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FOREIGN DIRECT INVESTMENT AND LOCAL FINANCIAL MARKET DEVELOPMENT: A GRANGER CAUSALITY TEST USING PANEL DATA

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Abstract

This paper reports the findings of Granger causality tests on the relationship between foreign direct investment (henceforth, FDI) and local financial market development across 62 countries from 1996 to 2007. In this paper we explore whether local financial market development is important in catalyzing the flow of foreign direct investment. findings results are robust to different measures of financial market development. Furthermore, the results indicate that most of the causal links are found in Non OECD, Low income and Lower middle Income countries.

Keywords : FDI; Financial market, Capital markets; Credit markets;
JEL classification F21;P45;O16;G1

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1.Introduction

The literature on FDI has advanced several explanations of those links between financial market development and FDI inflows across a number of developing as well as developed countries. *Greenwood and Jovanovic (1990)* and *King and Levine (1993b)* show that financial market development reduces informational frictions and improves resource allocation more efficiently. *Hermes et al (2003)* shows that FDI plays an important role in contributing to economic growth but the level of financial development is crucial for these positive effects to be realized. *Alfaro et al. (2004)* and *Choong, et al.(2005)* show that better developed financial systems tend to benefit more from FDI. *Omran, et al (2003)* show that domestic financial reforms should precede policies promoting FDI . *Beck, et al. (2000)* suggest that financial systems are important for both productivity and development. *Ashraf Abdelaal (2010)* show that Countries with better financial systems, and healthy business environment are able to attract more FDI *Rebecca M., et al (2009)* examined the volatility of capital flows (FDI, portfolio flows, and other debt flows) following the liberalization of financial market and they found that capital flows are responding differently to financial liberalization. Surprisingly, portfolio flows appear to show little response to capital liberalization, while FDI flows show significant increases in volatility, particularly for the emerging markets.

The empirical literature suggests that FDI inflows depend conditionally on host country characteristics, *De Mello (1999)* and *Zhang, K.H. (2001)*.

Table (1) FDI inflow

| FDI inflow | Value (billion dollars) | | | % GDP | | |
|---------------------------------|-------------------------|------|------|-------|------|------|
| | 1986 | 1996 | 2006 | 1986 | 1996 | 2006 |
| World | 86 | 390 | 1461 | 0.6 | 1.3 | 3 |
| Developed economies | 71 | 237 | 973 | 0,6 | 1 | 2.7 |
| Developing economies | 16 | 147 | 434 | 0.6 | 2.3 | 3.6 |
| Sub-Saharan Africa ² | 0.7 | 3.7 | 38 | 0.4 | 1.9 | 7.6 |
| COMESA | 1 | 1 | 18 | 1 | 0.7 | 6.07 |

Source : [UNCTAD\(2009\)](#), *World Investment Report* . FDI inflow comprise capital provided (either directly or through other related enterprises) by a foreign direct investor to a FDI enterprise, or capital received by a foreign direct investor from a FDI enterprise. FDI includes the three following components: equity capital, reinvested earnings and intra-company loans. **Equity capital** is the foreign direct investor's purchase of shares of an enterprise in a country other than that of its residence. **Reinvested earnings** comprise the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested. **Intra-company loans** or intra-company debt transactions refer to short- or long-term borrowing and lending of funds between direct investors (parent enterprises) and affiliate enterprises.

