The Dynamic of Financial Development, Imports, Foreign Direct Investment and Economic Growth: Cointegration and Causality Analysis in Pakistan

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The Dynamic of Financial Development, Imports, Foreign Direct Investment and Economic Growth: Cointegration and Causality Analysis in Pakistan

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Abstract: The paper investigates the effect of financial development, imports and foreign direct investment (FDI) on output in case of Pakistan over the period of 1990-2008 using quarterly data set. ARDL bounds testing approach is applied to examine the long run relationship and the direction of causality is investigated by using VECM framework.

Our findings confirm the existence of cointegration, showing long run relation between financial development, imports, FDI and real GDP. Financial development, imports and FDI have positive and significant effect on the output of the country. Causality analysis reveals bidirectional relation among the variables but strong causality is also running from financial development, economic growth and FDI to real imports.

Keyword: Financial Development, Imports, FDI, Economic Growth

I. Introduction

Developed financial sector, imports and foreign direct investment (FDI) – all these can play a contributory role in economic growth of a country. Over the last few decades, though many studies were conducted on the export-growth relationship and/or FDI-growth relationship based on a specific country or a group of countries, research on import-growth relationship and financial development-growth relationship is limited. It is also rare in the literature that any single paper looks for the effects of all these three variables on economic growth at a time. Our current paper aims at filling out this gap, and thus we believe it will add knowledge to the existing literature.

A developed financial sector allows credit-constrained entrepreneurs to start their own business. As a result, the number of varieties of intermediate goods increases, causing an increase in demand for final goods. The financial sector's efficiency eases the cost constraint for fulfilling this increased demand. An economy with more developed financial markets and institutions tend to have significantly higher economic growth rate and sizeable increase of FDI. Hence, development of financial institutions is pre-requisite to obtain positive spillovers from FDI (Shahbaz and Rahman 2010).

Imports also play a crucial role in the link between exports and economic growth, and ignoring imports from the analysis can yield misleading results (Uddin, 2004). A large share of imports of developing countries consists of capital and intermediate goods which enter into domestic production; so imports expand the country's production possibilities. This suggests that imports facilitate the export sector to use more advanced and sophisticated technologies which ultimately lead to higher export activities and growth. A decline in imports of factors of production causes a decline in output (Hentschel, 1992 and Lee, 2010).

In addition, FDI plays a vital and budding role in worldwide business. A firm can approach new markets and marketing channels, cheaper production facilities, have access to new technology, products, skills and financing through FDI and resources. FDI also provides a host country or firm with investment funds, capital, processes, organizational

technologies and management skills. The main advantage of FDI and resources through their externalities is the adoption of new (foreign) technology, which can happen via licensing agreements, commencement, competition for resources, employee training, and knowledge, and export spillovers (Shahbaz and Rahman, 2010).

However, the effects of FDI are not always favourable for the recipient countries, and a simple policy with regard to FDI is unlikely to be optimal. It is confirmed by both firm-level and aggregate-level studies (Rahman and Shahbaz, 2010). FDI might have adverse effects on the recipient economy through the substantial reverse flow of profit transfer, remittance of resources via transfer pricing and grant of substantial concessions from the host country. Therefore, its real effect on economic growth of the recipient country still remains a controversial issue.

The individual case study on specific countries to examine the effects of financial development, imports and FDI on growth is crucial as the stage of development, the complexity of the financial environments and economic history are different for different countries. The results obtained from case studies can be used to better shape of the institutional structure and to better exploit the benefits of financial development, imports and FDI. However, to the best of our knowledge, such a country specific case study is limited. Hence this paper considers Pakistan as a case study. The reason for selecting Pakistan is that it is the medium sized and the second largest economy in south Asia. Though India is the largest economy in South Asia, we do not focus on it just because India has drawn significant attention from researchers (Love and Chandra, 2005; Lee, 2010). Other countries in the region are relatively small. Also Pakistan's foreign trade regime is now much more liberalized.

