nabli, 1999). More specifically, reversals in capital flows to emerging market countries in the 1990s and early 2000s exerted a substantial influence on the relevant economies affected even leading to financial crises, while, on the whole, international capital reversal has been absent in the case of advanced countries. Another characteristic of recent crises is the swiftness and the magnitude of the crises itself and its impact on asset prices and the exchange rate.

The objective of this paper is to examine the role of sudden stops in causing a currency crisis in Asia. Moreover, the herding behaviors on capital flows will be analyzed in Asian emerging countries. So the probability of the occurring a currency crisis after sudden stop in capital inflows caused by herding behaviors will be estimated by a logit regression for Asian countries during 1970-2011.

The results show that the sudden stop phenomenon raises the probability of currency crisis occurring in the sample. Also one of the major factors to determine the sudden stop in capital flows is the large capital inflows episode (Bonanza) at previous period.

Keywords: Sudden Stop, Capital Reversal, Currency Crisis, Herding Behavior, Emerging Markets, Asia.

JEL Classification: C23, C25, F41, G01.

1. M.yazdani@econ.ui.ac.ir, +98 311 793 5231 (phone), +98 311 668 3116 (fax)
2. Sk.tayebi@ase.ui.ac.ir, +98 311 793 5242 (phone), +98 311 668 3116 (fax)
3. Charvie@uow.edu.au, +61 242 213 665 (phone), +61 242 214 157 (fax)
1. Introduction

The expression of financial crisis is used generally to a difference positions in which some financial institutions or assets abruptly drop a large part of their value. In the 19th and early 20th centuries, several financial crises were related with banking panics, and many depressions corresponded with these events. Other positions that are frequently described as financial crises contain stock market collapses and the bursting of other financial bubbles, currency crises, and sovereign defaults (Kindleberger and Robert, 2005; Laeven and Valencia, 2008). Moreover a lot of economists have presented theories about how financial crises expand and how they will be avoided. However, there is little agreement and financial crises are still a regular episode in international markets.

The critical issue in analyzing financial crises in many emerging economies is sudden stop of capital flows or capital account reversals. Generally sudden stops in capital flows can be explained by quick reversals in capital inflows, large decreases in output, and sharp collapses in asset prices (Mendoza and Smith, 2009). Moreover in theoretical literature about financial crises and causes of them, systemic sudden stops have been introduced as the major root of the pattern of strict financial turmoil in emerging countries in recent decades (Calvo, et al, 2004; Calvo and Talvi, 2005; Calvo et al, 2004, 2006).

On the other hand, according to realized facts in this regards, it should be mentioned that foreign investors have a critical role to create these phenomena and they withdrew from emerging markets at the same time. For example the U.S. investors and Japanese banks pull out from the Latin American and Asian financial markets respectively and create crisis in these countries. Except the impacts of this phenomenon on real sector of economy and losses in output, emerging market countries lost access to international capital markets during these periods (Calvo and Reinhart, 2000; Kaminsky and Reinhart 1999).

Moreover one of the reasons behind the current global financial crises might be the interdependence or herding behavior by investors. Because the gathering and processing information on economic fundamental variables in emerging markets is difficult, expensive and time consuming, while the following of other investment and their decisions is cheap. Thus investors and lenders in emerging markets do not evaluate the volatility in macroeconomic variables fundamentally, whereas their evaluation according to herding behaviors will be based on technical analysis. So it can be expressed that herding behaviors are possible in emerging market economies. On the other hand, these phenomena in financial markets lead to sudden stops in capital flows and capital reversals. Although there are several theoretical to explain of these behaviors and this phenomenon has been found to be more frequent in emerging markets and crisis situations, but the empirical researches on this topic are scarce.
The remainder of the paper is structured as follows. Section (2) reviews sudden stops and herding behavior literature and its related impacts on financial crises. The methodology of research and empirical model to evaluate the hypothesis of the study will be represented in Section (3). Section (4) analyzes the empirical results and finally, Section (5) concludes relevant remarks.

2. Literature Review
2-1. Capital Flows and Financial Crises
Generally it should be mentioned that according to the microeconomics level, capital inflows lead to welfare improving, because they can change the time profile of consumption and can exploit a high Marginal Product of Capital (MPK). Moreover, according to the macroeconomics level, capital inflows can expand physical capital, productivity and economic growth (Henry, 2003; Obstfeld, 1994; Kose et al., 2008; Prasad et al., 2003; Obstfeld and Taylor, 2004; Mishkin, 2008; Obstfeld, 2009).

Feldstein and Horioka (1980), however, were early promoters of the argument that capital may not fully utilize international investment opportunities. This category of literature emphasizes the negative outcomes of international capital flows. The volatility of capital flows, especially portfolio flows is the main outline for considering financial globalization can be welfare reducing for emerging and developing countries (Rodrik, 1998; Stiglitz, 2002). According to literature, exogenous shocks that could be international or domestic in origin, lead to withdrawal of capital flows and create Sudden Stops and Sudden Flights (Calvo and Reinhart, 2000; Rothenberg and Warnock, 2006). Reduced capital flows will be associated with a decline in sentiment, reduced investment, output and employment.

Generally it should be mentioned that the East Asian and subsequent crises - Brazil, Turkey, Argentina, Uruguay, and the Dominican Republic - outcome in the appearance of a new (and more prudent) approach towards macroeconomic policy in emerging and transition economies. The general purpose of this new approach is to decrease vulnerability to external shocks and to lower the probability of external crises, such as sudden stops and high devaluation in domestic currency. Moreover this new view on macro policy has recognized the need of maintaining the public and external debts at prudent levels. In addition, the accumulation of international reserves has been introduced as a self insurance instrument and current account deficits have been controlled (Edwards, 2007).

