FDI-GROWTH RELATIONSHIP:
IS FINANCIAL DEEPENING A PRE-CONDITION
"EMPIRICAL EVIDENCE FOR EGYPT"

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Prepared for

EcoMod **C**onference, **H**ong **K**ong

June 28-June 30,
2006

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FDI-Growth Relationship: Is Financial Deepening a Pre-condition "Empirical Evidence for Egypt"

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Abstract:

In an attempt to investigate the relationship between foreign direct investment and economic growth in Egypt, financial development was hypothesized as a leading channel through which the FDI positive spillovers accelerate growth rate. A simultaneous equations model (SEM) was specified using quarterly data within period (1993-2005). The estimated model evidenced a unidirectional causality from economic growth towards FDI. However, the reverse equations traced the indirect impact of the FDI on economic growth through its dualistic influence on both the financial sector as well as domestic investment. Thus, further financial liberalization is highly recommended if and only if the planned institutional and regulatory reforms are politically supported.

Keywords: *Foreign direct investment, economic growth, financial sector.*

* Views expressed in this paper are those of the author and should not be necessarily attributed to any other organization the author is affiliated to.

"*Economic evolution is a continuity of cause and effect. It is a scheme of blindly cumulative causation, in which there is no trend, no final term, no consummation…, a theory of the process of consecutive change, realized to be self-continuing or self-propagating and to have no final term", Veblen (1919, pp.36-37).*

1. Introduction:

Foreign Direct Investment (FDI) has been a subject of major concern especially for developing economies. It is believed that bridging the gap in technology between foreign country and the host country is the *main effect of FDI*[1], which in turn improves the productivity and growth of the host country, Moosa (2002). However, the volume and the type of FDI inflows as well as the degree of its impact on economic growth are argued to depend on the *absorptive capacity*[2] of the host country, Grima (2003).

As a result extensive literature has examined the relationship between foreign direct investment and economic growth whether in developed or developing countries. Most of them showed that FDI growth and GDP growth tends to granger cause each other, however, the direction of causality depends on the recipient economy's structure "market size, technological capabilities, degree of macroeconomic stability and trade policy". Few studies has emphasized the role of the financial institution, and argued that the lack of development of local financial market can limit the economy's ability to take advantage of potential FDI spillovers.

For instance, Borensztein, De Gregorio, and Lee (1998) argue that FDI has a positive growth-effect when the country has a highly educated workforce that allows it to exploit FDI spillovers. Blomstrom, Lipsey and Zejan (1994) argued that FDI has a positive growth-effect when the country is sufficiently rich. Alfaro, Chandra, Kalemli-Ozcan, and Sayek (2001)[3] find that FDI promotes economic growth in economies with sufficiently developed financial markets. The later highlight the role of financial development in accelerating the FDI spillovers, thus, maximizing the economic growth. This

[1] This impact can be found via many channels but mainly by increasing the degree of competition in host-country markets, incorporating new inputs and foreign technologies in the production function of the host country, thus augmenting its level of knowledge.

[2] At the macro level, the analysis of the absorptive capacity is done by examining the recipient economy's trade regime, legislation, political stability, human resources, institutional and financial absorptive capacity, balance of payments constraints, and the size of the domestic market for the goods produced via FDI, for more details see Durham (2004).

[3] They stress on the importance of the financial market as a crucial variable for FDI spillovers: ❶spillovers are restricted to only costless improvements in the organization of the workforce; ❷lack of financial markets can constrain potential entrepreneurs particularly when the arrival of an entirely new technology brings with it the tap not just domestic markets but export markets; ❸the potential of FDI to create backward linkages, in the absence of well developed financial markets, is severely impeded.

predominant view is that the increased availability of financial instruments and institutions reduces transaction and information costs in an economy helping economic agents to hedge, trade and pool risk which in turn raise investment and economic growth. Many economists showed that financial development itself exerts a strong positive effect on economic growth.

For developing countries, empirical research showed that there is a positive but weak relationship between FDI as a share of GDP and gross fixed capital formation (UNCTAD, 2003a:77). The overall empirical evidence seems to suggest that although FDI may affect growth, growth itself is also a crucial determinant of FDI.

Despite that both economic theory and recent empirical evidence suggest that FDI has a beneficial impact on developing host countries, recent work points to some potential risks:

- It can be reversed through financial transactions;
- It can be excessive owing to adverse selection and fire sales;
- Its benefits can be limited by leverage; and,
- A high share of FDI in a country's total capital inflows may reflect its institutions' weakness rather than strength.

Logistically, a passive policy which assumes that *FDI will substitute for domestic investment*[4] is unlikely to achieve its desired effects, but FDI can generate benefits if the government invests in public infrastructure and helps domestic enterprises create the domestic capabilities needed to absorb and internalize the spillovers.

Moreover, Hausmann and Arias (2000) found that while the share of FDI in total liabilities tends to be higher in countries that are safer, more promising and with better institutions and financial markets, the share of FDI in total flows is not an indication of good health "bad Cholesterol view[5]". On the contrary, countries that are riskier with less financially developed markets and weaker institutions tend to attract less capital but more of it in the form of FDI[6].

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[4] A heated debate has been explored concerning that issue, generating a common trend argued that if the competition between potential FDI is *perfect*, all the benefits from the superior FDI management skills accrue to the host economy, leaving the FDI investors with a return on their investment similar to that of the world interest rate. These gains can be categorized as follows; ❶*conventional gains* that allow a more efficient inter-temporal allocation of consumption (e.g. via consumption smoothing); ❷*intrinsic gains* associated with the superior micro-management by FDI investors. However, if the competition is *imperfect*, gains will split between FDI investors and the host country. On the other hand, Bosworth and Collins (1999) provides evidence concerning the effect of three types of capital inflows (FDI, portfolio investment and bank loans) on domestic investment for 58 developing countries and 18 emerging economies during 1978-95. They evidenced that FDI appears to bring about close to one-for-one increase in domestic investment, and the other types seems to have no effect or ambiguous.

[5] The "*bad cholesterol*" is represented by debt, especially of the short-term variety. FDI is driven by speculative considerations based on interest rate differentials and exchange rate expectations, not on long-term considerations. Its movement is often the result of moral hazard distortions such as implicit exchange rate guarantees or the willingness of governments to bailout the banking system.

[6] Razin (2003), evidenced that the share of FDI in total inflows is higher in riskier countries (measured by credit rating for sovereign debt) and those where quality corporate governance institutions are lower.

