# Forecasting Financial Crises in Developing Countries: Revisiting the Roles of External Financing and Exchange Rate Stability

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## Abstract

This paper investigates the effects of external financing and exchange rate stability on the likelihood of financial crises (banking, currency and twin) in 67 developing countries between 1972 and 2011. We begin by developing a two-period theoretical model of banking, including two different sources of financing (FDI and external debt). Then, in the empirical investigation, we estimate three prediction logit panel models (fixed-effects, random-effects and population-averaged) and include several tests to check the robustness of the results. Our main findings are the following: i) foreign direct investment reduces the likelihood of financial crises occurrence but external debt increases it; ii) exchange rate stability within a flexible regime decreases the occurrence of financial crises, whereas exchange rate rigidity increases it. Therefore, developing countries should control the composition of their external financing by favoring FDI over debt and consider an intermediate currency regime rather than extreme exchange rate policies.

Keywords: financial crises, FDI, debt, panel logit models, political decision-making, economic policy

## 1. Introduction

Preventing financial crises has become a major issue for policy–makers in developing countries after the global financial crisis of 2008 and since the crises of some emerging countries–e.g. Mexican crisis (1994), Asian crisis (1997–1998), Brazilian and Russian crises (1998), Turkish crisis (2000–2001) and Argentine crisis (1998–2002)). In this regard, reconsidering the benefits of financial globalization and the desirability of exchange rate rigidity or flexibility is of particular importance. In this sense, the two questions to ask are: i) What type of external financing is consistent with financial stability and low probability of financial crises occurrence? ii) Does exchange rate stability go hand in hand with financial stability and reduced occurrence of crises?

The evolution of foreign direct investment liabilities and external debt liabilities (see Appendix, Figure 1 and 2) between 1972 and 2011 shows that since the 1990s, the march towards financial globalization of developing countries is based more on FDI than on external debt. However, debt remains by far the leading source of external financing for growth in these countries. At the same time, the number of financial crises has decreased since the mid-1990s in developing countries (see Appendix, Figure 4). In contrast, there is no clear pattern regarding the evolution towards more rigid or more flexible exchange rate regimes (see appendix, Figure 3), after a period of increased exchange rate volatility from 1972 to the early 1990s. Hence, this first descriptive analysis suggests that globalization through FDI and the waiver of strong exchange rate flexibility are consistent with a low occurrence of financial crises in developing countries. But what does the economic literature say?

The literature on the relationship between financial crises and exchange rate regime is very rich. Eichengreen and Rose (1998) show that more stable exchange rates reduce the probability of banking crises occurrence for a sample of 105 countries observed between 1975 and 1990. The same results are proved by Domaç and Martinez Peria (2003) and Coulibaly (2009). In this sense, Magud, Reinhart and Vesperoni al. (2011), Dell'Ariccia et al. (2012) and Ghosh (2014) prove that less flexible exchange rate arrangements are more likely to be associated with financial turbulence, namely financial crises. Esaka (2009) argues that, compared with high exchange rate fluctuations, exchange rate stability is most likely to harm the banking sector. From 1990 to 2003, Angkinand and Willett (2011) observe for a large sample of 114 countries that the probability of occurrence of banking crises is lower in flexible regimes and higher in intermediate regimes. However, the opposite findings are emphasized by Bubula and Otker-Robe (2003) for currency crises during the period 1990-2001. Moreover, Karimi and Voia (2011) find that pegged or intermediate regimes reduce the probability of currency crises. Thus, they highlight the strong correlation between exchange rate stability and the decrease in the occurrence of crises.

As for the literature on financial globalization, we can identify opposite findings in regards to the effects of external financing in developing economies. A first line of the literature emphasizes the positive effects of promoting better accumulation and allocation of capital, better risk sharing, and the development of the domestic financial system (e.g. McKinnon (1973), Shaw (1973), Mishkin (2009), Beck et al. (2013), Ahmed (2016), Trabelsi and Cherif (2017)). Moreover, some authors prove that financial globalization is a factor of macroeconomic stability (e.g. Shehzad and De Haan (2009), Kim, Lin and Suen (2012), De Nicolò and Juvenal (2014), Iamsiraroj (2016)). A second line of the literature associates financial openness with macroeconomic instabilities, notably with financial crises (Díaz-Alejandro (1985), Kaminsky and Reinhart (1999), Rodrik and Velasco (1999), Eichengreen,

Hausmann and Panizza (2003), Edwards (2007) and Reinhart and Rogoff (2008)). More recently, Joyce (2011) focused on 20 emerging countries between 1976 and 2002. He concludes that, if FDI and portfolio investment reduce the occurrence of banking crises, external debt promotes the incidence of the latter. Khallouli and Nabi (2013) construct an Early Warning System (EWS) based on a third-generation mechanism of financial crises using the Markov switching model and a new twin-crisis index. They focus on Turkey using monthly data ranging between February 1992 and December 2007. Their model identifies the important role played by the speculators' self-fulfilling expectations in the twin-crises of November 2000/February 2001. Hamdi and Jlassi (2014) find that foreign debt as well as foreign direct investment increases the likelihood of occurrence of banking crises for a panel of 58 developing countries observed during the period 1984-2007. Later, Lee, Lin and Zeng (2016) prove that financial liberalization has a negative impact on the occurrence of currency and banking crises. Their conclusions concern 39 emerging, developing and developed countries.

Hence, the context of this paper is threefold: first, the controversy in the economic literature, second, the importance of the prediction of financial crises, and third, the choice of the type of external financing and of the exchange rate regime in developing countries. In that respect, this paper examines the impact of the type of external financing (FDI vs. External Debt) and the effect of exchange rate stability on the probability of banking, currency and twin crises in developing countries. Theoretically, the study is based on a two-period model of banking and empirically, it relies on fixed-effects, random-effects, and population-averaged logit panel models.

In comparison with the recent studies (Joyce (2011), Lane and McQuade (2014), Hamdi and Boukef Jlassi (2014), Lee, Lin and Zeng (2016)), our paper goes a step further in several respects. First, our analysis combines two trends of the literature. The first trend focuses on the exchange rate regime and the occurrence of financial crises. The second trend concerns the effect of financial globalization on the occurrence of crises. In our knowledge, there is no study that joined the two trends. The second feature that distinguishes our study is related to the type of the crisis indicator that allows us to predict the probability of three types of financial crises (banking crises, currency crises and twin crises). Apart from the work of Lee, Lin and Zeng (2016), which examines banking and currency crises – without examining twin crises or differentiating the type of external financing – other work only considers banking crises. Another distinguishing feature is related to combining theoretical approach (through a two-period banking model) and multiple empirical investigations (through logit panel models), while the previous cited studies employed an exclusive empirical approach. Indeed, the most recent studies use only one model for their estimates. In this paper, we employ three different estimators and test the robustness of the results through a battery of tests.

Overall, our findings suggest that: i) FDI reduces the probability of financial crises' occurrence and, conversely, external debt increases it; ii) exchange rate stability decreases the occurrence of financial crises, whereas a higher level of stability turns into exchange rate rigidity and increases their occurrence likelihood. These results are robust to all the considered robustness tests. Based on these results, the following economic policy recommendations hold for developing countries. Firstly, they shall control the composition of their external financing by favoring FDI over debt. Secondly, consider intermediate currency regime rather than extreme exchange rate policies.

The remaining parts of the paper are organized as follows. Section 2 presents the two-period model of banking and its theoretical results. In Section 3, we present the empirical analysis and

discuss its findings. Finally, we summarize the main results and draw the resulting policy recommendations in Section 4.

## 2. Theoretical analysis

### 2.1. The economic environment

We consider a single-good economy with two periods and three discrete time periods t=0, 1, 2. The single good is used for consumption and investment and produced through a two-period project. There is a continuum of mass 1 of risk-neutral agents who live for two periods and endowed with initial quantity of the good. There is a competitive banking system having access to a short-term storage technology and finance two-period risky projects. The economy is open to foreign direct investment. The consumption (investment) good serves as unit of account.

#### *2.1.1. The agents*

There is a continuum of mass 1 of agents. Each agent is endowed with $w_0$ units of the good that he deposits in the representative bank in the form of a demand deposit contract. Agents are initially uncertain about their time preferences. Each one will know only at date $t = 1$ whether he is an *early consumer* who only wants to consume at date $t = 1$ or *late consumer* who only want to consume at date $t = 2$. This time preference is a private information of the consumer which is not observable by the bank. Hence, late consumers can pretend to be early consumers and withdraw their deposits at date $t = 1$ if they will obtain higher return than withdrawing at date $t = 2$. At date $t = 0$, each agent has a probability $\gamma$ to be an early consumer and a probability 1 - $\gamma$ to be a late consumer. Therefore, the ex-ante preferences of a consumer could be represented by

$$U(c_1, c_2) = \begin{cases} u(c_1) \text{ with probability } \quad \gamma \\ \delta u(c_2) \text{ with probability } 1-\gamma \end{cases} \tag{1}$$

Where $c_t$ denotes consumption at date $t = 1,2$ and $\delta < 1$ is the discount factor. The utility function *u(.)* is assumed to be twice continuously differentiable, increasing, and strictly concave. In ex-ante terms the expected utility of a consumer is

$$EU = \gamma u(c_1) + (1-\gamma)\delta u(c_2) \tag{2}$$

#### *2.1.2. The production technologies*

There is a continuum of mass 1 of two-period projects which need two-period bank loans in order to be undertaken. The projects are identical and exposed to idiosyncratic risks. A project succeeds with a probability $\theta$ and fails with a probability $1-\theta$. In case of success, the project generates a return factor equals to $R > 1$ whereas it equals zero in case of failure. The average gross return is therefore $\theta R > 1$. The uncertainty regarding the state of the nature (success or failure) of each investment project is alleviated at the mid of the production cycle ($t = 1$). A project which is liquidated before maturity at $t = 1$, faces a liquidation cost that reduces the gross average return to $\mu\theta R < 1$.

There is also a risk-free storage technology which transfers one unit of the good from one period to another without depreciation. For risk-neutral banks the projects that are conducted until their maturity, are more attractive than the storage technology.

### *2.1.3. The exchange rate and the representative bank*

Under a ***fixed exchange rate regime***, the exchange rate $S$ is fixed and equals $S_0$. Here, $S$ denotes the spot exchange rate expressing the value of one unit of the foreign currency in terms of the domestic good. Under a ***flexible exchange rate regime***, the exchange rate $S$ fluctuates and the bank is hedged against any level of appreciation of the foreign currency. For simplicity we assume that there is no hedging cost.

There is a competitive banking sector represented by a bank which finances the projects. The bank provides credits ($X$) out of the deposits ($w_0$) (savings of the lenders) and the foreign debt ($w^*$) it contracts in foreign currency from the international market at a fixed interest factor $r^*$ for two periods. The foreign lenders can ask the premature termination (at the end of the first period) of the debt contracting without the reimbursement of the interest payment. The raison-d'être of the bank in this model is the diversification of the idiosyncratic risks of the projects. Hence, the bank is able by financing the continuum of projects to diversify its assets such that the proportion of successful projects at each date is known and equal to $\theta$ (by the law of large numbers). Each lender deposits his initial wealth $w_0$ in the representative bank in exchange of a demand deposit contract $(c_1, c_2)$ allowing him to withdraw either $c_1$ units of the consumption good at date $t = 1$ or $c_2$ units at date $t = 2$. The bank plays also here the role of liquidity insurer. Since the deposit contract is not contingent on the state of the nature, the bank invests its resources in a portfolio $(X, Z)$ where $Z$ represents the amount stored to hedge against the liquidity risk.

We assume that borrowing from the international market and investing in the domestic projects is beneficial, which requires the following condition:

$$r^* < \theta R \tag{3}$$

Therefore, the portfolio $(X, Z)$ of the representative bank satisfies the following conditions:

$$X + Z = w_0 + S_0 w^* \tag{4}$$

$$Z = \gamma c_1 \tag{5}$$

$$\theta RX + r^*(S_2 - S_0)^+ w^* \quad = (1-\gamma)c_2 + r^* S_2 w^* \tag{6}$$

Equation (4) expresses the equality between the resources and expenditures of the bank. Condition (5) says that the liabilities of the bank at date $t = 1$ are covered by the amount invested in the storage asset. Condition (5) signifies that the output of the project and the amount received from the hedging institution in case of appreciation of the foreign currency $r^* w^* (S_2 - S_0)^+ = r^* w^* . \max(0, S_2 - S_0)$, enables the bank to pay its late depositors the constant amount $c_2$ and reimburses the loan it obtained from the international creditors. Whatever, the evolution of the exchange rate (constant of appreciation of the foreign currency) equation (6) could be rewritten as follows

$$\theta RX = (1-\gamma)c_2 \; + S_0 r^* w^* \tag{6'}$$

Since the banking system is assumed to be competitive our representative bank will offer the demand deposit contract $(c_1, c_2)$ which maximizes the expected utility (2) of each agent under the constraints (4), (5) and (6'). Therefore, using the first order optimal condition, this contract

is completely determined by the following equations:

$$u'(c_1) = \theta R \delta u'(c_2) \tag{7}$$

$$\gamma c_1 + \frac{(1-\gamma)c_2 + S_0 r^* w^*}{\theta R} = w_0 + S_0 w^* \tag{8}$$

For simplicity, we consider a logarithmic utility function $u(.) = ln(.)$. From equations (7) and (8) we obtain

$$c_2 = \theta R \delta c_1;\ c_1 = \frac{W}{\gamma + \delta(1-\gamma)} \tag{9}$$

where

$$W = w_0 + S_0 w^* [1 - r^*/\theta R] \tag{10}$$

Under the condition $\theta R \delta > 1$ and given that the utility function is concave it is easy to show, using simple algebra on equations (8) and (9), that $c_1 > c_2$. Hence, a late consumer has no incentive to declare he is an early one to obtain $c_1$ and store it to consume at date 2. Therefore, even if the bank cannot observe the depositors' types the latter will correctly reveal it in normal times.