Pakistan has a historical trade deficit. That means the country's imports are always greater than exports. So imports play a dominating role in Pakistan's external sector. Pakistan energetically seeks overseas inflows of capital and resources. Three distinct government investment liberalization initiatives began in 1992, 1997 and 2000 have progressively opened Pakistan to foreign direct investment (FDI), offering broad arrays

of incentives to attract new foreign capital inflows. The government also initiated a successful, broad-based macroeconomic reforms and structural adjustment programs during 1999-2002. In spite of this pro-investment stance, foreign direct investment remains relatively modest (Shahbaz and Rahman 2010).

The main objective of present study is to investigate the effects of financial development, imports and FDI on economic growth in a transition economy like Pakistan in the long run. Causal relationship among the variables will also be examined. The contribution of the paper is that econometric findings of the project will enrich the existing literature with reference to Pakistan by employing ARDL bounds testing approach and Vector Error Correction Model (VECM). The research outcome will also help the policy makers of Pakistan to adopt the appropriate policies with regard to financial development, imports and FDI, and provide a scope for policy debate.

The paper is organized as follows. Section II provides an analytical framework and a review of literature on financial development, imports, FDI and economic growth; section III explains modeling, methodological framework, and data; section IV presents and discusses the research outcomes, and finally section V concludes the paper with policy implications.

II. Analytical Framework and A Review of Literature

Financial sector that is more effective at pooling the savings of individuals may have profound effect on economic growth. Besides, direct effect of savings on capital accumulation, better savings mobilization can improve resource allocation and boost technological innovation [Cotton and Ramachandran (2001); Maureen, (2001); Omran and Bolbol (2003); Ahmad, Alam and Butt, (2004); Alfro et al, (2004)]. Several country specific studies carried out to investigate the results of spillover effects of FDI on economic growth. Positive impacts from spillovers have been found, for example, Mexico [Blomstrom and Wolff (1994)], Uruguay [Kokko, Tansini and Zejan (1996)], Indonesia (Sjoholm, 1999); Thailand (Kohpaiboon, 2003) and in Pakistan [Ahmad, Alam

and Butt, (2004), and Aqeel and Nishat, (2005)] but no spillover is traced in studies for Morocco (Haddad and Harrison, 1993) and Venezuela (Aitken, Hanson and Harrison, 1997, Aitken, and Harrison 1999). These conflicting results may underline the essential role of recipient country characteristics necessary to permit FDI's positive and significant contribution to economic growth through spillovers. Alfro and Rodriguez-Clare, (2006) argue that the lack of development of local financial markets could limit the economy's ability to take advantage of potential FDI's spillovers. If the entrepreneurship allows greater assimilation and adoption of best technological practices made available by FDI, then the absence of well-developed financial markets limits the potential positive FDI externalities [Hermes and Lensink (2003); Omran and Bolbol (2003)].

In literature, there are plenty of cross-sectional studies, which provide evidence about importance of well functioning of financial markets to obtain positive spillovers from FDI to stimulate economic growth. The more developed the domestic financial system is the better; it will be able to mobilize savings, and screen and monitor investment projects, which will contribute to speed economic growth rate (Hermes and Lensink, 2003; and Omran and Bolbol, 2003). However, Hsu and Wu (2009) argue that cross-country evidence cannot support the growth effect of FDI through financial development. It may be inferred that economies with better-developed financial markets are not essential to obtain benefit more from FDI to accelerate their economic growth.

Some time series studies show the important role of financial sector development in developing strong positive and significant effect of FDI to economic growth. For instance, Ljunwal and Li (2007) investigate the relation between FDI and economic growth with role of financial sector in China. Time series data set starting from 1986 up to 2003 has been used over 28 Chinese provinces. Their empirical findings seem support the view by Hermes and Lensink (2003) and Alfaro et al. (2004). Ang (2008) examines relationship between FDI and economic growth under the role financial sector for Malaysian economy. Time series data from 1965 up to 2004 have been used. The results indicate that financial development and FDI exert positive impact on economic growth in long span of time. Causality evidence shows that economic growth tends to cause FDI in

the long-run, but no feedback relationship is found. Ang (2009) investigates role of financial development on FDI and economic growth for the case of Thailand. The empirical findings reveal that financial development stimulates economic development but FDI have negative impact on output expansion. It is also inferred that an increased level of financial development enables Thailand's economy to obtain more from FDI. Similarly, it seems to suggest that the impact of FDI on output growth can be improved through development of financial markets.