Table (2) FDI Inward Stock

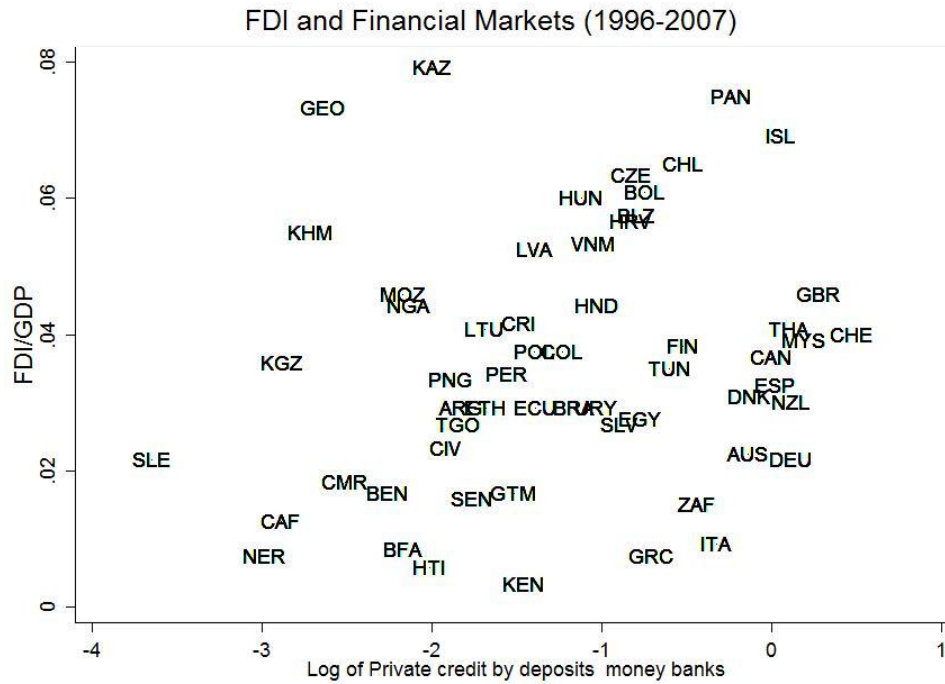
| FDI Inward Stock | Value (billion dollars) | | | % GDP | | |
|----------------------|-------------------------|------|-------|-------|------|------|
| | 1986 | 1996 | 2006 | 1986 | 1996 | 2006 |
| World | 1096 | 3246 | 12404 | 8 | 11 | 25 |
| Developed economies | 693 | 2240 | 8645 | 6 | 10 | 24 |
| Developing economies | 402 | 988 | 3364 | 16 | 16 | 28 |
| Sub-Saharan Africa | 19 | 44 | 147 | 12 | 23 | 30 |
| COMESA | 11 | 23 | 74 | 11 | 14 | 25 |

Source : [UNCTAD\(2009\)](#), *World Investment Report*, FDI stock is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises

Flows of FDI have grown considerably in recent decades. In 1986, the level of FDI inflows stood at US\$ 86 Billion, and by 2006, it stood at US\$ 1461 Billion. FDI flows have increased from approximately 0.6% of world GDP at the beginning of the 1980s to a share between 2% and 3% since the end of millennium (*see Table 1*).

FDI stocks have increased from a level of about 8% of world GDP at the beginning of the 1980s to 25% of world GDP in 2006 (*see Table 2*). FDI now represents the largest component of net resource flows to developing countries, surpassing official development assistance (ODA), portfolio investments, and bank loans [Miyamoto\(2003\)](#).

² excluding South Africa



Source: Author elaboration (FDI/GDP source UNCTAD(2009), Private credit by deposit source IMF's International Financial Statistics, October 2008)
 Fig. 1. Countries in this plot are the 64 countries (the sample data of this paper) .

Fig. 1. data on FDI and financial development shows the links between financial market development (Private credit to deposits)³ and FDI inflows, which consider the motivation of this work i.e. countries with better developed financial markets are able to absorb more from FDI to promote their economic growth but the level of financial development is crucial for these positive effects to be realized.

In a trade, English capital is instantly at the disposal of persons capable of understanding the new opportunities and making good use of them. In countries where there is little money to lend enterprising traders are long kept back, because they cannot at once borrow the capital, without which skill and knowledge are useless *Bagehot (1873)*.

James Ang (2009) shows that efficient financial system facilitates FDI to create backward linkages, which are beneficial to the local suppliers in the form of improved production efficiency. This implies that financial market development plays a crucial role in the host country and its ability to attract FDI and absorbs the benefits associated with it, *Durham (2004)* observed that the deeper financial systems absorb capital inflows such as FDI.

³ One of the traditional Financial Sector Development Indicators for banking (Raw data are from the electronic version of the IMF's International Financial Statistics, October 2008).

Furthermore, financial markets affect both the financing of investment and day-to-day business activities. *Wurgler (2000)* shows that even if financial development does not lead to higher levels of investment, it seems to allocate the existing investment better.

In this paper, we examine whether better-developed financial markets are able to catalyze the flow of foreign direct investment. To do this, we use a battery of financial market variables that exist in the literature

The remainder of the paper is organized as follows: data are defined in Section 2; empirical results are discussed in Section 3; and Section 4 concludes.

