Journal of Economic Integration
Vol. 34, No. 3, September 2019, 426-464
https://doi.org/10.11130/jei.2019.34.3.426

 pISSN: 1225-651X eISSN: 1976-5525

Financial Openness and Growth in Developing Countries: Why Does the Type of External Financing Matter?

Brahim Gaies[1+], Mahmoud-Sami Nabi[2]

[1]*IPAG Lab - IPAG Business School, France*
[2]*LEGI-Tunisia Polytechnic School, Tunisia, FSEG Nabeul, University of Carthage, Tunisia*

Abstract This study examines how external financing (EF) affects growth in developing countries by distinguishing between two forms of external financing: debt and foreign direct investment (FDI). We show that both types favor growth by boosting investment through the credit channel. However, excessive external debt increases vulnerability to financial crises. Contrariwise, FDI plays an amortizing role by reducing a crisis' effects. The empirical evidence confirms these results and demonstrates that, despite the more secure nature of FDI, mixed financing (debt and FDI) remains more profitable for developing countries because of the inverted U-shaped growth effect of the FDI-to-debt ratio. Moreover, exchange rate stability decreases vulnerability to financial crises, whereas higher stability turns into exchange rate rigidity and thus increases crisis occurrence.

Keywords: External debt, FDI, Financial crisis, Exchange rate rigidity

JEL Classifications: F41, G15, C02, C58

Received 4 May 2019, Revised 29 July 2019, Accepted 14 August 2019

I. Introduction

The external financial liberalization that has been ongoing in developing countries since the 1980s has been largely justified by its expected benefits for economic growth (Gaies *et al*. 2019). According to the neoclassical theses of international finance, these benefits materialize through a better mobilization and allocation of capital, more efficient risk-sharing, and rapid development of the domestic financial system (e.g., McKinnon 1973, Shaw 1973, Obstfeld 1998, Stulz 1999a, 1999b, Bekaert *et al.* 2005, Mishkin 2006, 2009, Baltagi *et al.* 2009, Cull and Martinez Peria 2010, De Haas and Van Lelyveld 2010, Ahmed 2016, Trabelsi and Cherif 2017). The literature has also identified collateral advantages of financial openness, namely institutional

+Corresponding Author: Brahim Gaies
Assistant Professor, IPAG Lab - IPAG Business School, 188 rue de Rivoli, 75001 Paris, France, Tel: +33 7 85 29 19 51, Email: gaies_brahim@yahoo.fr
Co-Author: Mahmoud-Sami Nabi
Professor, LEGI-Tunisia Polytechnic School, FSEG Nabeul, University of Carthage, Email: msaminabi@gmail.com

Acknowledgements: We would like to thank the anonymous reviewers and editors who gave us thorough and valuable comments that allowed us to enrich our paper considerably.

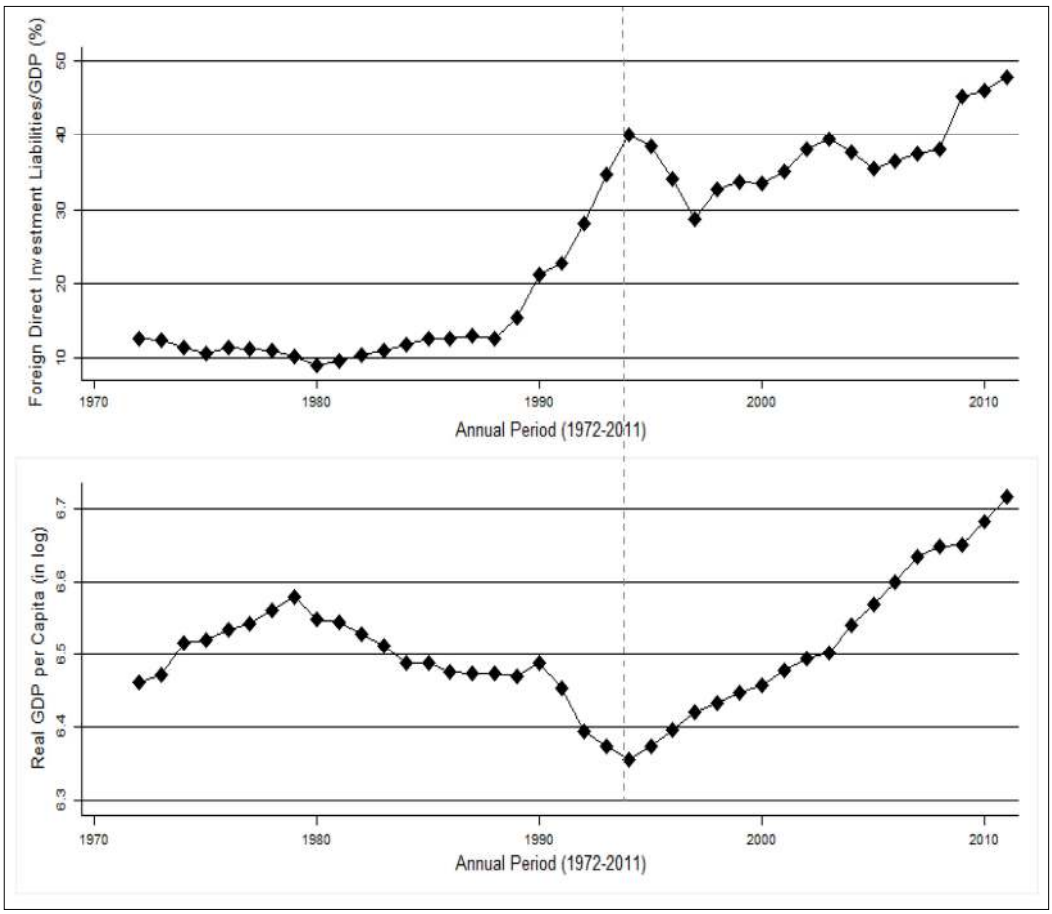
development, better governance, and greater macroeconomic discipline (e.g., Wei 2000, Gelos and Wei 2005, Doidge *et al.* 2007, Kose *et al*. 2006, 2009, Obstfeld 2009, Ju and Wei 2010, Gourinchas and Jeanne 2013). Aside from the proposition that these collateral effects can improve total factor productivity, many studies identify them as necessary threshold conditions for developing countries' capacity to benefit from financial globalization (Rodrik 2001, Rodrik and Subramanian 2009, Broner *et al*. 2010, Kunieda *et al.* 2014, Chen and Quang 2014). However, the benefits of financial openness have been questioned by many authors. The proponents of capital controls argue that financial openness is associated with higher macroeconomic instabilities resulting from international capital movements and the unstable dynamics of foreign banks. According to this view, external financing promotes financial fragility (particularly crises) and economic recessions, especially in developing countries with weak domestic institutions (e.g., Díaz-Alejandro 1985, Kaminsky and Reinhart 1999, Eichengreen *et al.* 2003, Loayza and Rancière 2006); Kharroubi 2007, Tong and Wei 2010, Joyce 2011).

This study contributes to the current debate on the relevance of greater financial openness for non-emerging developing countries by highlighting how growth impacts foreign direct investment (FDI) and debt financing. Our focus on these channels is justified by the facts shown in Figures 1 and 2. The figures illustrate the evolution of de facto financial openness (external financing through FDI and external debt) and real GDP per capita in non-emerging developing countries between 1972 and 2011. The figures display two trends. In the first, covering the mid-1990s until 2011, an increase in FDI financing and the relative decline of debt financing were accompanied by an increase in real GDP per capita. In the second, covering the 1990s onward, the external financing of developing countries has increasingly been based on FDI rather than external debt. However, debt remains by far the leading source of external financing for growth in these countries. This descriptive analysis suggests that FDI in developing countries favors growth while external financing based on external debt does not.

The overview shown in these figures and the ongoing controversy in the related literature motivate us to study not only the direct effects of FDI and debt financing on economic growth but also their indirect impacts through credit and financial crises channels. To this end, we investigate the effects of external financing on growth, the effects of external financing on financial crises, and the effects of external financing on financial development—while also considering the role of exchange rate volatility in non-emerging developing countries. This all-encompassing approach is this first of its kind in the literature. Our analysis is also the first to be based on empirical and theoretical frameworks capturing the three main aspects of the effects of external financing. This approach ensures a comprehensive discussion of the mechanisms and channels related to external financing, financial crises, financial development, and growth from both macro and microeconomic perspectives. The study's third novelty is its focus on not only the effects of FDI and debt financing but also on the repercussions of

their impacts on growth, offering new insights into the suitability of mixed financing (FDI and debt) for non-emerging developing countries.

Figure 1. FDI liabilities and real GDP per capita in developing countries

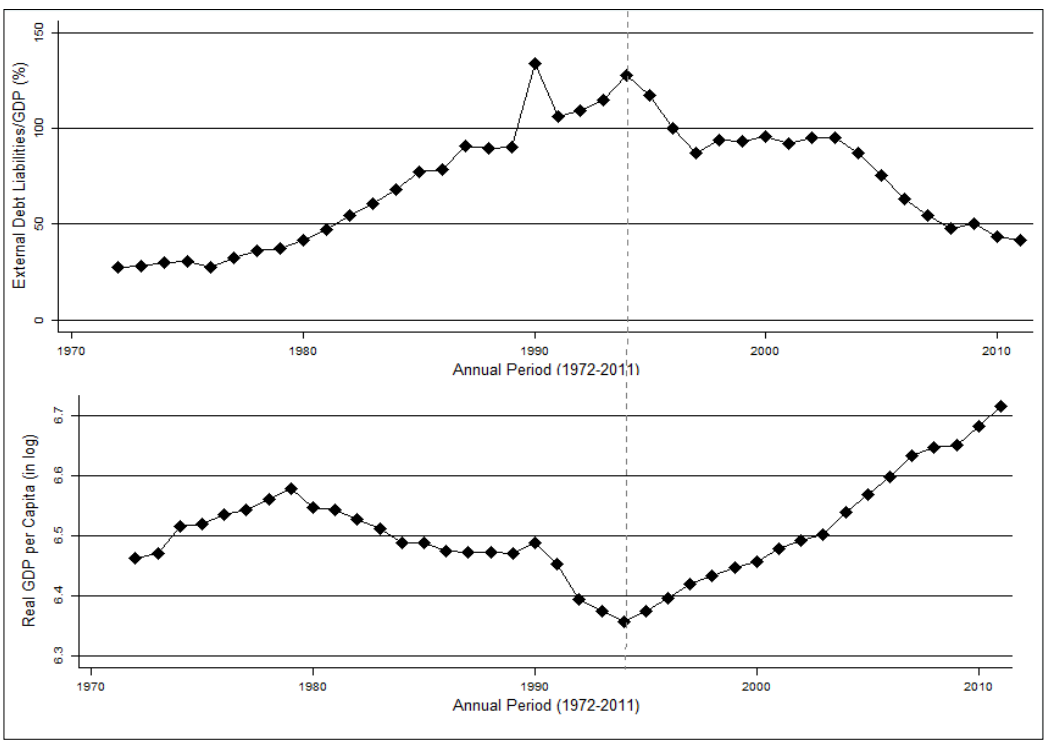


(Notes) Calculation done by the authors on the basis of FDI liabilities to GDP by mean levels of the full sample (External Wealth of Nations Dataset [updated and extended, 1970~2011]) and real GDP per capita by mean levels of the full sample (World Development Indicators [2014]).

Our theoretical framework incorporates banking and economic growth mechanisms, models vulnerability to banking and currency crises, and incorporates various choices regarding exchange rate regimes and external financing channels (i.e., FDI versus debt). The study's main theoretical results are as follows. First, the external financing of an economy (through external debt and foreign direct investment) boosts investment through increased credits granted to projects, and thus favors economic growth. Second, a higher level of external debt and bank credits increases vulnerability to financial crises. Third, FDI reduces the recessionary incidence of financial crises. The study's empirical analysis considers a dataset comprising 67 developing countries selected

from among low- and middle-income countries based on the World Bank's classification covering 1972 to 2011 and growth and financial development models using the two-step system generalized method of moments technique and a fixed effects model, as well as three probit panel models (fixed-effects, random-effects, and population-averaged). Our empirical evidence confirms the theoretical results regarding the effects of FDI and external debt on economic growth, the vulnerability to crises, the amortizing effect of FDI during recessions caused by such crises, and the role of exchange rate volatility. However, the evidence also suggests that mixed financing is better for growth than financing by FDI alone, despite its beneficial effects on financial stability and development. Specifically, our empirical analysis reveals an inverted U-shaped growth effect of the FDI-debt ratio, which means that FDI (or debt) increases growth at a certain level of debt (or FDI) but the positive effect declines and becomes negative below this level. Thus, FDI financing, identified as a crisis-prevention measure, can reduce the negative effect of debt financing on financial stability, enhancing its advantages for financial development. On the contrary, debt financing can slow the decline in the positive effect of FDI financing on growth. This novel result is particularly important, since the literature (e.g., Hamdi and Boukef

Figure 2. External debt liabilities and real GDP per capita in developing countries



(Notes) Calculation done by the authors on the basis of external debt liabilities to GDP by mean levels of the full sample (External Wealth of Nations Dataset [updated and extended, 1970~2011]) and the real GDP per capita by mean levels of the full sample (World Development Indicators [2014]).