### 2.2. FDI, external debt and crises

#### *2.2.1. Negative economic shock and the banking and currency crises*

We assume that an unexpected macroeconomic shock $\varepsilon > 0$ reduces the gross return of the projects to $R - \varepsilon$. Domestic and foreign depositors observe a signal at date $t = 1$ revealing this macroeconomic shock. As consequence of this shock, the assets of the bank are impacted and the revenues it is able to collect becomes $\theta(R - \varepsilon)X$.

In case of a ***rigid exchange rate regime*** there is no apparent exchange risk and the bank doesn't hedge its short position. However, the negative shock might force the economy to abandon the pegged exchange rate (passing to $S_2 > S_0$ ) under the pressure of a premature termination of the external financing. If this happens the liabilities of the bank increase at the termination date $t = 2$. It increases by the amount of the appreciation $(S_2 - S_0)r^* w^*$. Therefore, its balance sheet (6') (at $t = 2$) becomes

$$\theta(R - \varepsilon)X = (1-\gamma)\tilde{c}_2 + \underbrace{(S_2 - S_0)r^* w^* + S_0 r^* w^*}_{r^* S_2 w^*} \tag{11}$$

where $\tilde{c}_2 < c_2$ represents the readjusted reimbursement of late domestic depositors that the bank is obliged to make in order not to default on its foreign debt and repays the entire amount of $r^* S_2 w^*$. Simple algebra using (6') and (11) enables us to determine the new reimbursement of late depositors $\tilde{c}_2$ which is strictly inferior to the initial contractual level $c_2$

$$\tilde{c}_2 = \frac{\theta(R - \varepsilon)X - r^* S_2 w^*}{1-\gamma} = c_2 - \frac{[(S_2/S_0 - 1)r^* S_0 w^* + \varepsilon X]}{1-\gamma} < c_2 \tag{12}$$

It is clear that $\tilde{c}_2$ decreases with the amplitude of the shock $\varepsilon$.

***Definitions***

*i)* A currency crisis is defined by the abandon of the pegged exchange rate.

*ii)* A banking crisis (bankruptcy) occurs at date t=1 when late domestic depositors trigger a bank run (obliging the bank to liquidate all the projects prematurely and partially defaults on its domestic obligations vis-à-vis its domestic depositors).

In reaction to the shock, the proportion $(1-\gamma)$ of late consumers might have an incentive to withdraw their deposit prematurely, claiming they are early depositors, asking for $c_1$ and storing it during the second period. The rationale behind this behaviour is the loss that impacts their saving $\tilde{c}_2 < c_2$ and the possibility to receive higher reimbursement by claiming they are early consumers (the bank cannot observe the true type of the depositors). Besides, the occurrence of this precautious reaction causes a bank run which in turn pushes the foreign creditors to ask for the premature termination of the financing contract. This happens despite that, in the absence of a bank run, they have no incentive to withdraw prematurely their saving (since they are only guaranteed the repayment $w^*$ instead of $r^*w^*$ whatever the evolution of the exchange rate). This early reimbursement at $t = 1$ forces the abandon of the fixed exchange rate.

In normal circumstances, the amount of savings asked by the bank's early domestic depositors equals $\gamma c_1$. However, in case of a bank run all the agents ask to withdraw their deposits prematurely $\gamma c_1 + (1-\gamma)c_1$. The bank cannot satisfy this demand since its liquid assets are insufficient $Z = \gamma c_1$ . Therefore, it is obliged to liquidate its assets $X$ invested in the two-period projects obtaining only $(R-\varepsilon)X$ . Taking in account the reimbursement of the external debt $S_2 w^*$, the amount $\hat{c}_1$ available to domestic depositors in case of a bank run is given by

$$Z + \mu\theta(R-\varepsilon)X = \gamma\hat{c}_1 + (1-\gamma)\hat{c}_1 + S_2 w^* \qquad (13$$

Hence, we obtain

$$\hat{c}_1 = Z + \mu \underbrace{\theta(R-\varepsilon)}_{<1} X - S_2 w^* \qquad (14)$$

***Propositions***

*i) The financial crises occur when the unexpected shock ε exceeds $\varepsilon_m$ given by $\tilde{c}_2 = \hat{c}_1$.*

*ii) A flexible exchange rate reduces the vulnerability to the banking crisis*

*iii) A higher level of external debt $w^*$ increases the vulnerability to the financial crises.*

*iv) Foreign direct investment reduces the vulnerability to the financial crises.*

***Proof of Proposition 1.*** See appendix.

## 3. Empirical analysis

### 3.1. Spatiotemporal framework

In order to study the impact of external financing and exchange rate stability on the probability of occurrence of financial crises in developing countries, we constitute an unbalanced panel of 67 countries among low- and middle-income countries over the period 1972-2011, in accordance with the classification of the World Bank (for the list of selected countries, see appendix). This sample has the advantage of including most non-emerging developing countries. Our analysis considers the longest period, compared to recent studies (Joyce (2011), Hamdi and Boukef Jlassi (2014), Lee, Lin and Zeng (2016)). The choice of this period is also explained by the fact that it has undergone various financial reforms and a significant number of financial crises in the countries of our sample (see, appendix Figure 4).

### 3.2. Model, variables and estimation method

In line with recent work on the relationship between financial globalization and financial crises, notably Joyce (2011) and Hamdi and Boukef Jlassi (2014), we use panel logit regressions. However, while these studies used only one model for their baseline estimates, we use three logit panel models, namely logit fixed-effects, logit random-effects, and logit population-averaged.

To measure the probability of the crises' occurrence, we construct a dummy variable of financial crisis (FCRISIS). The variable takes the value of (1) if country *i* in period *t* experiences a banking crisis (BC), a currency crisis (CC) or a twin crisis[1] (TC) and (0) otherwise:

$$\text{FCRISIS} = f(\text{BC}, \text{CC}, \text{TC}) \tag{15}$$

FCRISIS[2] follows a binomial distribution. Thus, FCRISIS = 1 if a financial crisis occurs and FCRISIS = 0 otherwise. We estimate the following equation:

$$Z_{it} = \lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it} + \upsilon_{it} \tag{16}$$

Where $Z_{it}$ indicates whether country *i* experienced a financial crisis during the year *t*. $EF_{it}$ represents the external financial variables, $ERS_{it}$ represents the exchange rate stability variables and $ERS^2_{it}$ its square. $K_{it}$ regroups the set of control variables. $\upsilon_{it}$ is the error term. $i = 1 \ldots N$ countries and $t = 1 \ldots T$ years. If the economy of country *i* endured a financial crisis in the year *t*, $Z_{it} > 0$. Hence,

$$FCRISIS = \begin{cases} 1, & Z_{it} > 0 \\ 0, & \text{otherwise} \end{cases} \tag{17}$$

Thus, the probability *P* that the economy of country *i* endures a financial crisis in the year *t* is as follows:

[1] A twin crisis is defined by the simultaneous occurrence of a banking crisis and a currency crisis.

[2] The variable is calculated by the authors on the basis of the crisis dates in the Systemic Banking Crises Database, IMF (2012).

$$P\ (FCRISIS = 1) = P(Z_{it} > 0) = F(\lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it}) \quad (18)$$

and

$$F(\lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it}) = \frac{\exp(\lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it})}{1 + \exp(\lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it})} \quad (19)$$

In turn, the probability *P* that the economy of country *i* does not endure a banking crisis in the year *t* is as follows:

$$P\ (FCRISIS = 0) = 1 - P\ (FCRISIS = 1) = 1 - \frac{\exp(\lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it})}{1 + \exp(\lambda_1 EF_{it} + \lambda_2 ERS_{it} + \lambda_3 ERS^2_{it} + \varphi' K_{it})} \quad (20)$$

Where *F* is the log partition function.

Furthermore, according to Davidson and MacKinnon (1984), Archer and Lemeshow (2006) and Greene (2012), the validity of the panel logit models is conditioned upon: i) the estimate of the parameters' values that maximize the value of the likelihood function, that is, to find the set of parameter estimates that make the data most likely, and ii) the estimate of globally significant parameters (significance different from zero), which proves the overall significance of the model. The values of *Wald Test Statistic* and *Log-Pseudolikelihood Statistic* or *Log-Likelihood Statistic* confirm at the 5% level at most these conditions for all of our regressions (baseline estimates and robustness tests) as reported in the related tables (see, appendix).
Moreover, the interest variables (external financing variables and exchange rate stability variables) are as follows:

| Variable | Description | Expected Signs | Source |
|---|---|---|---|
| ***L.FDI:*** | Total stocks of external assets and liabilities FDI (% of GDP) lagged one period | (+/-)[3] | EWN[4]. |
| ***L. DEBT:*** | Total stocks of external assets and liabilities debts (% of GDP) lagged one period | (+/-) | EWN. |
| ***L.FDIL:*** | Total stocks of external liabilities FDI (% of GDP) lagged one period | (+/-) | EWN. |
| ***L.DEBTL:*** | Total stocks of external liabilities debts (% of GDP) lagged one period | (+/-) | EWN. |
| ***L.EXCH-STA:*** | The measure of the stability of the exchange rate (ERS) constructed by Aizenman, Chinn and Ito (2008) lagged one period. This is the annual standard deviation (*stdev*) of the growth rate of the monthly nominal exchange rate (*exch_rate*), normalized and calculated in the form of an index. | (+/-)[5] | TI[6]. |

[3] As we have already explained above, some studies show that external financing increases the probability of occurrence of crises (e.g. Hausmann and Panizza (2003); Edwards (2007); Reinhart and Rogoff (2008)), others prove the opposite (e.g. Joyce (2011); Lee, Lin and Zeng (2016)).
[4] External Wealth of Nations Dataset (Updated and extended, 1970-2011) and calculations by the authors.
[5] As with external financing, the nature of the impact of exchange rate stability on the probability of crises is non-consensual. Indeed, this impact is positive in some studies (e.g. Eichengreen and Rose (1998); Karimi and Voia (2011)) and negative in others et (Dell'Ariccia et al. (2012) and Ghosh (2014)).
[6] The "Trilemma Indexes" (updated on July 1, 2016).

| | | | |
|---|---|---|---|
| | $\text{ERS} = \frac{0.01}{0.01+stdev(\Delta(log(exch\_rate))}$ | | |
| ***L.EXCH-STA(2):*** | The square of the measure of the stability of the exchange rate (ERS) constructed by Aizenman, Chinn and Ito (2008) lagged one period. | (+/-) | TI. |

For the choice of the control variables, we follow the model of Lee, Lin and Zeng (2016), since these variables explain both banking crises and currency crises. It is worth repeating that these authors study banking and currency but do not examine twin crises and do not differentiate external financing according to its nature. Moreover, the majority of other recent work deals only with banking crisis. We also refer to the paper by Claessens and Kose (2013) that explains the determinants of crises based on a broad literature review.

| Variable | Description | Expected Signs | Source |
|---|---|---|---|
| *L.GROWTH:* | GDP growth (annual %) lagged one period | (-) According to Joyce (2011), Hamdi and Boukef Jlassi (2014) and Lee, Lin and Zeng (2016). It is an indicator of economic prosperity. | WDI[7]. |
| *L.M2toRES:* | Money and quasi money (M2) to total reserves ratio lagged one period | (+) According to Joyce (2011), Claessens and Kose (2013), Hamdi and Boukef Jlassi (2014) Lee, Lin and Zeng (2016). It captures the vulnerability of the economy to sudden stop phenomenon. | WDI. |
| *L.CLAIM-PRIV:* | Growth of claims on private sector to GDP lagged one period | (+) According to Hamdi and Boukef Jlassi (2014) and Claessens and Kose (2013). It captures the vulnerability of the economy to private sector default phenomenon. | WDI. |
| *L.LIFE-EXP:* | Life expectancy at birth, total years lagged one period | (-) According to Lee, Lin and Zeng (2016). It is an indicator of economic development, in particular human capital quality (Barro (2001)). | WDI. |

### 3.3 Main results

Tables 1a and 1b (see, appendix) report the results of our baseline estimates of the effects of the external financing indicators (L.DEBT, L.DEBTL, L.FDI and L.FDIL) and the indicators of exchange rate stability (L.EXCH-STA and L.EXCH-STA (2)) on the probability of the financial crises occurrence. Let us recall that these estimates are made through three logit panel models, namely logit fixed-effects (FE), logit random-effects (RE), and logit population-averaged (PA).

The coefficients of the indicators of external debt (L.DEBT and L.DEBTL) are significant and positive at the 1% level in all regressions. Therefore, we conclude that external financing through external debt increases the vulnerability (the probability of occurrence) to financial crises. In addition, the negative sign of the coefficients of FDI (L.FDI and L.FDIL) and their significance at the 1% level indicate that this type of external financing is associated with low probability of financial crises' occurrence.

[7] World Development Indicators (2014) and calculations by the authors.