2.Data

This section describes the data used in the empirical analysis, specifically the measures of FDI, and financial market development indicators. One of the fundamental problems inherent in literature is that, to date, no specific causality analysis of the mutual relationship between FDI and Local financial market development indicators has been conducted. The reason is that sufficiently long time series necessary for using Granger causality tests are not available. However, recent theoretical developments in Granger causality methods have made tests using relatively short time series possible through the use of panel data approach⁴, adapting the methodology proposed by (*Larrain et al., 1997; Hurlin and Venet, 2001 Robert et al,2005*) and recently applied by *Erdil and Yetkiner (2008)*.

I test for Granger causality between two variables FDI and local financial market development indicators: First, FDI, measured by the net inflow of foreign direct investment/GDP, FDI is defined as the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, long-term capital and short-term capital as shown in the balance of payments. FDI inflows with a negative sign indicate that at least one of the three components of FDI is negative and not offset by positive amounts of the remaining components. These are called reverse

⁴ As using micro-panels, where there are large numbers of cross-section units and small numbers of time series observations, the FE estimator of the coefficients of lagged endogenous variables is biased and inconsistent *Nickell, (1981)*. On the other hand, the ML estimators for the dynamic fixed effects models remain biased with the introduction of exogenous variables when T is small *Hurlin and Venet,(2001)*. Moreover, *Kiviet (1995)* also provides an analytical expression for this bias. However, *Nickell, (1981)* demonstrates a fall in the size of bias on the coefficients of lagged endogenous variables with the presence of exogenous regressors. Furthermore, *Judson and Owen (1999)* provide Monte Carlo evidence and show that the FE estimator's bias decreases with T. Thus, for our case, we have decided to use the FE estimator since the bias is not large and the available literature does also show evidence in favor of fixed effects models for similar cases.

investment or disinvestment. The data are from *United Nations Conference on Trade and Development (UNCTAD) 2009 FDI database*.

Second, local financial market development proxied by different measure which can be classified into two levels :those relating to the banking sector and those relating to the equity markets.

For the first group, we will use first, **Private Credit by Deposit Money Banks to GDP** (henceforth, PCDBGDP) and second, **Private Credit by Deposit Money Banks and Other Financial Institutions to GDP** (henceforth, PCDBOGDP). They are the measures of the activity of financial intermediaries in one of its main function: channeling savings to investors .Both indicators have been used by researchers, the first by *Levine and Zervos (1998)*, and the second by *Levine, Loayza and Beck (1999) and Beck, Levine, and Loayza (1999)*.

Third , **liquid liabilities** of the financial system (henceforth, LLGDP): equals currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP. This is the broadest available indicator of financial intermediation, since it includes all three financial sectors. Liquid Liabilities is a typical measure of financial depth and thus of the overall size of the financial sector, without distinguishing between the financial sectors or between the use of liabilities.

Fourth, **Deposit Money Banks Assets to Total Financial Assets** (henceforth, DBACBA): This measure has been used as a measure of financial development by, among others, *King and Levine (1993a,b) and Levine, Loayza, and Beck (1998)* and equals the ratio of deposit money banks assets and the sum of deposit money and central bank assets.

For the second group, To measure the activity or liquidity of the stock markets we use **stock market total value traded to GDP**(henceforth, SMTVT), which is defined as total shares traded on the stock market exchange divided by GDP., and as indicator of the size of the stock market we use the **stock market capitalization to GDP ratio** (henceforth, STMK)which equals the value of listed shares divided by GDP.

Data for financial variables are available from the World Bank Financial Structure Database. Our sample comprises 62 countries from 1996 to 2007. These countries were classified into three groups according to the World Bank's World Development Indicators. The first sub-group consists of 37 low-

income countries, the second consists of 50 middle-income countries and the third consists of 25 high-income countries

3. Empirical analysis

Consider a time-stationary VAR representation, adapted to a panel data context. For each individual i I have $\forall t \in [1, T]$:

$$FDI_{i,t} = \sum_{k=1}^p \gamma^k FDI_{i,t-k} + \sum_{k=1}^p \beta^k FIN_{i,t-k} + V_{i,t} \quad (1)$$

$$FIN_{i,t} = \sum_{k=1}^p \vartheta^k FIN_{i,t-k} + \sum_{k=1}^p \phi^k FDI_{i,t-k} + U_{i,t} \quad (2)$$

With $p \in \mathbb{N}^*$ and $V_{i,t} = \alpha_i + \varepsilon_{i,t}$ and $U_{i,t} = \delta_i + \omega_{i,t}$ where $\varepsilon_{i,t}$ and $\omega_{i,t}$ are *i.i.d* $(0, \sigma_\varepsilon^2)$, *i.i.d* $(0, \sigma_\omega^2)$, respectively.

