

IMPACT OF THE INTERNATIONAL FINANCIAL CRISIS ON ECONOMIC GROWTH AND FOREIGN DIRECT INVESTMENT: AN EMPIRICAL ANALYSIS

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Abstract

The world is experiencing severe economic disruptions caused by the spread of the effects of financial crises. Due to globalization, all countries suffer directly or indirectly from the consequences of these crises. The main purpose of this paper is to contribute to the economic analysis of the effects of global financial crises on economic growth and foreign direct investment from a sample of one hundred and five countries belonging to OECD, MENA, Asia, Latin America and Africa during the period 1990-2009 using a panel data. As for our empirical study, it has two econometric models. The first model is used to study the effect of the financial crisis on economic growth; the model estimate is based on the use of dynamic panel approach because of the presence of a delay of the dependent variable included as an explanatory variable. At this level, the most appropriate method to treat this kind of problem is the Generalized Method of Moments GMM (General Method of Moment). The second model, it highlights the impact of the financial crisis on foreign direct investment. We estimate this model using static panel approach and applying the Hausman test for randomness. In the light of the teachings of the results obtained, we find that the effect of the financial crisis is differentiated from one region to another depending on their degrees of integration into the international financial system. However, the negative consequences of the recent crisis have fueled the debate on the need for a redefinition of the financial system based on greater transparency,

equitable risk sharing, cooperation for controlling systemic risk in short, a world governance. This allows us to identify which proposals may surpass this crisis and avoid the occurrence of other malfunctions. The recapitalization of banks; monitor the movement of capital; improving market transparency; improve international coordination.

Keywords: Financial Crisis, Economic Growth, Foreign Direct Investment, Panel data, Global economy

INTRODUCTION

The global economy has been marked over the past two decades by a recurrence of financial crises (monetary, banking, stock market crash) affecting both developed and developing countries. In this context, several definitions have been offered for the term financial crisis. In fact, according to Sach et al (1996) "The financial crisis can be seen as a shock, an accident or an element of danger (systemic risk). It is characterized by seizure, the extent of dysfunction, the inability to self-correction, the failure of market mechanisms, and the cost of resolution as a percentage of gross domestic product (GDP) is important. "

The recent financial crisis in 2008, the largest since the Great Depression, was born in the rich countries in the second half of 2007. It had its roots in the bursting of the housing bubble in the United States with the now infamous subprime. Basically, it comes to mortgage loans (mortgages), credit cards, car rental, and other risky loans originally granted in (2001) with a little solvent clientele. It is the result of a misallocation of resources. Indeed, the rise of oil prices is a cause for at least two reasons: On the one hand, the sustained increase in prices stimulated the Speculative behavior of investors and contributed to the swelling of a speculative bubble that has put pressure on the real economy.

The increase in oil prices has led to increased production costs which favored the orientation towards green fuels and plunged the world into an unprecedented food crisis with shrinking land for food agriculture. On the other hand, this increase in exports supplied countries with extra funds they have placed in securitization activities. And products that have been released secured banks of the risks and encouraged them to fund other more risky activities until the October 2008 collapse.

It seems that the world is experiencing the worst economic crisis it has known since the thirties and has paralyzed the international financial system. Poly-sectoral crisis industries returns lowered, exports of goods and services are in decline, the machine of international trade is seized. The market economy is in a dismal state, capitalism has failed, and the outlook is

alarming to say the least. Due to globalization, the crisis does not spare anyone. It affects rich countries and poor ones. The main objective of this paper is to determine the effect of the current financial crisis on real economy, particularly on foreign direct investment and economic growth from a sample of one hundred and five countries belonging to the OECD, MENA, Asia, Latin America and Africa over the period extending from 1990 to 2009.

To answer our problem namely the impact of the global financial crisis on economic growth and foreign direct investment for a sample of countries, the first section presents a brief review of the origin, dimensions and managements policies of the international financial crisis. The second section presents the models and the empirical results.

THE INTERNATIONAL FINANCIAL CRISIS: Origin, Dimensions and Management Policy

The current international financial crisis is the most serious recession since the great recession of 1929. Its impact spread quickly to real economy in developed countries as well as developing ones. The scale and dimensions of the crisis incited international institutions and governments around the world to implement a series of management policies. Overall, these policies were aimed at stabilizing financial markets and boost aggregate demand. In parallel, in order to avoid the occurrence of such crises, a deep discussion was held around the shortcomings of the current international financial system and the need to restructure it.

In what follows, we intend to present an overview of the origins and dimensions of the crisis. This is followed by a brief review of management policies adopted to mitigate the effects of the crisis and ensure recovery.

Origin of the crisis

During the 90s, agencies and real estate companies managed to convince American low-income households to invest in the sector and to acquire houses. The orientation towards this category of households is explained by the importance of access to housing for low-income families and the opportunities it offers for their enrichment.