Jlassi 2014, Zhou 2017, Wei 2018, Boukef Jlassi *et al.* 2018) emphasizes only the virtuous effects of FDI, neglecting the role that debt can play in sustaining these virtuous effects.

Section II reviews the literature and outlines the main contributions made by this study. Section III presents the study's theoretical framework and describes the various channels through which external financing (FDI and debt) affects economic growth, vulnerability to financial crises (banking and currency), and the recessionary consequences of those crises. Section IV presents the study's empirical results. Finally, Section V draws conclusions from the main results of the study.

II. Literature and Contributions

Our article relates to two research strands. The first includes the group of studies on how growth impacts financial openness that distinguish between FDI and external debt channels. Broner *et al.* (2010) build a standard growth model showing that an economy initially endowed with low capital cannot settle its foreign debt because its debt-to-domestic savings ratio is weak. Drine and Nabi (2010) find that external public debt reduces the size of the formal sector relative to the informal sector through the taxation on capital intended for the reimbursement of annuities. According to the authors, this impact reduces production efficiency because the informal sector is less productive than the formal one. More recently, Okada (2013) shows that FDI financing promotes growth through its enhancement of the quality of institutions in 112 countries observed from 1985 to 2009. Neto and Veiga (2013) find the same result for 139 countries between 1970 and 2009. Later, Lane and McQuade (2014) show a strong correlation between external debt inflows and domestic credit boom for 54 developed and emerging countries from 1993 to 2008, while finding that FDI flows are uncorrelated with this boom. Bekaert *et al.* (2011) study the impact of capital account opening and equity market liberalization for 96 developed and developing countries between 1980 and 2006, finding positive effects of all types of financial liberalization on GDP growth and productivity.

The second strand of the literature to which this article belongs includes studies analyzing the effects of financial openness on financial crises. Kharroubi (2007) analyzes the impact of external private debt on growth in the context of imperfect capital markets with moral hazard. He shows that maturity mismatch in capital markets translates into macroeconomic fluctuations and may generate liquidity crises, and that financial development mitigates the negative effects on growth caused by macroeconomic fluctuations but not those caused by the crises. Hamdi and Boukef Jlassi (2014) show that a high ratio of foreign debt liabilities to total liabilities increases the likelihood of banking crises for a panel of 58 developing countries between 1984 and 2007. The same results are found by Tong and Wei (2010), and Boukef Jlassi *et al.* (2018).

Lee *et al.* (2016) prove that all foreign capital flows increase the vulnerability to currency and banking crises. Zhou (2017) argues that over-borrowing and sudden stop problems arise only with external financing through short-term debt. Furthermore, Wei (2018) claims in a recent literature review on the effects of financial globalization that over-indebtedness, agency, and, sudden stop problems are more recurrent with debt financing than with FDI financing in developing countries.

Our study makes three important contributions to the literature. First, it offers a comprehensive empirical analysis of the effects of external financing on financial development, crises, and growth that considers the role of exchange rate volatility in non-emerging developing countries, whereas previous studies have focused on only one aspect of these relationships. None of the studies on how growth affects financial openness that distinguish between FDI and external debt channels has modeled the external financing mode as a factor in financial crises, which could explain its indirect effects on growth, and studies on how financial crises impact financial openness have ignored how external financing affects financial development, thus missing their potential collateral repercussions in terms of crises and growth *via* the credit channel. Thus, this study appears to be the first all-encompassing investigation into the direct and indirect effects of external financing on financial development, crises, and growth in developing countries. Second, this study goes beyond the recent literature by adding theoretical proof and explanations of the mechanisms evidenced by the all-encompassing empirical investigation, whereas existing analyses are generally based on a single perspective, either empirical or theoretical, but never both. This twofold (empirical and theoretical) approach provides a better understanding of the mechanisms and indirect effects of external financing on growth by providing both with macroeconomic and microeconomic foundations. Third, the literature pits two types of external financing (FDI and debt) against each other and studies their effects separately. This study goes further by examining the growth effects of FDI and debt not only separately but also in terms of their interaction, and by exploring the suitability of mixed (FDI and debt) financing.

III. Theoretical Analysis

A. Economic environment

We consider a single-good economy with two periods and three discrete time dates, $t = 0, 1, 2$. The single good used for consumption and investment could be produced through a two-period project. There is a continuum of mass 1 of risk-neutral agents who live for two periods and are endowed with the initial quantity of the good. There is a competitive banking system

featuring access to short-term storage technology and financing for two-period risky projects. The economy is open to FDI. The unit of account is the consumption (investment) good.

1. Agents

There is a continuum of mass 1 of agents. Each agent is endowed with w_0 units of the good, which the agent 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 the agent is an *early consumer* who only wants to consume at date $t=1$ or a *late consumer* who only wants to consume at date $t=2$. This time preference is private information possessed by the consumer and 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 a return higher than what they would obtain by withdrawing at date $t=2$. At date $t=0$, each agent has a probability γ to be an early consumer and a probability $1-\gamma$ to be a late consumer. Therefore, the *ex ante* preferences of a consumer can be represented by:

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

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. 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 of θ and fails with a probability of $1-\theta$. If successful, the project generates a return factor equal to $R>1$, and it equals zero in case of failure. The average gross return is therefore $\theta R>1$. The uncertainty regarding the success or failure of each investment project is alleviated at the mid of the production cycle $(t=1)$. A project that 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 that transfers one unit of the good from one period to another without depreciation. For risk-neutral banks, the projects conducted until their maturity are more attractive than the storage technology.

3. Representative bank

There is a competitive banking sector represented by a bank that finances the projects. The bank provides credits (X) out of the deposits (w_0), the savings of the lenders, and foreign debt (w^*). It contracts in foreign currency from the international market at a fixed interest factor, $1 < r^* < \theta R$ ($S_0 w^*$ represents the debt in domestic good where S_0 serves as a spot exchange rate expressing the value of one unit of the foreign currency in terms of the domestic good). The *raison d'être* of the bank in this model is the diversification of projects' idiosyncratic risks. Hence, by financing the continuum of projects, the bank can diversify its assets such that the proportion of successful projects at each date is known and equal to θ (by the law of large numbers). The lenders deposit their initial wealth w_0 in the representative bank in exchange for a demand deposit contract (c_1, c_2), allowing them to withdraw either c_1 units of the consumption good at date $t=1$ or c_2 units at date $t=2$. The bank again serves as liquidity insurer. Since the deposit contract is not contingent on project success or failure, the bank invests its resources in a portfolio (X, Z, F) wherein Z represents the amount stored to hedge against the liquidity risk. F represents the premium paid to hedge the bank's short position in foreign currency ($S_2 r^* w^*$) against the appreciation of the foreign currency (which corresponds to $S_2 > S_0$), as given by:

$$F = f S_0 r^* w^* \tag{3}$$

where f is the unitary premium per unit of foreign currency. If the foreign currency appreciates, the hedging institution transfers to the bank the amount $r^*(S_2 - S_0)\ w^*$ (this could be thought of as hedging using a call with a strike equal to the spot exchange rate S_0 and a premium f). We assume that borrowing from the international market, hedging against the foreign exchange risk, and investing in domestic projects are beneficial, which corresponds to the following condition:

$$r^* < \theta R(1 - f r^*) \tag{4}$$

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

$$X + Z + F = w_0 + S_0 w^* \tag{5}$$

$$Z = \gamma c_1 \tag{6}$$

$$\theta R X + r^*(S_2 - S_0) + w^* = (1-\gamma)c_2 + r^* S_2 w^* \tag{7}$$

Equation (5) expresses the equality between the resources and expenditures of the bank, including the total premium paid for hedging the foreign exchange risk. Condition (6) indicates

that the liabilities of the bank at date $t=1$ are covered by the amount invested in the storage asset. Condition (6) signifies that the output of the project and the amount received from the hedging institution in case of foreign currency appreciation, $r^*w^*(S_2-S_0)^+ = r^*w^*.\max(0, S_2-S_0)$, enables the bank to pay its late depositors the constant amount c_2 and reimburse the loan it obtained from international creditors. Given the expression (3) of F, Equation (5) could be rewritten as follows:

$$X+Z=w_0+(1-fr^*)S_0w^* \tag{5'}$$

Therefore, the evolution of the exchange rate (the constant appreciation of the foreign currency) in Equation (7) could be rewritten as follows:

$$\theta RX=(1-\gamma)c_2+S_0r^*w^* \tag{7'}$$

Since the banking system is assumed to be competitive, our representative bank will offer the demand deposit contract (c_1, c_2) that maximizes the expected utility (2) of each agent under constraints (5') to (7'). Therefore, using the first-order optimal condition, this contract is completely determined by the following Equations:

$$u'(c_1)=\theta R\delta u'(c_2) \tag{8}$$

$$\gamma c_1+\frac{(1-\gamma)c_2+S_0r^*w^*}{\theta R}=w_0+S_0w^*(1-r^*f) \tag{9}$$

For simplicity, we consider a logarithmic utility function $u(.)=\ln(.)$. From Equations (8) and (9) we obtain:

$$c_2=\theta R\delta c_1;\ c_1=\frac{W}{\gamma+\delta(1-\gamma)} \tag{10}$$

where

$$W=w_0+S_0w^*[(1-fr^*)-r^*/\theta R] \tag{11}$$

Given Equations (7'), (10), and (11), we obtain $\partial X/\partial w^*>0$ and $\partial c_2/\partial(S_0w^*)>0$, which means that borrowing w^* on the international market increases the credits allocated to the projects as well as the consumption level. Moreover, under the condition $\theta R\delta>1$ and given

that the utility function is concave, using simple algebra on Equations (8) and (9) reveals that $c_1 > c_2$. Hence, late consumers have no incentive to declare that they have obtained c_1 early and store it to consume at date 2. Therefore, even if the bank cannot identify each depositor's type, the latter will reveal it in normal times.

4. Growth of the capital stock

In addition to the projects financed through the banking system, other projects are undertaken by foreign investors though FDI equal to I. We assume that these projects have the same characteristics as those undertaken by domestic entrepreneurs. Hence, the stock of the capital good at the end of the second period is given by:

$$w_2 = \theta R(X + I) \tag{12}$$

and the growth factor g_2 is given by:

$$g_2 = \frac{w_2}{w_0} = \frac{\theta R(X + I)}{w_0} \tag{13}$$

where X is determined by Equations (7'), (10), and (11).

> ***Proposition 1***
> *The external financing of the economy (through external debt and FDI) boosts the credits granted to the projects and increases economic growth.*

Proof. It can be easily shown that $\partial X / \partial I > 0$ and $\partial X / \partial (S_0 w^*) > 0$ using Equation (12) and simple derivatives of X and W given by (10) and (11). As we will see, however, external financing through debt increases vulnerability to financial crises.

B. External financing, vulnerability to financial crises, and economic recession

1. Exchange rate and exchange rate regime

The value of the exchange rate is determined by the equilibrium of the balance of payments:

$$T(w, S) - Sr^* w^* = 0 \tag{14}$$

where $T(w, S) = Saw - b = 0$ with $a, b > 0$ represents elements of the balance of payments except the reimbursement of external debt. This depends on the production level of the economy w and is assumed to increase as the value of the domestic good depreciates in terms of the foreign

currency. The initial spot exchange rate S_0 equilibrates the balance of payments at date $t=0$, so that $T(R,S_0)=S_0aw_0-b=0$, or, equivalently, $S_0=b/(aw_0)$. In normal circumstances, no evolution of the exchange rate happens at date $t=1$ (hence $S_1=S_0$), and the exchange rate S_2 at the final date is given by:

$$T(w_2,S_2)-S_2r^*w^*=0 \tag{15}$$

The solution to Equation (15) is given by:

$$S_2=\rho S_0 \text{ where } \rho=\frac{w_0}{w_2-r^*w^*/a}>1 \tag{16}$$

with w_2 given by (12) and the parameter a suitably chosen to reflect the sensitivity of the trade balance to the depreciation of the domestic good's value in foreign currency. The economic agents expect this foreign currency appreciation, which is the rationale justifying the bank's hedging of its short position. It is this expected evolution of the exchange rate that justifies the bank's recourse to hedging its short position in foreign currency.

Definitions 1

i) Under a rigid exchange rate regime, the exchange rate S is announced to fluctuate within the band $[S_0,\rho S_0]$. In this case, the bank cannot hedge its short position against the appreciation of the foreign currency beyond ρS_0.

ii) Under a flexible exchange rate regime, no upper bound is fixed for the exchange rate S, and the bank is hedged against any level of foreign currency appreciation.