First step : The hypotheses to be tested are the homogenous non-causality hypotheses, given by:

$$\text{For equation (1)} \quad H_0: \beta^k = 0 \quad \forall i \in [1, N], \forall k \in [1, p]$$

$$H_1: \beta^k \neq 0 \exists (i, k)$$

$$\text{For equation (2)} \quad H_0: \phi^k = 0 \quad \forall i \in [1, N], \forall k \in [1, p]$$

$$H_1: \phi^k \neq 0 \exists (i, k)$$

In the general case, the test statistics can be computed by the following Wald test proposed by [Hurlin and Venet \(2001\)](#)

$$F_{hnc} = \frac{(RSS_2 - RSS_1) / (Np)}{RSS_1 [SN - N(1 + p) - p]}$$

where SN denotes the total number of observations, RSS_2 stands for the restricted sum of squared residuals obtained under H_0 , whereas RSS_1 is unrestricted sum of squared residual computed from equations 4 and 5. This procedure also follows a standard Granger causality assumption where the variables entered into the system need to be time-stationary. Thus, the two variables are subjected to [Levin, Lin and Chu \(2002\)](#) and [Im, Pesaran and Shin \(IPS\) Test](#)

(1997) which are the most widely used methods for panel data unit root tests in the literature.

the null hypothesis is that there is unit root. unit root testing.

Table 3 Combined results of the panel unit root tests for FDI and Financial market indicators in their levels using Levin, Lin and Chu (2002)

| Country / Variable | FDI/GDP | Financial Market Indicators | | | | | |
|---------------------|-----------|-----------------------------|-----------|-----------|-----------|--------|----------|
| | | PCDBGDP | PCDBOGDP | LLGDP | DBACBA | SMTVT | STMK |
| All country | -4.918*** | -3.025** | -4.254*** | -7.619*** | -6.778*** | ----- | -4.62*** |
| OECD | -1.489† | -5.712*** | -5.694*** | -4.576*** | -3.769*** | -0.200 | -5.92*** |
| Non OECD | -5.882*** | -0.721 | -2.023*** | 2.612 | -5.799*** | ----- | ----- |
| Low Income | -5.486*** | 0.439 | 0.455 | -0.857 | 0.820 | ----- | ----- |
| Lower Middle Income | -3.224*** | -2.220* | -3.490*** | -5.646*** | -1.712* | -0.196 | ----- |
| Upper Middle Income | -1.920* | -0.422 | -0.865 | -6.229*** | -19.66*** | ----- | ----- |

† if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$

Table 4 Combined results of the panel unit root tests for FDI and Financial market indicators in their First difference using Levin, Lin and Chu (2002)

| Country / Variable | FDI/GDP | Financial Market Indicators | | | | | |
|---------------------|------------|-----------------------------|------------|------------|-----------|-----------|-----------|
| | | PCDBGDP | PCDBOGDP | LLGDP | DBACBA | SMTVT | STMK |
| All country | -10.337*** | -10.735*** | -10.506*** | -16.155*** | -26.28*** | ----- | -13.04*** |
| OECD | -3.224*** | -11.028*** | -10.291*** | -6.166*** | 2.43 | -3.372*** | -13.54*** |
| Non OECD | -11.302*** | -11.273*** | -8.979*** | -15.007*** | -26.60*** | ----- | ----- |
| Low Income | -8.125*** | -5.297*** | -4.773*** | -6.713*** | -6.490*** | ----- | ----- |
| Lower Middle Income | -5.986*** | -3.202*** | -4.134*** | -16.757*** | -37.03*** | -2.996** | ----- |
| Upper Middle Income | -7.273*** | -8.560*** | -7.172*** | -7.089*** | -3.824*** | ----- | ----- |