The acquisition of the property is insured through a mortgage, a Subprime as it was called. This type of loan has some specific features. It is a risky credit given to a household that does not have sufficient guarantees. The credit is available regardless of the household's ability to repay the loan. This type of credit is given at a preferential and variable interest rate which increases after the first years. Finally, it is a renewable credit as it offers the borrower the opportunity to get a new loan equivalent to the amount of the increase in the value of the mortgaged house.

To account for inflation and growth in the U.S. economy, the Federal Reserve decided to increase the key interest rate. The latter is increased from 1% to 5% between 2004 and 2006. Therefore, repayment expenses of loans increased and an increasing number of households could not cope, in summer 2007, the default rate on subprime loans exceeded 15% (The Finance for All, 2008). Given the failure of repayment, lenders decided to get rid of mortgaged housing. The supply of homes has exploded and prices fell rapidly. The result is the collapse of the U.S. housing sector.

In the context of financial globalization, the crisis of the U.S. housing sector quickly spread to the financial markets of developed countries through securitization. The latter is a financial technique to convert receivables capitalized institutions loans into tradable securities. The use of credit institutions is explained by their willingness to share the risk with a large number of investors. Thus, following the collapse of the United States housing sector, real estate securities holders have sought to get rid of them and the securities prices declined rapidly.

The result is that banks heavily involved in real estate loans and with important titles in their balance sheets, experienced difficulties. These difficulties are worsened by the lack of confidence and liquidity crisis. The latter manifested itself since August 2007 with severe disruptions in interbank markets. The disorder of the banking sector in developed countries quickly contaminated insurance companies who failed to respond to all customer inquiries on the edge of bankruptcy. Doubt is installed and confidence has totally disappeared, leaving players with uncertainty and chance.

The elements of a profound crisis have thus been established. The first warning was in July 17, 2007 when two mutual funds of U.S. bank Bear Stearns, which invested heavily in real estate, went bankrupt. On 9 August 2007 the French bank BNP (Banque Nationale de Paris) Paribas decided to close three of its funds (Banque de France, 2009). A domino effect arose and financial institutions in developed countries began to experience the effects of the crisis one after the other. The turning point in this financial storm was September 15, 2008, with the announcement of the bankruptcy of U.S. investment bank Lehman Brothers and the lack of confidence worsened and financial markets in developed countries were paralyzed.

Dimensions of the crisis

Uncertainties in the financial markets, lack of liquidity and difficulties of large international banks constituted sufficient evidence that the crisis took two new dimensions: a geographical dimension and a socio-economic one.

Indeed, at present, it appears that no region of the world has been spared the effects of the crisis. These have spread to the real economy in developed and developing countries and deteriorating social indicators began to appear. The current global crisis is to demonstrate the saying "when the U.S. coughs everyone has the flu."

Thus, recent projections on prospects for global development for 2009 show an unprecedented deterioration of socioeconomic indicators. These projections consider that the global economy experienced a historical decline in real GDP of 1.3%; countries where per capita production is expected to decline represent three quarters of the global economy (IMF, 2009a). Private consumption and fixed capital investment would decrease to, 1.5% and 9.8% respectively (World Bank, 2009a). The volume of trade in goods and services would fall by 11% (IMF, 2009a). The flow of foreign direct investment (FDI), which fell to 21% in 2008, was likely to worsen in 2009 (United Nations, 2009b Nations). The number of unemployed reached a record of 290 million (International Labor Office). The number of undernourished and hungry would cross the threshold of unprecedented billion (World Bank, 2009c). If no action was taken, between 200 thousands and 400 thousands more children could die each year (World Bank, 2009c).

For developed countries, the effects of the crisis are transmitted to the real economy through, mainly, the tightening of credit and auctioneering. Indeed, the difficulties of funding faced by businesses contributed to disadvantage the investment and production and to discourage foreign trade. Unemployment and poverty have therefore increased. Due to the devaluation of their heritage and the deterioration in the labor market, households have revised down their request. The result is that many developed countries have entered, from the last quarter of 2008, in a deep recession.

Thus, the IMF (2009a) estimates that developed countries have recorded an unprecedented 7.5% decline in real GDP in the last quarter of 2008. In 2009, the decline in real GDP is expected at 3.8%, against a 2.7% growth in 2007. IMF (2009a) provides also a significant contraction of private consumption, Gross Fixed Capital Formation (GFCF) and the volume of trade. In fact, for 2009, projections show a 1.4% decline in private consumption and a drop of 12.5%, 13.5% and 12.1%, for GFCF, export volumes and Imports of goods and services respectively. The decline in economic activity has contributed greatly to accelerate the rate of unemployment. It increased from 5.4% in 2007 to 5.8% in 2008 and expected to reach 8.1% in 2009 (IMF, 2009a: p.71).

For developing countries, although they were spared the direct effects of the crisis that has shaken global financial markets; they seem to be more exposed to its indirect effects. The latter are transmitted to the real economy of these countries following the collapse of socio-

economic indicators of developed countries. These effects were amplified due to the volatility and fragility in developing economies and weak internal spring growth. Thus, because of the recession in advanced economies, the main drivers of growth in developing countries are locked and their development prospects have deteriorated.