In spite of the appearance of a new approach on macroeconomic policy, there is no agreement in some areas. One of the important issues refers to the suitable degree of capital mobility in emerging and transition economies. Some authors discuss that limiting the

---

1. The failure of capital flows to fully exploit MPK differentials is known as the Lucas (1990) Paradox.
degree of international financial integration decreases speculation and helps countries withstand external shocks without suffering from massive crises. According to this view, countries that control and limit capital mobility are less probable to suffer contagion from abroad.

In criticism toward the International Monetary Fund (IMF), Stiglitz (2002) discusses that the major reason why India and China were spared from substantial currency crises and were not subject to contagion from the East Asian or other crises of the 1990s and early 2000s is that they did not permit free capital mobility. Stiglitz (2002) goes as far as arguing that the easing of controls on capital mobility was at the center of most modern currency crises in the emerging markets, such as Mexico 1994, East Asia 1997, Russia 1998, Brazil 1999, Turkey 2001, and Argentina 2002.

According to other authors, limitations on capital mobility are ineffective and the private sector finds ways of circumventing them, so these restrictions lead to introduce costly microeconomic distortions and encourage corruption (Forbes, 2006, 2007). What makes the discussion on capital controls is that some of the critics of free capital mobility in the emerging countries are authors that have been stop supporters of free trade in goods and argue that there are fundamental differences between markets for goods and markets for securities (Bhagwati, 1998, 1999).

There is an accepted view, however, that episodes of large capital inflows raise the weakness of the financial system and the risk of sudden reversals in capital inflows. Episodes of large capital inflows, or “bonanza” episodes, can increase vulnerabilities and financial risks via several channels. First, bonanza episodes will be associated with large exchange rate appreciations which may lead to Dutch disease situations. At the same time, the bonanza episode can create an unexpected reversal of such flows more probable, which may in turn cause lasting output contractions, particularly in the existence of a fixed exchange rate regime. Also the large capital inflows can lead to upward pressure in asset prices, increase the exposure of the economy to foreign liabilities, and fuel foreign-financed credit booms, which may subsequently turn to burst when capital flows are reversed (Reinhart and Reinhart, 2009).

2-2. Sudden Stops of Capital Flows and Financial Crises
The sudden stop phenomenon is basically defined as an unexpected reduction of the capital inflows to a country and up to time of sudden reduction that have been receiving large volumes of foreign capital (Calvo, 1998). This event occurs due to volatility of macro-

---

fundamental variables, the conditions of balance of payment and the change in investors’
behavior (Efremidze, 2009). Moreover the emerging markets have been affected by these
phenomena in 1990s and 2000s (for example East Asian Crisis (1997-98), Russian Crisis
(1998) and Mexican Crisis (1994)). This definition of sudden stop episode was extended by
Mendoza (2001), Mendoza and Smith (2002) and Hutchison and Noy (2006). These
authors consider the effect of large downward adjustments in domestic production after a
sharp reversal in capital inflows and collapses in asset prices and in the relative prices of
non-tradable goods relative to tradable ones (Sulimierska, 2008).

According to the literature, the sudden stop of capital flow includes a reversal in capital
inflows associated with a currency and balance of payments crisis (Calvo, 1998; Rodrik
and Velasco, 1999; Calvo et al., 2003; Kaminsky and Schumukler, 2003; Hutchison and
Noy, 2006). There are three mechanisms through which a sudden stop in international
capital flows can lead to currency and balance of payments crises. The first two channels
were constructed on the financial friction of the “great depressions” model. The first
channel is based on the Keynesian hypothesis of price or wage stickiness and its association
with an external financing premium (Bernanke et al., 1999).

The second channel is called as Fisherian analysis of debt-deflations motivated by
collateral constraints. This analysis was presented by Kiyotaki and Moore (1997) and
extended by integrating forms of imperfect credit markets, by Mendoza (2001). Basically,
these two approaches explored the effect of a fall in credits, attributable to the sudden stop
in capital approaches, combined with an external financing premium, a “financial
accelerator”, reducing aggregate demand and causing a fall in output. On the contrary,
Mendoza’s approach to Bernanke et al. (1999) and Kiyotaki and Moore’s (1997) sudden
stop models is completely different. This analysis concentrates on an extra volatility event
and clarifies the unexpected economic collapses of sudden stops as a typical occurrence
nested within the co-movements of systematic business cycles. The model also makes
stresses upon interaction among uncertainty, risk aversion and incomplete contingent-
claims markets in forming the transmission mechanism linking financial frictions to the real
economy. This analysis is the same as the models developed by Aiyagari (1993) and
Aiyagari and Gertler (1996), where precautionary saving and state-contingent risk premium
play a major role in driving business cycle dynamics. In addition, Mendoza (2001) added
“policy uncertainty” and “involuntary contagion” as explanatory variables in sudden stops
model.

Finally, the third mechanism is the analysis of existence the multiple equilibria more of
which were expanded as fraction of the second and third generation model (Calvo, 1998;
Rodrik and Velasco, 1999; Aghion et al., 2001). However, according to Rodrik and
Velasco (1999), in this method, extreme short debt can make borrowing economies
vulnerable to abrupt changes in lenders’ or investors’ expectations, which can in turn become self-fulfilling of a currency crisis. Moreover the cause for the shift of the economy to an inappropriate equilibrium might be the sudden capital reversal (Sulimierska, 2008).