2. Negative economic shock and 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 a consequence of this shock, the bank's assets are impacted, and the revenues it is able to collect equal $\theta(R-\varepsilon)X$. The macroeconomic shock also pushes the foreign exchange rate beyond ρS_0. It is easy to show using Equations (15), (16), and (12) that the new exchange rate S'_2 is given by:

$$S'_2=\rho' S_0>\rho S_0 \tag{17}$$

where ρ' is determined by:

$$\frac{1}{\rho'}=\frac{1}{\rho}-\frac{\theta\varepsilon(X+I)}{w_0} \tag{17'}$$

It is clear that the appreciation of the foreign currency beyond ρS_0 increases as the shock impacting the domestic projects increases (ρ is given by [16]). In the case of a *rigid exchange rate regime*, the bank is not completely hedged against the appreciation of the foreign currency to the level S'_2. At date $t=2$, its liabilities increase by the amount of the uncovered appreciation $(\rho'-\rho)r^*S_0w^*$. Therefore, its balance sheet (7') (at $t=2$) becomes:

$$\theta(R-\varepsilon)X=(1-\gamma)\tilde{c}_2+(\rho'-\rho)r^*S_0w^*+S_0r^*w^* \tag{18}$$

where $\tilde{c}_2<c_2$ represents the readjusted reimbursement to late domestic depositors that the bank is obliged to make in order not to default on its foreign debt and to repay the entire amount of $r^*S_2w^*$ given by:

$$r^*S_2w^*=\rho' S_0r^*w^*=\underbrace{(\rho'-\rho)S_0r^*w^*}_{\substack{\text{additional amount}\\ \text{to secure after the shock}}}+\underbrace{(\rho S_0-S_0)r^*w^*}_{\substack{\text{amount received from}\\ \text{the hedging institution}}}+\underbrace{S_0r^*w^*}_{\substack{\text{amount initially}\\ \text{secured by the bank}}}$$

Simple algebra using (7') and (18) enables us to determine the new reimbursement of late depositors $\tilde{c}_2$ which is strictly inferior to the initial contractual level c_2:

$$\tilde{c}_2=\frac{\theta(R-\varepsilon)X-[1+(\rho'-\rho)]r^*S_0w^*}{1-\gamma}=c_2+\frac{[(\rho-\rho')r^*S_0w^*-\varepsilon X]}{1-\gamma}<c_2 \tag{19}$$

It is clear that $\tilde{c}_2$ decreases as the shock ε increases.

Definitions 2

i) A currency crisis is defined by the appreciation of the foreign currency beyond the expected level ρS_0.

ii) A banking crisis (bankruptcy) occurs at date t=1 when late domestic depositors trigger a bank run, which obliges the bank to liquidate all the projects prematurely and partially default on its domestic obligations to its domestic depositors.

Due to the shock, the proportion $(1-\gamma)$ of late consumers might have an incentive to

withdraw their deposits prematurely while claiming they are early depositors, asking for c_1, and storing it during the second period. The rationale behind this behavior is the loss that would impact their saving $\tilde{c}_2 < c_2$ and the possibility of receiving greater reimbursements by claiming they are early consumers (as the bank cannot identify their actual depositor type). This precautionary reaction causes a bank run, which in turn impacts the foreign exchange rate. Even if foreign creditors have no incentive to withdraw their savings prematurely (assuming they are guaranteed the repayment $r^* S_0 w^*$ whatever the evolution of the exchange rate), their early reimbursement at $t=1$ forces the appreciation of the foreign currency beyond the expected level ρS_0. In normal circumstances, the amount of savings requested by the bank's early domestic depositors equals γc_1. Amid a bank run, however, 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 $\mu\theta(R-\varepsilon)X$ due to the additional liquidation cost of $(1-\mu)\theta(R-\varepsilon)X$. Taking into account the reimbursement of the external debt, the amount $\hat{c}_1$ available to domestic depositors during a bank run is given by:

$$Z + \mu\theta(R-\epsilon)X = \gamma\hat{c}_1 + (1-\gamma)\hat{c}_1 + (\rho'' - \rho) r^* S_0 w^* + S_0 r^* w^* \tag{20}$$

where $\rho'' S_0 > \rho' S_0$ is an additional appreciation of the foreign currency due to the additional liquidation shock caused by the bank run. Using (17'), the new exchange rate level is determined by:

$$\frac{1}{\rho''} = \frac{1}{\rho} - \frac{\theta(X+l)[\varepsilon\mu + (1-\mu)R]}{w_0} < \frac{1}{\rho'}$$
$$\hat{c}_1 = Z + \mu\underbrace{\theta(R-\varepsilon)}_{<1} X - [1 + (\rho'' - \rho)] r^* S_0 w^* < c_1 \tag{21}$$

Proposition 2.

i) Financial crises occur when the unexpected shock of the balance of payment generates an initial appreciation of the foreign currency ε exceeding ε_m given by $\tilde{c}_2 = \hat{c}_1$.

ii) A flexible exchange rate reduces vulnerability to financial crises.

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

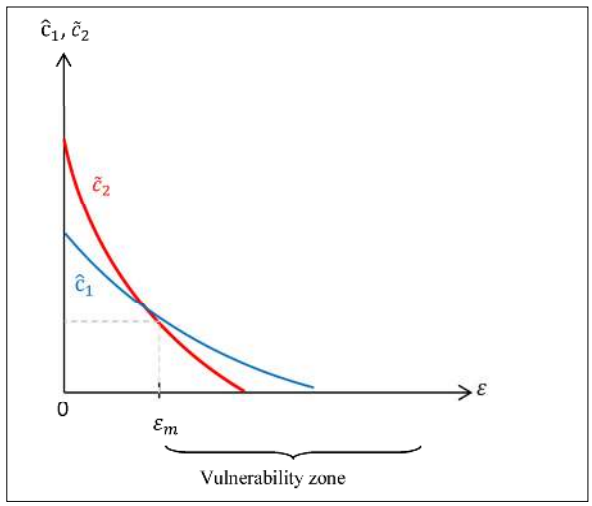
iv) Foreign direct investment that improves economic performance reduces vulnerability to financial crises.

v) The recessionary effect of financial crises decreases as the FDI level decreases but increases as bank credits increase.

Proof of Proposition 2. See appendix.

Figure 3 shows the zones of vulnerability to financial crises

Figure 3. Economic shock and vulnerability to financial crises under a rigid exchange rate regime



IV. Empirical Evidence

A. Data and models

We test the validity of our theoretical predictions regarding the impact of FDI financing and debt financing on growth in developing countries through the credit and financial crisis channels using an unbalanced panel comprising yearly data on 67 low- and middle-income countries[1] from 1972 to 2011[2] based on the classification used by the World Bank.[3] Three

1) 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 Republic, Central African Republic, Gambia, Kenya, Nicaragua, Sri Lanka, and Zimbabwe.

2) Summary statistics and correlations are provided in the appendix.

3) The World Bank considers that a country is low-income if its GNI per capita is lower or equal to 935 US dollars. A country is considered to have lower-than-average income if its GNI per capita is no less than 936 US dollars and no more than 3,705 US dollars. A country is considered to have a higher-than-average income if its GNI per capita is between 3,706 US dollars and 11,455 US dollars. A country is considered to be high-income if its GNI per capita exceeds 11,456 US dollars. The countries with higher-than-average or higher incomes are characterized by a level of economic and financial development as well as an institutional quality that is higher than that of other countries. These two groups are mainly comprised of developed and emerging economies. Thus, excluding them from our sample enhances its homogeneity. We have also removed five middle-income countries

different models are estimated: growth and financial development models, estimated *via* the two-step system generalized method of moments technique; and a fixed effects and financial crises model - estimated using fixed-effects, random-effects, and population-averaged probit methods.

1. Growth model

Through this growth model, we examine the effects of external financing variables separately and in their interaction (between FDI and debt) on economic growth. We consider the real GDP per capita (*GDPPC*) as an indicator of economic growth following recent empirical studies on the relationship between financial and long-run growth in developing countries—particularly Aghion *et al.* (2009), Neto and Veiga (2013), and Ahmed (2016). This dependent variable is explained on the basis of six indicators of external financing: FDI stocks of assets and liabilities to GDP (FDI); FDI stocks of liabilities to GDP (*FDIL*); FDI stocks of assets to GDP (*FDIA*); debt stocks of assets and liabilities to GDP (*DEBT*); debt stocks of liabilities to GDP (*DEBTL*); and debt stocks of assets to GDP (*DEBTA*). We also control for the sum of exports and imports to GDP (*TRADE*); the lack of price stability[4] (*STAB-PRICE*); government spending as a share of GDP (*GOV*); secondary school enrollment[5] (*EDUS*); and the population growth rate (*POPG*). These control variables, apart from being used in the recent empirical literature, are selected following several studies on the phenomenon of economic growth, since they have been proven robust by Sala-I-Martin (1997), Barro and Sala-I-Martin (2004), Sala-I-Martin, Doppelhofer and Miller (2004). We consider data from two sources to collect these variables: The World Development Indicators database (WDI) for the dependent and control variables and the External Wealth of Nations dataset (EWN) for the external financing variables. The model can be expressed as:

$$GDPPC_{it} = a_0 + \gamma GDPPC_{it-1} + a_1 EF_{it} + a_2 TRADE_{it} + a_3 STAB-PRICE_{it} + a_4 GOVa_5 EDUS_{it} + a_6 POPG_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (22)$$

where EF represents the indicators of external financing (*FDI*, *FDIL*, *FDIA*, *DEBT*, *DEBTL* or *DEBTA*); a_0 is a constant; μ_i is the country-specific effect; λ_t is the time-specific effect; and ε_{it} is the error term. Indicators i and t represent the countries ($i = 1,2 \ldots N$) and the periods ($t = 1,2 \cdots T$), respectively.

We estimate this model using the GMM system dynamic panel data estimator developed

---

from our sample (Egypt, Pakistan, India, Indonesia, and the Philippines) because they are classified as emerging economies in the Morgan Stanley Capital International (MSCI) 2018 indices.

4) *Log*(100+inflation rate).

5) The ratio of total secondary enrollment, regardless of age, to the population of the age group that officially corresponds to that level of education.

by Arellano and Bond (1991), Arellano and Boyer (1995), and Blundell and Bond (1998), and we compute robust two-step standard errors using the methodology proposed by Windmeijer (2005). We make this choice to avoid potential endogeneity problems (i.e., measurement errors, omitted variables, simultaneity), address the potential correlation between country-fixed effects and the error term, and resolve the weak instrument problem[6] (Roodman 2009a, 2009b, Bun and Windmeijer 2010). We also use robust standard error estimations in the fixed effects to test the robustness of the baseline GMM system results.

2. Financial development model

We test our theoretical prediction that FDI and external debt increase credits and might thus promote economic growth using the empirical model of Baltagi *et al.* (2009). In contrast to these authors, however, we distinguish between external financing variables according to their nature (FDI versus debt). The model can be expressed as:

$$CPRIVETG_{it} = a'_0 + \gamma CPRIVET_{it-1} + a_1 GDPPC_{it-1} + a_2 TRADE_{it-1} + a_3 EF_{it-1} + a_4 (EF\ x\ TRADE)_{-1} + \mu'_i + \lambda'_t + \varepsilon'_i t \quad (23)$$

where *CPRIVET* represents domestic credit to the private sector (percent of GDP) according to WDI; *EF* x *TRADE* is the interaction term[7] between the sum of exports and imports to GDP and the external financial indicators; a'_0 is a constant; μ'_i is the country-specific effect; λ'_t is the time-specific effect; and ε_{it} is the error term. Indicators i and t represent the countries ($i = 1,2 \ldots N$) and the periods ($t = 1,2 \ldots T$), respectively. All of the explanatory variables are one-period lagged (L.).

We utilize the same GMM system estimator as that used for the growth model, and we verify its robustness by fixed effects estimations.

3. Financial crises model

We develop a financial crisis model to examine three main outcomes from our theoretical

---

6) The validity of the GMM system estimator is conditioned by i) the quality of the chosen instruments (*Hansen*-test) and ii) the non-autocorrelation of errors of order two (AR2) in the equation in difference. The *P*-values of the *Hansen*-test and AR2 test confirm these conditions for all regressions, as reported in the related tables. Following Roodman (2009a, 2009b), we restrict the moment conditions by using the Stata command "collapse," which guarantees a small number of instruments (exogenous independent variables). The number of instruments is thus lower than the number of groups (countries) in all of the regressions. This technique resolves the instrument proliferation problem.

7) As indicated by Baltagi *et al.* (2009), this interaction term is useful for capturing the simultaneous openness hypothesis. Indeed, the total effect (margin and direct) of a higher *EF* or *TRADE* can be measured by calculating the partial derivatives of *CPRIVET* on *EF* and the partial derivatives of *CPRIVET* on *TRADE*.

model. In the first, a higher level of external debt and bank credits increases vulnerability to financial crises. In the second, FDI reduces the incidence of crises. In the third, a rigid exchange rate increases financial crises. To construct our empirical framework, we follow the model of Lee *et al*. (2016), but with several key changes: Our crisis indicator allows us to predict the probability of the three major financial crises (Claessens and Kose 2013): the probability of banking crises, currency crises, and twin crises. We explain these in terms of different external financing indicators and exchange rate stability levels. Lee *et al.* (2016) explain banking and currency crises but do not examine twin crises, do not consider the mobility of the exchange rate, and fail to differentiate between external financing modes. In line with Lee *et al*. (2016), we also use panel probit regressions. However, while those authors used only one model for their baseline estimates, we use three probit panel models: probit fixed effects, probit random effects, and probit population averaged models.