† if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$

Table 5 Combined results of the panel unit root tests for FDI and Financial market indicators in their levels using Im, Pesaran and Shin (IPS) (1997)

| Country / Variable | FDI/GDP | Financial Market Indicators | | | | | |
|---------------------|----------|-----------------------------|----------|---------|-----------|-------|---------|
| | | PCDBGDP | PCDBOGDP | LLGDP | DBACBA | SMTVT | STMK |
| All country | -2.213* | 4.273 | 3.639 | 0.346 | 3.082 | ----- | -0.047 |
| OECD | -0.607 | -0.524 | -1.061 | -0.329 | 1.014 | 3.474 | -1.964* |
| Non OECD | -2.916** | 2.975 | 3.180 | 1.547 | 1.889 | ----- | ----- |
| Low Income | -2.928** | 2.310 | 2.236 | 1.153 | 2.937 | ----- | ----- |
| Lower Middle Income | -1.849* | -0.317 | -1.034 | -2.346* | 0.195 | 1.761 | ----- |
| Upper Middle Income | -0.538 | -0.150 | 0.022 | 0.044 | -5.626*** | ----- | ----- |

† if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$

Table 6 Combined results of the panel unit root tests for FDI and Financial market indicators in their First difference using Im, Pesaran and Shin (IPS) (1997)

| Country / Variable | FDI/GDP | Financial Market Indicators | | | | | |
|---------------------|-----------|-----------------------------|-----------|-----------|-----------|---------|-----------|
| | | PCDBGDP | PCDBOGDP | LLGDP | DBACBA | SMTVT | STMK |
| All country | -8.068*** | -4.929*** | -4.904*** | -6.032*** | -6.912*** | ----- | -5.703*** |
| OECD | -2.710** | -6.557*** | -5.945*** | -3.428*** | 2.388 | -1.800* | -6.075*** |
| Non OECD | -8.711*** | -5.540*** | -4.465*** | -5.755*** | -6.850*** | ----- | ----- |
| Low Income | -6.231*** | -2.454** | -2.418** | -2.127* | -3.105** | ----- | ----- |
| Lower Middle Income | -4.646*** | -2.115* | -2.748** | -5.191*** | -9.490*** | -1.301† | ----- |
| Upper Middle Income | -4.890*** | -4.358*** | -3.392*** | -3.323*** | -1.481† | ----- | ----- |

† if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$

Given these results, I ought to use stationary first difference level variables for conducting the

Granger causality analysis. The causality relationships between two variables are subject to

investigation. I computed the panel data VAR (equation 1,2) with the usual FE estimator, the *Fhnc* statistics are reported in [Table 7](#) and [Table 8](#).

Table 7. Granger causality analysis FDI to Financial market

| Category | FDI> PCDBGDP | FDI> PCDBOGDP | FDI> LLGDP | FDI> DBACBA | FDI> SMTVT | FDI> STMK |
|---------------------|-----------------|------------------|---------------|----------------|---------------|--------------|
| All country | 4.64* | 4.16* | 2.77† | 1.25 | ----- | 1.76 |
| OECD | 4.05* | 3.10‡ | 0.23 | 0.90 | 0.38 | 1.33 |
| Non OECD | 3.96* | 4.06* | 3.90* | 3.25‡ | ----- | ----- |
| Low Income | 3.52† | 4.35* | 3.62† | 3.72‡ | ----- | ----- |
| Lower Middle Income | 4.13* | 0.16 | 1.36 | 3.66‡ | 0.72 | ----- |
| Upper Middle Income | 0.03 | 0.07 | 0.00 | 0.87 | ----- | ----- |

† if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$

Table 8.reverse Granger causality Financial market to FDI

| Category | PCDBGDP > FDI | PCDBOGDP > FDI | LLGDP > FDI | DBACBA > FDI | SMTVT > FDI | STMK > FDI |
|---------------------|------------------|-------------------|----------------|-----------------|----------------|---------------|
| All country | 0.00 | 0.03 | 0.15 | 1.24 | ----- | 2.94† |
| OECD | 0.01 | 0.00 | 0.04 | 2.14 | 3.17‡ | 4.27* |
| Non OECD | 1.04 | 1.15 | 0.00 | 1.96 | ----- | ----- |
| Low Income | 1.47 | 1.37 | 0.52 | 0.47 | ----- | ----- |
| Lower Middle Income | 3.41‡ | 3.29‡ | 0.04 | 5.81* | 4.09* | ----- |
| Upper Middle Income | 0.01 | 0.00 | 0.42 | 0.06 | ----- | ----- |

† if $p < 0.10$, * if $p < 0.05$; ** if $p < 0.01$; *** if $p < 0.001$

To investigate the contemporaneous relationships between FDI and Financial market development indicators, we fitted the conventional panel data models. First, For all countries , $FDI = f (Fin)$, We selected the estimator fixed or random effects using two diagnostic statistics: Hausman (H) test statistics and Lagrange Multiplier (LM), The results are given in [Table 9](#).

