Sector Level Analysis of FDI-Growth Nexus: A Case Study of Pakistan

SOMIA IRAM and MUHAMMAD NISHAT

I. INTRODUCTION

The most stable nature of Foreign Direct Investment (FDI) among the all capital inflows has provoked its importance especially in case of capital scarce developing economies. Economic growth is the indicator of the health of economy and capital is one of the prerequisites to maintain and enhance the momentum of growth. In the current scenario, growth of Pakistan economy has gone considerable changes and regarding these changes, Pakistan has adopted different policies concerning different sectors of economy.

Currently, the services sector share to GDP has improved considerably against the dismal performance of manufacturing sector over the last ten years. In order to enhance the economic growth effectively and efficiently, government has taken several steps to attract foreign capital. One of these measures is the adaptation of highly liberalised policies to attract most needed financial capital along with its spillovers. Even after suffering from obnoxious economic ailments, Pakistan in current decade is able to attract massive capital inflow perhaps highest in the history. However, the massive inflow of FDI is directed towards services sector.

Even after conducting a handful empirical research, the impact of FDI on growth is countervailing. Some early studies [Singer (1950); Griffin (1970)] recognised the negative impact of FDI on economic growth in developing countries. Aitkin and Harrison's (1999) in case of Venezuela, Jhon and Athanasios (2004) in case of US and Western European countries, and Katerina, *et al.* (2004) in case of transition countries found that FDI do not significantly affect economic growth. However, Blomstrom, *et al.* (1992), Caves (1974) and Kokko (1994) showed a positive effect of FDI inflows on economic growth. Findlay (1978) highlighted the positive effect through technology spillovers, which has the strongest potential to enhance economic growth in the host country.

Borensztein, *et al.* (1998), Xu (2000) and Alfaro, *et al.* (2003) suggested the positive impact of FDI in presence of the sound educational level, development of local financial markets, and other necessary conditions to absorb spillovers. Blomstrom and Kokko (2003) explained that positive effects of FDI are not automatic but the local conditions influence firms' adoption of foreign technologies and skills. Borensztein (1995, 1998) explained the growth enhancing effect of FDI through the channel of

Somia Iram <somia_irum@yahoo.com> is MPhil Student at Applied Economics Research Centre (AERC), University of Karachi, Karachi. Muhammad Nishat <mnishat@iba.edu.pk> is Professor of Business and Finance at Institute of Business Administration (IBA), Karachi.

technology. Borensztein (1995, 1998) emphasised the presence of at least threshold level of initial human capital for the diffusion of technology spillovers. Romar (1986, 1990), Helpman and Grossman (1990) emphasised the importance of knowledge capital, coming through research and development in the long run economic growth.

According to Chudnovsky and Lopez (1998), FDI may boost economic growth through the improvement of manufacturing export and improved balance of payment. However, in the long run, due to the control of foreigners over the local production resources, profit outflow deteriorate the balance of payment condition. In case of developing countries, FDI mostly work through the channel of externalities. However, there is no definite conclusion related to spillovers of FDI. Benefits and cost associated with FDI is not disseminated homogenously across all countries and even across all sectors. Therefore, different countries, regions and even sectors react differently to same FDI inflow.

Alfardo (2003) examined the effect of FDI on growth in the primary, manufacturing and services sectors. The author suggested that total FDI exerts an ambiguous effect on economic growth. FDI in the primary sector tends to have a negative effect on growth. However, investment in manufacturing tends to have a positive effect on growth. Moreover, evidence from the service sector is ambiguous. Zaman, *et al.* (2008) investigated the factors effecting FDI in case of Pakistan using data over the period of 1971–2003, and found that variables used for market size and trade balance are significant, whereas, variable used for service sector has negative effect on the growth of economy. Importance of FDI can not be denied, especially in case of developing economies. FDI not only allows overcoming the financing and liquidity constraints, but also provide new capital, allowing additional investment in both human and physical capital, which can be very beneficial for developing countries.