Furthermore, to measure the likelihood of crisis occurrence, we calculate a dummy variable of financial crises (*FCRISES*):

$$FCRISES^{8)} = f(BC, CC, TC) \tag{24}$$

FCRISIS is explained by the external financing variables (*EF*), the exchange rate stability[9)] variable in level and squared forms (*ERS* and ERS^2), and the six control variables: GDP growth (*GROWTH*); growth of money and quasi money to total reserves ratio (*M2/RESEG*); growth of claims on private sector to GDP (*CLAIMPRIVG*); life expectancy at birth in total years (*LIFE-EXP*); the domestic credit provided by the financial sector to GDP (*FINCREDIT*); and the lack of price stability (*STAB-PRICE*). All of the explanatory variables are one-period lagged (L.) and extracted from the WDI database. The model can be expressed as follows:

$$\begin{aligned} Z_{it} = {} & \lambda_1 EF_{it-1} + \lambda_2 ERS_{it-1} + \lambda_3 ERS^2{}_{it-1} + \lambda_4 GROWTH_{it-1} + \lambda_5 M2/RESEG_{it-1} \\ & + \lambda_6 CLAIMPRIVG_{it-1} + \lambda_7 LIFE-EXP_{it-1} + \lambda_8 FINCREDIT_{it-1} \\ & + \lambda_9 STAB-PRICE_{it-1} + \upsilon_{it} \end{aligned} \tag{25}$$

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 exchange rate stability, υ_{it} is the error term, and $i = 1 \ldots N$ indicates the country and $t = 1 \ldots T$ the year. If the economy of country i endured a financial crisis in year t, $Z_{it} > 0$. Hence,

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

9) The variable is extracted from the Trilemma Indexes Database (updated July 1, 2016).

$$FCRISES=\begin{cases}1, & Z_{it}>0\\ 0, & \text{otherwise}\end{cases} \tag{26}$$

Thus, *FCRISES* is a dichotomous variable. The model therefore becomes non-linear, and the probability of a financial crisis can be estimated through the fixed effects (FE), random effects (RE), and population-averaged (PA) panel probit models[10] (Greene 2012). Thus, we can express our model as follows:

$$\begin{aligned}FCRISES_{it}=F(&\lambda_1 EF_{it-1}+\lambda_2 ERS_{it-1}+\lambda_3 ERS^2{}_{it-1}+\lambda_4 GROWTH_{it-1}+\lambda_5 M2/RESEG_{it-1}\\&+\lambda_6 CLAIMPRIVG_{it-1}+\lambda_7 LIFE-EXP_{it-1}+\lambda_8 FINCREDIT_{it-1}\\&+\lambda_9 STAB-PRICE_{it-1}+\upsilon_{it})\end{aligned} \tag{27}$$

where F is the standard normal cumulative distribution function. Thus, $FCRISES_{it}$ takes the value of 1 if country i in period t experiences a banking crisis (BC) or a currency crisis (CC) or a twin crisis (TC)—in other words, a banking crisis and a currency crisis at the same time—and 0 otherwise. Following Greene (2012), the log-likelihood function of our financial crises model is written as follows:

$$Log\,L=\sum_{t=1}^{t}\sum_{i=1}^{N}\{(FCRISES)_{it})\log[F(.)]+(1-FCRISES_{it})\log[1-F(.)]\} \tag{28}$$

where $F(.)$ is an abbreviation of $F(\lambda_1 EF_{it-1}+\lambda_2 ERS_{it-1}+\lambda_3 ERS^2{}_{it-1}+\lambda_4 GROWTH_{it-1}+\lambda_5 M2/RESEG_{it-1}+\lambda_6 CLAIMPRIVG_{it-1}+\lambda_7 LIFE-EXP_{it-1}+\lambda_8 FINCREDIT_{it-1}+\lambda_9 STAB-PRICE_{it-1}+\upsilon_{it})$.

B. Results and discussion

We start our discussion by interpreting the results of our baseline estimates (see Tables 1 to 6), which show the direct and indirect effects of FDI and debt financing separately (FDI versus debt). Then, based on the conclusions drawn from these baseline outcomes, we study the suitability for growth of mixed financing (FDI and debt) relative to FDI or debt financing alone (see Table 7).

10) According to Davidson and MacKinnon (1984) and Greene (2012), the validity of a panel probit model can be verified using i) a Wald Test and ii) the value of a log-pseudolikelihood statistic (RE) or log-likelihood statistic (FE). These conditions are attained at a 5% level at most in all of our regressions, as reported in the related tables.

1. FDI financing versus debt financing

There are four main results to be drawn from the estimates of the three models (22, 23, and 25; growth model, financial development model, and financial crisis model) described above (see Tables 1 to 6).

First, the coefficients of the *FDI* and *FDIL* variables are significant and positive in all of the regressions of our growth model, as shown in Table 1. This reflects the positive impact of FDI financing on growth. Moreover, the coefficient of the variable *FDIA* is non-significant. This means that, unlike liabilities, FDI assets do not promote GDP growth because they are

Table 1. FDI Financing and Growth

	FE	**SYS-GMM**	**FE**	**SYS-GMM**	**FE**	**SYS-GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
L.GDPPC	0.941***	0.951***	0.934***	0.979***	0.927***	0.931***
	(0.009)	(0.043)	(0.010)	(0.041)	(0.019)	(0.033)
FDI	**0.005***	**0.027****				
	(0.003)	(0.011)				
FDIL			**0.007****	**0.024****		
			(0.003)	(0.010)		
FDIA					**-0.000**	**-0.003**
					(0.002)	(0.009)
TRADE	0.050***	0.025	0.053***	0.039	0.069***	-0.050
	(0.008)	(0.039)	(0.008)	(0.032)	(0.021)	(0.044)
STAB-PRICE	-0.009***	-0.014***	-0.011***	-0.016***	-0.009*	-0.013**
	(0.002)	(0.004)	(0.002)	(0.004)	(0.005)	(0.006)
GOV	-0.001***	-0.005***	-0.002***	-0.005***	-0.002**	-0.007**
	(0.000)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)
EDUS	0.000	0.001	0.000	0.000	0.001*	0.002*
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
POPG	-0.005	-0.011*	-0.005	-0.011**	0.010	-0.022
	(0.003)	(0.006)	(0.003)	(0.005)	(0.008)	(0.026)
Constant	0.222***	0.258	0.260***	0.052	0.206*	0.768**
	(0.050)	(0.374)	(0.059)	(0.350)	(0.111)	(0.372)
R-squared	0.946		0.943		0.916	
Panel Countries	67	67	67	67	67	67
Fisher-Statistic	3035		2451		698.4	
AR2 *P*-value		0.255		0.267		0.443
Hansen *P*-value		0.604		0.544		0.440

(Notes) Dependent variable: real GDP per capita; period: 1972~2011; estimations: fixed-effects model robust correction (Stata commands xtreg, fe rob) and two-step system GMM with Windmeijer (2005) small sample robust correction (Stata commands xtabond2, collapse nomata rob); time and fixed effects are included in all regressions; standard errors are presented below the corresponding coefficient; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

not a financing source for the domestic economy. These empirical findings confirm our theoretical predictions about the virtuous effect of external financing *via* FDI on economic growth. This effect can be further explained by referring to the results highlighted in Tables 3 and 6. Table 3 shows that the coefficients of the FDI-financing indicators (*FDI* and *FDIL*) are statistically significant and positive in all of the regressions of the financial development model. Thus, FDI financing increases the private credit supply. As a consequence, we can assume that this type of external financing promotes growth by increasing the private credit supply, as predicted by the theoretical model. Table 3 also shows that the coefficients associated with the terms of the interaction between FDI financing and the sum of exports and imports to GDP ($FDI\,x\ TRADE$ *and* $FDIL\,x\ TRADE$) from regression (1) to regression (4) are negative and significant. Knowing that the *FDI*, *FDIL*, and *TRADE* variables are characterized by significantly positive coefficients, this empirical finding lends nuance to the hypothesis of simultaneous openness, as explained by Baltagi *et al*. (2009). It indicates that the marginal effects on private sector domestic credit (*CPRIVET*) of FDI financing (*FDI* and *FDIL*) are negatively related to the degree of trade openness (*TRADE*). Symmetrically, the marginal effects on private sector domestic credit (*CPRIVET*) of trade openness (*TRADE*) are negatively related to the degree of FDI financing (*FDI* and *FDIL*). Thus, developing countries can benefit from FDI financing (trade opening) even if they are characterized by a small degree of it. Furthermore, the significantly negative sign of the coefficients of the FDI-financing indicators (FDIL, and FDI) in all of the regressions of the financial crisis model in Table 5 indicates the negative impact of this type of financing on the likelihood of financial crises. Once again, this finding confirms our theoretical predictions, especially the proposition that FDI decreases vulnerability to financial crises. In addition, the coefficient of the variable *FDIA* is positive and significant in regressions (8) and (9) in Table 6. This means that, unlike liabilities, FDI assets may increase vulnerability to financial crises because they can be assimilated to foreign capital flight, which may increase the risk of a sudden stop.

Second, Table 2 shows that the coefficients associated with debt financing (*DEBT*, *DEBTL* and *DEBTA*) are not stable. They are sometimes negative and sometimes non-significant. This suggests that the direct impact of debt financing on growth is ambiguous, unlike the FDI-financing effect. How may this be explained? This result can be understood with reference to the outputs shown in Tables 4 and 6. Table 4 reveals that debt financing increases the development of domestic private credit, as illustrated by the positivity and significance of the coefficients of *DEBT* and *DEBTL*. In regression (5) of Table 4, *DEBTA* has a positive and significant coefficient. This result could occur because the inflow of the interest on external debt assets may encourage the domestic financial sector to grant more credit. All of these empirical findings corroborate our theoretical proposition that the external financing of the economy (through external debt and FDI) boosts credits granted to projects. However, Table 4 shows that the marginal effects

on private sector domestic credit (*CPRIVET*) of debt financing (*DEBT* and *DEBTL*) are negatively related to the degree of trade openness (*TRADE*). Symmetrically, the marginal effects on private sector domestic credit (*CPRIVET*) of trade openness (*TRADE*) are negatively related to the degree of debt financing (*DEBT* and *DEBTL*). Once more, our prediction of the positive impact of external debt on vulnerability to financial crises is confirmed. Regarding the relationship between FDI financing and trade openness (see discussion above), we conclude that developing countries can benefit from external debt financing without requiring significant trade opening. We draw this conclusion on the basis of the negativity of the interaction terms *DEBT* x *TRADE* and *DEBTL* x *TRADE*, as well as from the positivity of the coefficient of the variable *TRADE*,

Table 2. Debt Financing and Growth

	FE	**SYS-GMM**	**FE**	**SYS-GMM**	**FE**	**SYS-GMM**
L.GDPPC	0.934***	0.985***	0.933***	0.982***	0.943***	0.971***
	(0.011)	(0.048)	(0.011)	(0.037)	(0.009)	(0.032)
DEBT	**-0.010*** **	**-0.022***				
	(0.003)	(0.012)				
DEBTL			**-0.009*** **	**0.013**		
			(0.003)	(0.010)		
DEBTA					**-0.001**	**0.009**
					(0.004)	(0.013)
TRADE	0.061***	0.084***	0.061***	0.096***	0.055***	0.089***
	(0.008)	(0.031)	(0.008)	(0.036)	(0.008)	(0.031)
STAB-PRICE	-0.012***	-0.014***	-0.012***	-0.022***	-0.011***	-0.021***
	(0.003)	(0.004)	(0.003)	(0.007)	(0.002)	(0.008)
GOV	-0.002***	-0.005***	-0.002***	-0.004***	-0.002***	-0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)
EDUS	0.0004**	0. 0004	0. 0004**	0. 00005	0. 0004*	-0. 0001
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
POPG	-0.004	-0.016***	-0.004	-0.006	-0.003	-0.004
	(0.003)	(0.006)	(0.003)	(0.009)	(0.003)	(0.009)
Constant	0.269***	-0.014	0.268***	-0.198	0.199***	-0.087
	(0.066)	(0.352)	(0.069)	(0.298)	(0.051)	(0.252)
R-squared	0.945		0.945		0.946	
Panel Countries	67	67	67	67	67	67
Fisher-Statistic	2637		2818		2743	
AR2 *P*-value		0.134		0.278		0.382
Hansen *P*-value		0.539		0.692		0.403

(Notes) Dependent variable: real GDP per capita; period: 1972~2011; estimations: fixed-effects model robust correction (Stata commands xtreg, fe rob) and two-step system GMM with Windmeijer (2005) small sample robust correction (Stata commands xtabond2, collapse nomata rob); time and fixed effects are included in all regressions; standard errors are presented below the corresponding coefficient; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

as shown in Table 4. Moreover, unlike its positive effect on private credit, external debt financing has a perverse effect on financial stability. Indeed, Table 6 shows that debt financing increases the probability of financial crisis because the coefficients of *DEBT* and *DEBTL* are positively significant in regressions (1) to (6). Overall, therefore, the ambiguous effect of debt financing on growth is explained by two contrary impacts: on the one hand, the positive impact of debt financing on private credit development and, on the other, the positive effect of debt financing on the occurrence of financial crises.