Overall, the main transmission channels of the crisis to the real economy of developing countries can be summarized by the reflux of foreign capital, deteriorating financing conditions, slump of foreign trade, deteriorating terms of exchange, decline in aid for development and reduced remittances from migrant workers. These factors contributed to hamper growth and investment, increase unemployment and poverty and threaten access to education and health services (World Bank, 2009c). The achievement of national development goals of these countries and development goals adopted at the international level, including the MDGs, has thus been jeopardized.

Projections for 2009 show that the socio-economic assessment of developing countries faces a worrying degradation. Indeed, these projections consider that this group of countries should record a real GDP growth of around 1.6%, a rate of 4.5 and 6.7 percentage points lower than the recorded rate, respectively, in 2008 and 2007 (IMF, 2009a). The fixed capital investment would grow by 0.6% only, against 10.2% and 15% in 2008 and 2007 respectively (World Bank, 2009a). The values of trade in goods and services would fall by 6.4% for exports and 8.8% for imports and terms of trade would decline by 8% (IMF, 2009a). The flow of private capital would fall to \$ 363 billion, against \$ 707 billion in 2008 (World Bank, 2009b). FDI flows, which fell by 3.6% in 2008, would likely worsen in 2009 (United Nations, 2009b Nations). This trend would have a negative impact on external financing and may invalidate many investment projects.

On the social dimension of the crisis in developing countries, projections describe an alarming situation. Indeed, these projections estimate that in 2009 the total number of people living on less than \$ 1.25 a day is expected to be 1.184 billion (World Bank, 2009c). This situation may be exacerbated by the significant decrease in remittances from migrants and threat of declining aid to the region is an essential cushion against poverty. The crisis may also make basic services (education and health) less accessible to the poor. Indeed, the first findings in the context of a survey conducted by the World Bank in March 2009 and covering 69 countries, show that eight developing countries are experiencing shortages in certain types of medicines and 22 countries are expecting such difficulties in the course of the year (World Bank, 2009d).

Crisis Policy Management

The experience of previous banking crises teaches that nature, the speed and range of public intervention determine largely the extent of the crisis. Thus, at the first signs of the global financial crisis and to mitigate its impact, public authorities in various parts of the world decided to implement a set of measures. The first measures were aimed primarily at ensuring the viability of the financial system and avert bankruptcy of major financial institutions, to ensure access to liquidity and to restore investor confidence by government guarantees on deposits. These measures have helped prevent the complete collapse of the international financial system.

Then, in order to stimulate aggregate demand, guidance is addressed to the practice of fiscal stimulus and easing of monetary policy. This orientation, in opposition to the Washington Consensus, is justified by the fact that automatic stabilizers are not effective during major crises (IMF, 2008). Without denying the important role of monetary policy, the IMF (2009a) emphasizes the superiority of the fiscal stimulus. The latter is all the more necessary when the country is thwarted by tightening the flexibility of monetary policy because of currency flaps. Among the tools of fiscal policy, the IMF (2009a) considers that government investment has the most visible impact on growth because it directly influences the demand.

The need for fiscal expansion is also defended by Nobel Prize winner, Paul Krugman. In order to stimulate demand and ensure economic recovery, Krugman has called on governments to make significant investments in infrastructure and to increase their aid to poor (although the effects of social transfers and lower taxes on growth dynamics are based on propensity to consume).

However, it is worth noting that the practice of fiscal stimulus may degrade the budget deficit and increase debt to GDP ratio. Indeed, given the stimulus plans, projections predict that the budget deficit of major advanced economies would increase from less than 2% of GDP in 2007 to 10.5% of GDP in 2009 (IMF, 2009a: p .15) and the public debt to GDP ratio was expected to reach 110% by 2014 (IMF, 2009a: p.32). For emerging and developing countries, fiscal balances were expected to deteriorate from a small overall surplus in 2007 to a deficit of 4% in 2009 (IMF, 2009a: 16). Proponents of fiscal stimulus consider that rapid and sustainable growth is able to improve these ratios. These supporters refer to the experience of the United States after the Second World War which managed, thanks to its strong growth rate, to reduce the ratio of debt to GDP from 121% to 50% between 1946 and 1965 (IMF, 2009b: p.29).

Thus, in order to calm the impact of the crisis and boost its economy, the United States have decided to opt for a joint fiscal stimulus and lower interest rates. Indeed, the U.S. benchmark interest rate fell from 5.25% in August 2007, to 0.25% in December 16, 2008

(Banque de France, 2009). This policy, which aimed at facilitating access to credit, has contributed to weaker effects of the crisis than expected. This policy was quickly followed by a policy of fiscal stimulus of an amount close to 5% of GDP over the period 2009-2011 (IMF, 2009a: p.70); 365.5 billion dollars were allocated to conduct great work and reforming the health care system and \$ 370 billion were reserved for grants and transfers to the benefit of businesses, households and unemployed people (Banque de France, 2009).