On the other hand, the recent volatilities at emerging and even non-emerging markets economies have caused a huge misunderstanding among economists. The knee-jerk reaction after Mexico’s Tequila Crisis was to blame it on fiscal deficits and current account deficits, CADs (while it was 8 percent of GDP in 1994 and was expected to rise to 9 percent in 1995). Since the international debt problems were preceded by CADs, it was alluring to summarize that high CAD and low saving rates lied at the heart of Mexico’s difficulties then, and in 1994.

The 1997-1998 Asia Crisis increased serious doubts about the corollary’s relevance. In contrast to Mexico and the other countries of Latin America (except for Chile), Asian countries displayed enviably high saving rates while CADs was low for some countries such as Indonesia or was large surpluses for a few countries such as Taiwan. Moreover the Asian crisis emerges to be deeper and longer-lasting than the Tequila. Hence different views presented about reasons and causes of crises. For example, there is still a group claiming that CADs are the major reason (particularly about high CAD in Thailand). On the other hand, the “floaters” are becoming more obvious claiming that the fundamental error was not to permit for greater exchange rate flexibility (Calvo, 1998).

Hence this study aims to evaluate the causes of sudden stops of capital inflows, which may generate financial crises, while it has different views on reasons and causes of financial crises. We thus model herding behavior and sudden stops in a framework of currency crises. More specifically, we add capital flows and the likelihood of sudden stops of capital inflows into a currency crisis model, and then examine the role of capital movements in the recent financial crises. Moreover, some questions are raised regarding the paper objectives: how does an increase in capital flows affect the crisis vulnerability? What does occur for a financial crisis if the lenders follow of herding behavior while are interdependent? In conjunction with the theoretical literature and empirical evidence from the Asian financial crises, this study analyzes empirically the critical role of sudden stops in capital flows and herding behavior, which lead to financial crisis.

3. The Model and the Methodology

This section introduces an empirical model based on theoretical literature to identify the statistical significance of the determinants of sudden stops and also its impact on financial crises.
According to the theoretical literature on financial crises and capital flows argued in Section (2), the interaction between capital flows and sudden stops and financial crises (such as banking and currency crises) are shown in Figure (1).

In general, after a capital inflow episode (Bonanza) occurring through herding behavior in a country, sudden stops (balance of payment crisis) can be observed (Furceri et al., 2011; Agosin and Huaita, 2012). It should be noticed that the large capital inflows certainly did not lead to financial crises, but it is a necessary condition. In other words, if the large capital inflows into a country are determined through a herding behavior mechanism, they can also be withdrawn by the same mechanism and consequently lead to a financial crisis. Moreover, according to the theoretical literature, the expectations of a devaluation policy can affect fundamental variables and move them into grey area. In this situation, the probability of multiple equilibria will arise and this condition leads to balance of payment crisis (sudden stops), and then currency crisis. Additionally, if policy makers do not have a suitable response to this situation, a banking and currency crises will occur, where the Latin America crisis (1980s and 1990s) and the East Asian crisis (1997) are respectively two examples. Moreover, even in the absence of sudden stops initially, the large capital inflow episodes increase the likelihood of financial crisis through boom lending and the effects of this phenomenon on sudden stops and interaction between banking and a currency crisis, can be shown by a conceptual framework (Figure 1).

---

1. This episode is considered as short term financial capital flows.
The hypothesis of “overreaction” in the stock market introduced in the seminal work of De Bondt and Thaler (1985) and loan pushing model by Basu (1999) is used to determine sudden stops in capital inflows and the role of herding behavior on this phenomenon. They prove that due to the animal spirits of participants and investors in financial markets, these markets show excessive responses to new information or unexpected outcomes. According to their study, it is possible that inverse response in prices (the negative return) be forecasted by severe upward prices (positive returns) in last. Thus after any upward response in the financial market, there is an unexpected downward adjustment.1

According to this explanation of capital flows in emerging markets, irrational and psychological factors become main aspects in the determination of large capital volatility and such behavior can act instead of the fundamental variables of the economy. Consequently, the model is applied to determine the reasons of capital flows into emerging countries where there are excess volatilities and frequent in these flows.

Although there are some studies in the literature being focused on the determinants of sudden stops and currency crises such as Glick and Hutchison (2005); Broner and Rigobin (2006); Furceri et al. (2011) and Agison and Huaita (2012), this study is different, in several respects. First, this study tries to classify the determinants of sudden stops into two separate groups including domestic and foreign determinants. The domestic determinants for sudden stops are fundamental variables while the foreign determinants are divided into two international and regional variables.

Second, another major contribution of this study is to introduce herding behavior as a factor in the determination of sudden stops and then enter this variable in a financial crisis model. Such behavior will be added to the model via a proxy. To measure this variable, the common property of De Bondt and Thaler (1985) model and loan pushing model by Basu (1999) has been used which the large capital inflows episode occurring in period $t$ that leads to sudden stop at period $t+1$ or $t+2$, is as a proxy for herding behaviors and is added to sudden stops and financial crisis model. Third, in empirical studies to date a sudden stops variable has not been added to a financial crises model as an explanatory variable. But in this study, according to the theoretical literature, the estimated value of this variable in the sudden stops model (to avoid the endogeneity problem) has been added in the financial crisis model as a new explanatory variable.