In sum, there are two broad views; *optimistic modernization* version viewed FDI as a healthy component of a liberal development strategy involving technology transfer, job creation and infrastructure improvement. *Pessimistic dependency* version argued that FDI has a corrupting, homogenizing and explorative character.

It is obvious, that ambiguity is everywhere, whether concerning the bi-directional anticipated relationship between FDI and economic growth, and the role of local financial market as a channel of impact. Thus, from my own point of view results can not be generalized, each country should be studied on case by case basis.

The paper is going to present the theoretical background concerning the relationship between foreign direct investment and economic growth, the direction of causality between both variables, why is it important to underline the financial sector development as a leading channel of transmission, channel through which FDI versus economic growth can affect each others in case of Egypt. Then, policy implications will be drawn concerning financial system development and the extent of liberalization in financial services needed to enforce boosting economic growth through FDI spillovers.

2. Literature Review:

Within the framework of the neo-classical models[7], the impact of FDI on the growth rate of output was constrained by the existence of diminishing returns in the physical capital. Solow (1956) emphasized that FDI could only exert a *level effect* on the output per capita, but not a *rate effect*, unable to alter the growth rate of output in the long run[8]. Therefore, a group of economists did consider FDI as a drive engine of growth by *mainstream economics*. As opposed to the neoclassical growth theory, the endogenous growth literature points out that, FDI can not only contribute to economic growth through capital formation and technology transfers[9], but also through the augmentation of the level of knowledge through labor training and skill acquisition[10]. In the context of the New Theory of Economic Growth, however, FDI may affect not only the *level* of output but also its *rate* of growth.

On other hand, the direction of causality between FDI and economic growth has been highly debatable issues. Some economists evidenced that FDI contributes significantly to economic growth. Wang (2002), using data from 12 Asian economies over the period of 1987-1997, found that FDI in the manufacturing sector has a significant and positive impact on economic growth. Nair-Reichert and Weinhold (2001), using a sample of 24 developing countries, find positive causal relationship running from FDI to economic

[7] According to the new growth theory, economic growth generally comes from two sources: factor accumulation and total factor productivity, Felipe (1997).
[8] Due to the principle of diminishing return, FDI can contribute to speeding up an economy's convergence to its balanced growth path but tends to have little effect on the path.
[9] See Blomstrom et al. (1996), and Borensztein et al. (1998).
[10] See de Mello (1997 & 1999).

growth. Similarly, Makki and Somwaru (2004) examine the impact of FDI on economic growth in 66 developing countries and identify FDI as a major source for stimulating domestic investment and growth.

Others showed that the causality runs from economic growth to FDI, Johansen and Juselius (1997) using a cointegrating model with a vector error correction mechanism, utilizing annual data of India over the period 1974-1996.

Moreover, Liu, Burridge and Sinclair (2002) found a bi-directional causal relationship among FDI, growth and exports in china, using a cointegrating framework of quarterly data within 1981-1997.

Obviously, there are enormous numbers of studies that has tackled the relationship between FDI and economic growth[11], in addition to those which has tested the relationship between financial development and economic growth[12]. But only few who argued that financial development can act as a precondition for "Good Cholesterol" FDI to magnify its positive impact on economic growth. Alfaro, Chanda, Sayek and Kalemli-Ozcan (2005) showed that a 1% increase in FDI generates four times more growth for countries with deeper financial markets. Hermes and Lensink (2003) showed that a more developed financial system contributes positively to the process of technological diffusion associated with FDI, thus promotes economic growth. At the micro-level, Rajan and Zingales (1998) analyze the relationship between industry-level growth performance across countries and financial development. They found that the state of financial development reduces the cost of external finance to firms, thereby promoting growth. Demirgüç-Kunt and Maksimovic (1996) argue that firms with access to more developed stock markets grow faster. Wurgler (2000) showed that even if financial development does not lead to higher levels of investment, it seems to allocate the existing investment better and hence promote economic growth. Bekaert and Harvey (2001) showed that foreign investors, enjoying improved financial diversification benefits, will drive up local equity prices permanently thereby reducing the cost of capital, which in turn leads to investment efficiency, then more economic growth. Rioja and Valev (2002),

[11] Annex (1) shows a comprehensive literature survey for the relationship between FDI and economic growth, conducted by JBIC (2002), in an attempt to answer for the following four questions: ❶Does FDI significantly affect the growth of income or productivity? ❷Does FDI "crowd-out" or "crowd-in" domestic investment? ❸Do technology and knowledge spillover occur in the domestic economy? ❹Are there any necessary pre-condition (e.g. human capital, technological or financial development)?

[12] The theoretical underpinnings of relationship between financial depth and growth can be traced back to the work of Schumpeter (1912), then, to McKinnon and Shaw (1973). More recently King and Levine (1993b) showed a strong positive link between financial development and growth, they also showed that financial development has predictive power for future growth and interpret this finding as evidence for a causal relationship that runs from financial development to growth. Moreover, Levine and Zervos (1998) found that stock market liquidity and banking development can positively predict growth, capital accumulation and productivity improvements. On other hand, a bi-directional relationship between financial development and economic growth has been first postulated by Patrick (1966), where he showed that the direction of causality goes from economic growth to financial development is "Demand Driven", and that goes from financial development to economic growth is "Supply Initiatives", which in turn stimulate the demand for more financial development. Jung (1986) evidenced that the causal direction running from financial to economic development by less developed countries but reversed in case of developed economies.

using dynamic panel generalized method of moments (GMM) techniques[13], found that financial development exerts a strong positive effect on economic growth only once it has reached a certain *size threshold*[14]. Eller, Haiss and Steiner (2005) argued that financial reform in emerging economies that normally implemented with more liberalization, usually maximize foreign direct investment in financial sector (FSFDI), which in turn increase the economic growth (g_{GDP}) via the following channels as shown in Figure (1 & 2).