For the European region, the first steps were intended to deal with liquidity problems. Monetary policy remained very restrictive and has instead focused on the fight against inflation. The European Central Bank decided then to conduct a series of lower interest rates. It stood at 2.5% as of December 4, 2008 after it was 4.25 before 8 October 2008. To boost investment, the European Investment Bank had 30 billion Euros available to banks for financing small and medium-sized European companies.

The stimulus package adopted by the European Union is estimated at € 200 billion, or 1.5% of GDP. The European community has, also, a series of decisions aimed at lowering VAT, extending the duration of unemployment benefits and reducing taxes on low incomes (Banque de France, 2009).

For emerging economies, monetary policy was manifest by a decrease in interest rates, especially in Asia and the Middle East, and a general depreciation of the currency against the dollar. Fiscal policy is more concentrated in Asia, an area that has the most leeway. In this area the stimulus is of the order of 1% to 3% of GDP, China announced a stimulus package of 16% of GDP over several years (Banque de France, 2009: p.69).

Developing countries have also reversed the general trend of their monetary policies governing interest rates which have been reduced in three quarters of developing countries for which data are available. The median interest rate of this group of countries has decreased from 8.1% to 6.6% between December 2008 and late May 2009 (World Bank, 2009a). For this group of countries that already have a high level of public debt, options of fiscal stimulus are limited. Thus, to encourage investment in infrastructure and continue efforts to achieve the MDGs, international assistance to these countries is more than necessary. Donors are asked to honor their commitments of aid; delay might amplify the effects of the crisis in these countries and hurt the economic recovery.

However, it is worth noting that some experts consider that the actions and interventions are not commensurate with the magnitude of the crisis. They caricature the policies implemented by "massive blood transfusion to a person with severe internal bleeding" (J. Stiglitz). These experts suggest the need to find new leads. The latter, in the context of a global consensus, should be targeted for reform, in depth, of the international financial system.

METHODOLOGY

While focusing on an abundant literature, at the same time theoretical and empirical on the determinants of the financial crises it is important to note that no work has so far been devoted to the evaluation of the consequences of the financial crises on real economy Barro (2001), Bordo et al (2001) ; Aziz et al (2002).

The data used for this study come mainly from the database of the World Bank's "World Development Indicators" (2000). Observations are annual and the sample consists of one hundred and five countries belonging respectively to the Latin American region, OECD, MENA, Africa region, and the Asian region.

ANALYSIS AND RESULTS OF ESTIMATES

Impact of the crisis on economic growth

Estimating the impact of the global financial crisis on economic growth is made from the following growth equation:

$$\Delta \ln Y_i = \alpha_i + \varphi \ln Y_{it} - \beta_1 + \beta_2 \ln INV_{it} + \beta_3 POPG_{it} + \beta_4 \ln OUV_i + \beta_5 \ln INF_i + \beta_6 \ln CONSPUB_i + \beta_7 CRFIN_i + \beta_8 DUM_{it} + \varepsilon_{it} \quad (1)$$

With α_i fixed country β_i coefficient to estimate effect and ε_i error term. i and t respectively indexing countries and years.

Descriptive statistics

Table 1: Descriptive statistics for the first equation (1)

Variable	Average	Standard deviation	Maximum	Minimum	Number of observations
Ln Y	8.966542	1.275868	12.52759	6.206576	1971
Ln SCH	1.349248	0.5227013	2.612523	-4.362548	948
Ln INV	2.481219	0.6043353	4.456902	-2.120264	1796
Ln OPEN	3.464926	0.565115	5.389281	1.68924	2015
Ln CONSPUB	4.194128	0.9367485	5.803537	-6.792389	1900
INF Ln	1.910804	1.160574	10.07635	-4.242136	1784
POPG	59.76502	6.91088	82.92471	46.28831	2079
CR END	0.366667	0.4820092	1	0	2100

Table 2: The matrix of the correlation coefficients for the first equation (1)

Variable	Ln Y	Ln SCH	Ln INV	POPG	Ln OPEN	INF Ln	Ln CONSPUB	CR END
Ln Y	1.0000							
Ln SCH	0.2931	1.0000						
Ln INV	0.1542	0.2070	1.0000					
POPG	0.7814	0.2474	0.1093	1.0000				
Ln OPEN	0.2494	0.0800	0.1204	0.3136	1.0000			
INF Ln	-0.2879	-0.1461	-0.0316	-0.2548	-0.1775	1.0000		
Ln CONSPUB	0.1903	0.0545	0.0548	0.2704	0.1879	-0.5628	1.0000	
CRFIN	0.0915	-0.0347	-0.0432	0.1277	0.0429	-0.0604	0.1699	1.0000

Regression Results

Table 3: Estimation results of the model (1) Dependent variable: Economic growth rate ($\Delta \ln Y$)