### 3-1. Sudden Stop Model

---

1. It might lead to this view that if this is the case then such unexpected downward adjustments would become expected. Therefore investors learn from previous experience and begin to anticipate such a downturn. It should be mentioned that it is assumed that investors have not learning behavior and their behavior is defined by herding behavior.
Suppose that $\Phi$ represents the distribution function (standard normal or logistic), then a panel model will be estimated with heterogeneous unobserved effects. For the sudden stops phenomenon, the following equation will be estimated:

$$\Pr(SS_u = 1) = \Phi(\gamma_sB_{it-1} + \gamma_c ContSS_{it} + \gamma_d D_{it-1} + \gamma_F F_{it-1} + c_i)$$  \hspace{1cm} (1)

The sudden stop events $SS_u$ are established in the following manner where the annual change in capital flows are as follows:

$$SS_{it} = \begin{cases} 1 & \text{if } \Delta \frac{NF_{it}}{GDP_{it}} < \Delta \frac{NF_{it}}{GDP_{it}} - \sigma_{\frac{NF_{it}}{GDP_{it}}} \text{ and } \left| \Delta \frac{NF_{it}}{GDP_{it}} \right| > 5\% \text{, Whenever } B_{it} = 0 \\ 0 & \text{o.w.} \end{cases}$$  \hspace{1cm} (2)

where $NF_{it}$ is net financial account. Thus, this episode is known as a series of years in which this measure is satisfied.

It should be noticed that there is a joint condition in Equation (2) ensuring that it is impossible for a country to experience a sudden stop ($SS_{it}$) and large capital inflows episode ($B_{it}$) in the same year. Also the contraction in capital flows must be greater than 5% as a share of GDP. According to this measure, the sample will be restricted to those countries in which the capital account reversal exceeds 5 percent of GDP to keep away from including cases that show minimal change in the capital account which is larger than one standard deviation but it is not serious for that economic. In the other word, the size of economy is important (Guidotti et al., 2004; Cardarelli et al., 2010).

The large capital inflows episode is established as follows:

$$B_{it} = \begin{cases} 1 & \text{if } TDev\text{it} > \sigma_{TDevit} \text{ and } \frac{NF_{it}}{GDP_{it}} > 1\% \\ 0 & \text{o.w.} \end{cases}$$  \hspace{1cm} (3)

where $TDev\text{it} = \frac{NF_{it}}{GDP_{it}} - trend_{it}$ and $\sigma_{TDevit}$ are the deviation of net financial account-GDP ratio from its historical trend and the standard deviation of de-trended series for net capital inflows in economy $i$ respectively.

It should be noticed that during large capital inflow episodes, the optimism of investors will be improved, because investors evaluate the behavior and responses of other participants in international capital markets (Agosin and Huaita, 2012). Therefore the large plan attracts new investment and then creates a boom in financial market that can be self-sustaining for some time. Moreover, this variable is a suitable measure to decide about the

---

1. It should be noticed that in this study is assumed that investors only have herding behavior and they didn’t use of their previous information and they haven’t learning behavior. Consider to learning behavior can be as a topic for future studies.
strategies used by private and institutional investors during periods. In other words, this variable is a proxy for herding behavior of capital flows into an economy.

The estimated coefficient of $B_{it.4}$ in Equation (1) is a proxy for over-reaction or herding behavior in international capital markets. Indeed in financial markets with heterogeneous agents, they are informed that the higher level of capital inflows into emerging markets is dependent on the decisions of other investors and not only response to economic fundamentals. Therefore, the updated information in these markets such as not optimistically insight toward the economic fundamentals by investors could create a sharp adjustment in these markets and lead to herding behavior by investors. Moreover, $ContSS$ is a dummy variable to show the contagion in the international capital market. This variable takes the value 1 whenever the number of sudden stops in any year (period $t$) and the previous year (period $t-1$) are more than twice the number of annual average of sudden stops in the sample and 0 otherwise.

On the other hand, the dummy variable for contagion could show the herding behavior in capital flows, because according to empirical evidence, the over-reaction phenomena and capital reversals in financial flows have occurred simultaneously in emerging markets (Agosin and Huaita, 2012). Consequently, these evidences are consistence with the hypothesis of this study that sudden stops phenomenon and also the large capital inflows episodes in international capital market are not necessarily related to changes in fundamental variables and instead they are been affected by psychological behavior. For example, if there were optimistically insights about the economic growth in a country, investors prefer to invest in this country and the large capital inflows episode will happen (Broner and Rigobón, 2006). An example for this case is the capital surge to Asian economies before the Asian crisis (1997). Also the probability of sudden stops occurrence will increase in the particular country, if the sudden stops happened in the counties with the same structure. Again the Asian counties are the appropriate example that after occurring capital flight in Thailand in mid of 1997, the enormous surge of sudden stops had occurred in Malaysia, Korea, Philippine and even in Singapore and Hong Kong.

---

1. Although it depends on whether the majority of investors agree or whether markets are led by changes in key investors, But it should be noticed that in emerging countries this matter is usual and often each investor though that others have more information than himself/herself. Also since the gathering and processing the information in emerging market countries is costly and time consuming, usually investors follow and imitate of other investors.

2. Again it should be mentioned that it assumed that investors do not learn from their previous experiences. In other word, it assumed that investors believe that “this time is different”.

3. However the source of this information and the credibility of them would be important.

4. It might raise a view that after capital inflow into a country, there are some downward pressures on investment returns, eventually making the country less attractive to invest in and bringing capital inflows to a halt. It should be mentioned that this matter occurs in during time while the large capital inflows episode occurs immediately it has different effects than the capital inflows.
Several empirical studies such as Broner and Rigobón (2006), Fiess (2003), and Forbes and Rigobón (2001) have used the contagion variable as an explanatory variable in capital flows models. In this study there is a different view with respect to contagion variable. Although contagion defined differently as a regional event, here contagion is more generally in emerging markets and is an international occurrence; because it could be observed that the Russian crisis at 2008 affected other economies such as Brazil’s.