This result is corroborated by the studies of Joyce (2011) and Hamdi and Boukef Jlassi (2014) for banking crises using spatiotemporal horizons and estimation methods different from ours. However, it nuances the findings of Lee, Lin and Zeng (2016) who do not differentiate external financing according to its type. Our empirical results confirm the theoretical findings. FDI-financing allows the diversification and reduction of financial and monetary risks. This is done by improving random market sharing, reducing the vulnerability to bad macroeconomic shocks and the negative effects of the local market imperfections (see e.g. Bekaert and Harvey (2000)). Another explanation of the positive effects of FDI is rooted in the now well-proved following channel: the participation of foreign investors in domestic financial institutions improves their governance and internal organization. This is achieved through the transfer of foreign knowledge and know-how, as well as better supervision of the domestic financial sector (see e.g. Levine (1996; 2003)). On the contrary, external indebtedness is often identified as a source of agency problems, namely anti-selection and moral hazard (McKinnon and Pill (1996; 1998)). Furthermore, according to Wei (2006), the sudden stop phenomenon of capital inflows is more redundant for foreign debt flows than for foreign direct investment flows. In our theoretical model, we showed that higher external debt exacerbates the vulnerability to bankruptcy and obliges the abandon the fixed exchange rate regime.
Moreover, the exchange rate stability indicator is characterized by a significant negative sign coefficient. But when this indicator is squared, its coefficient becomes positive in the case of a significant estimation. Therefore, there is a U-shaped relationship between exchange rate stability and the probability of financial crises occurrence. This means that the exchange rate stability reduces the occurrence of financial crises, but exceeding a given threshold, this stability turns to rigidity and increases the probability of occurrence of the financial crises. In other words, extreme exchange rate regimes are associated with higher probability of financial crises occurrence.

This result is consistent with Karimi and Voia (2011) and Williamson (2002), who use a different approach from ours and recommend the application of intermediate exchange rate regimes to avoid financial crises. Let us note that large exchange rate fluctuations are symptomatic of increased uncertainty which causes macroeconomic instabilities (see e.g. Rose (2000), Frankel and Rose (2002)). Symmetrically, strong exchange rate stability that turns into rigidity also increases macroeconomic instabilities because it decelerates shock absorption and rapid price adjustment (see e.g. Mundell (1961; 1963) and Bayoumi and Eichengreen (1994)).

Furthermore, Tables 1a et 1b (see, appendix) also show that, when significant, the coefficients of the:

- GDP growth (L.GROWTH) variable are negative, which means that crises are less recurrent in periods of economic prosperity characterized by high production;
- Money and quasi money (M2) to total reserves ratio (L.M2toRES) variable are positive. This suggests that capital flows that increases credit booms (captured through the external counter-party of the monetary mass) is associated with higher probability of financial crisis;
- Growth of claims on private sector to GDP (L.CLAIM-PRIV) variable is positive. This result confirms the above mentioned one. The probability of occurrence of financial crises is high when the credits to the private sector increase at higher levels (often fueling speculative bubbles in the real estate sector an unproductive investment opportunities).
- and lastly, the coefficient of the economic development proxy (LIFE-EXP) – also included in the empirical model of Lee et al. (2016) – is negative. According to Barro

(2001), this implicates that macro-financial turbulences, especially crises, are more recurrent in developing countries characterized by lower human capital quality.

### 3.4. Robustness tests

In order to test the robustness of our main results we subject our baseline estimates to a battery of tests. These tests consist of changing the control variables, the dependent variable, the external financing variables, as well as the period and the panel of countries.

#### 3.4.1. Changing the control variables

By selecting the statistically most significant explanatory control variables for financial crises in the model by Lee, Lin and Zeng (2016) and in the literature review by Claessens and Kose (2013), we risk falling into a selection or omission bias of the explanatory variables. To prove that this bias does not exist, we first add the variable "Domestic credit provided by financial sector in percentage of GDP lagged one period" (L.FINCREDIT) (and to test the Kaminsky and Reinhart (1999) hypothesis, which stipulates that the crises follow lending "booms"). We also add the indicator of political rights lagged one period (L.POL), given that since the work of Rodrik (1997) there is a strong economic intuition that links financial instability to political institutions. In a second step, we change all the control variables of our basic models. Indeed, we introduce the following indicators as alternative control variables:

| Variable | Description | Expected Signs | Source |
|---|---|---|---|
| *L.GDPPC:* | The real GDP per capita lagged one period (in log) | (-) According to Joyce (2011) and Hamdi and Boukef Jlassi (2014). It is an indicator of economic development. More economic development is associated with a low probability of crisis. | WDI. |
| *L.TRADE :* | The sum of exports and imports to GDP lagged one period | (-) According to Joyce (2011) and Hamdi and Boukef Jlassi (2014). Trade openness reduces the occurrence of crisis. | WDI. |
| *L.INF :* | Lack of Price Stability log(100+inflation rate) lagged one period | (+) According to Joyce (2011) and Hamdi and Boukef Jlassi (2014). It reflects macroeconomic volatility and should have a positive effect on likelihood crisis 'occurrence. | WDI. |
| *L.GOV:* | Government spending as a share of GDP lagged one period | (+) Hamdi and Boukef Jlassi (2014). The government budget deficits should increase the probability of crisis. | WDI. |

Estimates made after these changes are shown in Tables 2a, 2b, 2c and 2d (see, appendix). These tables show that external financing and exchange rate stability variables remain significant, with signs supporting our basic results across all regressions. Also, when significant, the new control variables have coefficients with the expected signs.

### 3.4.2. Changing the dependent variable

So far, we have considered the FCRISIS variable as an indicator of financial crises. Let us recall that this variable includes banking crises, currency crises and twin crises. In order to verify once again the robustness of our baseline estimates, we have changed this indicator in this test. The alternative variable we use refers to a broader definition of financial crises. It takes the value of (1) if country *i* at period *t* experiences a banking crisis (BC) or a currency crisis (CC) or a twin crisis (TC) or a debt crisis (DC) – and (0) otherwise.

$$GCRISIS^{8} = f\,(BC, CC, TC, DC) \quad (18)$$

We chose this indicator for this robustness test because, as Blundell-Wignall indicates, there is a strong correlation between banking crises and debt crises. In addition, according to Dreher, Herz and Karb (2006) this correlation also exists between exchange rate crises and debt crises. Thus, in Tables 3a and 3b (see, appendix), we have taken up our baseline regressions with GCRISIS as the explanatory variable. The latter indicates the probability of occurrence of financial crises in the broad sense. The results in these two tables are relatively consistent with our basic results for all crisis determinants, including external financing indicators and exchange rate stability indicators.

### 3.4.3. Changing the external financing variables

Tables 4a and 4b (see, appendix) relate to the results of the estimates applied to our basic modelling, introducing new external financing variables. These variables are as follows:

| Variable | Description | Source |
|---|---|---|
| *L.PDEBTL:* | Total stocks of external liabilities, debts to total stocks of external liabilities FDI and debts lagged one period. | EWN. |
| *L.PDEBT:* | Total stocks of external assets and liabilities, debts to total stocks of external assets and liabilities FDI and debts lagged one period | EWN. |
| *L.DEBTS:* | External debt stocks (% of GNI) lagged one period | WDI. |
| *L.PFDIL:* | Total stocks of external liabilities FDI to total stocks of external liabilities FDI and debts lagged one period | EWN. |
| *L.PFDI:* | Total stocks of external assets and liabilities, FDI to total stocks of external assets and liabilities, FDI and debts lagged one period | EWN. |
| *L.FFDI:* | The foreign direct investment, net flows to GDP lagged one period | WDI. |

The outputs of Tables 4a and 4b (see, appendix) are consistent with our basic results. These tables show the coefficients of the external debt (L.PDEBTL, L.PDEBT and L.DEBTS) with significantly positive signs in all regressions. This highlights that external financing through external debt increases the probability of occurrence of financial crises. Moreover, the significantly negative sign of the coefficients of the indicators of FDI (L.PFDIL, L.PFDI and PFDIL) indicates the negative impact of this type of financing on the likelihood of occurrence of crises. Also, the U-shaped relationship between exchange rate stability and the probability of occurrence of financial crises is verified in Tables 4a and 4b. In fact, the indicator of exchange rate stability is characterized by a negative and significant coefficient. But, when this indicator is squared its coefficient becomes positive, when significant. Furthermore, the control

[8] The variable is calculated by the authors on the basis of the crisis dates in the Systemic Banking Crises Database, IMF (2012).

variables retain the same signs and almost the same significance, with orders of magnitude that do not differ from those of the estimates in Tables 1a and 1b.

### 3.4.4. Changing of the period and the panel of countries.

In order to check if our results remain stable over other time horizons, initially, we only considered the 1972-2006 subperiod in our estimates. Indeed, the 2007-2011 subperiod corresponds to an exceptional fall in cross-border trade in financial flows (IMF (2012)), due to the advent of the international financial crisis in 2008, hence the possibility of the presence of outliers among our data for this subperiod. In a second step, we removed the 1997-2001 subperiod. Indeed, this sub-period includes a strong occurrence of crises as shown in Figure 4 (see, appendix), hence, as well, the possibility of outliers in our data. Therefore, it seemed interesting to us to test the robustness of our baseline estimates after the suppression of this subperiod. In a third step, we excluded the 1982-1986 subperiod because, according to Figure 4 (see, appendix), the countries in the sample experienced the highest number of crises over this time interval, hence, as well, the risk of outliers.

From tables 5a, 5b, 6a, 6b, 7a and 7b in the appendix, it appears that our basic results remain significantly stable after all these changes in the time frame of our sample.

In addition, to test the stability of our results after the modification of our panel of countries, we exclude the groups "South Asia, East Asia and Pacific Countries" at first, then the groups "Latin America, Caribbean, Europe and Central Asia", in a second time. Indeed, some countries in these groups risk being affected by serious regional crises, such as the Asian financial crisis and the Latin American debt crisis, hence the possibility of outliers among our data.

Again, Tables 8a, 8b, 9a and 9b show the robustness of our results after these changes in the spatial framework of our sample.

## 4. Conclusion and policy recommendations

This paper belongs to the literature analyzing the determinants of the financial crises occurrence in developing countries. It focuses on two major questions: i) Does the type of external financing provided by financial globalization plays a role in the likelihood of financial crises in developing countries? ii) Does exchange rate stability go hand in hand with financial stability and especially with the decline in the occurrence of financial crises?

The strong controversy that characterizes the literature on the effects of external financing and exchange rate stability on the incidence of crises, as well as the importance of the political and economic stakes of financial openness in terms of growth, are at the root of this questioning. In order to make an original contribution, this study considers a sample of 67 lower- and lower-middle-income developing countries examined over a long period from 1972 to 2011. Its bottom-line is to see to what extent external financing through FDI and external debt, as well as exchange rate stability increases or decreases the likelihood of financial crises (banking, currency and twin) occurring. It is based on a double approach: theoretical and empirical. The theoretical approach is based on a Two-Period Model of Banking, including two different sources of financing (FDI and external debt). As for the empirical approach, it is based on estimates conducted on three logit panel models (fixed-effects, random-effects and population-averaged) augmented by a series of tests, the utility of which is to prove the robustness of the results, namely that i) foreign direct investment reduces the probability of occurrence of

financial crises and, unlike that, external debt increases it. ii) Also, exchange rate stability decreases the occurrence of financial crises, whereas a higher level of stability turns into exchange rate rigidity and thus increases the likelihood of their occurrence.

This implies that, for developing countries, the control of external financing depending on its nature is indispensable in order to avoid financial shocks, and that the choice of intermediate exchange rate regimes, with flexible exchange rates but with less volatility, can go hand in hand with the objective of financial stability.

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**Appendix**

***Proof of proposition 1***

***i)*** *Under the fixed exchange rate, the financial crisis occur when the unexpected productivity shock ε exceeds $\varepsilon_m$ given by $\tilde{c}_2 = \hat{c}_1$.*

Late domestic depositors have an incentive to withdraw their deposits prematurely at date $t = 1$ (and store it for consumption at date $t = 2$) if they obtain larger repayment than waiting until date $t = 2$ which is the case if $\hat{c}_1 > \tilde{c}_2$ where

$$\begin{aligned} \hat{c}_1 &= f(\varepsilon, S_2, w^*) \\ &= Z + \mu\theta(R-\varepsilon)X - S_2 w^* \\ &= \mu\theta(R-\boldsymbol{\varepsilon})X - S_2 w^* + \gamma \frac{w_0 + S_0 w^* \frac{r^*}{\theta R}}{\gamma + \delta(1-\gamma)} \end{aligned} \tag{15}$$

And

$$\begin{aligned} \tilde{c}_2 &= g(\varepsilon, S_2, w^*) = \\ &= (\theta(R-\varepsilon)X - r^* S_2 w^*)/(1-\gamma) \end{aligned} \tag{16}$$

Using (15) and (16)

**P1)** $\frac{\partial \hat{c}_1}{\partial \varepsilon} = -\mu\theta X < 0$ ; $\frac{\partial^2 \hat{c}_1}{\partial \varepsilon^2} = 0$

**P2)** $\frac{\partial \tilde{c}_2}{\partial \varepsilon} = -\theta X/(1-\gamma) < 0$ ; $\frac{\partial^2 \tilde{c}_2}{\partial \varepsilon^2} = 0$

**P3)** $\left|\frac{\partial \tilde{c}_2}{\partial \varepsilon}\right| > \left|\frac{\partial \hat{c}_1}{\partial \varepsilon}\right|$

**P4)** $\hat{c}_1(\varepsilon = 0) = \underbrace{Z + \mu\theta RX}_{<Z+X} - S_2 w^* <$

$\tilde{c}_2(\varepsilon = 0) = (\theta RX - r^* S_2 w^*)/(1-\gamma)$

These properties are sufficient to prove the existence of $\varepsilon_m > 0$ such that $\hat{c}_1(\varepsilon_m) = \tilde{c}_2(\varepsilon_m)$ , $\hat{c}_1(\varepsilon) > \tilde{c}_2(\varepsilon)$ pour $\varepsilon > \varepsilon_m$ and $\hat{c}_1(\varepsilon) < \tilde{c}_2(\varepsilon)$ pour $\varepsilon < \varepsilon_m$.