Explanatory Variables	Model (1) Africa	Model (1) Latin America	Model (1) Asia	Model (1) MENA	Model (1) OECD
Ln Y-1	-0.018812 (-0.36)	.0003656 (0.92)	- .0004028 (-0.07)	- .0017515 (-0.34)	.008885 (1.65)
Ln INV	-0081419 (-1.59)	- .0027152 (-0.62)	- .0373052 ** (-2.05)	- .0011128 (-0.25)	- .0048515 (-1.13)
Ln SCH	.0066876 (1.06)	.002654 (0.40)	.0245692 ** (2.54)	.0070382 (0.92)	.0051453 (0.78)
POPG	6.56e-06 (0.01)	.0006885 (0.93)	.0012745 (1.08)	.0013637 (1.48)	- .0003759 (-0.36)
Ln OPEN	.0184885 ** (3.06)	.0079027 (1.21)	.0190175 ** (2.50)	.0130033 ** (2.20)	.0123592 ** (2.03)
INF Ln	- .0001671 (-0.05)	.0032609 (0.86)	.0041731 (1.07)	- .000182 (-0.05)	.0026955 (0.80)
Ln CONSPUB	.0002901 (0.09)	.0040947 (1.35)	.0065528 (1.59)	.0019615 (0.64)	- .0004808 (-0.16)
CR END	- .0631435 * (-1.86)	- .0141311 (-0.96)	.0230894 ** (1.98)	.001953 (0.20)	.0165474 ** (2.17)
DUM	- .0695992 ** (-2.64)	.0018101 (0.04)	.02629063 ** (2.11)	.1044573 * (1.90)	.0694141 (1.39)
Interactive	.107526 (1.91)	- .0527497 (-0.50)	- .523687 ** (-2.09)	- .2497525 * (-1.76)	- .1738402 (-1.51)
Constant	.0096693 (0.20)	- .104252 (-3.13)	- .1014429 (-2.38)	- .1195709 (-3.56)	- .0924793 (-2.38)
Comments	649	649	649	649	649
AR (1)	0004	0008	0097	0001	0002
AR (2)	0763	0749	0451	0589	0558
Sargan test	0880	0507	0970	0871	0910
Hansen test	0531	0360	0858	0.668.	0505

The values in parentheses are the t-student values.

*, **, ***: the coefficient is significant at, respectively, 10%, 5% and 1%.

In our estimation we introduced an interactive variable that is equal to the variable financial crisis multiplied by the variable DUMMY: interactive variable

$$= (\text{CRFIN} * \text{DUM}).$$

The estimation results of model (1) for our sample of countries in Africa, Latin America, Asia, MENA and OECD, are presented in tables (see Appendix).

The estimates were made using the method of system GMM dynamic panel given the nature of the specificity of the equation in which the endogenous variable delay is used as an explanatory variable.

For African countries, the results of the estimates show that the variables are in regression: the initial GDP, the stock of physical and human capital, population growth, inflation and the rate of public consumption variables are not statistically significant. To further clarify the results, we add the interactive variable that proves insignificant risk of 5%. This leads us to conclude that the financial crisis in Africa has had a specific but less important effect compared to the rest of the world. This effect is explained by the weak integration of African countries into the international financial system. These results are confirmed by previous works of the ADB. As for the countries of Latin America, the estimation results teach us that the variables namely gross domestic product is not significant and has a positive coefficient, while the variable stock of physical or human capital, inflation, public consumption and opening indicators are not statistically significant.

According to Arellano and Bond, auto correlation test, where the null hypothesis is the absence of first order autocorrelation of errors in the equation levels is accepted as the p-value found (0.08) exceeds 1%.

Similarly, the results of over-identification tests (i.e. the validity of instruments) are provided with the results of estimates. The p-value found exceeds 10%, and then the null hypothesis of validity of instruments will be accepted.

Adding the interactive variable (financial crisis x Dummy Latin America), we note that this variable appears insignificant but the coefficient has a negative sign, this leads to conclude that the financial crisis has had a specific effect on economic growth countries of Latin America with the rest of the world. This corroborates the theoretical and previous empirical studies. Moreover, Latin American countries have experienced a series of crises in the past episodes (Mexican crisis in 1994, Brazil in 1999 and Argentina 2001). However, after such a crisis regardless of its type, it is usually followed by a substantial contraction in economic activity, especially economic growth and indirectly economic development. These empirical results are consistent with the assertions of the theoretical studies of the financial crisis in Latin American countries that have experienced a decline in economic growth from 4.5% in 2008 to 2% in 2009.

These contractions can be explained by lower commodity prices and the fall in oil prices seriously affecting the most dependent economies on oil income, as well as the contraction of international trade which has led to the decline in exports leading to a deterioration of the current account, a lower opening rate and indirectly, a severe disastrous effect on the economic growth.

However, for Asian countries, the estimation results show that the initial GDP variable is not significant. The variable of population growth rate, the inflation rate and government consumption rate are not significant. The following variables: the human capital stock, the openness indicator, the financial crisis and the dummy variable for Asia prove significant at the 5% level and their coefficients are positive.