The results are given in Table 8 and 9 Collectively, all models revealed a reasonable overall fit. The interpretation is based on the latter specified models. For the All Countries, OECD Countries , Non OECD Countries, low income countries, and Lower Middle Income there are a positive significant coefficient of banking sector indicators . Implies that countries with high levels of financial market development attract more FDI.

For OECD and lower middle income countries, a positive significant coefficient of FDI is computed implying that FDI is positively correlated with the degree to which capital raising.

Table(8) Contemporaneous relationships between FDI and Financial market Indicators

| Category | FDI>PCDBGDP | | | | | FDI>PCDBOGDP | | | | | FDI>LLGDP | | | | FDI>DBACBA | | | | |
|----------------------------|--------------------------|-----------------|--------------------|--------------------------------|--|--------------------------|-----------------|--------------------|--------------------------------|--|-------------------------|----------------|--------------------|--------------------------------|------------------|----------------------------------|------------------|------------------|--------------------------------|
| | Diagnostic tests | Cons | Coef | R ² | | Diagnostic tests | Cons | Coef | R ² | | Diagnostic tests | Cons | Coef | R ² | Diagnostic tests | Cons | Coef | R ² | |
| All Countries | H: 131.25*** LM: 0.84 | 0.370 0.0123 | 9.62*** 5.73*** | W: 0.65 B : 0.86 O: 0.76 | | H: 99.91*** LM: 0.20 | 0.354 0.0128 | 8.78*** 5.35*** | W: 0.72 B : 0.95 O: 0.91 | | H: 49.29*** LM: 0.62 | 0.191 0.011 | 4.66*** 6.70*** | W: 0.64 B : 0.83 O: 0.83 | | H: 159.60*** LM: 5.56* | 0.080 0.011 | 1.95† 6.45*** | W: 0.66 B : 0.87 O: 0.86 |
| OECD Countries | H: 20.88*** LM: 0.00 | 0.318 0.038 | 3.75*** 4.47*** | W: 0.74 B : 0.96 O: 0.94 | | H: 16.22*** LM: 0.07 | 0.297 0.039 | 3.31** 4.04*** | W: 0.65 B : 0.88 O: 0.76 | | H: 7.29* LM: 0.77 | 0.149 0.022 | 1.66† 4.15*** | W: 0.02 B : 0.86 O: 0.83 | | H: 9.92** LM: 0.33 | 0.493 0.004 | 1.93† 2.25* | W: 0.73 B : 0.83 O: 0.83 |
| Non OECD Countries | H: 92.03*** LM: 1.58 | 0.424 0.005 | 10.44*** 3.24** | W: 0.76 B : 0.95 O: 0.88 | | H: 80.02*** LM: 0.92 | 0.427 0.005 | 10.38*** 3.24** | W: 0.87 B : 0.95 O: 0.94 | | H: 30.98*** LM: 0.88 | 0.228 0.008 | 5.04*** 5.15*** | W: 0.60 B : 0.77 O: 0.77 | | H: 119.58*** LM: 2.83† | 0.0705 0.013 | 1.69† 6.55*** | W: 0.66 B : 0.79 O: 0.78 |
| Low Income | H: 68.13*** LM: 3.51† | 0.284 0.005 | 3.62*** 4.47*** | W: 0.87 B : 0.89 O: 0.85 | | H: 65.50*** LM: 3.67† | 0.280 0.005 | 3.63*** 4.15*** | W: 0.75 B : 0.96 O: 0.96 | | H: 26.83*** LM: 0.03 | 0.145 0.009 | 1.85† 3.59*** | W: 0.73 B : 0.94 O: 0.94 | | H: 46.74*** LM: 0.38 | 0.0118 0.0233 | 2.17* 5.88*** | W: 0.68 B : 0.88 O: 0.87 |
| Lower Middle Income | H: 35.42*** LM: 0.85 | 0.432 0.0001 | 6.13*** 1.67† | W: 0.77 B : 0.95 O: 0.88 | | H: 30.91*** LM: 0.57 | 0.426 0.005 | 5.98*** 2.16* | W: 0.77 B : 0.95 O: 0.95 | | H: 1.60 LM: 3.00† | 0.344 0.003 | 4.78*** 1.69† | W: 0.76 B : 0.87 O: 0.86 | | H: 228.76*** LM: 5.65* | 0.164 0.008 | 2.15* 3.09** | W: 0.76 B : 0.93 O: 0.93 |