***ii) A flexible exchange rate reduces the vulnerability to the financial crises***

The case of flexible exchange rate regime can be obtained from equations (15) and (16) by setting $S_2 = S_0$(this is a mathematical artifice which only signifies that the bank doesn't need to secure additional resources $(S_2 - S_0)r^* w^*$ above the transfers received by the hedging institution.).

$\hat{c}_1^f = \hat{c}_1 + (S_2 - S_0)w^*$

$\tilde{c}_2^f = \tilde{c}_2 + (S_2 - S_0)r^* w^*/(1-\gamma)$

Hence, taking in account the properties P1) to P4) the solution $\varepsilon'_m$ to $\hat{c}_1^f(\varepsilon) = \tilde{c}_2^f(\varepsilon)$ verifies $\varepsilon'_m > \varepsilon_m$.

***iii) A higher level of external debt $w^*$ increases the vulnerability to the financial crises.***

Using (15) and (16) we can show the following properties

**P3)** $\frac{\partial \hat{c}_1}{\partial w^*} < 0$

**P4)** $\frac{\partial \tilde{c}_2}{\partial w^*} < 0$

*which translates to* **)** $\frac{\partial \varepsilon_m}{\partial w^*} < 0$

***v) Foreign direct investment that improves the economic performance reduces the vulnerability to the financial crises.***

Again using (15) and (16) we can show the following properties

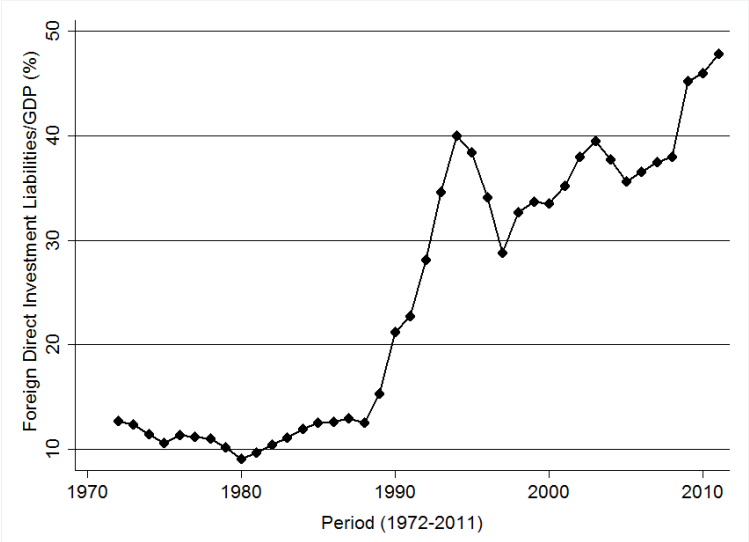
**P5)** $\frac{\partial \hat{c}_1}{\partial \theta} > 0$ *and* $\frac{\partial \hat{c}_1}{\partial R} > 0$

**P6)** $\frac{\partial \tilde{c}_2}{\partial \theta} > 0$ *and* $\frac{\partial \tilde{c}_2}{\partial R} > 0$

Hence, the foreign direct investment which enables the operated projects to have higher return R and higher probability of success, improves the aggregate economic performance of the economy and favors its resilience to negative economic shocks.

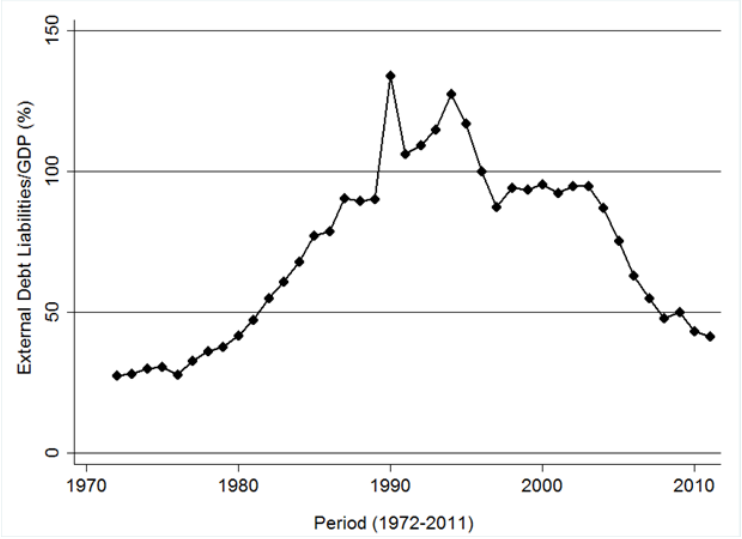
*Figures*

**Figure 1. Foreign Direct Investment Liabilities in Development Countries Between 1972 and 2011**



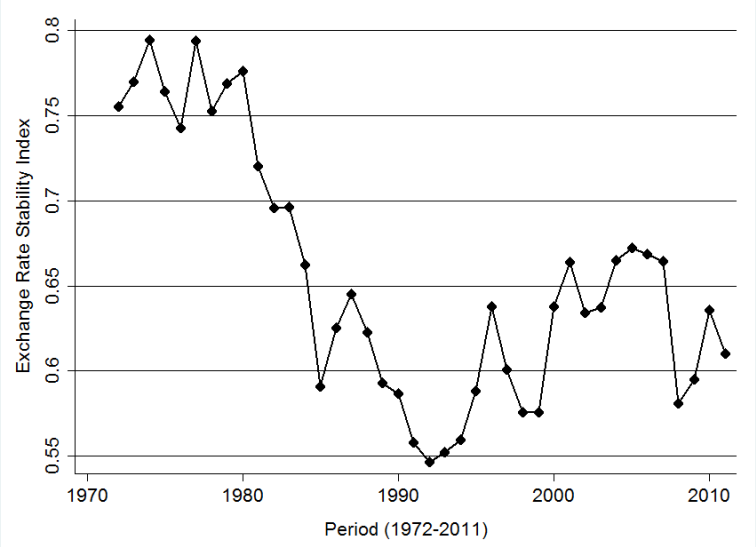

Notes: Calculation done by the authors on the basis of the foreign direct investment liabilities to GDP by mean levels of the full sample (External Wealth of Nations Dataset (Updated and extended, 1970-2011)).

**Figure 2. External Debt Liabilities in Development Countries Between 1972 and 2011**



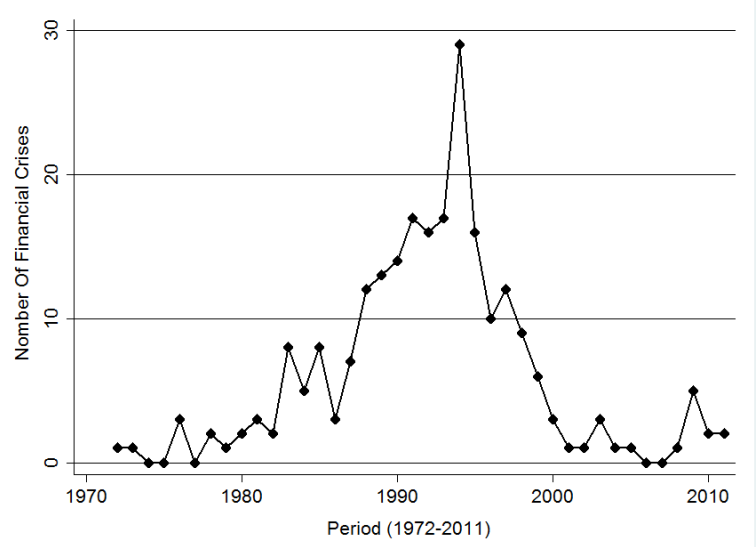

Notes: Calculation done by the authors on the basis of the external debt liabilities to GDP by mean levels of the full sample (External Wealth of Nations Dataset (Updated and extended, 1970-2011)).

**Figure 3. Exchange Rate Stability in Development Countries Between 1972 and 2011**




Notes: Calculation done by the authors on the basis of the exchange rate stability index by mean levels of the full sample (The "Trilemma Indexes" (updated on July 1, 2016)).

**Figure 4. Financial Crises in Developing Countries Between 1972 and 2011**




Notes: Calculation done by the authors on the basis of the financial crisis dummy variable by mean levels of the full sample (Systemic Banking Crises Database: An Update (IMF, 2012)).

## *Tables*

### Table 1a. Baseline Estimates: External Debt, Crises and Exchange Rate Stability

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.04809*** | -0.04884** | -0.04612*** | -0.04852*** | -0.04919** | -0.04663*** |
| | (0.01392) | (0.01964) | (0.01753) | (0.01394) | (0.01978) | (0.01766) |
| L.M2toRES | 0.27341* | 0.29015** | 0.26745** | 0.27478* | 0.29418** | 0.27049** |
| | (0.14446) | (0.14581) | (0.13300) | (0.14519) | (0.14879) | (0.13608) |
| L.CLAIM-PRIV | 0.00040 | 0.00035*** | 0.00038*** | 0.00041 | 0.00035*** | 0.00038*** |
| | (0.00031) | (0.00010) | (0.00009) | (0.00031) | (0.00010) | (0.00009) |
| **L.DEBTL** | **0.44489*** ** | **0.63276*** ** | **0.42209*** ** | | | |
| | (0.12527) | (0.16449) | (0.13604) | | | |
| **L.DEBT** | | | | **0.45247*** ** | **0.67453*** ** | **0.43316*** ** |
| | | | | (0.13461) | (0.17095) | (0.14730) |
| L.EXCH-STA | -3.61108** | -2.60649* | -3.70885*** | -3.64944** | -2.60918* | -3.77683*** |
| | (1.47040) | (1.43873) | (1.41591) | (1.47048) | (1.45018) | (1.44101) |
| L.EXCH-STA(2) | 2.84551** | 2.06390 | 2.91806** | 2.86281** | 2.07987 | 2.95938** |
| | (1.23734) | (1.31137) | (1.22996) | (1.23726) | (1.32549) | (1.25116) |
| L.LIFE-EXP | -1.55957** | -0.78690 | -1.43134*** | -1.62523** | -0.78523 | -1.50769*** |
| | (0.65506) | (1.19479) | (0.53911) | (0.65160) | (1.24892) | (0.55439) |
| *Observations* | 1,930 | 1,669 | 1,930 | 1,926 | 1,665 | 1,926 |
| *Wald Test Statistic* | 60.10 | 76.42 | 255.6 | 59.13 | 74.31 | 266.6 |
| *Log-Likelihood* | -581.1 | | | -581.7 | | |
| *Log-Pseudolikelihood* | | -448.1 | | | -448.3 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

### Table 1b. Baseline Estimates: FDI, Crises and Exchange Rate Stability

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05186*** | -0.05362*** | -0.05125*** | -0.05172*** | -0.05379*** | -0.05114*** |
| | (0.01408) | (0.02027) | (0.01878) | (0.01401) | (0.02021) | (0.01872) |
| L.M2toRES | 0.19363 | 0.17081 | 0.20127 | 0.19236 | 0.17080 | 0.19923 |
| | (0.14447) | (0.14959) | (0.15486) | (0.14402) | (0.14848) | (0.15362) |
| L.CLAIM-PRIV | 0.00050 | 0.00040*** | 0.00048*** | 0.00050 | 0.00040*** | 0.00048*** |
| | (0.00037) | (0.00007) | (0.00009) | (0.00037) | (0.00007) | (0.00009) |
| **L.FDIL** | **-0.38659*** ** | **-0.64631*** ** | **-0.36033*** ** | | | |
| | **(0.08844)** | **(0.18747)** | **(0.08836)** | | | |
| **L.FDI** | | | | **-0.34328*** ** | **-0.57592*** ** | **-0.32445*** ** |
| | | | | (0.08592) | (0.18206) | (0.08919) |
| L.EXCH-STA | -4.10622*** | -2.81455* | -4.02211*** | -4.16224*** | -2.81589* | -4.06715*** |
| | (1.46299) | (1.57048) | (1.39108) | (1.45950) | (1.55034) | (1.39309) |
| L.EXCH-STA(2) | 2.94715** | 1.66283 | 2.86437** | 3.01696** | 1.68564 | 2.91885** |
| | (1.24187) | (1.49601) | (1.21051) | (1.23788) | (1.47578) | (1.21355) |
| L.LIFE-EXP | -1.13015* | 1.62327 | -0.99178 | -1.18721* | 1.45143 | -1.03351 |
| | (0.66023) | (1.94805) | (0.65074) | (0.65077) | (1.83519) | (0.63500) |
| *Observations* | 1,911 | 1,656 | 1,911 | 1,911 | 1,656 | 1,911 |
| *Wald Test Statistic* | 67.21 | 378.9 | 208.2 | 64.40 | 403.3 | 207.2 |
| *Log-Likelihood* | -575.7 | | | -577.8 | | |
| *Log-Pseudolikelihood* | | -442.5 | | | -445.3 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 2a. Robustness Test: Alternative Control Variables