We have integrated the financial crisis variable x interactive dummy variable for Asia; we find a significant effect since the p-value is calculated (0.039) which is less than 5%. The Arellano and Bond autocorrelation tests and the Sargan test of over-identification are checked.

It is appropriate to conclude that the financial crisis has had a specific effect on Asian countries. In other words, the financial crisis has a negative impact on economic growth in Asian countries compared to the rest of the world. This is confirmed by the work of Bordo et al (2001), Barro (2001).

In MENA countries, the effect of the financial crisis on economic growth is negative and more important than the rest of the world which requires the recycling of the new economic cycle of these countries, as well as a restructuring of the economic policy of the region.

Dealing with the effect of the financial crisis on economic growth in OECD member countries, the estimation results of equation (1) confirms the significance of only two variables respectively indicator of openness and the financial crisis which are on the threshold of 5%. The Interactive variable proves insignificant. This leads us to conclude that the financial crisis has no specific effect on OECD countries compared to the rest of the world. This is explained by the fact that these countries were the cause of the crisis.

Impact of the crisis on foreign direct investment

The estimation of this equation is performed using a static approach panel.

$$\begin{aligned} \ln IDE_{it} = & \alpha_i + \alpha_1 \ln INV_{it} + \alpha_2 \ln OUV_{it} + \alpha_3 \ln INF_{it} + \alpha_4 \ln CONSPUB + \alpha_5 \ln TRI_{it} \\ & + \alpha_6 \ln CRFIN_{it} \end{aligned}$$

Descriptive statistics

Table 4: Descriptive statistics of equation (2)

Variable	Average	Standard deviation	Maximum	Minimum	Number of observations
Ln IDE	.04153148	1.767643	6.336678	-13.2786	1807
Ln INV	2.841219	.6043353	4.456902	-2.120264	1796
Ln OPEN	3.464926	.565115	5.389281	1.68924	2015
INF Ln	1.910804	1.160574	10.07635	-4.242136	1784
Ln CONSPUB	4.194128	.9367485	5.803537	-6.792389	1900
TRI	10.62352	14.06762	374309	.0344788	1341

Table 5: Correlation coefficient matrices

	Ln IDE	Ln INV	Ln OPEN	INF Ln	Ln CONSPUB	TRI
Ln IDE	1.0000					
Ln INV	0.1185	1.0000				
Ln OPEN	0.3385	0.1204	1.0000			
INF Ln	-0.0789	-0.0316	-0.1775	1.0000		
Ln CONSPUB	0.1657	0.0548	0.1879	-0.5628	1.0000	
TRI	0.0388	0.0129	-0.0616	0.1240	-0.1186	1.0000

Regression Results

Table 6: Model estimation Investment Results (2) Dependent Variable Rate (Ln IDE)

Explanatory Variables	Model (2) Africa	Model (2) Latin America	Model (2) Asia	Model (2) MENA	Model (2) OECD
Ln INV	.2424785 * (2.77)	.2253267 *** (2.58)	.258013 ** (2.78)	.2614126 ** (2.98)	.2315274 *** (2.62)
Ln OPEN	1.053888 *** (-0.88)	1.124733 *** (7.28)	1.059709 *** (6.83)	1.105398 *** (7.21)	1.062551 *** (6.90)
INF Ln	.0406562 (0.80)	.032255 (0.63)	.038969 (0.76)	.0350219 (0.69)	.041636 (0.81)
Ln CONSPUB	.2720223 *** (4.10)	.2691747 *** (4.06)	.2714943 *** (4.09)	.2706273 *** (4.09)	.2744703 *** (4.13)
TRI	.008696 * (1.69)	.0073815 (1.43)	.0085117 * (1.65)	.0081699 (1.59)	.0088304 * (1.71)

The values in parentheses are the t-student.

*, **, ***: The coefficient is significant at, respectively, 10%, 5% and 1%.

We estimated equation (2) by applying the Housman test for fixed effects and random effects. The regression results show that the p-value (0.6942) is greater than 5% in this situation we estimate our equation using the random effects model. And as our sample includes OECD, Latin America, Asia, MENA and African regions, we perform this regression in two steps: first we estimate the regression region and secondly we introduce all regions.

Interpretation of results

The results of estimating equation (2) show that the variables namely the accumulation of physical capital, the degree of openness, government size measured by government consumption, and the financial crisis are significant at different degrees of significance since the p-value is less than either (10%, 5%, 1%) and we checked the results by STUDENT which makes estimating a single variable: if $t > |t_{critical}|$, the variable is significant and it is not significant in the opposite case. $|t| > 1.96$

But we note that the OECD dummy variable is not significant. This means that the financial crisis in OECD countries has no negative effect on foreign direct investment and indirectly on economic growth and hence economic development. Moreover, the OECD member countries are developed and rich countries. These countries are even the origin and source of the financial crisis. They are the creators of the crisis, but they are not affected by the economic turmoil.

This result is important as policy makers in these countries do encourage investment and attract more investors by offering tax and financial incentives, hence, the high concentration of FDI volumes in this region.