Moreover, this variable could show the evidence on leverage problem for investors. According to this view, when investors are faced with a sudden decline in the value of their portfolio of assets in a particular country, the other countries assets in their portfolio must be sold in order to compensation. Then, other investments may make a mistake decision about the sign of fundamentals and consequently the country can experience the large capital outflows because of such behavior. The extreme case is even rumors in financial markets lead to that the unaware investors follow other participants in the market that they are selling for reasons unrelated to weakness of fundamentals. These collective behaviors are known as herding behavior in the literature that leads to waves of capital inflows into emerging countries and in the next period will create a capital flight or sudden stops in capital inflows.

The current account deficit is one of the variables that have been used in studies as an explanatory variable for sudden stops. Also the banking crisis index is another explanatory variable defined by the interaction between currency and banking crisis. The exchange rate index is added into the model to test the hypothesis that countries with fixed exchange rate regimes experience sudden stops rather than countries with a flexible exchange rate. Moreover, the higher levels of external debt to export ratio will increase the likelihood of sudden stops. Other variables that have been used in the literature are liability dollarization, trade openness, the ratio of M2 to GDP and the change in the terms of trade and the change of reserves. Also the foreign interest rate to control the relationship with international environment and domestic fundamentals (such as domestic interest rate and budget deficit) are added into the model.

3-2. Currency Crisis Model

According to the theoretical literature, the emerging of sudden stops in capital inflows can be as a result of a currency crisis. In this section, we introduce an empirical model to evaluate the role of the sudden stops (balance of payment crises) in causing currency crisis at emerging market countries. The represented model is defined as:

$$\Pr(CC_{t+j} = 1) = \Phi(\gamma_B B_{t-1} + \gamma_{SS} SS_t + \gamma_{SS} B_{t-1} \beta + \gamma_X X_{t+1} + \gamma_{\beta^*} \beta^* + c)$$  \hspace{1cm} (4)
where \( B_{it-1} \) is the large capital inflows episode in previous period, \( SS_{it} \) is the estimated value for probability of the occurring of sudden stops in capital inflows, \( X_{it} \) and \( X_{i^{*}t-1} \) denotes two sets of explanatory variables in period t and t-1, respectively. These sets include inflation rate, economic growth rate, population (as a scale variable), credit growth, capital account liberalization, financial liberalization and regularity quality and in matrix of foreign variables, net foreign asset (ratio to GDP).

Therefore, the covariates for the large capital inflow episode (\( B_{it-1} \)), sudden stops (\( SS_{it} \)) and the matrices of controls \( X_{it} \) and \( X_{i^{*}t-1} \) has been separated in Equation (4) and also an interaction term for the large capital inflows episode (bonanzas) and sudden stops is enter the model. The main purpose of this econometric specification is to make a decision on two issues: a) Do the surges (bonanza) in capital inflows raise the probability of currency crises? This question will be answered by estimating the Equation (4) (without considering the interaction terms) and evaluating the sign and the statistical significance of \( \hat{\beta} \) (\( H_0 : \hat{\beta} = 0 \)). b) Do does the bonanza directly affect the currency crises? This question will be evaluated by estimating Equation (4) including the interaction term of the bonanza and sudden stops and evaluating the sign and significance of the coefficient of the bonanza (\( H_0 : \hat{\beta} = 0 \)) and finally the linear combination of the two coefficients (\( H_0 : \hat{\beta} + \hat{\beta}_{bas} = 0 \)).

According to the hypothesis of this study on the existence of herding behavior in capital flows into emerging markets and implication of Basu’s (1999) loan pushing model and the overreaction hypothesis of De Bondt and Thaler (1985), the higher capital inflows episode variable at the previous period (\( B_{it-1} \)) has been added to the currency crisis model. In fact, the significance of this variable will confirm the existence of herding behavior. Moreover, after this phenomenon occurred, as a response to not optimistically insight and perception about fundamental variables, lenders and investors gregariously will withdraw from these markets and create sudden stops in capital inflows. Hence, \( SS_{it} \) has been added to the model.

Moreover, according to the realized facts on interaction between currency crises and sudden stops of capital flows, there are two major questions. First, what amounts of the volatility in exchange rates are relative to other factors which will be extended by sudden stops in capital flows? Second, is there a causality relation from sudden stops to exchange rates or vice versa? In other word, do exchange rate risks lead to sudden stops?

In order to answer these questions, the role of other potential explanatory variables has to be considered for explanation of exchange rate behaviors. These variables can present the reverse causality from the changes in exchange rate to sudden stops of capital flows. A
model of exchange rate determination that considers various possible relationships is a practical and useful starting point. For example, the monetary models used to exchange rate determination that have been introduced in 1970s and 1980s are reliable and being consistent with short-run price rigidity. A few models in this case were introduced by Frankel (1979) and Frankel and Rose (1995). In our model specification, a change in risk premium of a country (that is dependent on the supply of international liquidity) has been added into model. In this model, it has been allowed that the equilibrium of real exchange rate violates the long-run purchasing power parity (PPP). Instead the model will include some variables such as terms-of-trade trends, long-run productivity differentials between domestic country and abroad, and the country’s fiscal condition which are important to determine. More specifically, the model is consistent with a large group of open macroeconomic models (see, e.g., Edwards (1989) and Obstfeld and Rogoff (1996) for information). Hence, control and explained variables in $X_u$ and $X_{u-1}$ are defined as