| | RE | FE | PA | RE | FE | PA |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.04056*** | -0.03871** | -0.03941** | -0.04050*** | -0.03840** | -0.03942** |
| | (0.01409) | (0.01868) | (0.01632) | (0.01411) | (0.01873) | (0.01636) |
| L.M2toRES | 0.18285 | 0.16598 | 0.18063 | 0.18332 | 0.16744 | 0.18303 |
| | (0.15094) | (0.14557) | (0.12893) | (0.15158) | (0.14749) | (0.13153) |
| L.CLAIM-PRIV | 0.00041 | 0.00039*** | 0.00039*** | 0.00041 | 0.00039*** | 0.00039*** |
| | (0.00030) | (0.00011) | (0.00009) | (0.00030) | (0.00011) | (0.00009) |
| **L.DEBTL** | **0.39888*** ** | **0.55331*** ** | **0.36759*** ** | | | |
| | (0.12789) | (0.18403) | (0.13748) | | | |
| **L.DEBT** | | | | **0.41531*** ** | **0.60783*** ** | **0.38771*** ** |
| | | | | (0.13832) | (0.19230) | (0.15019) |
| L.EXCH-STA | -3.81140** | -2.68721* | -3.83433*** | -3.83507** | -2.68534* | -3.88053** |
| | (1.51786) | (1.47413) | (1.48780) | (1.51793) | (1.48308) | (1.50808) |
| L.EXCH-STA(2) | 2.96846** | 2.04177 | 2.99229** | 2.98139** | 2.06101 | 3.02528** |
| | (1.27808) | (1.32254) | (1.27122) | (1.27803) | (1.33082) | (1.28713) |
| L.LIFE-EXP | -1.60242** | -0.74296 | -1.42252** | -1.68377** | -0.77548 | -1.50176** |
| | (0.71331) | (1.51789) | (0.60202) | (0.71100) | (1.54136) | (0.60306) |
| L.FINCREDIT | 0.17908 | 0.50219* | 0.12749 | 0.18868 | 0.52713** | 0.13447 |
| | (0.13529) | (0.26588) | (0.12829) | (0.13538) | (0.26509) | (0.12851) |
| L.POL | 0.04345 | 0.02943 | 0.04806 | 0.04386 | 0.02839 | 0.04966 |
| | (0.05190) | (0.07081) | (0.05121) | (0.05192) | (0.07113) | (0.05216) |
| *Observations* | 1,867 | 1,628 | 1,867 | 1,863 | 1,624 | 1,863 |
| *Wald Test Statistic* | 57.80 | 65.81 | 220 | 57.33 | 64.08 | 216.9 |
| *Log-Likelihood* | -564.1 | | | -564.3 | | |
| *Log-Pseudolikelihood* | | -431 | | | -430.7 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 2b. Robustness Test: Alternative Control Variables

| | RE | FE | PA | RE | FE | PA |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.04217*** | -0.04190** | -0.04154** | -0.04207*** | -0.04210** | -0.04141** |
| | (0.01439) | (0.02061) | (0.01824) | (0.01431) | (0.02050) | (0.01813) |
| L.M2toRES | 0.08634 | 0.05751 | 0.09081 | 0.08637 | 0.05835 | 0.09015 |
| | (0.15089) | (0.14754) | (0.14649) | (0.15035) | (0.14639) | (0.14521) |
| L.CLAIM-PRIV | 0.00046 | 0.00040*** | 0.00044*** | 0.00046 | 0.00040*** | 0.00045*** |
| | (0.00034) | (0.00007) | (0.00008) | (0.00034) | (0.00007) | (0.00008) |
| **L.FDIL** | **-0.39863*** ** | **-0.65514*** ** | **-0.35482*** ** | | | |
| | (0.09244) | (0.20423) | (0.08575) | | | |
| **L.FDI** | | | | **-0.35238*** ** | **-0.57535*** ** | **-0.31933*** ** |
| | | | | (0.08961) | (0.19778) | (0.08736) |
| L.EXCH-STA | -4.28817*** | -2.89608* | -4.14862*** | -4.33961*** | -2.89656* | -4.18295*** |
| | (1.52047) | (1.61891) | (1.48615) | (1.51552) | (1.59199) | (1.48739) |
| L.EXCH-STA(2) | 3.08492** | 1.81364 | 2.96829** | 3.15115** | 1.82931 | 3.01364** |
| | (1.29080) | (1.53685) | (1.26135) | (1.28561) | (1.50839) | (1.26409) |
| L.LIFE-EXP | -1.37100* | 1.52042 | -1.23717* | -1.41647** | 1.34843 | -1.27124* |
| | (0.72493) | (2.34993) | (0.73698) | (0.71424) | (2.24881) | (0.71417) |
| L.FINCREDIT | 0.27998** | 0.52979** | 0.26246* | 0.27342** | 0.53120** | 0.25897* |
| | (0.13879) | (0.26799) | (0.14693) | (0.13755) | (0.26439) | (0.14442) |
| L.POL | 0.00634 | -0.02333 | 0.01201 | 0.01034 | -0.01633 | 0.01470 |
| | (0.05292) | (0.08173) | (0.04991) | (0.05254) | (0.08136) | (0.05027) |
| *Observations* | 1,851 | 1,615 | 1,851 | 1,851 | 1,615 | 1,851 |
| *Wald Test Statistic* | 67.24 | 282.7 | 351.1 | 64.55 | 261.1 | 357 |
| *Log-Likelihood* | -557.1 | | | -559.3 | | |
| *Log-Pseudolikelihood* | | -423 | | | -425.9 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 2c. Robustness Test: Alternative Control Variables

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GDPPC | 0.32541 | 0.30579 | 0.32757 | 0.28845 | 0.16756 | 0.29660 |
| | (0.23485) | (0.91742) | (0.22944) | (0.23337) | (0.90228) | (0.22199) |
| L.GOV | 0.44675 | 0.83605 | 0.42436 | 0.44074 | 0.88824 | 0.39285 |
| | (0.31709) | (0.68487) | (0.40152) | (0.31784) | (0.70472) | (0.39521) |
| L.INF | 0.00108 | 0.00057 | 0.00087* | 0.00109 | 0.00057 | 0.00091* |
| | (0.00099) | (0.00059) | (0.00047) | (0.00100) | (0.00061) | (0.00049) |
| L.TRADE | -1.71503*** | -2.56831*** | -1.47889*** | -1.75063*** | -2.61339*** | -1.47553*** |
| | (0.34248) | (0.71910) | (0.40330) | (0.34693) | (0.71034) | (0.40368) |
| **L.DEBTL** | **0.49549*** ** | **0.63549*** ** | **0.44067** ** | | | |
| | (0.15277) | (0.21068) | (0.18510) | | | |
| **L.DEBT** | | | | **0.51328*** ** | **0.70610*** ** | **0.44170** ** |
| | | | | (0.16825) | (0.22636) | (0.20365) |
| L.EXCH-STA | -4.87266*** | -4.02891** | -4.54155*** | -4.94199*** | -4.11310** | -4.65941*** |
| | (1.88615) | (1.84506) | (1.49628) | (1.88474) | (1.86597) | (1.49380) |
| L.EXCH-STA(2) | 3.89632** | 3.03597* | 3.69232*** | 3.96188** | 3.13528* | 3.79133*** |
| | (1.57733) | (1.76137) | (1.29760) | (1.57659) | (1.77094) | (1.30381) |
| *Observations* | 1,577 | 1,283 | 1,577 | 1,571 | 1,277 | 1,571 |
| *Wald Test Statistic* | 49.05 | 32.21 | 47.32 | 47.80 | 33.80 | 46.94 |
| *Log-Likelihood* | -424 | | | -424.6 | | |
| *Log-Pseudolikelihood* | | -305.5 | | | -305 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 2d. Robustness Test: Alternative Control Variables

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GDPPC | 0.30975 | 0.45224 | 0.28806 | 0.28818 | 0.39098 | 0.27890 |
| | (0.24592) | (0.78321) | (0.22640) | (0.24120) | (0.77771) | (0.22150) |
| L.GOV | 0.51277 | 0.79937 | 0.48705 | 0.50893 | 0.81034 | 0.48434 |
| | (0.32527) | (0.61457) | (0.46465) | (0.32248) | (0.61489) | (0.45851) |
| L.INF | 0.00107 | 0.00049 | 0.00083** | 0.00111 | 0.00049 | 0.00086** |
| | (0.00107) | (0.00040) | (0.00040) | (0.00108) | (0.00041) | (0.00042) |
| L.TRADE | -1.26978*** | -1.98117** | -1.11100*** | -1.30584*** | -2.05450** | -1.15067*** |
| | (0.35392) | (0.82928) | (0.35447) | (0.35306) | (0.83020) | (0.35484) |
| **L.FDIL** | **-0.39672*** ** | **-0.66555** ** | **-0.27966** ** | | | |
| | (0.12538) | (0.26244) | (0.11782) | | | |
| **L.FDI** | | | | **-0.32365*** ** | **-0.56468** ** | **-0.22798** * |
| | | | | (0.12244) | (0.25285) | (0.11931) |
| L.EXCH-STA | -5.45036*** | -3.86237* | -5.05267*** | -5.51085*** | -3.91566* | -5.10330*** |
| | (1.89545) | (2.03225) | (1.48314) | (1.88758) | (2.00520) | (1.48720) |
| L.EXCH-STA(2) | 3.97543** | 2.33044 | 3.72589*** | 4.06773** | 2.41115 | 3.79550*** |
| | (1.59469) | (1.97670) | (1.30641) | (1.58643) | (1.95422) | (1.31239) |
| *Observations* | 1,547 | 1,263 | 1,547 | 1,547 | 1,263 | 1,547 |
| *Wald Test Statistic* | 46.41 | 42.47 | 70.61 | 44.51 | 41.67 | 67.38 |
| *Log-Likelihood* | -420.1 | | | -421.8 | | |
| *Log-Pseudolikelihood* | | -299.1 | | | -301.5 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 3a. Robustness Test: Alternative Dependent Variable

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05842*** | -0.05677*** | -0.05645*** | -0.05898*** | -0.05713*** | -0.05709*** |
| | (0.01363) | (0.01894) | (0.01847) | (0.01364) | (0.01901) | (0.01859) |
| L.M2toRES | 0.24073* | 0.24445* | 0.23851* | 0.24105* | 0.24736* | 0.24019* |
| | (0.13738) | (0.13645) | (0.12937) | (0.13806) | (0.13901) | (0.13208) |
| L.CLAIM-PRIV | 0.00039 | 0.00035*** | 0.00038*** | 0.00040 | 0.00035*** | 0.00038*** |
| | (0.00031) | (0.00009) | (0.00009) | (0.00031) | (0.00009) | (0.00009) |
| **L.DEBTL** | **0.42574*** ** | **0.58964*** ** | **0.41350*** ** | | | |
| | (0.11742) | (0.16106) | (0.13626) | | | |
| **L.DEBT** | | | | **0.42396*** ** | **0.62037*** ** | **0.41494*** ** |
| | | | | (0.12593) | (0.16696) | (0.14648) |
| L.EXCH-STA | -3.39324** | -2.35613* | -3.53284** | -3.44878** | -2.36306* | -3.61376** |
| | (1.43948) | (1.37038) | (1.42112) | (1.43998) | (1.37891) | (1.44478) |
| L.EXCH-STA(2) | 2.88840** | 2.26595* | 2.99312** | 2.91547** | 2.28029* | 3.03965** |
| | (1.20117) | (1.23649) | (1.21202) | (1.20139) | (1.24797) | (1.23275) |
| L.LIFE-EXP | -1.63566*** | -1.33995 | -1.50745*** | -1.69601*** | -1.34368 | -1.58117*** |
| | (0.60715) | (1.11819) | (0.52137) | (0.60423) | (1.16954) | (0.53603) |
| *Observations* | 1,930 | 1,696 | 1,930 | 1,926 | 1,692 | 1,926 |
| *Wald Test Statistic* | 68.97 | 96.64 | 388.1 | 67.50 | 93.23 | 436.3 |
| *Log-Likelihood* | -612.8 | | | -613.8 | | |
| *LogPseudolikelihood* | | -479.7 | | | -480 | |

Notes: Dependent variable is financial crisis dummy GCRISIS. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 3b. Robustness Test: Alternative Dependent Variable

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.06271*** | -0.06286*** | -0.06165*** | -0.06251*** | -0.06289*** | -0.06151*** |
| | (0.01369) | (0.01923) | (0.01910) | (0.01364) | (0.01919) | (0.01909) |
| L.M2toRES | 0.16342 | 0.13248 | 0.17009 | 0.16243 | 0.13227 | 0.16825 |
| | (0.13840) | (0.14070) | (0.15001) | (0.13800) | (0.13974) | (0.14878) |
| L.CLAIM-PRIV | 0.00050 | 0.00041*** | 0.00049*** | 0.00049 | 0.00041*** | 0.00049*** |
| | (0.00037) | (0.00007) | (0.00009) | (0.00037) | (0.00007) | (0.00009) |
| **L.FDIL** | -0.37200*** | -0.67369*** | -0.35194*** | | | |
| | (0.08514) | (0.18057) | (0.08254) | | | |
| **L.FDI** | | | | -0.33499*** | -0.61113*** | -0.32145*** |
| | | | | (0.08267) | (0.17744) | (0.08338) |
| L.EXCH-STA | -3.83949*** | -2.52863* | -3.83167*** | -3.89991*** | -2.54041* | -3.87610*** |
| | (1.43784) | (1.47782) | (1.38865) | (1.43492) | (1.46404) | (1.39072) |
| L.EXCH-STA(2) | 2.95837** | 1.80373 | 2.94537** | 3.02695** | 1.83402 | 2.99691** |
| | (1.21196) | (1.37692) | (1.18460) | (1.20847) | (1.36387) | (1.18775) |
| L.LIFE-EXP | -1.19473* | 1.29544 | -1.04032 | -1.24454** | 1.15925 | -1.08208* |
| | (0.62251) | (1.74826) | (0.63395) | (0.61353) | (1.66080) | (0.61800) |
| *Observations* | 1,911 | 1,683 | 1,911 | 1,911 | 1,683 | 1,911 |
| *Wald Test Statistic* | 75.16 | 237.5 | 203.7 | 72.83 | 254.9 | 197.6 |
| *Log-Likelihood* | -607.2 | | | -609.1 | | |
| *LogPseudolikelihood* | | -471.2 | | | -474 | |