To the best of my knowledge, in case of Pakistan only few studies have investigated FDI-growth nexus. FDI-growth nexus is not being investigated with respect to services sector and manufacturing sector. Overall, the impact of FDI on growth can be misleading. This study is first attempt to investigate the impact of manufacturing sector and services sector FDI on growth in the presence of macroeconomic instability and privatisation regime in case of Pakistan.

The main objective of the study is to investigate the impact of services and manufacturing Foreign Direct Investment (FDI) on economic growth over period of 1972 to 2008. We decompose the FDI into services sector and manufacturing sector and examine their impact on economic growth. To further evaluate the role of FDI on growth in presence of privatisation policy, interaction terms of services as well as manufacturing FDI with privatisation dummy is introduced.

This paper is organised in to following sections: Section II regards the data, model and methodology; Section III contains results and conclusion, whereas, last section includes conclusion and policy recommendation.

II. MODEL SPECIFICATION AND DATA SOURCES

To estimate the relationship between FDI and economic growth at sector level, we estimate the following model:

$$Y_t = \delta_o + \lambda_1 MFDI_t + \delta_2 SFDI_t + \delta_3 INV_t + \delta_4 INF_t + \delta_5 MFDI_t * DUM_t$$
$$+ \delta_6 SFDI_t * DUM_t + \mu \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Where *Y* represents the real GDP per capita, MFDI and SPFDI represent FDI in manufacturing and service sectors respectively, INV represents public sector investment and INF represents Inflation rate proxied for macroeconomic instability and *t* represents time period (1972–2008). The Dummy of privatisation is also included in this model due to its significance

Data used in this paper is obtained from the electronic database of International Financial Statistics (IFS), Annual report state bank of Pakistan. The FDI of selective sectors is chosen for the sample because of the unavailability of data in case of Pakistan. Data on services and manufacturing FDI is obtained from foreign liabilities and assets and investment in Pakistan (Various Issues).

Before estimating the long run and short run results, ADF and PP unit root tests in order to check the unit root of all variables. We use the robust technique Autoregressive Distributed Lag model (ARDL) introduced by Pesaran, Pesaran, and Smith (1998), Pesaran and Shin (1999) and Pesaran, *et al.* (2001).

The error correction version of ARDL model is given below:

$$\Delta Y_t = \alpha + \alpha_1 \sum_{i=1}^{p} \Delta Y_{t-i} + \alpha_2 \sum_{i=0}^{p} \Delta MFDI_{t-i} + \alpha_3 \sum_{i=0}^{p} \Delta SINV_{t-i} + \alpha_4 \sum_{i=0}^{p} \Delta INV_{t-i} +$$

$$\alpha_5 \sum_{i=0}^{p} \Delta INF_{t-i} + \lambda_1 Y_{t-1} + \lambda_2 MFDI_{t-1} + \lambda_3 SFDI_{t-1}$$

$$+ \lambda_4 INV_{t-1} + + \lambda_5 INF_{t-1} + \mu_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Where β_0 component and μ trend is the error term. The term with summation sign represent the short run dynamics. While, the second part of the equation represent the long run dynamics.

In order to estimate the long run coefficients, the following long-run model is estimated:

$$Yt = \alpha + \beta_1 \sum_{i=1}^{p} Y_{t-i} + \beta_2 \sum_{i=0}^{p} MFDI_{t-1} + \beta_3 \sum_{i=0}^{p} SFDI_{t-i} + \beta_4 \sum_{i=0}^{p} INV_{t-i}$$

$$+ \beta_5 \sum_{i=0}^{p} INF_{t-i} + \mu_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

After finding the long run relation we use the following equation to estimate the short run coefficients:

$$\Delta Y_t = \alpha + \beta_1 \sum_{i=1}^{p} \Delta Y_{t-i} + \beta_2 \sum_{i=0}^{p} \Delta MFDI_{t-i} + \beta_3 \sum_{i=1}^{p} \Delta SFDI_{t-i}$$

$$+ \beta_3 \sum_{i=1}^{p} \Delta INV_{t-i} + \beta_1 \sum_{i=1}^{p} \Delta INF_{t-i} + \eta EC_{t-i} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

η is the error correction term in the model indicates the pace of adjustment reverse to long.