Figure (1): Identified Transmission Channels between FSFDI and Economic Growth

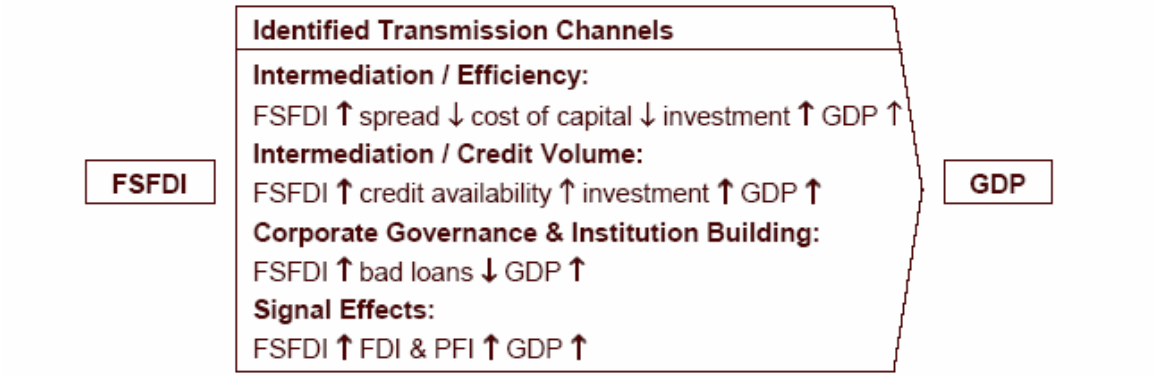
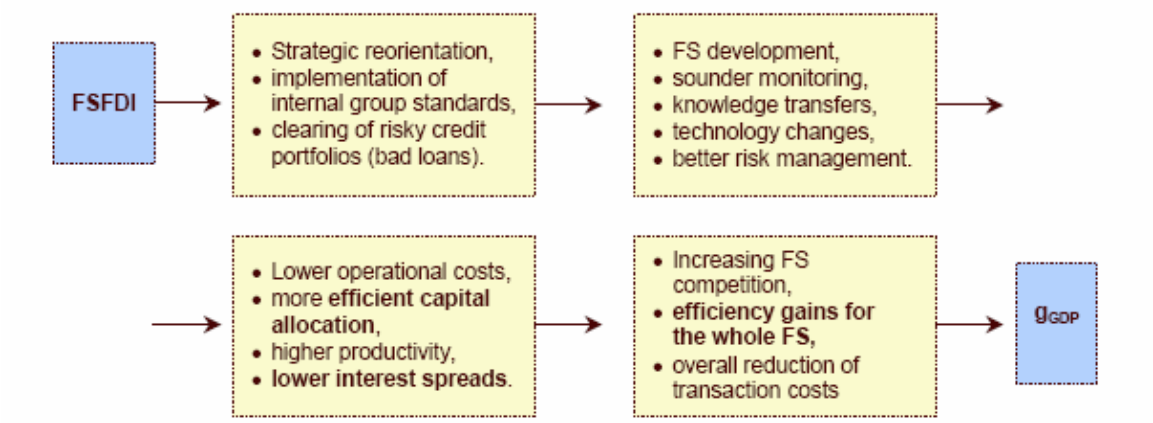


Figure (2): FSFDI-Induced Efficiency-Led Growth



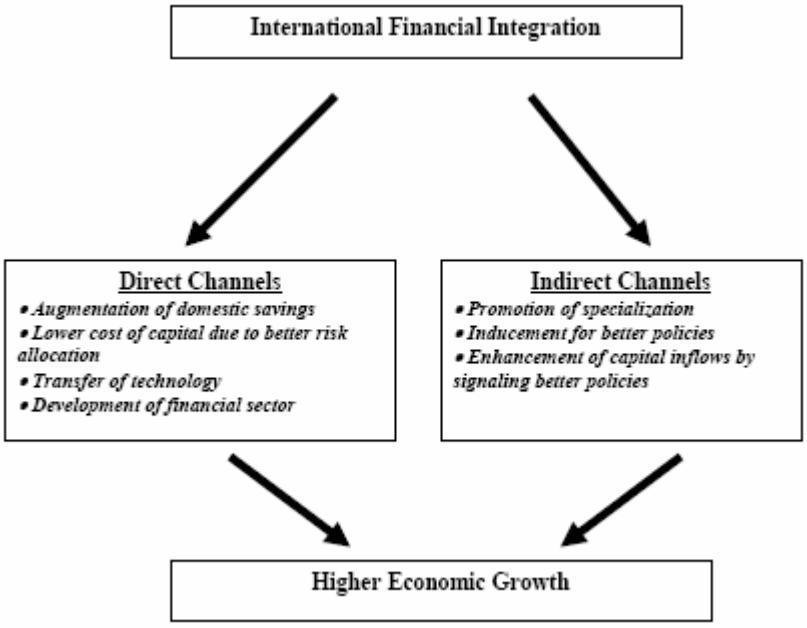
Source: Eller, Markus, Haiss, Petter and Steiner, Katharina (2005), "Foreign Direct Investment in the Financial Sector: The Engine of Growth for Central and Eastern Europe", *Europainstitut, University of Economics and Business Administration Vienna, Working paper No. 69, p.6.*

[13] This technique has been examined for 47 countries during period "1966-95", where Egypt is included as one of the countries in the middle region level of financial development (i.e. 0.12 < Private credit < 0.37).

[14] The authors define this threshold as the middle regions (those who have moderate levels of private credit that increase within range "0.15-1.00"% and grew per year within range "5.15:5.9"%), since in low regions (those who have low level of private credit that increase within range "0.02-0.25"% and grew per year within range "-1.46: -0.48"%), the effect is uncertain either negative, zero or positive effect. However, in high regions (those who have high level of private credit that increase within range "0.9-2.05"% and grew per year within range "1.4:1.9"%), the growth effect of the financial development declines once it reaches very high levels. These results are highly supported by Demetriades and Hussein (1996), who showed that financial development, can affect growth in different manners per country or time horizons. Levine et. al. (2000) showed that the positive and monotonic effect on growth declines as the level of financial development increases (diminishing returns hypothesis).

Moreover, it has been enormously evidenced that financial integration[15] moves hand-in-hand with the depth of the domestic financial system, and that the later is the only channel through which liberalization can positively affect economic growth in the long run[16].

Figure (3): Channels through which Financial Integration can raise Economic Growth:



Source: Prasad, Eswar, Rogoff, Kenneth, Wei, Shange-Jin, and Kose, M. Ayhan (2003), "Effects of Financial Globalization on Developing Countries: Some Empirical Evidence", International Monetary Fund Publishing (March), p. 24.