Notes: Dependent variable is financial crisis dummy GCRISIS. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 4a. Robustness Test: Alternative External Debt Variables

| | RE | FE | PA | RE | FE | PA | RE | FE | PA |
|---|---|---|---|---|---|---|---|---|---|
| L.GROWTH | -0.04668*** | -0.04637** | -0.04555** | -0.04721*** | -0.04642** | -0.04599** | -0.04447*** | -0.04735** | -0.04206** |
| | (0.01405) | (0.01970) | (0.01845) | (0.01410) | (0.02022) | (0.01866) | (0.01428) | (0.02018) | (0.01790) |
| L.M2toRES | 0.22411 | 0.22458 | 0.23124 | 0.22333 | 0.22294 | 0.23172 | 0.25702* | 0.27635* | 0.25222* |
| | (0.14318) | (0.14138) | (0.14848) | (0.14372) | (0.14274) | (0.15004) | (0.14387) | (0.15222) | (0.14021) |
| L.CLAIM-PRIV | 0.00046 | 0.00040*** | 0.00043*** | 0.00045 | 0.00039*** | 0.00042*** | 0.00038 | 0.00032*** | 0.00036*** |
| | (0.00035) | (0.00007) | (0.00009) | (0.00034) | (0.00007) | (0.00009) | (0.00028) | (0.00010) | (0.00009) |
| **L.PDEBTL** | **2.03400*** ** | **2.72247** ** | **2.39683** ** | | | | | | |
| | (0.45437) | (1.18286) | (0.93291) | | | | | | |
| **L.PDEBT** | | | | **2.60371*** ** | **3.80858** ** | **2.91565*** ** | | | |
| | | | | (0.59412) | (1.65485) | (1.11802) | | | |
| **L.DEBTS** | | | | | | | **0.61037*** ** | **0.82350*** ** | **0.57710*** ** |
| | | | | | | | (0.12818) | (0.19688) | (0.14550) |
| L.EXCH-STA | -3.66522** | -2.54165* | -3.63285*** | -3.71249** | -2.63725* | -3.68669*** | -3.73860** | -2.78203* | -3.81167*** |
| | (1.45903) | (1.34438) | (1.40325) | (1.46044) | (1.35435) | (1.39464) | (1.50541) | (1.59009) | (1.43961) |
| L.EXCH-STA(2) | 2.73751** | 1.76600 | 2.80425** | 2.78789** | 1.90841 | 2.83038** | 3.05493** | 2.23091 | 3.13719** |
| | (1.23249) | (1.24738) | (1.21798) | (1.23384) | (1.26906) | (1.21072) | (1.26841) | (1.43358) | (1.25813) |
| L.LIFE-EXP | -1.18116* | 0.64348 | -0.81136 | -1.21279* | 0.99532 | -0.91976 | -1.46120** | -0.30181 | -1.32785** |
| | (0.66540) | (1.41160) | (0.60257) | (0.67086) | (1.53813) | (0.61343) | (0.68055) | (1.38373) | (0.55031) |
| *Observations* | 1,930 | 1,669 | 1,930 | 1,926 | 1,665 | 1,926 | 1,819 | 1,580 | 1,819 |
| *Wald Test Statistic* | 65.30 | 417.7 | 374.5 | 64.77 | 372.4 | 391 | 69.57 | 87.35 | 172.3 |
| *Log-Likelihood* | -574.5 | | | -575 | | | -549.2 | | |
| *LogPseudolikelihood* | | -443.5 | | | -442.4 | | | -420 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 4b. Robustness Test: Alternative FDI Variables

| | RE | FE | PA | RE | FE | PA | RE | FE | PA |
|---|---|---|---|---|---|---|---|---|---|
| L.GROWTH | -0.04642*** | -0.04224** | -0.04634*** | -0.04628*** | -0.04227** | -0.04624** | -0.04213*** | -0.04148** | -0.04166** |
| | (0.01447) | (0.01908) | (0.01795) | (0.01443) | (0.01912) | (0.01800) | (0.01517) | (0.01851) | (0.01826) |
| L.M2toRES | 0.26122* | 0.27566* | 0.26074* | 0.25408* | 0.26817* | 0.25615* | 0.30221* | 0.30324* | 0.29978* |
| | (0.14550) | (0.15059) | (0.14546) | (0.14549) | (0.15154) | (0.14816) | (0.16471) | (0.18052) | (0.17645) |
| L.CLAIM-PRIV | 0.00033 | 0.00026** | 0.00032*** | 0.00034 | 0.00025** | 0.00033*** | 0.00210** | 0.00181 | 0.00205 |
| | (0.00028) | (0.00011) | (0.00009) | (0.00028) | (0.00011) | (0.00009) | (0.00106) | (0.00112) | (0.00132) |
| **L.PFDIL** | **-0.71935*** ** | **-1.24222*** ** | **-0.57930*** ** | | | | | | |
| | (0.12340) | (0.22591) | (0.09551) | | | | | | |
| **L.PFDI** | | | | **-0.70202*** ** | **-1.27849*** ** | **-0.57373*** ** | | | |
| | | | | (0.12630) | (0.24889) | (0.10232) | | | |
| **L.FFDI** | | | | | | | **-0.13358*** ** | **-0.18727*** ** | **-0.12690*** ** |
| | | | | | | | (0.04239) | (0.05727) | (0.04005) |
| L.EXCH-STA | -3.12432** | -2.33676* | -3.19812** | -3.16184** | -2.34705* | -3.22548** | -4.52832*** | -3.26386* | -4.36242*** |
| | (1.50356) | (1.37876) | (1.33692) | (1.50021) | (1.40064) | (1.34541) | (1.57330) | (1.69850) | (1.58737) |
| L.EXCH-STA(2) | 2.35809* | 1.85183 | 2.39591** | 2.38002* | 1.87535 | 2.40801** | 3.58349*** | 2.59760* | 3.43416** |
| | (1.27870) | (1.24370) | (1.14666) | (1.27493) | (1.26786) | (1.15418) | (1.31816) | (1.45305) | (1.33967) |
| L.LIFE-EXP | -1.06258 | 1.07665 | -1.10529* | -1.16019 | 1.31786 | -1.17453* | -1.39276** | 0.20167 | -1.31656** |
| | (0.76445) | (1.92170) | (0.67069) | (0.75695) | (1.93284) | (0.65174) | (0.62564) | (1.49220) | (0.60078) |
| *Observations* | 1,911 | 1,656 | 1,911 | 1,907 | 1,652 | 1,907 | 1,660 | 1,419 | 1,660 |
| *Wald Test Statistic* | 76.52 | 51.78 | 180.9 | 74.46 | 49.83 | 187.4 | 53.49 | 33.08 | 53.16 |
| *Log-Likelihood* | -562.4 | | | -564.6 | | | -489.6 | | |
| *LogPseudolikelihood* | | -419.1 | | | -420.5 | | | -369.9 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE) and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 5a. Robustness Test: Alternative Period (1972-2006)

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05076*** | -0.05267*** | -0.04921*** | -0.05072*** | -0.05296*** | -0.04925*** |
| | (0.01395) | (0.01988) | (0.01761) | (0.01395) | (0.01992) | (0.01761) |
| L.M2toRES | 0.24253* | 0.25317 | 0.23875* | 0.24314* | 0.25227 | 0.24105* |
| | (0.14488) | (0.15472) | (0.13958) | (0.14545) | (0.15618) | (0.14197) |
| L.CLAIM-PRIV | 0.00036 | 0.00033*** | 0.00034*** | 0.00037 | 0.00033*** | 0.00035*** |
| | (0.00029) | (0.00010) | (0.00009) | (0.00029) | (0.00010) | (0.00009) |
| **L.DEBTL** | **0.43513*** ** | **0.64649*** ** | **0.40245*** ** | | | |
| | **(0.12778)** | **(0.18414)** | **(0.13710)** | | | |
| **L.DEBT** | | | | **0.44370*** ** | **0.65827*** ** | **0.41812*** ** |
| | | | | (0.13459) | (0.18510) | (0.14732) |
| L.EXCH-STA | -4.02774*** | -2.61541* | -4.14725*** | -4.06775*** | -2.59829 | -4.21160*** |
| | (1.51446) | (1.58234) | (1.57657) | (1.51461) | (1.58290) | (1.60211) |
| L.EXCH-STA(2) | 3.29757*** | 2.15451 | 3.37135** | 3.31918*** | 2.13822 | 3.42147** |
| | (1.27243) | (1.43530) | (1.36672) | (1.27284) | (1.44448) | (1.38846) |
| L.LIFE-EXP | -1.12536* | -0.15054 | -1.07235* | -1.18580* | 0.02265 | -1.13294** |
| | (0.64597) | (1.36393) | (0.56377) | (0.64292) | (1.38549) | (0.57282) |
| *Observations* | 1,634 | 1,443 | 1,634 | 1,630 | 1,439 | 1,630 |
| *Wald Test Statistic* | 55.93 | 62.14 | 223.7 | 55.38 | 61.95 | 233.7 |
| *Log-Likelihood* | -535.2 | | | -535.5 | | |
| *LogPseudolikelihood* | | -410.4 | | | -410.6 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 5b. Robustness Test: Alternative Period (1972-2006)

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05551*** | -0.05773*** | -0.05495*** | -0.05518*** | -0.05794*** | -0.05463*** |
| | (0.01405) | (0.02020) | (0.01819) | (0.01399) | (0.02015) | (0.01813) |
| L.M2toRES | 0.16659 | 0.12706 | 0.17230 | 0.16617 | 0.12824 | 0.17115 |
| | (0.14521) | (0.14868) | (0.15562) | (0.14469) | (0.14767) | (0.15409) |
| L.CLAIM-PRIV | 0.00047 | 0.00038*** | 0.00045*** | 0.00047 | 0.00038*** | 0.00045*** |
| | (0.00036) | (0.00007) | (0.00010) | (0.00035) | (0.00007) | (0.00010) |
| **L.FDIL** | **-0.31485*** ** | **-0.63225*** ** | **-0.29805*** ** | | | |
| | **(0.08773)** | **(0.17230)** | **(0.08207)** | | | |
| **L.FDI** | | | | **-0.27263*** ** | **-0.54665*** ** | **-0.26110*** ** |
| | | | | **(0.08477)** | **(0.17114)** | **(0.08365)** |
| L.EXCH-STA | -4.62535*** | -2.90670* | -4.56001*** | -4.68989*** | -2.91230* | -4.61274*** |
| | (1.50616) | (1.67696) | (1.54696) | (1.50220) | (1.65632) | (1.55053) |
| L.EXCH-STA(2) | 3.51495*** | 1.81291 | 3.44179** | 3.59086*** | 1.84550 | 3.50500*** |
| | (1.27752) | (1.60795) | (1.35416) | (1.27320) | (1.58681) | (1.35852) |
| L.LIFE-EXP | -0.88774 | 2.14894 | -0.80239 | -0.92046 | 2.03107 | -0.82910 |
| | (0.63153) | (2.18263) | (0.65381) | (0.62327) | (2.06995) | (0.63868) |
| *Observations* | 1,615 | 1,430 | 1,615 | 1,615 | 1,430 | 1,615 |
| *Wald Test Statistic* | 58.17 | 417.7 | 220.4 | 55.74 | 431.2 | 215 |
| *Log-Likelihood* | -532.7 | | | -534.4 | | |
| *LogPseudolikelihood* | | -407.1 | | | -409.7 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 6a. Robustness Test: Alternative Period (1972-2011, Excluding: 1997-2001)

| | | | | | | |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05251*** | -0.05650*** | -0.05007*** | -0.05336*** | -0.05724*** | -0.05106*** |
| | (0.01494) | (0.02002) | (0.01909) | (0.01496) | (0.02013) | (0.01929) |
| L.M2toRES | 0.20424 | 0.23462 | 0.20329 | 0.20272 | 0.23599 | 0.20352 |
| | (0.15340) | (0.15236) | (0.13531) | (0.15428) | (0.15639) | (0.14021) |
| L.CLAIM-PRIV | 0.00042 | 0.00036*** | 0.00040*** | 0.00043 | 0.00036*** | 0.00041*** |
| | (0.00032) | (0.00010) | (0.00010) | (0.00033) | (0.00010) | (0.00010) |
| **L.DEBTL** | **0.56489*** ** | **0.80090*** ** | **0.52544*** ** | | | |
| | (0.14010) | (0.19835) | (0.15208) | | | |
| **L.DEBT** | -2.73939* | -1.89736 | -2.84354* | -2.79524* | -1.88418 | -2.93275* |
| | (1.61869) | (1.70140) | (1.72215) | (1.61864) | (1.71920) | (1.75255) |
| L.EXCH-STA | 2.23581* | 1.49807 | 2.32427 | 2.26375* | 1.50457 | 2.37636 |
| | (1.35418) | (1.49307) | (1.45547) | (1.35383) | (1.51263) | (1.48325) |
| L.EXCH-STA(2) | -1.70597** | -0.26886 | -1.53925** | -1.79484** | -0.30642 | -1.64080*** |
| | (0.70492) | (1.22842) | (0.59922) | (0.70036) | (1.26371) | (0.62086) |
| L.LIFE-EXP | | | | **0.56100*** ** | **0.84104*** ** | **0.52401*** ** |
| | | | | (0.14986) | (0.20342) | (0.16239) |
| *Observations* | 1,629 | 1,343 | 1,629 | 1,625 | 1,343 | 1,625 |
| *Wald Test Statistic* | 56.73 | 101 | 373.9 | 55.19 | 98.74 | 436.5 |
| *Log-Likelihood* | -495.2 | | | -496.5 | | |
| *Log-Pseudolikelihood* | | -370.4 | | | -371.2 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 6b. Robustness Test: Alternative Period (1972-2011, Excluding: 1997-2001)