III. ESTIMATION RESULTS

III.1. Testing of the Unit Root Hypothesis

We applied ADF test and PP unit root test in order to check the unit root of all variables. The results suggest that all variables are having mix order of integration. A summary of the results of ADF and PP unit root tests is given in Table 1.

Table 1

Unit Root Results

Variables	ADF (Drift and Trend)		P- P (Drift and Trend)	
	Level	1st diff	Level	1st diff
Y	−2.08***	−3.45**	−2.19***	−3.08**
MFDI	−0.98	−2.92*	−1.15	−3.12*
SFDI	−1.08	−2.98**	−1.44	−3.17**
INV	−2.89**	−3.76*	−2.78***	−3.94**
INF	−1.79	−4.58*	−2.01	−4.35*

Notes: *(**) Shows significance at 1 percent (5 percent) level.

From the results of unit root tests, it is apparent that the variables have different order of integration. In the next step, we proceed to apply the ARDL approach.

III.2. Autoregressive Distributed Lag Model (ARDL) Lag Selection

The first step of bound testing approach is to select the order of the lag length. On the basis of lag length, we found the F-statistics value. The estimated F-value selected on the basis of lag length is given below:

Table 2

Lag Length Selection and Bound Testing for Co-integration

Lags Order	AIC	HQ	SBC	F-test Statistics
1	12.27	11.45	12.54	2.34
2	12.04*	11.21	12.37*	4.95**

Short-run Diagnostic Test-Statistics

Serial Correlation LM, F = 0.78 (0.19)   Hetroscdasicity Test F= 1.92 (0.21)
Ramsey RESET Test F= 0.65 (0.35)   Normality J-B Value = 25.03 (0.07)

* Significant at 5 percent level according to Pesaran, *et al.* (2001) and Narayan (2005).[1]

We found that the optimum lag length is two, which is selected by using Akaiake Information Criterion (AIC) as shown in Table 2. At lag length two, the F-statistics is significant at 5 percent level. The significant F-value indicates that there is co integration among the variables. After finding a long run relationship we estimated the long run and short run parameters. The results of long run coefficients are given in Table 3.

[1] Critical values are obtained from Pesaran, *et al.* (2001) and Narayan (2005).

Table 3

The Long run Results

Dependent Variable Y	ARDL (1, 1,2, 2, 2)
Variables	**Coefficients**
MFDI	0.28 (0.02)
SFDI	0.74 (0.03)
INF	−0.45 (0.06)
INV	0.18 (0.04)
MFDI*DUM	0.28 (0.08)
SFDI*DUM	0.47 (0.04)
R2 = 0.97	
Adjusted R2 = 0.95	
F-statistics = 35.04 (0.00)	
Dh Stat = 1.97	

The values in the parenthesis are the probability values.

The results of the Table 3 show that all variables are significant and have expected signs. The positive coefficient of FDI shows that real GDP per capita is largely depends on inward flow of FDI. However, it is apparent from the results that FDI inflow contributes to economic growth mainly when the economy practices the privatisation. The results show that FDI inflow in the service sector accelerates economic growth by a high speed. FDI inflow in the manufacturing sector significantly affects economic growth. However, the magnitude of SFDI is much greater than MFDI. Moreover, it is apparent from the results that FDI inflow contributes to economic growth mainly when the economy practices the privatisation. The reason behind this result is that privatisation policy in most countries has proved to be investor's friendly. Privatisation reduces the management bottlenecks. It enhances the efficiency by introducing new and advance management practices. The coefficient of private investment (excluding foreign investment) is positive and significant at 5 percent level of significance, which is depicting the positive effect of private sector participation.

In case of Pakistan both services as well as manufacturing sectors are contributing but services sector is contributing much more than manufacturing sector. In the current decade major surge of FDI was towards the telecommunication sector that has strengthened the infrastructure as well as increased job potential and in return caused increased contribution to economic growth.