Third, in Tables 5 and 6, the exchange rate stability indicator (*SEXCH*) is characterized by

Table 3. FDI Financing and Private Credit

	FE	**SYS-GMM**	**FE**	**SYS-GMM**	**FE**	**SYS-GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
L.CPRIVET	0.877***	0.993***	0.878***	0.994***	0.858***	0.987***
	(0.014)	(0.100)	(0.014)	(0.106)	(0.021)	(0.067)
L.GDPPC	0.266***	0.158	0.263***	0.161	0.288***	0.013
	(0.031)	(0.168)	(0.031)	(0.172)	(0.045)	(0.095)
L.FDI	**0.108*****	**0.409***				
	(0.038)	(0.210)				
L.TRADE	0.151***	0.462**	0.148***	0.474**	0.045	0.378*
	(0.026)	(0.179)	(0.026)	(0.182)	(0.031)	(0.207)
L.FDI x L.TRADE	-0.029***	-0.105*				
	(0.009)	(0.055)				
L.FDIL			**0.108*****	**0.435****		
			(0.038)	(0.215)		
L.FDIL x L.TRADE			-0.028***	-0.111*		
			(0.009)	(0.056)		
L.FDIA					**-0.036**	**-0.867**
					(0.042)	(0.592)
L.FDIA x L.TRADE					0.006	0.195
					(0.010)	(0.138)
Constant	-1.974***	-2.799***	-1.945***	-2.873***	-1.697***	-1.706**
	(0.205)	(0.856)	(0.203)	(0.867)	(0.260)	(0.849)
R-squared	0.957		0.957		0.969	
Fisher-Statistic	1589		1579		744.5	
Panel Countries	67	67	67	67	67	67
AR2 *P*-value		0.597		0.594		0.153
Hansen *P*-value		0.168		0.144		0.424

(Notes) Domestic credit to private sector (% of GDP); period: 1972~2011; estimations: fixed-effects model robust correction (Stata commands xtreg, fe rob) and two-step system GMM with Windmeijer (2005) small sample robust correction (Stata commands xtabond2, collapse nomata rob); time and fixed effects are included in all regressions; standard errors are presented below the corresponding coefficient; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 4. Debt Financing and Private Credit

	FE	SYS-GMM	FE	SYS-GMM	FE	SYS-GMM
	(1)	(2)	(3)	(4)	(5)	(6)
L.CPRIVET	0.878***	0.976***	0.882***	0.990***	0.873***	0.951***
	(0.015)	(0.091)	(0.015)	(0.051)	(0.014)	(0.086)
L.GDPPC	0.254***	0.013	0.245***	0.035	0.278***	0.155
	(0.034)	(0.189)	(0.034)	(0.139)	(0.033)	(0.139)
L.DEBT	**0.124****	**0.576***				
	(0.052)	(0.341)				
L.TRADE	0.249***	0.961***	0.187***	0.745***	0.179***	0.482**
	(0.051)	(0.324)	(0.043)	(0.269)	(0.029)	(0.211)
L.DEBT x L.TRADE	-0.039***	-0.165**				
	(0.013)	(0.079)				
L.DEBTL			**0.077***	**0.549***		
			(0.046)	(0.294)		
L.DEBTL x L.TRADE			-0.025**	-0.142**		
			(0.011)	(0.069)		
L.DEBTA					**0.166*****	**0.491***
					(0.049)	(0.283)
L.DEBTA x L.TRADE					-0.044***	-0.120*
					(0.012)	(0.069)
Constant	-2.193***	-3.525**	-1.936***	-3.120**	-2.150***	-2.838***
	(0.292)	(1.444)	(0.257)	(1.340)	(0.233)	(0.954)
R-squared	0.960		0.960		0.960	
Panel Countries	67		67		67	
Fisher-Statistic	1800		1796		1767	1800
AR2 *P*-value		0.618		0.616		0.603
Hansen *P*-value		0.295		0.320		0.164

(Notes) Domestic credit to private sector (% of GDP); period: 1972~2011; estimations: fixed-effects model robust correction (Stata commands xtreg, fe rob) and two-step system GMM with Windmeijer (2005) small sample robust correction (Stata commands xtabond2, collapse nomata rob); time and fixed effects are included in all regressions; standard errors are presented below the corresponding coefficient; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

a significant negative coefficient in most regressions. However, when this indicator is squared ($SEXCH^2$), its coefficient becomes positive when it is significant. Therefore, there is a U-shaped relationship between exchange rate stability and the probability of financial crises. This means that the fluctuation in exchange rate stability reduces the occurrence of crises. There is a maximum stability threshold at which the exchange rate becomes rigid and thus increases the probability of financial crises. In other words, when they are moderate, exchange rate fluctuations reduce the incidence of crises. This empirical result is consistent with our theoretical proposition that exchange rate rigidity can increase the occurrence of crises.

Table 5. FDI Financing and Crises

	FE	**RE**	**PA**	**FE**	**RE**	**PA**	**FE**	**RE**	**PA**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
L.GROWTH	-0.02422**	-0.02221***	-0.02147**	-0.02415**	-0.02220***	-0.02140**	-0.03240	-0.02797**	-0.02674
	(0.00967)	(0.00839)	(0.01022)	(0.00971)	(0.00844)	(0.01029)	(0.02035)	(0.01389)	(0.01993)
L.M2/RESEG	0.02988	0.00947	0.00998	0.02924	0.00868	0.00938	-0.02715	-0.03154	-0.03145
	(0.07984)	(0.08541)	(0.08149)	(0.08008)	(0.08571)	(0.08198)	(0.13660)	(0.13124)	(0.15414)
L.CLAIMPRIVG	0.00016**	0.00021	0.00021**	0.00016**	0.00021	0.00021**	0.00021**	0.00032	0.00030***
	(0.00008)	(0.00017)	(0.00009)	(0.00008)	(0.00017)	(0.00009)	(0.00009)	(0.00023)	(0.00009)
L.FDI	**-0.11442 ****	**-0.17319 *****	**-0.15504 *****						
	(0.05016)	(0.04866)	(0.05385)						
L.FDIL				**-0.12992 *****	**-0.19535 *****	**-0.17360 *****			
				(0.04914)	(0.05008)	(0.05237)			
L.FDIA							**0.08893**	**0.12007** **	**0.10933***
							(0.05551)	(0.04513)	(0.05598)
L.SEXCH	-2.04730***	-1.77023**	-1.69711**	-2.04957***	-1.74875**	-1.68448**	-1.25463	-0.58516	-0.52644
	(0.72229)	(0.82892)	(0.74881)	(0.72249)	(0.83208)	(0.74961)	(1.37476)	(1.35548)	(1.37679)
$L.SEXCH^2$	1.55605**	1.23525*	1.17002*	1.54602**	1.20214*	1.14745*	1.11335	0.39302	0.33397
	(0.62049)	(0.68591)	(0.64347)	(0.62060)	(0.68923)	(0.64364)	(1.16056)	(1.12664)	(1.15537)
L.LIFE_EXP	-0.24957***	-0.72218**	-0.67262**	-0.24269***	-0.69422*	-0.65199*	-0.38783***	-2.02322***	-1.86382***
	(0.09079)	(0.36030)	(0.34316)	(0.09061)	(0.36534)	(0.35436)	(0.12389)	(0.59312)	(0.58551)
L.FINCREDIT	0.08347	0.14179*	0.13504*	0.08727	0.14630**	0.13859*	0.15759	0.33964**	0.30822**
	(0.06371)	(0.07352)	(0.07047)	(0.06405)	(0.07417)	(0.07154)	(0.10640)	(0.13727)	(0.12355)
L. STAB-PRICE	0.09781	0.05657	0.05691	0.09666	0.05456	0.05510	0.05317	-0.03051	-0.02230
	(0.06484)	(0.04741)	(0.07372)	(0.06474)	(0.04761)	(0.07340)	(0.10458)	(0.07183)	(0.11137)
Constant		1.86563	1.69753		1.78777	1.64758		6.03821***	5.56136**
		(1.41412)	(1.24260)		(1.43383)	(1.27825)		(2.29976)	(2.18474)
Wald Test Statistic	788.2	60.67	617.6	749.7	62.88	618.5	306.6	30.38	100.5
Log Likelihood	-506.7			-505.3			-260.4		
Panel Countries	67	67	67	67	67	67	67	67	67
Log Pseudolikelihood		-499.8			-498.1			-251.5	

(Notes) Dependent variable is a financial crisis dummy; regressions are estimated using the fixed-effects (FE; Stata commands probit, vce(cluster Countries)), random-effects (RE; Stata commands xtprobit, re), and population-averaged (PA; Stata commands xtprobit, pa vce(rob)) probit models with robust errors; standard errors are presented below the corresponding coefficient. Marginal effects (Stata command margin) and the coefficients of the constant are reported; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Only the estimates of the growth model (see Tables 1 and 2), the financial development model (see Tables 3 and 4), and the financial crisis model (see Tables 5 and 6) remain to be interpreted in terms of their control variables. We highlight three main points. First, it seems that the coefficients of the control variables, when significant, are consistent with our theoretic

results. The positive coefficient of *GDPPC* one-year lagged indicates the existence of conditional convergence among the countries, whereas the positive sign of the coefficient of *TRADE* is in line with the neoclassical international trade framework. *STAB-PRICE* has a negative coefficient, which means that macroeconomic instability reduces economic growth. The negative sign of *GOV* is consistent with the theory of public choice, and *EDUS*' positive coefficient is in accordance with the human capital theory. The negative sign of the coefficient of *POPG* indicates that greater population growth leads to lower economic growth in developing countries.

Table 6. Debt Financing and Crises

	FE	**RE**	**PA**	**FE**	**RE**	**PA**	**FE**	**RE**	**PA**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
L.GROWTH	-0.02616***	-0.02229***	-0.02181**	-0.02399***	-0.02244***	-0.02196**	-0.02513***	-0.02296***	-0.02248**
	(0.00883)	(0.00819)	(0.00937)	(0.00915)	(0.00819)	(0.00940)	(0.00948)	(0.00817)	(0.00965)
L.M2/RESEG	0.09293	0.06023	0.05735	0.06403	0.06006	0.05684	0.04888	0.03762	0.03642
	(0.07437)	(0.08530)	(0.07750)	(0.07528)	(0.08524)	(0.07581)	(0.08050)	(0.08441)	(0.08266)
L.CLAIMPRIVG	0.00024***	0.00016	0.00016**	0.00014*	0.00017	0.00017**	0.00015**	0.00019	0.00019**
	(0.00005)	(0.00015)	(0.00008)	(0.00007)	(0.00015)	(0.00008)	(0.00007)	(0.00016)	(0.00008)
LDEBT	**0.16734****	**0.17848****	**0.16635****						
	(0.07698)	(0.07303)	(0.07968)						
LDEBTL				**0.12529***	**0.16949****	**0.15478****			
				(0.06798)	(0.06759)	(0.07203)			
LDEBTA							0.03447	0.04983	0.05071
							(0.06530)	(0.05802)	(0.06695)
L.SEXCH	-2.58034***	-1.53148*	-1.50105**	-1.70695**	-1.51656*	-1.48158**	-1.87771**	-1.70243**	-1.67335**
	(0.75734)	(0.81820)	(0.75257)	(0.73304)	(0.81987)	(0.74511)	(0.74222)	(0.81033)	(0.76408)
$L.SEXCH^2$	2.05814***	1.18215*	1.14692*	1.35388**	1.17090*	1.13104*	1.46985**	1.27050*	1.23976*
	(0.63999)	(0.67266)	(0.64466)	(0.62873)	(0.67412)	(0.63926)	(0.63586)	(0.66724)	(0.65473)
L.LIFE_EXP	-0.37270***	-0.86936**	-0.79564***	-0.43755***	-0.83448**	-0.76090***	-0.34326***	-0.91030***	-0.84762***
	(0.10751)	(0.35121)	(0.29555)	(0.08802)	(0.35375)	(0.29000)	(0.09065)	(0.34343)	(0.31175)
L.FINCREDIT	0.03325	0.09370	0.07638	0.03600	0.09115	0.07448	0.05704	0.11327	0.09855
	(0.06774)	(0.07166)	(0.06422)	(0.06217)	(0.07197)	(0.06438)	(0.06263)	(0.07066)	(0.06638)
L. STAB-PRICE		0.08242*	0.07954	0.10218*	0.08001*	0.07718	0.11605*	0.08879*	0.08779
		(0.04572)	(0.06548)	(0.06064)	(0.04585)	(0.06567)	(0.06096)	(0.04549)	(0.06883)
Constant		1.24831	1.12558		1.19448	1.07983		2.05697	1.89901*
		(1.40908)	(1.11441)		(1.42379)	(1.09007)		(1.32266)	(1.14660)
Wald Test Statistic	1,868	1,739	1,739	1,743	1,743	1,743	1,735	1,735	1,735
Log Likelihood	-574.4			-510.5			-512.5		
Panel Countries	67	67	67	67	67	67	67	67	67
Log Pseudolikelihood		-505			-505			-507.6	

(Notes) Dependent variable is a financial crisis dummy; regressions are estimated using the fixed-effects (FE; Stata commands probit, vce(cluster Countries)), random-effects (RE; Stata commands xtprobit, re), and population-averaged (PA; Stata commands xtprobit, pa vce(rob)) probit models with robust errors; standard errors are presented below the corresponding coefficient. Marginal effects (Stata command margin) and the coefficients of the constant are reported; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Second, the coefficients of the control variables included in the financial development model (see Tables 3 and 4) are the same as those in the model of Baltagi *et al*. (2009). The positive coefficient of *GDPPC* one-year lagged shows that economic development level is an important determinant of financial development. Moreover, the negative coefficient of *CPRIVET* one-year lagged indicates the existence of conditional convergence in terms of financial development among the countries. The positive sign of the *TRADE* coefficient and the negative sign of the interaction terms *TRADE* x *DEBT*, *TRADE* x *DEBTL*, *TRADE* x *FDI* and *TRADE* x *FDIL* nuance the hypothesis of simultaneous openness, as explained by Baltagi *et al.* (2009) (see discussion above).