Choong and Lim (2009) discuss endogenous growth model to analyse the role of financial development and FDI in improving Malaysia's economic growth. They examine a dynamic endogenous growth function that includes the impact of FDI and financial sector development with locational determinants by employing cointegration framework for the sample period spanning from 1970 up to 2001. Their findings infer that FDI, labour, investment, and government expenditure play a crucial role in promoting local economic activity and hence prosperity. The interaction between FDI and financial development has positive and significant impact on economic growth of Malaysia.

From the theoretical point of view the relationship between imports and productivity is not an easy one. Increased imports of consumer products induce domestic import-substituting firms to innovate, update and restructure themselves in order to compete with foreign rivals. Hence domestic productive efficiency is increased by imports. Under perfect competition in the neoclassical model, when trade barriers are removed and the market is opened up to imports, factor used in an industry is reduced in the short run, but in the long run, the industry becomes more competitive and efficient, and expands its investments in new technology, resulting in more outputs. Import of capital and intermediate goods enables domestic firms to diversify and specialize which further enhances domestic productivity. Under imperfect competition, an import-substituting domestic market shrinks with the increase of imports, causing investment and productivity to fall. Therefore, the effects of imports on productivity depend on both market structure and institutional factors (Kim et al., 2007).

Iscan (1998) argues that trade contributes to economic growth by increasing the variety of intermediate inputs and by increasing the size of the market. Exports earn valuable foreign exchange which is essential for importing the much needed capital and intermediate inputs (Damooei and Tavakoli, 2006 quoted from Asufa-Adjaya and Chakraborty, 1999). Therefore, the importance of imports, particularly when imports constitute capital and intermediate inputs, needs to draw more attention as a source of economic growth compared to exports.

Quoting from Iscan (1998), Damooei and Tavakoli (2006) report a positive correlation between the imported inputs and productivity growth. This was evidenced in a study of 47 sectors in the manufacturing industry in Mexico over the period from 1973 through 1990. Blomstrom and Wolf (1994) also find the similar results. They mention that productivity of domestic firms in Mexico increased more rapidly. However, a study conducted by Blomstrom, Lipsey and Zegen (1994) on 78 less developed countries for the period of 1960-1985 gives the opposite results. They find no evidence of the positive relationship between imports of machinery and transport equipment and economic growth.

Lawrence and Weinstein (1999) conducted a panel data study on Japanese manufacturing industries. They find that imports contributed to total factor productivity (TFP) growth mainly through completion effects. Lawrence (1999) also notes that import competition demonstrated TFP growth in US industries. Another study on the Brazilian manufacturing sector by Muendler (2004) reveals that the competitive effects of imports on competition are large though the effect of intermediate imports on labour productivity is small (Kim et al. 2007).

Import-led growth effect is also observed in Thangavelu and Rajaguru (2004) for India, Indonesia, Malaysia, the Philippines, Singapore and Taiwan. Similar findings are also noted in Awokuse (2007) for Poland and in Awokuse (2008) for some South American countries. On the other hand, Awokuse (2007) finds the opposite results for the Czech

Republic. These mixed results imply that the real effects of imports largely depend on country specific characteristics.

FDI has several positive effects which, together with the direct capital financing, may contribute to economic growth. Such effects are productivity gains, technology transfers, introduction of new process, managerial skills and know-how to the domestic market, employee training, international production networks and access to markets. Firms in host countries are benefited from accelerated diffusion of new technology by the foreign firms' introduction of new products or processes to the domestic market (Alfaro et al, 2004). Quoting Findlay (1978) and Wang (1990), Hsu and Wu (2009) argue that the increase of technical progress in the host country is proportional to the extent to which the domestic country opens up to FDI. The spillover effect of FDI is also empirically supported by some other studies such as Cave (1974), De Gregorio (1992) and Kokko et al (1996).