However, it is worthy to note that estimated financial depth does not usually represent financial development. This argument has been robustly supported by Rousseau, and Wachtel (2005)[17], where they empirically evidenced that for low income countries (income below $3000), the effect of financial deepening on economic growth is positive

[15] Liberalizing trade in financial services is estimated to increase world GNP by 0.1 percent, Verikios and Zhang (2003). However, it would be wrong to infer that these gains can be realized by a mechanical opening up of services markets, it should be preceded or parallelized by institutional reform; including enforceable property rights, commercial codes and bankruptcy rules as well as sound corporate and public governance, in addition to transparency and anticorruption measures as well as human capital development; for more details see, Findlay and Sidorenko (2005).

[16] Goldsmith (1969) found "rough parallelism" between economic growth and financial development. Francois and Schukneckt (1999), evidenced a positive relationship between growth of pet capita real GDP on the concentration ratio of financial sector (as a measure of trade openness). Matoo et.al (2001) run cross-country regression for a sample of 60 countries within period (1990-99), where Egypt was included, evidenced a robust positive and significant relationship between liberalization of financial services and economic growth. Levine (2004) reported that increasing financial deepening from the mean of the lowest quartile to the mean of the upper quartile of the distribution of domestic credit/GDP increases growth by 1 percentage point.

[17] The authors estimated their results for 84 countries using rolling regression techniques, where Egypt is included over period from 1960 to 2003.

but insignificant, however, in middle income range (from $3000 to $12000), there seems to be clear evidence of a finance growth relationship. At higher income countries, the relationship disappears.

Here in appraised the importance of defining well the "Financial Deepening", whose role might affect the relationship between FDI and economic growth. In our study, it means explicitly financial development, which is simply the extent to which domestic firms are able to realize their investment plans in case external finance from banks or stock markets is needed, as well as the degree of efficiency in allocating financial resources over investment projects at the macro-level[18].

3. Why Financial Development as a Leading Channel for Egypt: Empirical Lessons

Over period 1967—1996, Hussein (1999) investigated the relationship between financial liberalization, financial development and economic growth in Egypt, using the autoregressive distributed lag (ARDL) procedure[19]. He showed that a rise in the ratio of private credit to total credit of 1% leads to an increase in the real GDP per capita growth by 0.17% in the long run.

Moreover, Abu-Bader and Abu-Qarn (2005) examined the causal relationship between financial development and economic growth in Egypt within period (1960-2001), using four indicators of financial development[20]. The results of the cointegration and granger causality test support the finance-led growth paradigm either directly through enhancing investment efficiency or through increasing investment resources. The variance decomposition support Hussein's findings that the private credit[21] is more significant to economic growth through increasing investment efficiency than the other measures.

It is worthy to note that the investigated period covered by the referred authors, witnessed the uneven financial reform and dynamic liberalization introduced by the government in 1991, accomplished in tandem with a comprehensive regulatory reform[22]. Only, it does

[18] For more details concerning such a definition see, Hermes and Lensink (2000)

[19] For more details concerning the referred techniques see Pesaran, and Shin (1999)

[20] The four indicators are: ❶the ratio of money stock (M2) to nominal GDP; ❷the ratio of M2 minus currency to GDP; ❸the ratio of bank credit to the private sector to nominal GDP; ❹the ratio of credit issued to non-financial private firms to total domestic credit (excluding credits to banks).

[21] It explains about 35.1% of the forecasting error variance of real GDP per capita after 5 years, and about 24% after 20 years, which is the largest proportion compared to other variables.

[22] Several laws have been issued to develop the Egyptian Financial Sector; ❶ The Capital market law no. 95 of 1992 and its amendments in 1998 to reinforce the CMA's role in regulating insider trading and central depository facilities essential for the dematerialization of securities; ❷ The central depository law of 2000 to enhance the market security coping it in line with the International Organization of Securities Commission's objectives and Principles of Securities regulation; ❸ The banking law no. 97 of 1996, to permit international partners to have majority ownership of joint ventures; ❹ Anti-money laundering law no. 80 of 2002 to ensure that funding going through the banking system, whether deposits, transfers, or investment capital, would be scrutinized to ensure that they are not associated with criminal activity. As a result, Egypt has been removed from the list of non-cooperating countries and territories blacklist on

not include the Central bank's July 2003[23] towards more integration, listing the following priorities[24]:

- Reinforce the information infrastructure for creditworthiness and other decision making by banks;
- Modernize the payment system, including the introduction of real time gross settlement;
- Strengthen the corporate governance and internal rating systems of banks; and
- Privatize joint-venture banks.

Also, it does not include the dramatic innovations that have taken place in the capital market[25], the insurance sector[26] and the mortgage market[27] since 2004 cabinet reshuffle.

4. Empirical Methodology:

In order to test the importance of foreign direct investment for economic growth, and the financial development as a channel of maximizing the positive spillover in Egypt[28], we are going to specify a simultaneous equations model (SEM)[29] using quarterly data within period (1993:Q1 – 2005:Q4) as follows:

February 27, 2004; ❺ Real estate finance law no. 148 of 2001 to introduce various mechanisms for long-term mortgage financing.

[23] In the same year, the government issued law no.88, and its executive regulations were issued on March 2004, requiring commercial banks to raise their capital levels. The law is expected to indirectly result in enhancing competition in the banking sector through lowering and eliminating barriers, which limited operational flexibility, for more details concerning the main changes associated with the new banking law see Femise (2004; p.66). Moreover, the anticipated enforcement of electronic signature is expected to facilitate e-commerce and e-banking services.

[24] These priorities are highly consistent with the Central Bank's development plan in 2001-2002 annual report for its own operation, including: banks' assessment, training, implementation of e-banking and e-money, computerization of brokerage. The announced steps have been applauded based on the IMF and the World Bank assessment for Egypt in line with the global standards employed in the Financial Sector Assessment Program (FSAP) since 1999. For more details see USAID & WTO (2004).

[25] The new automated system of disclosure for Cairo and Alexandria Stock Exchange (CASE), which allows online surveillance at CASE and offline surveillance at CMA, backbones by a Settlement Guarantee Fund (SGF) to ensure timely settlement of transaction. In addition a new trading mechanism was initiated in July 2002.

[26] A new insurance law has been prepared by the Egyptian Insurance Supervisory Authority (EISA), and is currently negotiated with the government. In addition, recent measures towards a more liberalized insurance sector have been admitted by the ministerial decree of 2003, which gradually eliminates requiring insurance companies to reinsure 30% of non-life and 50% of life insurance with the Egyptian reinsurance company.