| | | | | | | |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05829*** | -0.06417*** | -0.05823*** | -0.05806*** | -0.06440*** | -0.05800*** |
| | (0.01488) | (0.02030) | (0.01947) | (0.01483) | (0.02013) | (0.01943) |
| L.M2toRES | 0.10683 | 0.08746 | 0.11644 | 0.10554 | 0.08792 | 0.11444 |
| | (0.15371) | (0.16384) | (0.16311) | (0.15312) | (0.16265) | (0.16172) |
| L.CLAIM-PRIV | 0.00059 | 0.00049*** | 0.00058*** | 0.00059 | 0.00048*** | 0.00058*** |
| | (0.00040) | (0.00010) | (0.00013) | (0.00040) | (0.00010) | (0.00013) |
| **L.FDITL** | **-0.36602*** ** | **-0.62500*** ** | **-0.34855*** ** | | | |
| | (0.08756) | (0.20928) | (0.09369) | | | |
| **L.FDI** | | | | **-0.33026*** ** | **-0.55861*** ** | **-0.31702*** ** |
| | | | | (0.08524) | (0.20481) | (0.09481) |
| L.EXCH-STA | -3.49145** | -2.03085 | -3.43584** | -3.54864** | -2.04312 | -3.48548** |
| | (1.59557) | (1.93865) | (1.74814) | (1.59148) | (1.91261) | (1.74972) |
| L.EXCH-STA(2) | 2.50849* | 0.95850 | 2.45647* | 2.57765* | 0.98831 | 2.51510* |
| | (1.34440) | (1.74981) | (1.47125) | (1.34001) | (1.72450) | (1.47476) |
| L.LIFE-EXP | -1.14634* | 2.68020 | -0.95954 | -1.19902* | 2.47766 | -1.00780 |
| | (0.66582) | (1.87736) | (0.65651) | (0.65718) | (1.79111) | (0.64466) |
| *Observations* | 1,610 | 1,330 | 1,610 | 1,610 | 1,330 | 1,610 |
| *Wald Test Statistic* | 61.11 | 167.1 | 109.7 | 58.94 | 177.8 | 108.1 |
| *Log-Likelihood* | -493.1 | | | -494.8 | | |
| *Log-Pseudolikelihood* | | -370.9 | | | -373.2 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 7a. Robustness Test: Alternative Period (1972-2011, Excluding: 1982-1986)

| | | | | | | |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.04086*** | -0.04012** | -0.03940** | -0.04100*** | -0.03980* | -0.03955** |
| | (0.01486) | (0.02016) | (0.01731) | (0.01489) | (0.02033) | (0.01742) |
| L.M2toRES | 0.30397** | 0.31450** | 0.29498** | 0.30613** | 0.31854** | 0.29835** |
| | (0.15504) | (0.15647) | (0.14383) | (0.15599) | (0.15967) | (0.14728) |
| L.CLAIM-PRIV | 0.00017 | -0.00001 | 0.00018 | 0.00018 | -0.00003 | 0.00019 |
| | (0.00046) | (0.00013) | (0.00015) | (0.00047) | (0.00013) | (0.00014) |
| **L.DEBTL** | **0.53849*** ** | **0.71875*** ** | **0.51318*** ** | | | |
| | (0.13686) | (0.16980) | (0.14226) | | | |
| **L.DEBT** | | | | **0.55874*** ** | **0.78214*** ** | **0.53393*** ** |
| | | | | (0.14775) | (0.16875) | (0.14809) |
| L.EXCH-STA | -4.99695*** | -3.62456** | -5.05683*** | -5.04277*** | -3.63296** | -5.14237*** |
| | (1.59753) | (1.71508) | (1.63070) | (1.59699) | (1.72708) | (1.65507) |
| L.EXCH-STA(2) | 3.94494*** | 2.67964* | 4.02158*** | 3.96826*** | 2.70368* | 4.07412*** |
| | (1.35108) | (1.53228) | (1.40650) | (1.35098) | (1.54683) | (1.42692) |
| L.LIFE-EXP | -1.48118** | -0.68582 | -1.35169** | -1.56235** | -0.79979 | -1.44103*** |
| | (0.69305) | (1.31025) | (0.52969) | (0.69052) | (1.38586) | (0.54723) |
| *Observations* | 1,709 | 1,395 | 1,709 | 1,705 | 1,391 | 1,705 |
| *Wald Test Statistic* | 61.15 | 213.6 | 279.2 | 60.26 | 209.9 | 273.5 |
| *Log-Likelihood* | -507.9 | | | -508.5 | | |
| *Log-Pseudolikelihood* | | -379.7 | | | -379.7 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 7b. Robustness Test: Alternative Period (1972-2011, Excluding: 1982-1986)

| | | | | | | |
|---|---|---|---|---|---|---|
| | -0.04662*** | -0.04835** | -0.04592** | -0.04637*** | -0.04839** | -0.04567** |
| L.GROWTH | (0.01528) | (0.02061) | (0.01872) | (0.01517) | (0.02064) | (0.01863) |
| | 0.23101 | 0.21406 | 0.24033 | 0.22739 | 0.21124 | 0.23574 |
| L.M2toRES | (0.15495) | (0.16994) | (0.17499) | (0.15430) | (0.16847) | (0.17360) |
| | 0.00042 | 0.00026** | 0.00040*** | 0.00042 | 0.00025** | 0.00040*** |
| L.CLAIM-PRIV | (0.00043) | (0.00010) | (0.00010) | (0.00044) | (0.00010) | (0.00010) |
| | **-0.46021*** ** | **-0.74955*** ** | **-0.42869*** ** | | | |
| **L.FDIL** | (0.09751) | (0.20612) | (0.10050) | | | |
| | | | | **-0.40734*** ** | **-0.67807*** ** | **-0.38534*** ** |
| **L.FDI** | | | | (0.09455) | (0.20295) | (0.10056) |
| | -5.78683*** | -4.34364*** | -5.59491*** | -5.82664*** | -4.31484*** | -5.62150*** |
| L.EXCH-STA | (1.59024) | (1.65899) | (1.53628) | (1.58489) | (1.64207) | (1.53958) |
| | 4.20318*** | 2.66264* | 4.04615*** | 4.26794*** | 2.66354* | 4.08876*** |
| L.EXCH-STA(2) | (1.35762) | (1.55107) | (1.33258) | (1.35213) | (1.53283) | (1.33618) |
| | -0.91073 | 2.71531 | -0.80581 | -0.98906 | 2.51061 | -0.85289 |
| L.LIFE-EXP | (0.71660) | (2.21467) | (0.67075) | (0.70334) | (2.07633) | (0.65309) |
| *Observations* | 1,696 | 1,386 | 1,696 | 1,696 | 1,386 | 1,696 |
| *Wald Test Statistic* | 69.51 | 175.3 | 206.2 | 66.15 | 174.5 | 202.9 |
| *Log-Likelihood* | -502.3 | | | -504.9 | | |
| *Log-Pseudolikelihood* | | -372.1 | | | -375.4 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 8a. Robustness Test: Alternative Sample (Without: South Asia, East Asia and Pacific Countries)

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.04931*** | -0.04940** | -0.04741*** | -0.04931*** | -0.04973** | -0.04754** |
| | (0.01418) | (0.02030) | (0.01832) | (0.01421) | (0.02043) | (0.01850) |
| L.M2toRES | 0.28882** | 0.31226** | 0.28402** | 0.29586** | 0.31722** | 0.29230** |
| | (0.14719) | (0.14969) | (0.13346) | (0.14809) | (0.15312) | (0.13618) |
| L.CLAIM-PRIV | 0.00040 | 0.00038*** | 0.00038*** | 0.00040 | 0.00038*** | 0.00038*** |
| | (0.00031) | (0.00010) | (0.00010) | (0.00030) | (0.00010) | (0.00010) |
| **L.DEBTL** | **0.45163*** ** | **0.69288*** ** | **0.44164*** ** | | | |
| | (0.13366) | (0.18264) | (0.14534) | | | |
| **L.DEBT** | | | | **0.49874*** ** | **0.73799*** ** | **0.49260*** ** |
| | | | | (0.14393) | (0.18974) | (0.15937) |
| L.EXCH-STA | -3.17583** | -1.94514 | -3.24245** | -3.17950** | -1.95195 | -3.24359** |
| | (1.58358) | (1.43673) | (1.43507) | (1.58282) | (1.44508) | (1.45491) |
| L.EXCH-STA(2) | 2.51331* | 1.64828 | 2.56011** | 2.51759* | 1.67756 | 2.56111** |
| | (1.32961) | (1.29997) | (1.22977) | (1.32850) | (1.31255) | (1.24400) |
| L.LIFE-EXP | -1.30061* | -0.28551 | -1.21077** | -1.37153** | -0.25634 | -1.28188** |
| | (0.68599) | (1.19903) | (0.53608) | (0.68159) | (1.27428) | (0.54868) |
| *Observations* | 1,570 | 1,449 | 1,570 | 1,570 | 1,449 | 1,570 |
| *Wald Test Statistic* | 51.91 | 72.23 | 207.2 | 52.83 | 70.85 | 184.4 |
| *Log-Likelihood* | -514.5 | | | -514.3 | | |
| *LogPseudolikelihood* | | -402.9 | | | -403.3 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 8b. Robustness Test: Alternative Sample (Without: South Asia, East Asia and Pacific Countries)

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05254*** | -0.05408*** | -0.05155*** | -0.05246*** | -0.05423*** | -0.05156*** |
| | (0.01429) | (0.02092) | (0.01891) | (0.01422) | (0.02086) | (0.01888) |
| L.M2toRES | 0.18595 | 0.15375 | 0.19143 | 0.18595 | 0.15520 | 0.19054 |
| | (0.14732) | (0.15097) | (0.15608) | (0.14676) | (0.14972) | (0.15468) |
| L.CLAIM-PRIV | 0.00050 | 0.00042*** | 0.00048*** | 0.00050 | 0.00042*** | 0.00048*** |
| | (0.00037) | (0.00008) | (0.00010) | (0.00037) | (0.00007) | (0.00010) |
| **L.FDIL** | -0.45424*** | -0.75597*** | -0.43820*** | | | |
| | (0.09934) | (0.18046) | (0.09706) | | | |
| **L.FDI** | | | | -0.40217*** | -0.67373*** | -0.39436*** |
| | | | | (0.09615) | (0.17819) | (0.09913) |
| L.EXCH-STA | -3.59876** | -2.53097 | -3.40499** | -3.67816** | -2.52349 | -3.47999** |
| | (1.57826) | (1.67168) | (1.49767) | (1.57354) | (1.63752) | (1.49279) |
| L.EXCH-STA(2) | 2.49792* | 1.42079 | 2.32647* | 2.59366* | 1.44524 | 2.41155* |
| | (1.33944) | (1.59574) | (1.27365) | (1.33418) | (1.56057) | (1.27156) |
| L.LIFE-EXP | -0.76869 | 2.15453 | -0.58621 | -0.83554 | 1.95986 | -0.64207 |
| | (0.69442) | (2.32614) | (0.70768) | (0.68260) | (2.17154) | (0.67868) |
| *Observations* | 1,557 | 1,436 | 1,557 | 1,557 | 1,436 | 1,557 |
| *Wald Test Statistic* | 61.58 | 374.5 | 214.4 | 58.62 | 397.2 | 207.1 |
| *Log-Likelihood* | -507.2 | | | -509.6 | | |
| *Log-Pseudolikelihood* | | -395.6 | | | -398.9 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 9a. Robustness Test: Alternative Sample (Without: Latin America, Caribbean, Europe and Central Asia)

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.04994*** | -0.05246** | -0.04760** | -0.05054*** | -0.05315** | -0.04828** |
| | (0.01492) | (0.02220) | (0.01961) | (0.01493) | (0.02239) | (0.01978) |
| L.M2toRES | 0.23407 | 0.24773 | 0.22952 | 0.23284 | 0.24884 | 0.23015 |
| | (0.15174) | (0.15440) | (0.14363) | (0.15227) | (0.15709) | (0.14725) |
| L.CLAIM-PRIV | -0.00039 | -0.00040 | -0.00055 | -0.00034 | -0.00043 | -0.00046 |
| | (0.00314) | (0.00331) | (0.00303) | (0.00314) | (0.00336) | (0.00301) |
| **L.DEBTL** | 0.41534*** | 0.57177*** | 0.38588*** | | | |
| | (0.13479) | (0.16866) | (0.14719) | | | |
| **L.DEBT** | | | | 0.40707*** | 0.59875*** | 0.38128** |
| | | | | (0.14349) | (0.17699) | (0.15571) |
| L.EXCH-STA | -3.98713** | -2.73357* | -4.12653*** | -4.03051** | -2.73222* | -4.21054*** |
| | (1.60970) | (1.50428) | (1.49703) | (1.60974) | (1.51971) | (1.53227) |
| L.EXCH-STA(2) | 3.11410** | 1.90679 | 3.22626** | 3.12949** | 1.91995 | 3.27439** |
| | (1.36085) | (1.37736) | (1.31849) | (1.36068) | (1.39797) | (1.34920) |
| L.LIFE-EXP | -1.22108 | -0.48606 | -1.09786 | -1.28994* | -0.47305 | -1.18123* |
| | (0.77651) | (1.31535) | (0.69749) | (0.77028) | (1.36830) | (0.70911) |
| *Observations* | 1,547 | 1,347 | 1,547 | 1,543 | 1,343 | 1,543 |
| *Wald Test Statistic* | 44.63 | 32.61 | 36.71 | 43.53 | 31.24 | 36.23 |
| *Log-Likelihood* | -495.3 | | | -495.9 | | |
| *LogPseudolikelihood* | | -383.9 | | | -384.2 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## Table 9b. Robustness Test: Alternative Sample (Without: Latin America, Caribbean, Europe and Central Asia)