Economists accept that FDI can serve to increase competition thereby making markets more proficient (Shahbaz and Rahman, 2010). FDI is said to promote economic growth because it can last promotion in technology transfer through enhanced production, efficiency, improvement in the quality of production factors, generate an inflow of investment funds to the balance of payment, all of which will lead to increase in exports, increases in savings and investments and ultimately faster growth of output and employment (Khor 2000). Finally, investment in new sectors in host country can spur the growth of new industry and new products [Ramachandran and Shah, (1999), Cotton and Ramachandran, (2001) and Naveed and Shabeer, (2006)]. Besides, as inflow of foreign capital and resource creates backward and forward linkages and multinationals corporations (MNCs) contribute technical help to promote the domestic firms, it is expected that, the level of technology and productivity (through both labor and capital) of domestic producers will increase [Lim and Sidall (1997), Zhang (2001), Ahmad et al. (2004)].

A study on 11 sub-Saharan countries reveals that FDI has a significant and positive influence on economic growth in Ivory Coast, Niger, Kenya and Togo. A 1 percent change in FDI granger causes a change of GDP growth rate in a wide range from 1.1 percent in Togo to 5.7 percent in Niger (Most and Van Den Berg, 1996 cited in Damooei and Tavakoli, 2006). Sun (1998) notes that 1 percent increase in FDI induced to a 0.05 percent growth of GDP. Teboul and Mouslier (2001) and De Mello (1999) also find a positive effect of FDI on economic growth on two separate studies of 17 LDCs and 6 LDCs, respectively.

However, the positive effect of FDI with regard to growth for the recipient country is not always certain. For example, applying panel data Haddad and Harrsion (1993) reject the growth enhancing-spillover hypothesis for Morocco. Looking at plant-level data in Venezuela over 4,000 plants from 1976 to 1989 Aitken and Harrsion (1999) use annual census data and find no evidence of a positive technology spillover effect from FDI. Borensztein, De Gregorio and Lee (1998) and Carkovic and Levine (2002, 2005) conduct national level studies and employ cross-country growth regressions. These studies also provide little support of exogenous positive effect of FDI on economic growth.

Therefore, the above discussion indicates that financial-development-growth, import-growth and FDI-growth relationships are not uniform, and there is need for case-by- case study in view of each country's unique characteristics.

III. Modeling, Methodological Framework and Data

Financial development with inflow of foreign capital stimulates economic growth through capital formation, technology and know-how in host country. This transfer of knowledge through foreign capital inflows and imports further increases accessible stock of knowledge in recipient country by training her labor, shifting of new managerial and organizational skills from developed world. Imports have potential to make exports-growth relation stronger and enhance domestic production by importing capital and intermediate items. Developed financial sector of host country attracts foreign direct investment by offering financial incentive to foreigners, and foreign direct investment encourages local firms of host country

to use advanced technology through capital formation to enhance productivity growth and hence economic growth. Similarly, imports may provide an important conduit to transfer of new technology and to enhance productivity growth of local firms that promote economic growth.

In light of the above discussion, we have used log-linear specification to test the effect of financial development, foreign direct investment and imports on economic growth and all series are transformed into natural log-form. The log-linear transformation is superior as compared to simple linear specification (Shahbaz, 2010). The testable equation is modeled as follows:

$$\ln GDP_t = \beta_0 + \beta_{FD} \ln FD_t + \beta_{FDI} \ln FDI_t + \beta_{IMP} \ln IMP_t + \varepsilon_i \quad (1)$$

Where GDP_t is real GDP proxies for economic growth FD_t is financial development proxies by real domestic credit to private sector FDI_t is real foreign direct investment, IMP_t is real imports, and ε_i is normally distributed residual term.