The estimation of equation (2) in the Latin American region shows that the accumulation of physical capital, trade openness coefficient, public consumption and financial crisis have positive and significant signs threshold (5%, 1% , 1% and 5%) respectively. Thus, according to the Wald test if the p-value is less than 5% the overall model appears significant.

Similarly, the State, in a period of economic crisis, resorts to increase public spending in order to make recycling economic cycle which explains the significance of the regression coefficient.

When introducing the dummy variable AL (Latin America) in the regression, it turns out that there is a positive and significant effect. This also leads us to conclude that the financial crisis has had a specific effect on these countries. This means that Latin America attracts more FDI than the rest of the world. However, these results refute the empirical results found in previous studies Barro (2001) carried out on the effect of financial crises on foreign direct investment.

In Asian countries, the estimation results show that the coefficients of physical capital accumulation, openness, government consumption and financial crisis are significant and have a positive sign. The introduction of the dummy variable in Asia shows us the impact of the crisis only for Asian countries and since its p-value is greater than 10%, while the Asia dummy variable is not significant, it leads us to conclude that Asian countries, although they have seen a series of financial crises such as the crisis in Southeast Asia in 1997-1998, these countries were able to improve their economic conditions. Moreover, the recent financial crisis seems insignificant on the economy of these countries. This is explained by the lack of integration of these countries into the international financial system and economic policies adopted by the region.

For the MENA region, according to the Wald test, the model appears to be generally significant as the p-value is less than 5%. The variables accumulation of physical capital, openness, public consumption and financial crisis are significant. Similarly, the dummy variable is significant in MENA countries which allow us to conclude that MENA countries attract less FDI than the rest of the world. It is therefore necessary to implement reforms to boost the institutional and policy development for the MENA region so that it can finally act on economic development and hence economic growth.

As for the effect of the financial crisis on foreign direct investment on African countries, we see that the variable physical capital accumulation which is approximated by the ratio of domestic investment as a percentage of GDP, the variable openness, government consumption variable and variable real interest rates and financial crisis are statistically significant and have a positive sign. Thus, according to the Wald test the model is globally significant as the p-value is less than 5%. The Dummy variable for Africa is not significant.

These results allow us to conclude that the financial crisis has had a positive impact on foreign direct investment in the African region compared to the rest of the world. This is due to its weak integration into the international financial system, since they are developing countries. Similarly, African countries suffer from a regional disparity, inequality and concentration of population, underdeveloped infrastructure and inadequate climate which have been the obstacles hindering the concentration of foreign direct investment.

The regression results of each region show the positive impact of the financial crisis only for the African region.

Results of all countries in the sample

Table 7: Estimation results of all countries in the sample Dependent Variable:

Investment rate (LnIDE)	
Variable	Coefficients
Ln INV	.2555408 *** (2.75)
Ln OPEN	1.124537 *** (7.17)
INF Ln	.0311 (0.61)
Ln CONSPUB	.2657249 *** (4.01)
TRI	.0076451 (1.48)
CRFIN	.2198569 *** (3.15)
Dummy Latin America	.8775288 ** (2.14)
Dummy MENA	-.5435385 (-1.41)
Dummy Asia	.29330008 (0.79)
Dummy OECD	.2904871 (0.87)
Dummy Africa	-.2368556 (-0.88)
Constant	-5.687711 (-9.07)

The values in parentheses are the student's t test values.

*, **, ***: The coefficient is significant at, respectively, 10%, 5% and 1%.

We integrate the sample and note that the variables namely the accumulation of physical capital, the indicator of openness, government consumption, and the financial crisis are significant at different thresholds. Thus, according to the Wald test the model is globally significant because the p-value is less than 5%.

We note that the dummy variable for Latin America is significant and has a positive sign for Asia, OECD and dummy. The variables are not significant. The dummy variable for Africa and MENA proves insignificant.

The first observation that emerges in the light of the results obtained show that the effect of the financial crisis differs from developing, emerging and developed countries.

The second finding that can be drawn is that the positive effect of the financial crisis on foreign direct investment can be explained by policies that applied countercyclical stimulus to revive the economy and the States that encouraged investment to boost the economy, create new jobs and absorb unemployment. All these measures led to higher investments despite the crisis period, and therefore a positive effect of the financial crisis on investment and foreign direct investment was obvious.

Moreover, there is a positive effect of government expenditure on investment; these costs are expected to encourage investment by strengthening infrastructure and assisting in the establishment of new businesses. The same openness and domestic investment have a significant and positive effect on FDI.

CONCLUSION

The crisis has changed in a very fast way from a local financial crisis linked to the U.S. real estate sector into a global financial and economic crisis. Its spread is largely attributed to securitization operations by U.S. financial institutions that sold complex and opaque investment instruments and the objective was to boost yields, without complying with the required prudential standards. These developments have led to a widespread crisis of confidence in the international financial system and the occurrence of a liquidity crisis accompanied by a sharp decline in major international stock exchanges.