Third, the coefficients of the control variables of the financial crisis model (see Tables 5 and 6) are the same as those in the model of Lee *et al.* (2016). The coefficients of *GROWTH* are negative, which means that crises are less recurrent in periods of economic prosperity characterized by high production. Those of *M2/RESEG* are positive, which suggests that there is a strong chance that a sudden stop will turn into a financial crisis. The fact that the coefficients of *CLAIMPRIVG* are positive shows that the vulnerability of the economy to private sector default may increase the likelihood of financial crises. The coefficient of the variable *LIFE-EXP*, which is the economic development proxy and appears in the empirical model of Lee *et al.* (2016), is negative. According to Barro (2001), this means that macro-financial turbulence, particularly crises, are more likely to occur in developing countries characterized by lower human capital quality. Finally, the coefficients of *FINCREDIT* are positive, which indicates that crises follow lending booms. This empirical finding corroborates our theoretical proposition that a higher level of credit increases vulnerability to financial crises.

2. Mixed financing

Having demonstrated and empirically explained the superiority of FDI financing to debt financing in terms of growth and its effects on credit and crises, we now examine whether mixed financing (FDI and debt) is more profitable for growth than financing by FDI alone. For this purpose, we construct two sub-models (22a and 22b) from our baseline growth model (22). This captures the growth effects of mixed financing by FDI and debt, as well as the interaction of these two sources of external financing (sub-model 22a) and the potential inverted U-shaped growth effect of the FDI/debt ratio (sub-model 22b) in order to demonstrate why mixed financing is preferable (or not) for growth than FDI financing (model 22b). The two sub-models can be expressed as follows:

$$GDPPC_{it} = a_0 + \gamma\, GDPPC_{it-1} + a_1 FDI\_F_{it} + a_2 DEBT\_F_{it} + a_3 (FDI\_F \times DEBT\_F)_{it} + a_4 TRADE_{it} + a_5 STAB\_PRICE_{it} + a_6 GOV_{it} + a_7 EDUS_{it} + a_8 POPG_{it}$$

$$+\mu_i+\lambda_t+\varepsilon_{it} \tag{22a}$$

$$\begin{aligned} GDPPC_{it} = {} & a_0+\gamma\, GDPPC_{it-1}+a_1(FDI\_F/DEBT\_F)_{it}+a_2(FDI\_F/DEBT\_F)^2{}_{it} \\ & +a_3 TRADE_{it}+a_4 STAB\_PRICE_{it}+a_5 GOV_{it}+a_6 EDUS_{it} \\ & +a_7 POPG_{it}+\mu_i+\lambda_t+\varepsilon_{it} \end{aligned} \tag{22b}$$

where *FDI-F* represents the indicators of FDI financing (*FDI*, *FDIL* or *FDIA*), and *DEBT-F* represents the indicators of debt financing (*DEBT*, *DEBTL* or *DEBTA*); *FDI-F* x *DEBT-F* is the interaction term; *FDI-F/DEBT-F* indicates the ratios of FDI financing to debt financing (*FDI/DEBT*, *FDIL/DEBTL* or *FDIA/DEBTA*); a_0 is a constant; μ_i indicates country-specific effects; λ_t indicates time-specific effects; and ε_{it} is the error term. Indicators i and t represent the country ($i = 1,2 \ldots N$) and period ($t = 1,2 \ldots T$), respectively.

As in our baseline growth model, we regress these two sub-models using the GMM system dynamic panel data estimator, including the correction provided by Windmeijer (2005). The outputs of these estimates are shown in Table 7. They highlight that the magnitudes of the positive and significant coefficients of variables *FDI* and *FDIL* are higher than those presented in Table 1 (0.035 > 0.027 and 0.074 > 0.024). This means that the positive effect of FDI financing on growth is greater when combined with debt financing. In addition, according to the results of regressions (1) and (2) in Table 7, the coefficients of *DEBT* and *DEBTL* become positive and significant, respectively (0.007; *p*-value < 10% and 0.039; *p*-value < 5%), whereas they were characterized by negative and non-significant coefficients in Table 2 (-0.022; *p*-value < 10% and 0.013; *p*-value > 10%). This means that the joint presence of FDI and debt financing and their interaction reduce the negative effects of debt in terms of financial instability and reinforces their positive effect on financial development, thus promoting economic growth. A second argument therefore pleads in favor of mixed financing rather than FDI financing. Moreover, regressions (1) and (2) in Table 7 show negative and significant coefficients associated with the terms of interaction *FDI* x *DEBT* and *FDIL* x *DEBTL*. As the variables *FDI*, *FDIL*, *DEBT*, *DEBTL* are characterized by significantly positive coefficients, this empirical finding indicates the existence of an arbitrage between the marginal growth effects of FDI financing and debt financing. This means that increasing the marginal effect of FDI financing (or debt financing) on economic growth requires that part of the marginal effect of debt financing (or FDI financing) be abandoned. This arbitrage allows gains to be obtained from the diversification of external sources of growth financing, which FDI financing does not. The theoretical basis of this result could be associated with the modern portfolio theory developed in microeconomics by Markowitz (1952). This result also leads us to assume that the marginal effect of the FDI-to-debt ratio on growth is negative, which means that there is a threshold FDI-debt ratio at which

FDI financing becomes negative for growth and more debt financing is therefore needed to improve it. From another perspective, it can be assumed that there is a threshold FDI-debt ratio at which debt financing becomes positive for growth due to the existence of more FDI financing. Our assumption is tested and verified *via* the outputs of regressions (4) and (5) in Table 7. The table shows positive and significant coefficients for the FDI-to-debt-financing ratios (*FDI/ DEBT*, *FDIL/ DEBTL*), as well as negative and significant coefficients of the squared value of these ratios ($(FDI/\ DEBT)^2$, $(FDIL/\ DEBTL)^2$). It thus seems that there is an inverted U-shaped growth effect of the FDI-debt ratio, highlighting that FDI financing (or debt financing) increases growth at a certain level of debt financing (or FDI financing) and that the positive effect declines and becomes negative below this level. It also appears that FDI financing can reduce the negative effects of financial instability on growth generated by debt financing. Moreover, FDI financing can also increase the beneficial effect of debt financing on economic growth related to the credit channel. In addition, debt financing can arrest the decline in the marginal positive effect of FDI financing on growth. Overall, mixed financing (FDI and debt) is more profitable than FDI financing alone in terms of economic growth for non-emerging developing countries.

Table 7. Mixed Financing and Growth

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
L.GDPPC	0.955***	0.916***	0.920***	0.966***	0.970***	0.932***
	(0.009)	(0.043)	(0.031)	(0.013)	(0.010)	(0.031)
FDI	**0.035*****					
	(0.006)					
DEBT	**0.007***					
	(0.004)					
FDIxDEBT	**-0.006*****					
	(0.002)					
FDIL		**0.074*****				
		(0.022)				
DEBTL		**0.039****				
		(0.016)				
FDILxDEBTL		**-0.020*****				
		(0.006)				
FDIA			**-0.048***			
			(0.029)			
DEBTA			**0.027**			
			(0.031)			
FDIAxDEBTA			**0.017**			
			(0.011)			

Table 7. Continued

	(1)	(2)	(3)	(4)	(5)	(6)
FDI/DEBT				**0.021****		
				(0.009)		
(FDI/DEBT)^2				**-0.014*****		
				(0.005)		
FDIL/DEBTL					**0.064*****	
					(0.010)	
(FDIL/DEBTL)^2					**-0.009****	
					(0.004)	
FDIA/DEBTA						-0.015
						(0.014)
(FDIA/DEBTA)^2						-0.001
						(0.001)
TRADE	0.079***	0.083**	0.073***	0.119***	0.034***	0.046**
	(0.005)	(0.032)	(0.025)	(0.012)	(0.010)	(0.023)
STAB-PRICE	-0.011***	-0.019***	-0.014	-0.016***	-0.011***	-0.026***
	(0.002)	(0.006)	(0.009)	(0.002)	(0.001)	(0.007)
GOV	-0.004***	-0.004***	-0.005***	-0.003***	-0.005***	-0.005***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)
EDUS	-0.000	0.001	0.002**	-0.000	0.001***	0.002***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
POPG	-0.013***	0.005	-0.000	-0.008***	-0.015***	0.011
	(0.002)	(0.009)	(0.023)	(0.001)	(0.001)	(0.015)
Constant	0.046	0.137	0.194	-0.168	0.127	0.308
	(0.053)	(0.356)	(0.255)	(0.108)	(0.090)	(0.191)
Panel Countries	67	67	67	67	67	67
AR2 *P*-value	0.263	0.325	0.405	0.429	0.228	0.311
Hansen *P*-value	0.773	0.875	0.475	0.468	0.596	0.502

(Notes) Dependent variable is real GDP per capita; period: 1972~2011, estimations: two-step system GMM with Windmeijer (2005) small sample robust correction (Stata commands xtabond2, collapse nomata rob); time and fixed effects are included in all regressions; standard errors are presented below the corresponding coefficient; *, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

V . Conclusion

This study provides an all-encompassing theoretical and empirical analysis of the direct and indirect effects of external financing on financial development, crises, and growth in developing countries. It shows that the external financing of an economy might boost investment through an increased availability of credit, thereby fostering economic growth. Moreover, FDI improves

economic performance by promoting banking development and by reducing vulnerability to financial crises as well as their recessionary effects. However, external debt enhances economic performance by promoting banking development, as does FDI, but increases vulnerability to financial crises. In addition, a high level of credit and exchange rate rigidity may also increase the incidence of crises. Empirical data from 67 non-emerging developing countries covering 1972 to 2011 confirm these theoretical predictions. The empirical evidence also adds further nuance. Exchange rate stability decreases the occurrence of financial crises, whereas greater stability turns into exchange rate rigidity and thus increases the likelihood of crisis occurrence. In other words, moderate exchange rate fluctuations reduce the incidence of crises. Moreover, the presence of FDI financing and debt financing jointly and in interaction is more effective than FDI financing alone for growth in developing countries. There is an inverted U-shaped growth effect of the FDI-debt ratio, meaning that FDI (or debt) increases growth at a certain level of debt (or FDI), but the positive effect declines and becomes negative below this level. Thus, FDI financing can mitigate the negative effect of debt financing in terms of financial instability and enhance its advantages regarding the credit channel. At the same time, debt financing can mitigate the decrease in FDI financing's positive impact on growth.

This result is all the more important because the literature highlights only the virtuous effects of FDI, neglecting the role debt can play in maintaining these virtuous effects and in generating a leverage effect through credit favorable to economic growth in non-emerging developing countries. This new perspective could motivate future studies to determine the optimal level of mixed financing for economic growth in developing countries based on the ratio of FDI financing to debt financing. An empirical model different from those considered in this study could be used, particularly the dynamic panel threshold model proposed by Seo and Shin (2016). This will be the focus of future research.

References

Aghion, P., Bacchetta, P., Rancière, R., and Rogoff, K. (2009). "Exchange rate volatility and productivity growth: The role of financial development." *Journal of Monetary Economics* 56, no. 4, 494-513.

Ahmed, A. D. (2016). "Integration of financial markets, financial development and growth: Is Africa different?." *Journal of International Financial Markets, Institutions and Money* 42, 43-59.

Arellano, M., and Bond, S. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations." *The Review of Economic Studies* 58, no. 2, 277-297.

Arellano, M., and Bover, O. (1995). "Another look at the instrumental variable estimation of error-components models." *Journal of Econometrics* 68, no. 1, 29-51.

Baltagi, B. H., Demetriades, P., and Law, S. H. (2009). "Financial Development and Openness: Evidence from Panel Data." *Journal of Development Economics* 89, no. 2, 285-296.