[27] In January 2004, the first private real estate finance company was established, in which IFC has 20% equity stake. In February 2004, law no. 3 was issued to amend the property registration law no. 70 of 1964, reducing the fess from 4.5% to 3%.

[28] Konan and Kim (2004) demonstrated that liberalization of trade in services through foreign investment "commercial presence – mode 3 in GATS" was responsible for the largest share in estimated welfare gains in Egypt.

[29] The model used is a modified version of that adopted by Roy and Van den Berg (2006), which has been calibrated to test the relationship between FDI and economic growth rate of US, extrapolated from the neo-classical production function "Cobb-Douglas form" spirit. The difference between ours and the referred

$$Gr\,(Y) = a_0 + a_1\,(I/Y) + a_2\,(FDI/Y) + a_3\,Gr\,(P_C) + a_4\,Gr\,(T) + a_5\,(F) + t \quad (1)$$

$$(FDI/Y) = b_0 + b_1\,Gr\,(Y) + b_2\,Gr\,(T) + b_3\,Gr\,(P_C) - b_4\,(\pi) + t \quad (1.1)$$

$$(I/Y) = c_0 + c_1\,Gr\,(Y/N) + c_2\,(FDI/Y) + c_3\,Gr\,(P_C) + t \quad (1.2)$$

$$Gr\,(P_C) = d_0 + d_1\,Gr\,(Y) + d_2\,(FDI/Y) + d_3\,Gr\,(L_L) + d_4\,Gr\,(M_C) + t \quad (1.3)$$

Equation (1) is the main model, the rest of the three equations are explanatory for the exogenous variables of the former. Where Gr (Y) is the *economic growth rate*[30], (I/Y)[31] is the *domestic investment as a percentage of GDP* to approximate the growth rate of domestic capital, (FDI/Y) is *the foreign direct investment*[32] *as a percentage of GDP* to approximate the growth rate of foreign capital, (P_C) is the *private credit financed by money bank deposits and other financial institutions as a percentage to GDP*[33] to approximate the financial development level[34], (F) is the variable which examine the role of FDI on growth through financial market, where FDI and the proxy of the financial sector is interacted *to test for the significance of financial markets in enhancing the positive externalities associated with FDI flows*[35], and (T) is *the openness to international*

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model is that we include "P_C" the private credit and "T" trade openness rather than labor and exports, which are existed in the initial model, in addition to the interaction term. Consequently, some changes have been implemented for the explanatory equations, for instance "π" inflation rate rather than the growth rate of hourly wage index, "T" trade openness rather than per capita income, have been included in equation (1.1.), and all the variables used in equation (1.3); "L_L" Liquid liability of the financial system and "M_C" Market Capitalization. These models are always used to overcome the alleged biases which are anticipated to result in case of variables with bi-directional relationship, for more details see Greene (2003).

[30] The data sourced from the quarterly bulletin published by the Ministry of Planning. It is worthy to note that the available at the referred source was only since 2000, the time series for the period before 2000 have been segmented by the author using the same methodology identified by the Ministry.

[31] Same procedures and source of economic growth rate are used.

[32] The data sourced from the Central Bank of Egypt. However, it is worthy to note that the quarterly data was only given started from year 1999, the time series for the period before 1999 have been segmented based on the annual data published by the Central Bank of Egypt, using same methodology adopted by the Ministry of Planning.

[33] Levine et.al (2000) showed that this variable can act as a beneficial proxy for financial development especially in case of bank-based financial system economy. Also, Durham (2004) who studied the impact of FDI on growth in a broad panel of countries, where some Arab countries are included (Algeria, Egypt, Jordan, and Tunisia), using total stock market capitalization relative to GDP as a proxy for financial development, showed that only Jordan scores high enough on stock market capitalization to potentially benefit from FDI. However, Hermes and Lensink (2003) found that domestic credit provided by banking system should exceed 12 percent of GDP for host country to be able to absorb the potential technology diffusion of FDI. Similarly, Sadik and Bolbol (2003) through their investigation of four different measures of private sector, using Arab countries panel data, found that FDI will start benefiting the host economy only when the banking sector credit to the private sector is above 13 percent of GDP. In case of Egypt, our estimates for the data sourced from the World Bank Financial Structure Database http://www.worldbank.org/research/projects/finstructure/database.htm, for the banking credit to private sector as a percentage of GDP was 31.67% on average, and after including other financial institutions, it reaches 36.7% on average within the investigated period.

[34] There are many other variables used as proxies for financial development; ❶ratio of broad money to GDP (M2/GDP); ❷ratio of currency to narrow definition of money; ❸commercial-central bank assets (the ratio of commercial bank assets divided by commercial bank plus central bank assets).

[35] To ensure that the interaction term does not proxy for FDI or the level of development of financial markets, both of the latter variables were included in the regression independently.

trade[36], using the ratio of the sum of exports plus imports to total output (GDP). Moreover, a time trend, t, has been added in each equation to capture the effect of deterministic trend in level variables.

In addition, (Y/N) denotes the *real per capita GDP*[37] as a proxy for the cost of human capital "labor", and (π) the *inflation rate*[38] measured as the percentage change in GDP deflator is used as a proxy for macroeconomic stability. (L_L) is the *liquid liabilities of the financial system*[39] measured as currency plus demand and interest-bearing liabilities of banks and non-financial intermediaries divided by GDP, and (M_C) is the *market capitalization*[40] which captures the relative size of the stock market, measured as the average value of listed domestic shares on domestic exchanges in a year as a share of the size of the economy (GDP).

First; Unit root tests[41] of the null hypothesis of non-stationarity are conducted using *Augmented Dickey-Fuller (ADF) test*[42] to determine the order of integration of the variables. Robustness of results will be checked by reporting *Kwiatkowski, Phillips, Schmidt and Shin (1992) KPSS tes*t[43].

Second; the model will be estimated using three stage least squares (3SLS)[44]. The first and the second equation will be estimated twice: first using Gr (T) trade openness as a proxy for the degree of liberalization and second using Gr (X) *Egyptian total exports as a percentage of GDP*[45].