This study uses ADF, DF-GLS and Ng-Perron unit root tests to test the order of integration of the variables. The autoregressive distributed lag (ARDL) approach to cointegration is used to investigate long run relationship between the variables[1]. The ARDL cointegration approach involves the investigation of long run relationship in the form of unrestricted error correction model as follows:

[1] The ARDL bounds testing approach to cointegration has numerous advantages over the other cointegration methods like E-G (Engle-Granger, 1987) cointegration, J-J (Johansen and Juselius, 1990) cointegration and FMOLS (Fully Modified Ordinary Least Square) by Philip and Hansen (1990). Firstly, ARDL is applicable irrespective whether the variables are integrated at I(1) or I(0) or I(1)/I(0) while conventional approaches to cointegration such as J-J cointegration and FMOLS require that variables must be integrated at I(1). Secondly, the long run and short-run parameters of the model are estimated simultaneously with simple modification. Lastly, ARDL approach is free from endogenity problem.

$$\Delta \ln GDP_t = \alpha_1 + \alpha_2 \ln GDP_{t-1} + \alpha_3 \ln FD_{t-1} + \alpha_4 \ln FDI_{t-1} + \alpha_4 \ln IMP_{t-1} + \sum_{i=0}^{n} \alpha_{GDP} \Delta \ln GDP_{t-i} + \sum_{j=0}^{p} \alpha_{FD} \Delta \ln FD_{t-j} + \sum_{k=0}^{q} \alpha_{FDI} \Delta \ln FDI_{t-k} + \sum_{l=0}^{r} \alpha_{IMP} \Delta \ln IMP_{t-1} + \mu_t \quad (2)$$

$$\Delta \ln FD_t = \phi_1 + \phi_2 \ln GDP_{t-1} + \phi_3 \ln FD_{t-1} + \phi_4 \ln FDI_{t-1} + \phi_4 \ln IMP_{t-1} + \sum_{i=1}^{n} \phi_{FD} \Delta \ln FD_{t-i} + \sum_{j=0}^{p} \phi_{GDP} \Delta \ln GDP_{t-j} + \sum_{k=0}^{q} \phi_{FDI} \Delta \ln FDI_{t-k} + \sum_{l=0}^{r} \phi_{IMP} \Delta \ln IMP_{t-1} + \mu_t \quad (3)$$

$$\Delta \ln FDI_t = \varphi_1 + \varphi_2 \ln GDP_{t-1} + \varphi_3 \ln FD_{t-1} + \varphi_4 \ln FDI_{t-1} + \varphi_4 \ln IMP_{t-1} + \sum_{i=1}^{n} \varphi_{FDI} \Delta \ln FDI_{t-i} + \sum_{j=0}^{p} \varphi_{GDP} \Delta \ln GDP_{t-j} + \sum_{k=0}^{q} \varphi_{FD} \Delta \ln FD_{t-k} + \sum_{l=0}^{r} \varphi_{IMP} \Delta \ln IMP_{t-1} + \mu_t \quad (4)$$

$$\Delta \ln IMP_t = \rho_1 + \rho_2 \ln GDP_{t-1} + \rho_3 \ln FD_{t-1} + \rho_4 \ln FDI_{t-1} + \rho_4 \ln IMP_{t-1} + \sum_{i=1}^{n} \rho_{IMP} \Delta \ln IMP_{t-i} + \sum_{j=0}^{p} \rho_{FD} \Delta \ln FD_{t-j} + \sum_{k=0}^{q} \rho_{FDI} \Delta \ln FDI_{t-k} + \sum_{l=0}^{r} \alpha_{GDP} \Delta \ln GDP_{t-1} + \mu_t \quad (5)$$

The next step is to calculate the F-statistics following the null hypothesis of no cointegration i.e. $H_0 : \alpha_{GDP} = \alpha_{FD} = \alpha_{IMP} = \alpha_{FDI} = 0$, $H_0 : \phi_{GDP} = \phi_{FD} = \phi_{IMP} = \phi_{FDI} = 0$, $H_0 : \varphi_{GDP} = \varphi_{FD} = \varphi_{IMP} = \varphi_{FDI} = 0$ and $H_0 : \rho_{GDP} = \rho_{FD} = \rho_{IMP} = \rho_{FDI} = 0$ against the alternate hypothesis of cointegration i.e. $H_a : \alpha_{GDP} \neq \alpha_{FD} \neq \alpha_{IMP} \neq \alpha_{FDI} \neq 0$, $H_a : \phi_{GDP} \neq \phi_{FD} \neq \phi_{IMP} \neq \phi_{FDI} \neq 0$, $H_a : \varphi_{GDP} \neq \varphi_{FD} \neq \varphi_{IMP} \neq \varphi_{FDI} \neq 0$ and $H_a : \rho_{GDP} \neq \rho_{FD} \neq \rho_{IMP} \neq \rho_{FDI} \neq 0$. The distribution of F-statistic developed by Pesaran et al. (2001) is non-standard. The reason is that F-statistic is based on the assumption that