Barro, R. J. (2001). *Economic Growth in East Asia before and after the Financial Crises.* NBER Working Papers, 8330.

Barro, R. J., and Sala-i Martin, X. (2004). *Economic Growth.* Cambridge, MA: MIT Press.

Bekaert, G., Harvey, C. R., and Lundblad, C. (2005). "Does financial liberalization spur growth?." *Journal of Financial economics* 77, no. 1, 3-55.

Bekaert, G., Harvey, C. R., and Lundblad, C. (2011). "Financial openness and productivity." *World Development* 39, no. 1, 1-19.

Blundell, R., and Bond, S. (1998). "Initial conditions and moment restrictions in dynamic panel data models." *Journal of Econometrics* 87. no. 1, 115-143.

Broner, F., Martin, A., and Ventura, J. (2010). "Sovereign risk and secondary markets." *The American Economic Review* 100, no, 4, 1523-1555.

Bun, M. J., and Windmeijer, F. (2010). "The weak instrument problem of the system GMM estimator in dynamic panel data models." *The Econometrics Journal* 13, no. 1, 95-126.

Chen, J., and Quang, T. (2014). "The impact of international financial integration on economic growth: New evidence on threshold effects." *Economic Modelling* 42, no. C, 475-489.

Claessens, S., and Kose, M. A. (2013). "Financial Crises Explanations, Types, and Implications." *International Monetary Fund* 13, no. 28.

Cull, R., and Martinez Peria, M. S. (2010). *Foreign bank participation in developing countries: what do we know about the drivers and consequences of this phenomenon?.* World Bank Policy Research Working Papers, 5398.

Davidson, R., and MacKinnon, J. G. (1984). "Convenient specification tests for logit and probit models." *Journal of Econometrics* 25, no. 3, 241-262.

De Haas, R., and Van Lelyveld, I. (2010). "Internal Capital Markets and Lending by Multinational Bank Subsidiaries." *Journal of Financial Intermediation* 19, no. 1, 1-25.

Diaz-Alejandro, C. (1985). "Good-Bye Financial Repression, Hello Financial Crush." *Journal of Development Economics* 19, no. 1-2, 1-24.

Doidge, C., Karolyi, G. A., and Stulz, R. M. (2007). "Why do countries matter so much for corporate governance?." *Journal of Financial Economics* 86, no. 1, 1-39.

Drine, I., and Nabi, M.S. (2010). "Public external debt, informality and production efficiency in developing countries." *Economic Modelling*, 27, no. 2, 487-495.

Eichengreen, B., Hausmann, R., and Panizza, U. (2003). The pain of original sin. Other People's Money: Debt Denomination and Financial Instability in Emerging Market Economies, 1-49.

Gaies, B., Goutte, S., and Guesmi, K. (2019). "Are We Sentenced to Financial Globalization?." *The Journal of European Economic History* 48, no. 1, 49-72.

Gelos, R. G., and Wei, S. J. (2005). "Transparency and international portfolio holdings." *The Journal of Finance* 60, no. 6, 2987-3020.

Gourinchas, P. O., and Jeanne, O. (2013). "Capital flows to developing countries: The allocation puzzle." *Review of Economic Studies* 80, no. 4, 1484-1515.

Greene, W. H. (2012). *Econometric Analysis.* Upper Saddle River, NJ: Prentice Hall.

Hamdi, H., and Jlassi, N. B. (2014). "Financial liberalization, disaggregated capital flows and banking

crisis: Evidence from developing countries." *Economic Modelling* 41, no. C, 124-132.

Boukef Jlassi, N., Hamdi, H., and Joyce, J. P. (2018). "External liabilities, domestic institutions and banking crises in developing economies." *Review of International Economics* 26, no. 1, 96-116.

Joyce, J. P. (2011). "Financial globalization and banking crises in emerging markets." *Open Economies Review* 22, no. 5, 875-895.

Ju, J., and Wei, S. J. (2010). "Domestic institutions and the bypass effect of financial globalization." *American Economic Journal: Economic Policy* 2, no. 4, 173-204.

Kaminsky, G. L., and Reinhart, C. M. (1999). "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems." *American Economic Review* 89, no. 3, 473-500.

Khallouli, W., and Nabi, M. S. (2013). "Banking soundness and financial crises' predictability: a case study of Turkey." *International Economics* 135, 62-78.

Kharroubi, E. (2007). "Crises, volatility, and growth." *The World Bank Economic Review* 21, no. 3, 439-460.

Kose, M. A., Prasad, E., Rogoff, K., and Wei, S. J. (2006). "Financial Globalization: A Reappraisal." *IMF Staff papers* 56, no. 1, 8-62.

Kose, M. A., Prasad, E., Rogoff, K., and Wei, S. J. (2009). "Financial Globalization: A Reappraisal." *IMF Staff papers* 56, no. 1, 8-62.

Kunieda, T., Okada, K., and Shibata, A. (2014). "Corruption, capital account liberalization, and economic growth: Theory and evidence." *International Economics* 139, 80-108.

Lane, P. R., and McQuade, P. (2014). "Domestic credit growth and international capital flows." *The Scandinavian Journal of Economics* 116, no. 1, 218-252.

Lee, C. C., Lin, C. W., and Zeng, J. H. (2016). "Financial liberalization, insurance market, and the likelihood of financial crises." *Journal of International Money and Finance* 62, no. C, 25-51.

Loayza, N. V., and Rancière, R. (2006). "Financial development, Financial Fragility, and Growth." *Journal of Money, Credit and Banking* 38, no. 4, 1051-1076.

Markowitz, H. (1952). "Portfolio selection." *The journal of finance* 7, no. 1, 77-91.

McKinnon, R. I. (1973). *Money and Capital in Economic Development.* Washington, D.C: The Brookings Institution.

Mishkin, F. S. (2006). *The next great globalization: how disadvantaged nations can harness their financial systems to get rich.* Princeton: Princeton University Press.

Mishkin, F. S. (2009). "Globalization and financial development." *Journal of Development Economics* 89, no. 2, 164-169.

Nabi, M. S., and Drine, I. (2009). "External Debt, Informal Economy and Growth." *Economics Bulletin* 29, no. 3, 1695-1707.

Nabi, M. S., and Suliman M. O. (2009). "Institutions, Banking Development, and Economic Growth." *The Developing Economies* 47, no. 4, 436-457.

Neto, D. G., and Veiga, F. J. (2013). "Financial globalization, convergence and growth: The role of foreign direct investment." *Journal of International Money and Finance* 37, no. C, 161-186.

Obstfeld, M. (1998). *Foreign resource inflows, saving, and growth.* University of California: Berkeley.

Obstfeld, M. (2009). "International finance and growth in developing countries: What have we learned?." *IMF Staff Papers* 56, no. 1, 63-111.

Okada, K. (2013). "The interaction effects of financial openness and institutions on internatio-nal capital flows." *Journal of Macroeconomics* 35, no. C, 131-143.

Rodrik, D. (2001). *The global governance of trade: as if development really mattered.* Report submitted to the UNDP.

Rodrik, D., and Subramanian, A. (2009). "Why did financial globalization disappoint?." *IMF Staff Papers* 56, no. 1, 112-138.

Roodman, D. (2009a). "A note on the theme of too many instruments." *Oxford Bulletin of Economics and Statistics* 71, no. 1, 135-158.

Roodman, D. (2009b). "How to do xtabond2: An introduction to difference and system GMM in Stata." *Stata Journal* 9, no. 1, 86-136.

Sala-I-Martin, X. (1997). "I just ran two million regressions." *American Economic Review* 87, no. 2, 178-183.

Sala-I-Martin, X., Doppelhofer, G., and Miller, R. I. (2004). "Determinants of long-term growth: a Bayesian averaging of classical estimates (BACE) approach." *American Economic Review* 94, no. 4, 813-835.

Shaw, E. S. (1973). *Financial Deepening in Economic Development.* Oxford University Press: Oxford.

Seo, M. H., and Shin, Y. (2016). "Dynamic panels with threshold effect and endogeneity." *Journal of Econometrics* 195, no. 2, 169-186.

Stulz, R. M. (1999a). "Golbalization, corporate finance, and the cost of capital." *Journal of applied corporate finance* 12, no. 3, 8-25.

Stulz, R. M. (1999b). "International Portfolio Flows and Security Markets." *NBER Working Papers* 99, no. 3.

Tong, H., and S.-J. Wei. (2010). "The Composition Matters: Capital Inflows and Liquidity Crunch During a Global Economic Crisis." *Review of Financial Studies* 24, no. 6, 2023-2052.

Trabelsi, M., and Cherif, M. (2017). "Capital account liberalization and financial deepening: Does the private sector matter?." *The Quarterly Review of Economics and Finance* 64, no. C, 141-151.

Wei, S. J. (2000). "How taxing is corruption on international investors?." *The Review of Economics and Statistics* 82, no. 1, 1-11.

Wei, S. J. (2018). "Managing Financial Globalization: Insights from the Recent Literature." *NBER Working Papers* 24330.

Wei, S. J., and Zhou, J. (2017). *Quality of Public Governance and the Capital Structure of Nations and Firms.* Columbia University Working Paper.

Windmeijer, F. (2005). "A finite sample correction for the variance of linear efficient two-step GMM estimators." *Journal of Econometrics* 126, no. 1, 25-51.

Zhou, J. (2017). *Financial Crises, Debt Maturity, and Capital Controls.* Columbia University Working Paper.

Appendix 1. Proof of Proposition 2

i) Financial crises occur when the unexpected shock of the balance of payments generates an initial appreciation of the foreign currency ε exceeding ε_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 a repayment larger than what they would obtain after waiting until date $t=2$, which is the case if $\hat{c}_1 > \tilde{c}_2$ where:

$$\begin{aligned}\hat{c}_1 &= f(\varepsilon,\rho''(\varepsilon),w^*) \\ &= Z+\mu\theta(R-\varepsilon)X-[1+(\rho''-\rho)]r^*S_0w^* \\ &= \mu\theta(R-\varepsilon)X-[1+(\rho''-\rho)]r^*S_0w^*+\gamma\frac{w_0+S_0w^*\left[(1-fr^*)-\dfrac{r^*}{\theta R}\right]}{\gamma+\delta(1-\gamma)}\end{aligned} \tag{28}$$

and

$$\begin{aligned}\tilde{c}_2 &= g(\varepsilon,\rho'(\varepsilon),w^*) \\ &= (\theta(R-\varepsilon)X-[1+(\rho'-\rho)]r^*S_0w^*)/(1-\gamma)\end{aligned} \tag{29}$$

with

$$\frac{1}{\rho'}=\frac{1}{\rho}-\frac{\theta\varepsilon(X+I)}{w_0} \text{ and } \frac{1}{\rho''}=\frac{1}{\rho}-\frac{\theta(X+I)[\varepsilon\mu+(1-\mu)R]}{w_0} \tag{30}$$

Using (28), (29), and (30), we can show the following properties:

P1) $\dfrac{\partial\hat{c}_1}{\partial\varepsilon}=-\mu\theta X-r^*S_0w^*\underbrace{\dfrac{\partial\rho''}{\partial\varepsilon}}_{>0}<0\,;\ \dfrac{\partial^2\hat{c}_1}{\partial\varepsilon^2}=-r^*S_0w^*\underbrace{\dfrac{\partial^2\rho''}{\partial\varepsilon^2}}_{<0}>0$

P2) $\dfrac{\partial\tilde{c}_2}{\partial\varepsilon}=-\theta X-\dfrac{r^*S_0w^*}{1-\gamma}\underbrace{\dfrac{\partial\rho'}{\partial\varepsilon}}_{>0}<0\,;\ \dfrac{\partial^2\tilde{c}_2}{\partial\varepsilon^2}=-\dfrac{r^*S_0w^*}{1-\gamma}\underbrace{\dfrac{\partial^2\rho''}{\partial\varepsilon^2}}_{<0}>0$

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

P4) $\hat{c}_1(\varepsilon=0)=\underbrace{Z+\mu\theta RX}_{<Z+X}-r^*S_0w^*<$

$\tilde{c}_2(\varepsilon=0)=(\theta RX-r^*S_0w^*)/(1-\gamma)$

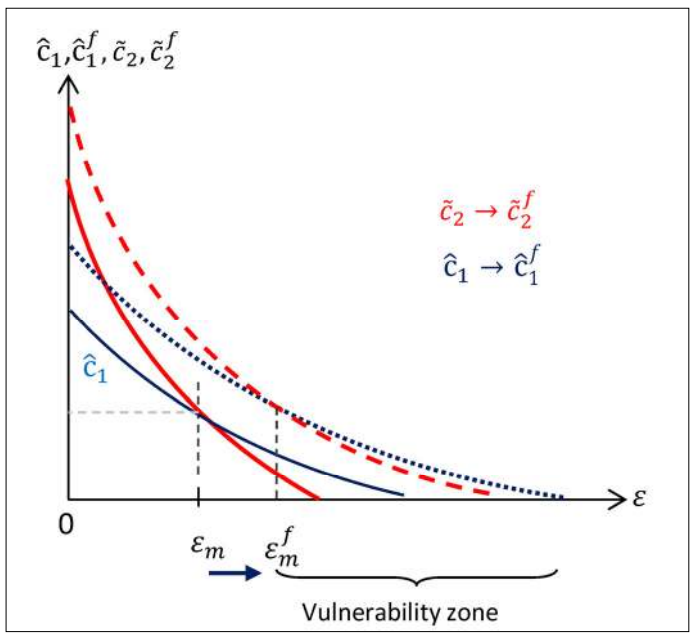
These properties justify the result shown in Figure 3 and are sufficient to prove the existence of $\varepsilon_{m>0}$ such that $\hat{c}_1(\varepsilon_m) = \tilde{c}_2(\varepsilon_m)$, $\hat{c}_1(\varepsilon) > \tilde{c}_2(\varepsilon)$ for $\varepsilon > \varepsilon_m$ and $\hat{c}_1(\varepsilon) < \tilde{c}_2(\varepsilon)$ for $\varepsilon < \varepsilon_m$.

ii) A flexible exchange rate reduces vulnerability to financial crises.