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[36] This variable is estimated by the authors based on the data published by the Ministry of Trade & Industry. It is worthy to note that there are other indicators used to measure trade openness: ❶foreign trade shares measured in relevance to purchasing power parity exchanges rates (see Alcalá & Ciccone, 2004) and adjusted by the country's population size (see Neuhaus, 2005). ❷The Volume of Trade restrictions which are measured either by the ratio of imports duties to total import volume (import duties) or the percentage of imports that are subject to a non-tariff trade restrictions (non-tariff trade barriers).

[37] Data is sourced from the quarterly bulletin of the Ministry of Planning.

[38] Data is sourced from the quarterly bulletin of the Central Bank of Egypt.

[39] Data is sourced from the World Bank Financial Structure Database.

[40] Data is sourced from the World Bank Financial Structure Database.

[41] The power of unit root tests diminish as deterministic terms are added to the test regressions.

[42] The ADF test that has been initially calibrated by Dickey and Fuller (1981) is asymptotically equivalent but may differ substantially in finite samples due to the different ways in which it corrects for serial correlation in the test regression. For more details see Blough (1992).

[43] The hypotheses to be tested are $H_0 : \sigma^2_\varepsilon = 0 \Rightarrow y_t \sim I(0)$; $H_1 : \sigma^2_\varepsilon > 0 \Rightarrow y_t \sim I(1)$ in the following model: $y_t = \beta' D_t + \mu_t + u_t$, $u_t \sim I(0)$; $\mu_t = \mu_{t-1} + \varepsilon_t$, $\varepsilon_t \sim WN(0, \sigma 2_\varepsilon)$; D_t = deterministic components.

[44] The three stage least squares is a combination of multivariate regression and two stage least squares, obtained by estimating a set of non-linear (or linear) equations with cross-equation constraints imposed, but with a diagonal covariance matrix of the disturbances across equations. The parameter estimates thus obtained are used to form a consistent estimate of the covariance matrix of the disturbances, which is then used as a weighting matrix when the model is re-estimated to obtain new values of the parameters. For further details on the linear three squares estimator see Zellner and Theil (1962).

[45] This variable has to be examined putting into consideration Abou Statit (2005) findings, based on cointegration analysis for the relationship between exports and economic growth for Egypt within period (1977-2003). The author evidenced an export-led growth paradigm for Egypt, despite of its dependency on raw materials exports.

5. Empirical Results:

First; Both ADF and KPSS tests as shown in table (1) confirm the presence of a Unit Root in the following series: (I/Y), (FDI/Y), (F) and (π). However, all other variables are stationary according to both tests. Then, all the non-stationery variables in level were first differenced before being included in the model.

Table (1): Stationarity Test Results:

Variables	ADF Test	KPSS Test
Gr (Y)	-5.289	0.203
(I/Y)	-3.738	0.536
(FDI/Y)	-3.256	0.348
Gr (P_C)	-4.556	0.252
Gr (T)	-4.637	0.196
(F)	-2.726	0.326
Gr (Y/N)	-5.272	0.487
(π)	-2.113	0.509
Gr (L_L)	-4.909	0.242
Gr (M_C)	-5.386	0.199

N.P.: The critical value for the ADF test with constant and trend at the 90 percent level is -4.135, while that for KPSS test with constant and trend at the 90 percent level is 0.284.

Second; the model is estimated using the three stage least squares (3SLS) as shown below:

Equation (1):

Gr (Y) = 0.012 + 1.02 (I/Y) + 1.53 (FDI/Y) + 1.35 Gr (P_C) + 0.067 Gr (T)[46] + 0.552 (F) + 0.41E-03t

(5.51)* (3.39)* (0.17) (0.75) (2.68)* (2.05)** (0.35)

Equation (1.1):

(FDI/Y) = 0.27 + 0.84 Gr (Y) + 0.71 Gr (T)[47] + 1.46 Gr (P_C) – 0.52 (π) – 0.12E-02t

(3.05)* (2.75)* (0.34) (0.59) (-3.56)* (0.43)

Equation (1.2):

(I/Y) = -0.12 + 1.36 Gr (Y/N) + 0.99 (FDI/Y) + 0.23 Gr (P_C) + 0.37E-03t

(-4.07) (5.25)** (3.66)* (4.17)* (0.28)

[46] In case of using exports Gr(X), the sensitivity of economic growth increased, since the coefficient is 0.251 and significant at 95 percentage level.

[47] In case of using exports in extent of trade openness variable, the coefficient becomes significant at 90 percentage level, these results are highly supported by EID (2006), where she investigated the direction of causality in short and long run between USFDI in Egypt and Egyptian Exports to the US market. She found a positive bidirectional relationship.

Equation (1.3):

$$Gr(P_C) = 0.08 + 1.76\ Gr(Y) + 0.81\ (FDI/Y) + 0.31\ Gr(L_L) + 1.25\ Gr(M_C) + 0.34E\text{-}03t$$
$$(2.45)\quad (3.76)^{**}\quad (2.13)^{**}\quad (5.09)^{*}\quad (4.72)^{**}\quad (0.23)$$

Based on the estimates of equation (1), it is obvious that the coefficients of both variables (FDI/Y) and Gr (P_C) are positive but insignificant, however, that of the interaction term is positive and significant at 95 percent level, implying the importance of having a well-developed financial sector as *a mean to an end and not an end in itself*[48]. Moreover, the coefficients of both the domestic investment and trade openness are positive and significant at 90 percent level. However, the coefficient of the former is greater highlighting its importance for the economic growth.

Equation (1.1) results indicate a *unidirectional causal relationship*[49] between economic growth and FDI, where the direction of causality goes from the former, whose coefficient is positive and significant at 90 percent level. On the other side, the coefficient of the inflation is *negative*[50] and significant at 90 percent level. The other two variables "openness and Financial market" were found positive but insignificant.

In equation (1.2), all coefficients are positive and significant at 90 percent level except that of the per-capita income which registers the greater impact at 95 percent level. In addition, the sign of the coefficient of the (FDI/Y) implies a *crowding-in effect* between foreign direct investment and domestic investment; it appears to bring about *close to a one-for-one*[51] increase in domestic investment. Moreover, the sign and the significance of the coefficient of financial development with regard to the results of equation (1) imply that "*the overall level of financial development makes domestic investment more responsive to output growth – accelerator enhancing effect*"[52].