H = Hausman test : LM = Lagrange Multiplier : W = within : B= Between : O = Overall
† if p < 0.10, * if p < 0.05; ** if p < 0.01; *** if p < 0.001

Table(9) Contemporaneous relationships reverse causality between FDI and Financial market Indicators

| Category | PCDBGDP > FDI | | | | PCDBOGDP > FDI | | | | DBACBA > FDI | | | | SMTVT > FDI | | | | | | |
|----------------------------|---------------------|----------------|----------------|--------------------------------|------------------|---------------------|----------------|----------------|--------------------------------|------|---------------------|----------------|------------------|--------------------------------|------|----------------------|---------------|---------------|--------------------------------|
| | Diagnostic tests | Cons | Coef | R ² | Diagnostic tests | Cons | Coef | R ² | Diagnostic tests | Cons | Coef | R ² | Diagnostic tests | Cons | Coef | R ² | | | |
| Lower Middle Income | H: 2.06 LM: 2.00 | 0.081 0.003 | 1.85† 1.68† | W: 0.09 B : 0.01 O: 0.08 | | H: 2.16 LM: 1.91 | 0.078 0.003 | 1.82† 1.70† | W: .093 B : 0.02 O: 0.08 | | H: 1.75 LM: 1.81 | 0.136 0.002 | 2.41* 1.29 | W: 0.11 B : 0.01 O: 0.09 | | H: 1.86 LM: 3.08† | .018 0.003 | 1.78† 1.10 | W: 0.09 B : 0.31 O: 0.08 |

H = Hausman test : LM = Lagrange Multiplier : W = within : B= Between : O = Overall
† if p < 0.10, * if p < 0.05; ** if p < 0.01; *** if p < 0.001

4.DISCUSSION

Our findings can be summarized in the following way. First for banking sector development indicators we found that for all paper sample, financial market development levels Granger cause inward FDI flows, and by studying the reverse causality between Financial market development indicators and FDI inflow we found no Granger causality relation except for lower Middle Income countries. The interpretations of this result is that FDI goes to countries with good institutions and fundamentals, helping develop the domestic financial system

Second, for liquidity of the stock markets indicators we found no Granger causality relation which implies that the liquidity of stock markets does not Granger cause inward FDI inflows. That results are true for the aggregate level data used in the current study for all countries. At the other extreme we found significant direction of causality from FDI to liquidity of stock markets among lower middle income countries. There are two interpretations of this results. First, FDI can be positively correlated with the number of firms in capital markets, since foreign investors might want to finance part of their investment with external capital or might want to recover their investment by selling equity in capital markets. Second, given that foreign investors partly invest through purchasing existing equity, the liquidity of stock markets will likely rise. Thus, the value traded domestically, the value traded internationally, or both might increase, depending on where these purchases take place. In sum, FDI can Granger cause stock market development.

List Countries in the samples: Austria, Canada, Switzerland, Czech Republic, Germany, Denmark, Spain, Finland, United Kingdom, Greece, Hungary, Iceland, Italy, New Zealand, Benin, Burkina Faso, Central African Republic, Côte d'Ivoire, Ethiopia, Kyrgyz Republic, Cambodia, Gambia, Mozambique, Niger, Nigeria, Papua New Guinea, Senegal, Sierra Leone, Togo, Tanzania, Zambia, Haiti, Vietnam, Argentina, Belize, Brazil, Chile, Costa Rica, Croatia, Jamaica, Kazakhstan, Lithuania, Latvia, Malaysia, Panama, Poland, Uruguay, South Africa

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