- $\Delta Ln(M_2)_t$: the change in Log of money (M2) at t.
- $\Delta Ln(Y_{real})_t$: the change in Log of real product in economy at t.
- $\text{totgap}_{t-1}$: the deviation of term of trade from its long-run trend at t-1.
- $\Delta Ln(Y_{real}/n)_{t-1} - \Delta Ln(Y_{real}^* / n^*)_{t-1}$: the difference in Log of GDP per capita between domestic country ($Y_{real}/n$) and foreign country ($Y_{real}^* / n^*$) (the proxy for any difference in productivity) at t-1.
- $\text{BD gap}_{t-1}$: the budget deficit from its long-run trend at time $t-1$.
- $(i_t - i^*_t)$: the difference in the short-run interest rate at time $t$.
- $\Delta Ln(CapitalFlows)_t$: the change in Log of capital flows at time $t$.
- $\Delta (res/M_0)_t$: the change in the ratio of foreign reserve (res) to the paper money (M0) at time $t$.
- $\text{Ln}(Ext.Debt / X)_{t-1}$ : Log of the ratio of external debt ($Ext.Debt$) to export at time $t-1$.
- $\text{Ln}(X / M)_{t-1}$: Log of the ratio of export (X) to import (M) at time $t-1$.

3.3. Data Structure

This study focuses on the twenty Asian countries from East and West, namely China, India, Indonesia, Iran, Korea, Turkey, Bangladesh, Malaysia, Pakistan, Philippine, Thailand, Vietnam, Bahrain, Jordon, Kuwait, Mauritius, Oman, Sri Lanka, Hong Kong, Singapore. The sampling time series are from 1970 to 2011, and the data and their sources are reported in Table 3 in Appendix 1.
4. Empirical Results
According to the specified models in the previous section and using data described in Appendix 1, the estimated results for sudden stops and currency crisis in sample countries during 1970-2011 are reported in Table (1) and Table (2), respectively.

4-1. Estimated Results for Sudden Stop Model
Table 1 shows the estimation results for the sudden stop model. According to the first column of the table, the higher capital inflows in the previous period ($B_{t-1}$), the contagion of sudden stop and current account deficit are strong predictors for a sudden stop. Moreover, the results in Table 1 show that the effect of Bonanza is the largest among the explanatory variables included (increasing the probability of a sudden stop by around 9% in the last model). It is robust to the inclusion of other variables. This result shows that the capital inflows into the emerging countries at period $t$, and then sudden stops and capital reversal at period $t+1$ are not based on a fundamental analysis, while there are some evidences about psychologically behavior.

Regional contagion increases the likelihood of a sudden stop by about 2.23% in the first model and 5.22% in the last model. All significant variables have the expected signs. The estimated coefficient for current account deficit shows the existence of such deficit in the previous period is a determinant for occurrence of sudden stops in capital flows.

Other variables that significantly affect sudden stop of capital flows in the emerging countries are: the external-debt-to-GDP ratio ($ED$), exchange rate regime rigidity ($ERR$), the change in the term of trade ($ToT$) and openness ($OP$).
Table (1): Empirical Results on Determinants of Sudden Stop of Capital Inflows in Emerging Countries (Balance of Payment Crisis)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model01</th>
<th>Model02</th>
<th>Model03</th>
<th>Model04</th>
<th>Model05</th>
<th>Model06</th>
<th>Model07</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t_B$</td>
<td>3.64***</td>
<td>3.65***</td>
<td>3.69***</td>
<td>3.76***</td>
<td>4.33***</td>
<td>9.13***</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Cont. SS</td>
<td>2.23***</td>
<td>2.38***</td>
<td>2.53***</td>
<td>2.82***</td>
<td>3.28***</td>
<td>5.22***</td>
<td>(0.44)</td>
</tr>
<tr>
<td>CAD</td>
<td>0.05***</td>
<td>0.12***</td>
<td>0.11**</td>
<td>0.09*</td>
<td>0.09*</td>
<td>0.13*</td>
<td>(0.02)</td>
</tr>
<tr>
<td>$CC$</td>
<td>-</td>
<td>0.47</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(0.70)</td>
</tr>
<tr>
<td>$BC$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$ERR$</td>
<td>-</td>
<td>0.59**</td>
<td>0.71**</td>
<td>0.89***</td>
<td>0.71*</td>
<td>1.17***</td>
<td>(0.29)</td>
</tr>
<tr>
<td>$ED$</td>
<td>-</td>
<td>0.02***</td>
<td>0.02***</td>
<td>0.01**</td>
<td>0.02**</td>
<td>0.05**</td>
<td>(0.008)</td>
</tr>
<tr>
<td>$ToT$</td>
<td>-</td>
<td>-</td>
<td>1.43*</td>
<td>1.86**</td>
<td>2.32</td>
<td>2.05</td>
<td>(0.89)</td>
</tr>
<tr>
<td>$DM$</td>
<td>-</td>
<td>-</td>
<td>0.0002</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(0.007)</td>
</tr>
<tr>
<td>$OP$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.02***</td>
<td>0.03***</td>
<td>0.03***</td>
<td>(0.007)</td>
</tr>
<tr>
<td>$CAO$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$R$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$CG$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.009</td>
</tr>
<tr>
<td>$BD$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.04</td>
<td>-</td>
</tr>
<tr>
<td>$GR$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.13</td>
</tr>
<tr>
<td>$GDP$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.67</td>
</tr>
<tr>
<td>$7G$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.13</td>
</tr>
<tr>
<td>$i^*$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.14</td>
</tr>
<tr>
<td>$FL$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.26</td>
</tr>
<tr>
<td>$GE$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-3.15</td>
</tr>
<tr>
<td>Constant</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Source: Author Findings

Figures in parenthesis are standard errors. All regressors are lagged with one period, with the exception for dummy SS.