In equation (1.3), all coefficients are positive and significant. The coefficient of the economic growth in addition to the reverse impact of financial development (in case of excluding the interaction term from equation 1), indicates a bi-directional causal relationship between both variables, with greater impact for the former. On the other

[48] For more details concerning the rational beyond using the interaction term see Alfaro et. al (2001). Similarly, the hypothesis that both FDI and the interaction between FDI and financial market are zero is rejected. Using the Alfaro et. al. methodology, equation (1) has been estimated without the interaction term, the coefficient of the (FDI/Y) was still positive and insignificant, however, that of the Gr(P_C) was positive and significant at 90 percent level.

[49] Such evidence is logic since the majority of FDI in Egypt is Greenfield investments, whose final impact depends on the behavior of domestic investors.

[50] Such a negative impact is highly supported by Hassan (2003), in his examination to the important factors that contribute to FDI and economic growth in the world compared to 8 selected MENA countries "Egypt, Iran, Jordan, Saudi Arabia, Morocco, Tunisia, Turkey and Yemen" with total set of 95 countries within period (1980-2001).

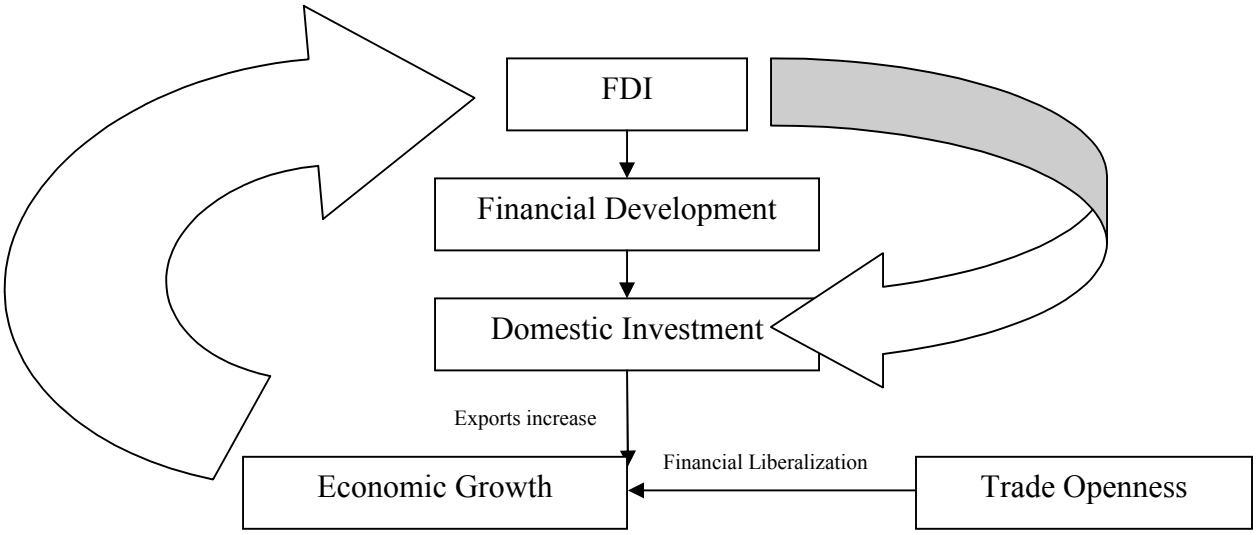
[51] Results are quite similar to that of Loungani and Razin (2001).

[52] Similar evidence has been argued by Ndikumana (2003), where he showed that the level of financial development not the type of financial system only matters for domestic investment in the long run. His regression results show a positive and statistically significant correlation between domestic investment and all indicators of financial development.

side, the sign of the (FDI/Y) coefficient indicates a unidirectional causal relationship directed from FDI to financial development. Then, the two other variables implicitly indicate the extent to which the chosen variable – representing financial development – captures the impact of both sectors; the banking sector and the capital market in Egypt. Moreover, it is worthy to note that the financial development variable is highly sensitive to (M_C) greater than to (L_L), since the former identify the level credit worthiness on which basis the firms gain more access to banking sector.

6. Conclusion and Policy Implications:

In sum, it is obvious from our estimated simultaneous equation model, which is justified by the significant reverse relationships between the dependent and explanatory variables in the first equation, that foreign direct investment directly affects domestic investment and indirectly through its impact on financial development. Then the later accelerate the output growth impact of both domestic and foreign investment, leading to an increase in economic growth which in turn positively affects the foreign direct investment. This is analyzed comprehensively in the following figure:



Consequently, the drawn figures implies that in case of *confirming the continuation of the planned institution and regulatory reform*[53], financial liberalization[54] is expected to increase financial depth in case of Egypt, which in turn positively accelerate economic growth leading to FDI encouragement, that crowd-in domestic investment on one side

[53] For instance, if increased entry into financial sectors is not accompanied by adequate prudential supervision and full competition, the result may be insider lending and poor investment decision.
[54] Although the financial sector in Egypt is being liberalized and reinforced, no specific export financing or insurance schemes are available, Femise (2004; p. 112)

and expand investment in financial sector raising competition in the sector. As a result, funds will be reallocated in more efficient manner, improving social infrastructure.

However, supportive polices are highly recommended to be implemented: First; technical and financial assistance should be directed towards the following operational priorities:

- Continued analytical work in-house on a broad front including standard trade diagnostics, investment climate surveys, trade facilitation diagnostics, and sector strategy papers in key trade-related services sectors such as finance, transport and telecommunications;
- Strengthening of regional analytical work and institutions to support in-country and in-region capacity for trade-related work; and
- Strengthening training of trade-related staff in governments to be able to better define and implement the agenda of reform.

Second, domestic political support is needed to deliver improved market access and accelerate the enforcement of new issued laws, amended ones and those under construction.

Third, more effort should be exerted to direct the FDI inflows towards infrastructure within a comprehensive national agenda (i.e. telecommunication, logistics "transport, distribution", energy network, water and waste network, financial services system, and research and development).