The error correction version of ARDL is presented in Table 4.

Table 4

Error Correction Representation of ARDL Model

Dependent Variable ΔY	ARDL (1, 1,2, 2, 2)
Variables	**Coefficients**
ΔMFDI	0.16 (0.17)
ΔSFDI	0.36 (0.13)
ΔINV	0.42 (0.07)
ΔINF	0.24 (0.18)
EC(-1)	−0.42 (0.09)
Adjusted R^2 = 0.89	F-statistics = 20.03 (0.01)

The values in the parenthesis are the probability values.

The sign of estimated lagged error correction term ECt-1 is negative and significant at 9 percent level of significance. There is 42 percent speed of adjustment towards long run equilibrium. In the short run, MFDI and SFDI do not significantly affect economic growth. In the case of developing countries FDI is important because of its spillover affects that are not instantaneous rather time consuming that's why FDI do not contributes the growth in the short run but it takes time to influence the growth patterns of economy. The short run results show that inflation and investment significantly affect economic growth. The sign of inflation is positive in the short run. This is due to the fact that an increase in the prices increases the profit margin of the producers in the short run. However, in the long run due to decreased real income of the general masses, economic growth hampers.

IV. CONCLUSION AND POLICY RECOMMENDATIONS

This study empirically investigated the impact of services and manufacturing Foreign Direct Investment (FDI) on economic growth in the presence of macroeconomic instability and privatisation over period of 1972 to 2008. In order to find out the order of integration, we used ADF and PP unit root tests. Autoregressive distributed lag model (ARDL) is used for the robustness of long-run relationship between the variables.

We found that in the long run MFDI and SFDI significantly affect economic growth. However, in the short run, both MFDI and SFDI do not significantly affect economic growth. Moreover, the magnitude of services sector FDI is greater than manufacturing sector FDI. Whereas, the variable of macroeconomic instability significantly affect economic growth both in long run as well as in short run.

The coefficient of inflation is positive in the short run. This is due to the fact that an increase in the prices increases the profit margin of the producers in the short run. However, in the long run due to decreased real income of the general masses, it hampers economic growth. Private investment is also helping to boost the economic growth. The results also show that in the presence of privatisation policy, FDI contribute to economic growth. However, this contribution is more in services sector as compared to manufacturing sector.

As regards the policy recommendation, proper attention should be paid proper to strengthen manufacturing sector that is real sector of economy. In case of services sector government should attract FDI toward infrastructure base services sector so that it may help to contribute the growth of manufacturing sector in the long run. FDI should be encouraged to amplify economic growth, to amplify benefit of innovative technology to curtail poverty and unemployment, to lift up living standards but at the mean time proper attention should also be paid to save sovereignty and profit outflow of the country. In order to enhance growth, policies should device to attract export oriented FDI instead of domestic demand oriented.

Appendix

Data Description and Sources

S.N.	Variables	Expected Sign in Literature	Data Sources and Description
1.	Market Growth (GDP)	+	GDP growth is used as dependent variable. Data is obtained from SBP annual report.
2.	Investment (INV)	+/–	Investment is proxied as GFCF. Data is obtained from hand book on statistics on Pakistan economy (Various issues).
3.	Macroeconomic Instability (INF)	–	Macroeconomic instability is proxied by inflation variable. Data on inflation is taken from WDI (2008) electronic database.
4.	Manufacturing FDI (MFDI)	+	Manufacturing FDI is calculated by adding the FDI coming towards all the manufacturing units. *Source:* Foreign liabilities and assets and investment in Pakistan (Various Issues).
5.	Services FDI (SFDI)	–	Services FDI is including FDI in infrastructure based services sector. *Source:* Foreign liabilities and assets and investment in Pakistan (Various Issues).
6.	Privatisation (Dummy)	+	Privatisation is taken as dummy .1 for years privatisation was taken, 0 otherwise.