*significant at 10%, **significant at 5% and *** significant at 1%.
4-2. Estimated Results for Currency Crisis Model

The interaction between currency crisis, banking crisis and balance of payment crisis (sudden stop) is considered in the first column of Table 2. Also the effect of large capital inflows (Bonanza) in previous period on currency crisis is evaluated through results of the model estimation. The results show that the Bonanza phenomenon does not lonely raise the probability of currency crisis while the sudden stop is an important factor in this regards.

The second column of Table 2 shows the estimates for the baseline model. A number of variables (except for the deviation of term of trade from its long-run) yield the expected signs consistent with the theory, affecting significantly the exchange rate crisis. The exceptions are the change in Log of money (M2), the proxy for difference in productivity, the terms-of-trade gap and the budget deficit deviated from its long-run trend.

In the third column of Table 2, the results are reported by dropping the bonanza variable (which had not been statistically significant) and replacing the interest rate differential variable by the foreign interest rate, \( i^* \), which is proxied by the Bank of the U.S short-run real interest rate – a close proxy to a short-run “risk-free” rate during the period. Also in this model the proxy for difference in productivity and the budget deficit deviated from its long-run trend are not significant.

Finally, columns (4) to (7) indicate the robustness of the foregoing regressions to the inclusion of four other potentially important variables which are the change in Log of capital flows, the change in the ratio of foreign reserve to paper money, the Log of the ratio of exports to imports and the Log of the ratio of external debt to export at \( t-1 \). Except for the external debt variable, the other variables have not affected the probability of currency crisis happening in these countries.
### Table 2: Probability of Occurrence of a Currency Crisis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model01</th>
<th>Model02</th>
<th>Model03</th>
<th>Model04</th>
<th>Model05</th>
<th>Model06</th>
<th>Model07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bt-1</td>
<td>0.10</td>
<td>0.49</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(0.49)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>1.24***</td>
<td>1.68***</td>
<td>1.69***</td>
<td>1.60***</td>
<td>1.60***</td>
<td>1.67***</td>
<td>1.96***</td>
</tr>
<tr>
<td></td>
<td>(0.73)</td>
<td>(0.62)</td>
<td>(0.55)</td>
<td>(0.56)</td>
<td>(0.60)</td>
<td>(0.54)</td>
<td>(0.69)</td>
</tr>
<tr>
<td>BC</td>
<td>1.47***</td>
<td>0.91**</td>
<td>0.97**</td>
<td>0.97**</td>
<td>1.03**</td>
<td>1.03**</td>
<td>1.03**</td>
</tr>
<tr>
<td></td>
<td>(0.38)</td>
<td>(0.42)</td>
<td>(0.42)</td>
<td>(0.45)</td>
<td>(0.43)</td>
<td>(0.49)</td>
<td></td>
</tr>
<tr>
<td>Bt-1*SS</td>
<td>0.51</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.02)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta Ln(M_2)$</td>
<td>-</td>
<td>1.99</td>
<td>5.86***</td>
<td>6.06***</td>
<td>7.98***</td>
<td>6.02***</td>
<td>4.95***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.81)</td>
<td>(1.7)</td>
<td>(1.73)</td>
<td>(1.91)</td>
<td>(1.76)</td>
<td>(1.81)</td>
</tr>
<tr>
<td>$\Delta Ln(Yreal)$</td>
<td>-</td>
<td>-7.74*</td>
<td>-</td>
<td>-9.73***</td>
<td>-</td>
<td>-10.1***</td>
<td>-10.12**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.19)</td>
<td>(3.80)</td>
<td>(3.77)</td>
<td>(4.15)</td>
<td>(3.72)</td>
<td>(4.40)</td>
</tr>
<tr>
<td>$\Delta Ln(Yreal/n)$</td>
<td>-</td>
<td>-0.25</td>
<td>-0.37</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.20)</td>
<td>(0.22)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta Ln(Yreal/n^*)$</td>
<td>-</td>
<td>0.0009</td>
<td>0.04</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.09)</td>
<td>(0.08)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta Ln(CapitalFlows)$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.05</td>
<td>0.005</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.05)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta(res / M_0)$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.01</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.01)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Ln(X / M)$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Ln(Ext. Debt / X)$</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.81**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.39)</td>
</tr>
<tr>
<td>Constant</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

| Observation | 666 | 508 | 560 | 560 | 534 | 560 | 439 |
| Wald Test (Prob.) | 26.72 | 40.52 | 61.05 | 46.38 | 49.99 | 47.21 | 42.85 |

Source: Author Findings  
Figures in parenthesis are standard errors. *significant at 10%, **significant at 5% and *** significant at 1%.

### 5. Conclusion

One of the critical issues in analyzing financial crises in many emerging economies is the phenomenon of sudden stop of capital flows or capital account reversals. The objective of this paper was to examine the role of sudden stops in causing the currency crisis in Asia. Hence the probability of up-and-coming a currency crisis after sudden stop in capital inflows caused by herding behaviors was estimated by a logit regression for the selected Asian countries during 1970-2011.
The empirical results show that the large capital inflow episodes (Bonanza), the contagion of sudden stop, current account deficit, the external-debt-to-GDP ratio, exchange rate regime rigidity, the change in the term of trade and openness are the major predictors of a sudden stop in the emerging countries.