"*The more FDI a developing country secures, the more it needs to service it and keep the system going", Tandon (2004).*

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Annex 1: FDI – Growth: Literature Survey

Authors (year)	Data/coverage	Questions addressed	Estimation technique	Major findings
Agosin and Mayer (2000)	UNCTAD. 32 developing countries over the 1970-96 period.	(2)	Three investment equations (one for each region) on pooled data using SUR (seemingly unrelated regression).	In Asia, there has been substantial crowding in of investment, while crowding out has been the norm in Latin America. In Africa, FDI has increased overall investment one-to-one. The positive impacts of FDI on domestic investment are not assured.
Alfaro, Chanda, Kalemil-Ozcan and Sayek (2001)	Net FDI inflows from IMF, *IFS*. Three samples (39-41 countries). Data averages over the 1981-97 period.	(1), (4)	Cross-country OLS (ordinary least squares) and IV (instrumental variables) regressions.	FDI contributes significantly to economic growth, but the positive effects do not materialise unless local financial markets are sufficiently developed.
Bende-Nabende, Ford and Slater (2000)	WB data on FDI inflows as a percentage of GDP. Five ASEAN countries over the 1970-94 period.	(1), (3)	System of equations estimated using 3SLS (three-stage least squares). A specific equation is estimated for each endogenous dependent variable in the growth regression (six channel equations). The model is estimated separately for each of the five countries.	FDI has a positive and significant coefficient in the growth equation for three out of five countries. The negative sign of FDI in Singapore and Thailand is attributed to the specific characteristics of capital formation in these countries. Authors claim that FDI boosts growth in countries with a fair balance of domestic private capital and FDI. Furthermore, FDI is positively associated with positive spillover effects that lead to human resource development, transfer of technology, expansion of trade and learning by doing. The spillover process is positively related to the level of economic development.
Blomström, Lipsey and Zejan (1994)	FDI inflows from IMF. 78 developing countries over the 1960-85 period.	(1)	Granger causality.	FDI Granger-causes economic growth.
Borensztein, de Gregorio and Lee (1998)	Gross FDI outflows from OECD countries. 69 countries, two periods: 1970-79 and 1980-89.	(1), (2), (4)	Two-equation (one for each decade) system estimated using SUR and IV.	FDI and growth: FDI exerts a positive effect on growth only when a minimum level of human capital exists. FDI and domestic investment: the complementarity between foreign and domestic investment is not robust to different specifications.

Annex 1: FDI – Growth: Literature Survey (continued)

Authors (year)	Data/coverage	Questions addressed	Estimation technique	Major findings
Carkovic and Levine (2001)	Gross FDI inflows from new WB database and IMF. Period: 1960-95.	(1), (2), (4)	Dynamic panel data estimator (GMM).	The impact of the exogenous component of FDI on GDP growth is not significantly different from zero, nor is FDI strongly linked to productivity (TFP) growth. These results are robust after controlling for the level of human capital and financial development.
De Mello (1999)	Net FDI inflows from IMF's *Balance of Payments Statistics*. 16 OECD and 17 non-OECD countries over the 1970-90 period.	(1), (4)	Stationarity and cointegration analysis plus dynamic panel estimation (fixed-effect and mean group estimators).	The FDI-growth nexus is not robust in all countries. Where the positive relationship holds, it depends on country-specific factors. FDI enhances output growth through higher productivity in OECD countries, and through capital accumulation in non-OECD countries. The growth impact of FDI tends to be lower in technological leaders and higher in laggards.
Hermes and Lensink (2000)	WB data on FDI as a percentage of GDP. 67 least developed countries, average of 1970-95 data.	(1), (4)	Cross-country OLS with stability tests.	FDI enhance growth once a country has reached a given threshold of human capital and financial market development. For most developing countries (30 of 67, almost all countries in sub-Saharan Africa), this threshold has yet to be attained.
Lensink and Morrissey (2001)	WB data on FDI/GDP over the 1975-98 period in 115 countries.	(1) (4)	OLS and IV for cross-section using the 1975-98 average values. Fixed-effect panel using three ten-year periods.	FDI exerts a robust positive impact on growth. This result is not conditional on the level of human capital. Volatility of FDI has a negative impact on growth, but it probably captures the growth-retarding effects of unobserved variables such as political uncertainty.
McMillan (1999)	IMF and UNCTAD. 1970-96.	(2)	Dynamic panel data on investment equations.	FDI is a strong catalyst for domestic investment in developing countries. Lagged FDI has a stronger effect on private domestic investment than does lagged private domestic investment itself.
Reisen and Soto (2001)	WB data on net FDI inflows. 44 non-OECD countries over the 1986-97 period.	(1)	Dynamic panel data.	Different types of capital inflows have different impacts on growth. FDI and portfolio equity flows show a positive and significant correlation with growth; debt inflows show a negative correlation.

Annex 1: FDI – Growth: Literature Survey (continued)

Authors (year)	Data/coverage	Questions addressed	Estimation technique	Major findings
UNCTAD (2000)	UNCTAD data on FDI inflows. Five-year periods from 1970 to 1995 for more than 100 LDCs.	(1)	Granger causality and OLS	Results from analysis of time-series characteristics of the explanatory variables show that: (1) FDI is always positively related to contemporaneous growth in per capita income; correlation with past growth rates is not robust; and (2) FDI is not related to past investment, while it is correlated with past trade. Growth regressions including lagged FDI and investment and other controls over individual and pooled periods have poor explanatory power. Lagged FDI is found to exert a positive but not statistically significant impact on growth. It turns out to be significant only when interacted with the level of schooling.
Usha Nair and Weinhold (2001)	WB data on net FDI inflows as percentage of GDP for 243 developing countries over the 1971-95 period.	(1), (4)	Non-dynamic fixed-effect panel, first-differenced instrumented panel and mixed (fixed and random) effect model (heterogeneous panel)	Standard fixed-effects estimation points to a significant and positive impact of FDI growth on GDP growth. Results from the dynamic model under the assumption of heterogeneity reinforce this claim and show how the indirect impact of FDI on growth works differently across countries.
Xu (2000)	Share of MNE affiliates' value added in host-country GDP. 40 countries over the 1966-94 period. Data from the US Direct Investment Abroad Benchmark Survey.	(1), (4)	Instrumental variables panel data estimation with country- and time-specific effects.	FDI boosts total factor productivity growth. Strong evidence of technology diffusion from US affiliates to developed countries, but only weak evidence for developing countries.
Zhang (2001)	Inward FDI stock from WB and UNCTAD/TNC for 11 Latin American and East Asian countries. Period: 1970-95.	(1), (4)	Stationarity and cointegration.	FDI is found to promote growth in five out of 11 countries, four of which are Asian. The impact of FDI on growth is country-specific and tends to be positive where policies favouring free trade and education are adopted to encourage export-oriented FDI.

Source: JBIC Institute (2002), "Foreign Direct Investment and Development: Where Do we Stand?" Japan Bank for International Cooperation , June, pp. 37-39.