REFERENCES

Aitken, B. and A. E. Harrison (1999) Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela. *American Economic Review* 89:3, 605–618.

Alfaro, L. (2003) Foreign Direct Investment and Growth: Does the Sector Matter? Harvard Business School, Boston, MA. (Mimeographed).

Atique, Z., M. H. Ahmad, and U. Azhar (2004) The Impact of FDI on Economic Growth under Foreign Trade Regimes: A Case Study of Pakistan. *The Pakistan Development Review* 43:4.

Bengoa, M. and B. Sanchez-Robles (2003) Foreign Direct Investment, Economic Freedom and Growth: New Evidence from Latin America. *European Journal of Political Economy* 19:3, 529–543.

Blomström, M. and A. Kokko (2003) Human Capital and Inward FDI. The European Institute of Japanese Studies. (EIJS Working Paper Series. No. 167).

Blomström, M., R. E. Lipsey, and M. Zejan (1994) What Explains Developing Country Growth? (NBER Working Paper No. 4132).

Borensztein, E., J. De Gregorio, and J. W. Lee (1998) How Does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics* 1:45, 115–135.

Caves, R. (1974) Multinational Firms, Competition and Productivity in Host-Country Markets. *Economica* 41:162, 176–93.

Enderwick, P. and M. Akoorie (1996) *Fast Forward: New Zealand Business in World Markets.* Longman Paul, Auckland.

Findlay, R. (1978) Relative Backwardness, Direct Foreign Investment and the Transfer of Technology: A Simple Dynamic Model. *Quarterly Journal of Economics* 62:1, 1–16.

Griffin, K. B. (1970) Foreign Capital, Domestic Savings and Development. *Oxford Bulletin of Economics and Statistics* 32, 99–112.

Grossman, G. and E. Helpman (1990) *Innovation and Growth in the Global Economy.* Cambridge, MA.: MIT Press.

Hunya, G. (1998) Integration of CEEC Manufacturing into the European Corporate Structures by Direct Investments. (MOSTMOCT, No. 1).

Hunya, G. (1998) Relationship between FDI, Privatisation and Structural Change in CEECS. Paper prepared for the Conference on Privatisation, Corporate Governance and the Emergence of Markets in Central Eastern Europe, FIT, Berlin, May 22-23. (Mimeographed).

Katherina, L., P. Jhon, and V. Athanasios (2004) *Foreign Direct Investment and Economic Growth in Transition Economies*. 1, 97–110.

Khan, A. H. (1997) FDI in Pakistan: Policies and Trends. *The Pakistan Development Review* 36:4, 959–985.

Kokko, A. (1994) Technology, Market Characteristics and Spillovers. *Journal of Development Economics* 43, 279–93.

Ozturk, I. and H. Kalyoncu (2007) Foreign Direct Investment and Growth: An Emprical Investigation Based on Cross Country Comparison. *Econimia Internazionale* 60:1.

Pesaran, H. M. (1997) The Role of Economic Theory in Modeling the Long-run. *Economic Journal* 107, 178–191.

Pesaran, H. M. and Y. Shin (1995) Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis. Department of Economics, University of Cambridge. (DAE Working Paper Series, No. 9514).

Pesaran, H. M. and Y. Shin (1998) An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis. In S. Storm (ed.) *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium.* Cambridge University Press.

Pesaran, M. H., Y. Shin, and R. Smith (1996) Testing for the Existence of a Long-run Relationship. Department of Applied Economics, University of Cambridge. (DAE Working Papers 9622).

Pesaran, M. H., Y. Shin, and R. Smith (2001) Bound Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics* 16, 289–326.

Romer, P. (1986) Increasing Returns and Long-run Growth. *Journal of Political Economy* 94, 1002–1037.

Singer, H. W. (1950) The Distribution of Gains between Investing and Borrowing Countries. *American Economic Review* 40, 473–485.

UNCTAD (Various Issues) *World Investment Report.* New York: UNCTAD.

Xu, B. (2000) Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth. *Journal of Development Economics* 62, 477–493.