The case of a flexible exchange rate regime can be obtained from Equations (19) and (21) by setting $\rho' = \rho'' = \rho$ (this is a mathematical artifice that signifies only that the bank does not need to secure additional resources above the transfers received by the hedging institution). The new expressions are obtained by the equations below, illustrated in Figure 4.

$$\hat{c}_1^f = f(\varepsilon, \rho'' = \rho, w^*) = \hat{c}_1 + (\rho'' - \rho) r^* S_0 w^*$$
$$\tilde{c}_2^f = g(\varepsilon, \rho, w^*) = \tilde{c}_2 + (\rho' - \rho) r^* S_0 w^* / (1 - \gamma)$$

Figure 4. *Effect of the flexibility of the exchange rate regime on vulnerability to financial crises*



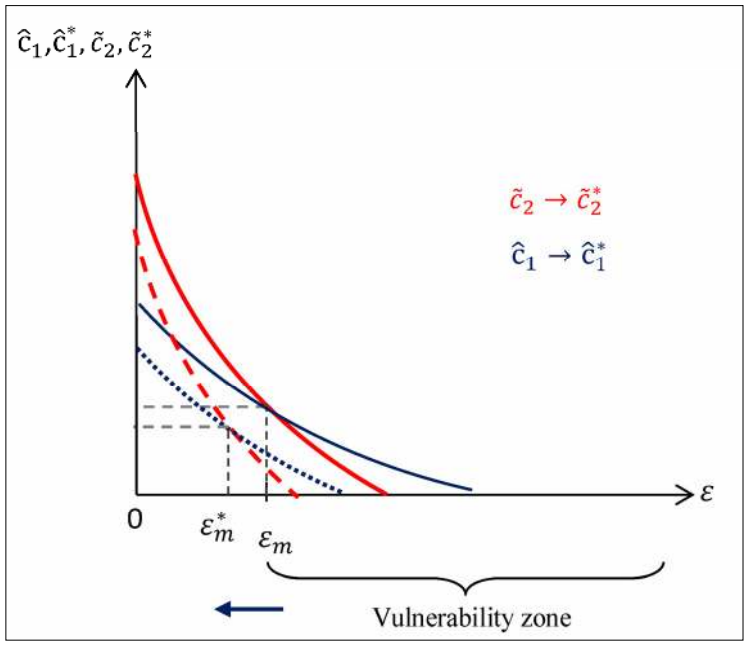
iii) A higher level of external debt w^* increases vulnerability to financial crises.

Using (28), (29), and (30), we can show the following properties:

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

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

Figure 5. Effect of increased external debt on vulnerability to financial crises



vi) Foreign direct investment that improves economic performance reduces vulnerability to financial crises.

Using (28), (29), and (30), 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, FDI, which enables projects to have higher return R and higher probability of success, improves the aggregate economic performance of the economy and improves its resilience against negative economic shocks.

vii) The recessionary effect of financial crises decreases with the level of FDI and increases with banking credits.

In financial crises, the stock of capital (w_2^c) is given by an equation analogous to (12) taking into account the liquidation of the projects financed by the bank's credit X. Hence:

$w_2^c = \mu\theta RX + \theta RI$

Recalling that $w_2 = \theta R(X+I)$, the recessionary effect of the crises is given by:

$$\frac{w_2 - w_2^c}{w_2} = \frac{1-\mu}{1+I/X}$$

It is clear that higher FDI dampens the recessionary effect of financial crises. The opposite effect takes place through banking credits.

Appendix 2. Summary statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
GDPPC	2391	6.506453	0.7808593	3.912867	8.337289
FDI	2303	2.44019	1.364183	-3.765743	7.328608
FDIL	2312	2.398214	1.357343	-3.765743	7.328608
FDIA	1054	-0.5980126	1.836614	-7.555677	3.072278
DEBT	2346	4.198346	0.8118192	0.5139456	7.661041
DEBTL	2356	3.895291	0.903531	0.1035851	7.641908
DEBTA	2327	2.309606	1.000476	-1.903819	6.322395
TRADE	2271	4.137581	0.518073	1.843773	5.636078
GOV	2170	15.13885	7.754441	1.375188	69.54283
EDUS	1671	35.72368	27.69421	1.18702	119.7186
POPG	2680	2.288982	1.249761	-7.597309	11.04339
CPRIVET	1801	2.556382	0.8569047	-2.120264	4.692173
INV	2037	2.8796	0.508283	-1.228027	4.526587
FCRISES	2680	0.0884328	0.2839763	0	1
GROWTH	2356	3.482106	7.100042	-64.04711	106.2798
M2/RESG	2116	-0.0172191	0.5419151	-7.024891	2.620249
STAB-PRICE	2176	2.345237	1.204203	-5.781061	10.19492
CLAIMPRIVG	2174	22.04587	270.7342	-70.52631	11046.93
SEXCH	2495	0.6776148	0.3459842	0.001342	1
LIF_EXP	2680	56.57807	9.611243	19.50493	77.16322
FINCREDIT	2075	3.168005	0.8081773	-4.794123	5.811103

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

Appendix 3. Correlation coefficients (1/2)

	GDPPC	FDI	FDIL	FDIA	DEBT	DEBTL	DEBTA	TRADE	STAB-PRICE	GOV	EDUS	POPG	INV
GDPPC	1.0000												
FDI	0.2310	1.0000											
(p-values)	(0.0000)												
FDIL	0.2290	0.9978	1.0000										
(p-values)	(0.0000)	(0.0000)											
FDIA	0.1149	0.4404	0.3599	1.0000									
(p-values)	(0.0002)	(0.0000)	(0.0000)										
DEBT	0.0115	0.3102	0.3085	0.0433	1.0000								
(p-values)	(0.5882)	(0.0000)	(0.0000)	(0.1605)									
DEBTL	-0.0945	0.2523	0.2517	-0.0773	0.8528	1.0000							
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0121)	(0.0000)								
DEBTA	0.2433	0.3299	0.3304	0.2129	0.5567	0.1653	1.0000						
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)							
TRADE	0.5035	0.5126	0.5077	0.3015	0.2672	0.1335	0.3723	1.0000					
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)						
STAB-PRICE	-0.1727	-0.1811	-0.1775	-0.1039	0.0734	0.1359	-0.0982	-0.0823	1.0000				
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0013)	(0.0009)	(0.0000)	(0.0000)	(0.0002)					
GOV	0.1305	0.1352	0.1386	-0.0915	0.1784	0.0563	0.2403	0.3739	-0.0658	1.0000			
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0037)	(0.0000)	(0.0105)	(0.0000)	(0.0000)	(0.0033)				
EDUS	0.5520	0.2392	0.2366	-0.0136	0.1268	0.0592	0.1994	0.3803	0.0640	0.0004	1.0000		
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.7295)	(0.0000)	(0.0201)	(0.0000)	(0.0000)	(0.0161)	(0.9877)			
POPG	-0.2809	-0.0585	-0.0575	0.0030	-0.0322	-0.0252	-0.0365	-0.2357	-0.0108	0.0327	-0.5684	1.0000	
(p-values)	(0.0000)	(0.0050)	(0.0057)	(0.9215)	(0.1190)	(0.2207)	(0.0785)	(0.0000)	(0.6161)	(0.1278)	(0.0000)		
INV	0.2390	0.0970	0.1044	-0.0597	-0.0122	-0.0612	0.0750	0.4005	-0.1388	0.2681	0.2023	-0.0684	1.0000
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0631)	(0.5906)	(0.0068)	(0.0010)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0020)	

This table reports the Pearson correlation coefficients between the variables (1/2).

Appendix 4. Correlation coefficients (2/2)

	FCRISES	CPRIVET	FDI	FDIL	FDIA	DEBT	DEBTL	DEBTA	TRADE	GROWTH	M2/ RESG	STAB- PRICE	CLAIMPRIVG	SEXCH	LIF_ EXP	FINCREDIT
FCRISES	1.0000															
CPRIVET	-0.0584	1.0000														
(p-values)	(0.0131)															
FDI	-0.0357	0.2130	1.0000													
(p-values)	(0.0864)	(0.0000)														
FDIL	-0.0412	0.2124	0.9978	1.0000												
(p-values)	(0.0475)	(0.0000)	(0.0000)													
FDIA	0.0608	-0.0613	0.4404	0.3599	1.0000											
(p-values)	(0.0483)	(0.0602)	(0.0000)	(0.0000)												
DEBT	0.1595	0.0263	0.3102	0.3085	0.0433	1.0000										
(p-values)	(0.0000)	(0.2672)	(0.0000)	(0.0000)	(0.1605)											
DEBTL	0.1826	-0.0052	0.2523	0.2517	-0.0773	0.8528	1.0000									
(p-values)	(0.0000)	(0.8260)	(0.0000)	(0.0000)	(0.0121)	(0.0000)										
DEBTA	0.0356	0.1364	0.3299	0.3304	0.2129	0.5567	0.1653	1.0000								
(p-values)	(0.0860)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)									
TRADE	-0.0904	0.3446	0.5126	0.5077	0.3015	0.2672	0.1335	0.3723	1.0000							
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)								
GROWTH	-0.1430	-0.0605	0.0473	0.0535	0.0600	-0.1034	-0.1013	0.0022	0.0464	1.0000						
(p-values)	(0.0000)	(0.0117)	(0.0272)	(0.0123)	(0.0526)	(0.0000)	(0.0000)	(0.9185)	(0.0287)							
M2/RESG	-0.1084	0.1006	-0.0138	-0.0110	-0.0533	-0.0716	-0.0668	-0.0468	0.0075	0.0330	1.0000					
(p-values)	(0.0000)	(0.0000)	(0.5281)	(0.6150)	(0.0908)	(0.0010)	(0.0021)	(0.0321)	(0.7390)	(0.1379)						
STABPRICE	0.1919	-0.2841	-0.1811	-0.1775	-0.1039	0.0734	0.1359	-0.0982	-0.0823	-0.1353	-0.1644	1.0000				
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0013)	(0.0009)	(0.0000)	(0.0000)	(0.0002)	(0.0000)	(0.0000)					
CLAIMPRIVG	0.0291	-0.0301	-0.0165	-0.0167	-0.0091	0.0813	0.0828	0.0191	-0.0011	-0.0361	-0.0364	0.2637	1.0000			
(p-values)	(0.1743)	(0.2063)	(0.4453)	(0.4418)	(0.7712)	(0.0002)	(0.0001)	(0.3771)	(0.9616)	(0.1001)	(0.0949)	(0.0000)				
SEXCH	-0.1019	0.0246	-0.0458	-0.0511	0.1574	-0.1574	-0.1921	-0.0362	0.0589	0.0543	0.0851	-0.2763	-0.0711	1.0000		
(p-values)	(0.0000)	(0.2984)	(0.0289)	(0.0146)	(0.0000)	(0.0000)	(0.0000)	(0.0828)	(0.0056)	(0.0095)	(0.0001)	(0.0000)	(0.0009)			
LIF_EXP	-0.0935	0.3676	0.1448	0.1483	-0.0100	0.0595	-0.0197	0.2353	0.3409	0.0664	-0.0220	-0.0535	0.0142	-0.0820	1.0000	
(p-values)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7449)	(0.0039)	(0.3393)	(0.0000)	(0.0000)	(0.0013)	(0.3107)	(0.0125)	(0.5084)	(0.0000)		
FINCREDIT	0.0173	0.5369	0.1243	0.1294	-0.0720	0.1742	0.1797	0.0723	0.2314	-0.1542	0.0595	-0.0052	0.0134	-0.0159	0.3219	1.0000
(p-values)	(0.4313)	(0.0000)	(0.0000)	(0.0000)	(0.0230)	(0.0000)	(0.0000)	(0.0011)	(0.0000)	(0.0000)	(0.0079)	(0.8219)	(0.5445)	(0.4710)	(0.0000)	

This table reports the Pearson correlation coefficients between the variables (2/2).