| | **RE** | **FE** | **PA** | **RE** | **FE** | **PA** |
|---|---|---|---|---|---|---|
| L.GROWTH | -0.05194*** | -0.05415** | -0.05124** | -0.05183*** | -0.05432** | -0.05114** |
| | (0.01527) | (0.02308) | (0.02075) | (0.01519) | (0.02291) | (0.02065) |
| L.M2toRES | 0.16413 | 0.15328 | 0.17446 | 0.16262 | 0.15275 | 0.17186 |
| | (0.15343) | (0.15213) | (0.15402) | (0.15283) | (0.15047) | (0.15289) |
| L.CLAIM-PRIV | -0.00170 | -0.00368 | -0.00208 | -0.00167 | -0.00364 | -0.00200 |
| | (0.00453) | (0.01035) | (0.01030) | (0.00448) | (0.01035) | (0.00993) |
| **L.FDIL** | -0.38441*** | -0.65333*** | -0.34973*** | | | |
| | (0.09688) | (0.21257) | (0.09463) | | | |
| **L.FDI** | | | | -0.33896*** | -0.58272*** | -0.31346*** |
| | | | | (0.09370) | (0.20729) | (0.09556) |
| L.EXCH-STA | -4.51003*** | -3.06134* | -4.47924*** | -4.56253*** | -3.04972* | -4.51722*** |
| | (1.60883) | (1.68456) | (1.45418) | (1.60438) | (1.66171) | (1.45750) |
| L.EXCH-STA(2) | 3.21317** | 1.59845 | 3.20399** | 3.28578** | 1.61577 | 3.25383** |
| | (1.37473) | (1.64104) | (1.29082) | (1.36959) | (1.61743) | (1.29486) |
| L.LIFE-EXP | -0.98266 | 1.34774 | -0.81537 | -1.02336 | 1.21481 | -0.84416 |
| | (0.78563) | (1.99637) | (0.75945) | (0.77427) | (1.88036) | (0.74652) |
| *Observations* | 1,528 | 1,334 | 1,528 | 1,528 | 1,334 | 1,528 |
| *Wald Test Statistic* | 51.40 | 32.83 | 48.84 | 49.03 | 31.31 | 45.10 |
| *Log-Likelihood* | -489.7 | | | -491.5 | | |
| *Likelihood Ratio Test* | 14.99 | | | 14.24 | | |
| *Log-Pseudolikelihood* | | -377.3 | | | -379.7 | |

Notes: Dependent variable is financial crisis dummy. Regressions are estimated using the fixed-effects (FE), random-effects (RE), and population-averaged (PA) logit models with robust errors. Standard errors are presented below the corresponding coefficient. Marginal effects are reported. Symbols *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

## List of Countries

## Basic sample (67 countries)

Albania, Chad, Georgia, Kiribati, Niger, Sudan, Armenia, Comoros, Ghana, Lesotho, Nigeria, Swaziland, Bangladesh, Rep. Demo of Congo, Guatemala, Liberia,, Syria, Belize, Republic of Congo, Guinea, Madagascar, Papua New Guinea, Tajikistan, Benin, Côte d'Ivoire, Guinea-Bissau, Malawi, Paraguay, Tanzania, Bhutan, Djibouti, Guyana, Mali, Tonga, Bolivia, Haiti, Mauritania, Rwanda, Uganda, Burkina Faso, Salvador, Honduras, Moldova, Samoa, Uzbekistan, Burundi, Eritrea, Mongolia, Senegal, Vanuatu, Cambodia, Ethiopia, Mozambique, Sierra Leone, Vietnam, Cameroon, Fiji, Iraq, Nepal, Solomon Islands, Zambia Rep., Central African Republic, Gambia, Kenya, Nicaragua, Sri Lanka, Zimbabwe.

## Classification by Region

## East Asia and Pacific (10 countries)

Cambodia Fiji, Kiribati, Mongolia, Papua New Guinea, Samoa, Solomon Islands, Tonga, Vanuatu, Vietnam.

## Europe and Central Asia (6 countries)

Albania, Armenia, Georgia, Moldova, Tajikistan, Uzbekistan, Belize.

## South Asia (4 countries)

Bangladesh, Bhutan, Nepal, Sri Lanka.

## Latin America and The Caribbean (9 countries)

Bolivia, El Salvador, Guatemala, Guyana, Haiti, Honduras, Nicaragua, Paraguay.

## Middle East and North Africa (3 countries)

Djibouti, Iraq, Syrian Arab Republic.

## Sub-Saharan Africa (35 countries)

Benin, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Comoros, Congo. Dem. Rep. of, Congo. Republic of, Côte d'Ivoire, Eritrea, Ethiopia, Gambia. The, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe.

## Summary statistics

| Variable | Observation | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| FCRISES | 2680 | 0,0884328 | 0,2839763 | 0 | 1 |
| GCRISES | 2680 | 0,0962687 | 0,2950144 | 0 | 1 |
| FDIL | 2312 | 2,398214 | 1,357343 | -3,765743 | 7,328608 |
| FDI | 2303 | 2,44019 | 1,364183 | -3,765743 | 7,328608 |
| DEBT | 2346 | 4,198346 | 0,8118192 | 0,5139456 | 7,661041 |
| DEBTL | 2356 | 3,895291 | 0,903531 | 0,1035851 | 7,641908 |
| PFDIL | 2312 | 2,760147 | 1,156015 | -3,570807 | 4,60517 |
| PDEBTL | 2356 | 4,277386 | 0,3319805 | 2,004261 | 4,60517 |
| FFDI | 1974 | -0,047277 | 2,04159 | -13,55161 | 4,51094 |
| DEBTS | 2126 | 3,927069 | 0,94132 | -1,262778 | 7,230393 |
| EXCH-STA | 2495 | 0,6776148 | 0,3459842 | 0,001342 | 1 |
| GROWTH | 2356 | 3,482106 | 7,100042 | -64,04711 | 106,2798 |
| M2toRES | 2116 | -0,0172191 | 0,5419151 | -7,024891 | 2,620249 |
| CLAIM-PRIV | 2174 | 22,04587 | 270,7342 | -70,52631 | 11046,93 |
| LIFE-EXP | 2680 | 56,57807 | 9,611243 | 19,50493 | 77,16322 |
| GDPPC | 2391 | 6,506453 | 0,7808593 | 3,912867 | 8,337289 |
| GOV | 2170 | 2,604487 | 0,4751783 | 0,3185904 | 4,241943 |
| INF | 1911 | 4,734772 | 0,2820272 | 4,405394 | 10,08051 |
| TRADE | 2271 | 4,137581 | 0,518073 | 1,843773 | 5,636078 |
| FINCREDIT | 2075 | 3,168005 | 0,8081773 | -4,794123 | 5,811103 |
| POL | 2514 | 5,597454 | 2,103814 | 1 | 8 |

Data from 1972 to 2011, including the 67 developing countries listed above.

## Correlation coefficients

| | FCRISES | GCRISES | FDIL | FDI | DEBT | DEBTL | PFDIL | PDEBTL | FFDI | DEBTS | EXCH-STA | GROWTH | M2toRES | CLAIM-PRIV | LIFE-EXP | GDPPC | GOV | INF | TRADE | FINCREDIT | POL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FCRISES** | 1,000 | | | | | | | | | | | | | | | | | | | | |
| **GCRISES** | 0,954 | 1,000 | | | | | | | | | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | | | | | | | | | | | | | | | | | | | | |
| **FDIL** | **-0,041** | **-0,052** | **1,000** | | | | | | | | | | | | | | | | | | |
| ***(p-values)*** | -0,048 | -0,012 | | | | | | | | | | | | | | | | | | | |
| **FDI** | **-0,036** | **-0,047** | **0,998** | **1,000** | | | | | | | | | | | | | | | | | |
| ***(p-values)*** | -0,086 | -0,025 | 0,000 | | | | | | | | | | | | | | | | | | |
| **DEBT** | **0,160** | **0,159** | **0,309** | **0,310** | **1,000** | | | | | | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | | | | | | | | | | | | | | | | | |
| **DEBTL** | **0,183** | **0,186** | **0,252** | **0,252** | **0,853** | **1,000** | | | | | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | | | | | | | | | | | | | | | | |
| **PFDIL** | **-0,150** | **-0,162** | **0,797** | **0,796** | **-0,233** | **-0,366** | **1,000** | | | | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | | | | | | | | | | | | | | | |
| **PDEBTL** | **0,125** | **0,135** | **-0,637** | **-0,635** | **0,195** | **0,363** | **-0,763** | **1,000** | | | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | | | | | | | | | | | | | | |
| **FFDI** | **-0,084** | **-0,079** | **0,646** | **0,647** | **0,161** | **0,088** | **0,549** | **-0,490** | **1,000** | | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | | | | | | | | | | | | | |
| **DEBTS** | **0,185** | **0,190** | **0,148** | **0,142** | **0,803** | **0,889** | **-0,406** | **0,397** | **0,041** | **1,000** | | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | -0,079 | | | | | | | | | | | | |
| **EXCH-STA** | **-0,102** | **-0,095** | **-0,051** | **-0,046** | **-0,157** | **-0,192** | **0,071** | **-0,028** | **-0,034** | **-0,167** | **1,000** | | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | -0,015 | -0,029 | 0,000 | 0,000 | -0,001 | -0,174 | -0,136 | 0,000 | | | | | | | | | | | |
| **GROWTH** | -0,143 | -0,157 | 0,054 | 0,047 | -0,103 | -0,101 | 0,104 | -0,090 | 0,080 | -0,058 | 0,054 | 1,000 | | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | -0,012 | -0,027 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | -0,008 | -0,010 | | | | | | | | | | |
| **M2toRES** | -0,108 | -0,112 | -0,011 | -0,014 | -0,072 | -0,067 | 0,033 | -0,021 | 0,048 | -0,070 | 0,085 | 0,033 | 1,000 | | | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | -0,615 | -0,528 | -0,001 | -0,002 | -0,133 | -0,340 | -0,042 | -0,002 | 0,000 | -0,138 | | | | | | | | | |
| **CLAIM-PRIV** | 0,029 | 0,027 | -0,017 | -0,017 | 0,081 | 0,083 | -0,075 | 0,037 | -0,026 | 0,071 | -0,071 | -0,036 | -0,036 | 1,000 | | | | | | | |
| ***(p-values)*** | -0,174 | -0,208 | -0,442 | -0,445 | 0,000 | 0,000 | -0,001 | -0,087 | -0,273 | -0,002 | -0,001 | -0,100 | -0,095 | | | | | | | | |
| **LIFE-EXP** | -0,094 | -0,098 | 0,148 | 0,145 | 0,060 | -0,020 | 0,153 | -0,126 | 0,147 | -0,030 | -0,082 | 0,066 | -0,022 | 0,014 | 1,000 | | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | -0,004 | -0,339 | 0,000 | 0,000 | 0,000 | -0,174 | 0,000 | -0,001 | -0,311 | -0,508 | | | | | | | |
| **GDPPC** | -0,093 | -0,089 | 0,229 | 0,231 | 0,012 | -0,095 | 0,273 | -0,250 | 0,221 | -0,121 | 0,142 | 0,034 | 0,021 | 0,019 | 0,585 | 1,000 | | | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | -0,588 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | -0,102 | -0,347 | -0,380 | 0,000 | | | | | | |
| **GOV** | -0,061 | -0,048 | 0,127 | 0,126 | 0,150 | 0,055 | 0,067 | -0,073 | 0,060 | 0,017 | 0,165 | -0,104 | 0,054 | 0,025 | -0,032 | 0,170 | 1,000 | | | | |
| ***(p-values)*** | -0,004 | -0,027 | 0,000 | 0,000 | 0,000 | -0,012 | -0,003 | -0,001 | -0,010 | -0,438 | 0,000 | 0,000 | -0,018 | -0,268 | -0,138 | 0,000 | | | | | |
| **INF** | 0,233 | 0,228 | -0,109 | -0,113 | 0,133 | 0,148 | -0,200 | 0,137 | -0,079 | 0,188 | -0,226 | -0,140 | -0,179 | 0,430 | -0,049 | -0,091 | -0,107 | 1,000 | | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | -0,002 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | -0,032 | 0,000 | 0,000 | | | | |
| **TRADE** | -0,090 | -0,088 | 0,508 | 0,513 | 0,267 | 0,134 | 0,371 | -0,346 | 0,486 | 0,114 | 0,059 | 0,046 | 0,008 | -0,001 | 0,341 | 0,504 | 0,384 | -0,107 | 1,000 | | |
| ***(p-values)*** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | -0,006 | -0,029 | -0,739 | -0,962 | 0,000 | 0,000 | 0,000 | 0,000 | | | |
| **FINCREDIT** | 0,017 | 0,030 | 0,129 | 0,124 | 0,174 | 0,180 | 0,006 | -0,008 | 0,037 | 0,222 | -0,016 | -0,154 | 0,060 | 0,013 | 0,322 | 0,276 | 0,257 | -0,085 | 0,231 | 1,000 | |
| ***(p-values)*** | -0,431 | -0,174 | 0,000 | 0,000 | 0,000 | 0,000 | -0,776 | -0,728 | -0,122 | 0,000 | -0,471 | 0,000 | -0,008 | -0,545 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | | |
| **POL** | 0,053 | 0,059 | -0,215 | -0,214 | -0,123 | 0,014 | -0,218 | 0,173 | -0,214 | 0,004 | 0,059 | -0,025 | -0,006 | -0,041 | -0,323 | -0,305 | -0,095 | 0,070 | -0,276 | -0,123 | 1,000 |
| ***(p-values)*** | -0,008 | -0,003 | 0,000 | 0,000 | 0,000 | -0,504 | 0,000 | 0,000 | 0,000 | -0,847 | -0,004 | -0,238 | -0,783 | -0,055 | 0,000 | 0,000 | 0,000 | -0,002 | 0,000 | 0,000 | |

This table reports the correlation coefficients of Pearson between the variables used in this paper.