In this paper, we recalled in the first place, the origin and dimensions of international policies and management followed to calm financial crisis effects. In the second place, through an empirical study using panel data, we are interested in the consequences of the crisis on economic growth and foreign direct investment. The analyses conducted in this study highlight the overall negative effects of international financial crises experienced during the period (1990-2009) on economic growth in the sample.

The results are obtained from a sample of one hundred and five countries from the regions of (MENA, OECD, Africa, Latin America and Asia) for the period 1990-2009. By taking a dynamic panel and applying the estimate generalized method of GMM (General Method of Moment).

As for the second estimate, which highlights the impact of the financial crisis on foreign direct investment, the results show a significant effect. Indeed, the positive impact of the financial crisis on foreign direct investment, due to political counter-cyclical stimulus applied to revive the economy and states' encouragement for investment to restart the economy, was translated into higher investment in times of crisis which invalidates the previous empirical work Bordo and Barro (2001). In light of the teachings of the results, we find that the effect of the

financial crisis is different from one region to another depending on their degree of integration into the international financial system.

Based on these theoretical assertions, we pointed out that the financial crisis spread throughout the world, through declining trade, FDI and reflux, securitization transactions, The financial market turmoil that was characterized by a large volume of amounts involved in stock trading, the supremacy of finance and control over the actors in the production, stakeholder were driven by speculative logic. Similarly, illegal finances from corruption or drugs were looking for bleaching space especially in tax havens. These factors have significantly contributed to slow economic growth.

We show that the effect of crises on growth is different from one region to another. Indeed the impact of crises on African countries is the opposite of that on the rest of the world. Crises seem to favor Africa which appears to be away from their drawbacks since it is less integrated into the international financial system and its lagging compared to the rest of the world.

However, the negative consequences of the recent crisis have fueled the debate on the need for a redefinition of the financial system based on greater transparency, equitable risk sharing, and cooperation to control the short systemic risk and global governance. This allows us to identify the proposals that surpass this crisis and avoid the occurrence of other dysfunctions.

- ✓ Recapitalize banks.
- ✓ Monitor capital flows.
- ✓ Improve market transparency.
- ✓ Improve international coordination.

The limitations of this study that the results which lead her differs from one region to another, so that even a relevant result we believe to analyze the effect of the international financial crisis for each region analyzed more thrusts that shall be an area of future research.

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APPENDICES

List of Countries

Latin America

Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Peru, Mexico, Venezuela, RB, Bolivia, Paraguay, Guatemala.

Africa

Angola, Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo, Burundi, Eritrea, Ethiopia, Kenya, Somalia, Uganda, Tanzania, Rwanda, Cameroon, Central African Republic, Congo rep, Congo Dem Rep, Gabon, Botswana, Madagascar, Mozambique, Malawi.

MENA

Algeria, Egypt Arab Rep., Libya, Morocco, Mauritania, Sudan, Tunisia, Saudi Arabia, Bahrian, Iraq,Iran, Kuwait, Lebanon, Malta, Djibouti, Oman, Qatar, Yemen Rep, Syria Arab Republic

OECD

Australia, Belgium, Canada, Denmark, Estonia, United States, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Iceland, Italy, Korea Rep, Luxembourg, Portugal, Poland, Slovenia, Slovak Republic.

Asia

Bangladesh, Bhutan, Brunei Darussalam, India, Indonesia, Japan, Mongolia, Maldives, Malaysia, Nepal, Kazakhstan, Philippines, Pakistan, Tajikistan, Turkmenistan, Sri Lanka, Singapore, South Asia, Thailand, Turkmenistan, Vietnam

Description of variables and their sources

Variable	Definition	Source
Yt	Real GDP growth	World Bank entitled "World Development Indicators" (2000).
Yt-1	Real GDP per capita	World Bank entitled "World Development Indicators" (2000).
INV	Accumulation of Capital Build: approximated by the ratio of domestic investment as a percentage of GDP.	World Bank entitled "World Development Indicators" (2000).
IDE	Indicates the Foreign Direct Investment	World Bank entitled "World Development Indicators" (2000).
SCH	Stock of human capital: it is the average number of years of schooling of the population aged 25 to 64ans.	World Bank entitled "World Development Indicators" (2000).
POP G	Population growth: Population growth of 15to 64ans.	World Bank entitled "World Development Indicators" (2000).
CONS PUB	Meter Size of Government: Government consumption as% of GDP	World Bank entitled "World Development Indicators" (2000).
OPEN	Indicator Hours: Sum of exports and imports as% of GDP.	World Bank entitled "World Development Indicators" (2000).

INF	Inflation indicator: indicates the change in the inflation rate.	World Bank entitled "World Development Indicators" (2000).
RI	Interest Rate Indicator: indicates the real interest rate.	World Bank entitled "World Development Indicators" (2000).
DUMMY	Takes the value 1 if there is a crisis, not 0 if (for specific countries)	
CR END	A binary variable takes the value 1 if it is a crisis year 0 if not.	