Moreover, the results for considering the interaction among currency crisis, banking crisis and balance of payment crisis (sudden stop) show that balance of payment (sudden stop) and banking crises are significant determinants to the probability of currency crisis occurring. Also, the results for currency crisis model indicated that the change in Log of money (M2), the change in Log of real product in economy, the deviation of term of trade from its long-run trend, the foreign interest rate and Log of the ratio of external debt to exports have statistically significant effects on the likelihood of currency crisis occurring.

In general, the econometric results indicated that fluctuations in international capital flows have been significant determinants of currency risk during the recent currency crises. According to results obtained, the monetary authorities should have a special care to capital flows internationally, applying efficient instruments to be able to manage the large fluctuating capital inflows and sudden capital outflows. Although the capital account controls are possible through applying physical restrictions, the price restrictions such as Tobin tax would be more efficient.
Appendix 1:
The definitions of variables, which are used in the sudden stop and the currency crisis models, their symbols and the sources of relevant data, are reported in Table 3.

Table 3: The Variables, Their Definitions and the Source of Them.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Symbol</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sudden Stop</td>
<td>According to main text.</td>
<td>SS</td>
<td>IFS and Author Calculations</td>
</tr>
<tr>
<td>Bonanza</td>
<td>According to main text.</td>
<td>B</td>
<td>IFS and Author Calculations</td>
</tr>
<tr>
<td>Currency Crisis</td>
<td>According to main text.</td>
<td>CC</td>
<td>Reinhart and Rogoff (2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IFS and Author Calculations</td>
</tr>
<tr>
<td>Banking Crisis</td>
<td>Dummy variable that takes value 1 if a crisis starts in that year.</td>
<td>BC</td>
<td>Reinhart and Rogoff (2012)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Laeven and Valencia (2010)</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product (constant 2000).</td>
<td>GDP</td>
<td>WDI</td>
</tr>
<tr>
<td>External Debt</td>
<td>External debt/GDP</td>
<td>ED</td>
<td>WDI, IFS</td>
</tr>
<tr>
<td>International Reserve</td>
<td>Total reserves (% of total external debt)</td>
<td>R</td>
<td>WDI, IFS</td>
</tr>
<tr>
<td>Exchange Rate Regime Rigidity</td>
<td>&quot;Coarse&quot; classification of exchange rate regimes. The index goes from 1 to 6 and is increasing in the flexibility of the regime. 1 is for pegs, 2 is for narrow bands and crawling pegs; 3 is for managed floats and wider bands; 4 is for flexible regimes, and 5 refers to what the authors call &quot;rely falling&quot;. When there is a dual market, the index is 6.</td>
<td>ERR</td>
<td>Ilzetzki et al. (2010)</td>
</tr>
<tr>
<td>Term of Trade</td>
<td>Ratio of export to import deflators, both obtained from real and nominal trade data.</td>
<td>TOT</td>
<td>WDI</td>
</tr>
<tr>
<td>Dollarization</td>
<td>External liabilities of financial sector as a percentage of money.</td>
<td>DM</td>
<td>IFS</td>
</tr>
<tr>
<td>Openness</td>
<td>Exports plus imports as a share of GDP.</td>
<td>OP</td>
<td>WDI</td>
</tr>
<tr>
<td>Capital Account Openness</td>
<td>Index that measures the extent of openness in capital account transactions. It is built based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The index is continuous and increasing in the openness of the capital account transactions. For the available sample it ranges in the interval [-1.8, 2.5].</td>
<td>CAO</td>
<td>Chinn and Ito (2008)</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
<td>Code</td>
<td>Source</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Excess Economic Growth</td>
<td>The deviation of economic growth from its long-run trend.</td>
<td>GR</td>
<td>WDI and Author Calculations</td>
</tr>
<tr>
<td>Budget Deficit</td>
<td>The ratio of budget deficit as GDP.</td>
<td>BD</td>
<td>WDI</td>
</tr>
<tr>
<td>Growth of Credit</td>
<td>The growth rate of money (M2).</td>
<td>CG</td>
<td>WDI</td>
</tr>
<tr>
<td>G7 Growth</td>
<td>The economic growth at G7 countries.</td>
<td>G7G</td>
<td></td>
</tr>
<tr>
<td>Foreign Interest Rate</td>
<td>Short-run interest rate at U.S.</td>
<td>i*</td>
<td>IFS</td>
</tr>
<tr>
<td>Financial Liberalization</td>
<td>Dummy variable that takes the value of one if an elimination of interest rate controls has taken place in any of the previous five years. Elimination of interest rate controls is proxied as a positive change in an index of interest rate controls.</td>
<td>FL</td>
<td>Computed using data from Abiad et al. (2010)</td>
</tr>
<tr>
<td>Interest Rate Controls</td>
<td>Index of interest rate controls, considering both deposit and lending rates. Index is based in regulation of rates, considering if rates are set by the government or subject to binding ceilings or bands, or if rates are freely floating. Index takes discrete values from 0 to 4, with 4 being fully liberalized.</td>
<td>FL</td>
<td>Abiad et al. (2010)</td>
</tr>
<tr>
<td>Current Account Deficit</td>
<td>The ratio of current account deficit to GDP.</td>
<td>CAD</td>
<td>WDI</td>
</tr>
<tr>
<td>Institutional Quality</td>
<td>As a measure of institutional quality “effectiveness of government” has reported which is one of the six proxies of institutional quality.</td>
<td>GE</td>
<td>The Worldwide Governance Indicators, 2012 Update</td>
</tr>
</tbody>
</table>

*Source: Authors*
Reference


- Efremidze, L. (2009), Sudden Stops, Currency Crises, and Twin Deficits, PhD Thesis in the Graduate faculty of Economics, Claremont, California.