variables are integrated at I(0) or I(1)[2]. If calculated F-statistic is less than lower critical bound (LCB) then decision about no cointegration may be accepted. The cointegration may be found if calculated F-statistic exceeds upper critical bound (UCB). The decision about long run relation is inconclusive if calculated F-statistic lies between lower and upper critical values.

Once cointegration is found then there must be causality at least from one direction. Granger pointed out that existence of cointegration between the variables means that there is information about long and short run granger causality. In doing so, VAR vector autoregression (VAR) model is used to test the direction of causality between financial development, foreign direct investment, imports and economic growth in case of Pakistan. For empirical purpose, following VECM granger approach, an error correction representation can be developed as follows[7]:

$$(1-L)\begin{bmatrix} \ln GDP_t \\ \ln FD_t \\ \ln FDI_t \\ \ln IMP_t \end{bmatrix} = \begin{bmatrix} \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \end{bmatrix} + \sum_{i=1}^{p}(1-L)\begin{bmatrix} \alpha_{11i}\alpha_{12i}\alpha_{13i}\alpha_{14i} \\ \beta_{21i}\beta_{22i}\beta_{23i}\beta_{24i} \\ \delta_{31i}\delta_{32i}\delta_{33i}\delta_{34i} \\ \rho_{41i}\rho_{42i}\rho_{43i}\rho_{44i} \end{bmatrix} + \begin{bmatrix} \theta \\ \chi \\ \xi \\ \zeta \end{bmatrix} ECM_{t-1} + \begin{bmatrix} \eta_{1t} \\ \eta_{2t} \\ \eta_{3t} \\ \eta_{4t} \end{bmatrix} \ldots \quad (6)$$

Where $(1-L)$ is the difference operator; ECM_{t-1} is the lagged error-correction term which is derived from the long run cointegrating relationship while $\eta_{1t}, \eta_{2t}, \eta_{3t}, \eta_{4t}$ are serially independent random errors with mean zero and finite covariance matrix. The existence of a significant relationship in first differences of the variables provides evidence on the direction of the short run causality while long run causation is shown by significant *t*-statistic pertaining to the error correction term (ECM_{t-1}).

The data on real GDP, real domestic credit to private sector, real imports and real foreign direct investment have been collected from GoP (2010). The study uses quarterly data for

[2] We have used critical bounds tabulated by Narayan (2005) are more suitable for small sample data set.

real GDP, real imports and real foreign capital inflows over the period of 1990QI-2008QIV.

IV. Results and Discussions

Table-1 provides the details on descriptive statistics and correlation matrix. Based on the statistics, Jarque-Bera test confirmed that series are normally distributed with constant variance and zero covariance. In correlation analysis, it is found that financial development, foreign direct investment and imports are positively correlated with economic growth. Similarly, correlation of foreign direct investment and imports with financial development is positive. Foreign direct investment is positively correlation with imports.

Table-1: Descriptive Statistics and Correlation Matrix

Variables	$\ln GDP_t$	$\ln FD_t$	$\ln IMP_t$	$\ln FDI_t$
Mean	13.7933	13.4441	7.1084	8.9833
Median	13.7615	13.4366	7.0700	8.8477
Maximum	14.3164	14.9378	7.5935	11.6844
Minimum	13.2917	12.0535	6.3899	5.9691
Std. Dev.	0.2518	0.8250	0.3098	1.4048
Skewness	0.3407	0.1831	-0.0477	0.2772
Kurtosis	2.3015	2.0429	1.8848	2.5697
Jarque-Bera	2.9357	3.2378	3.8624	1.5184
Probability	0.2304	0.1981	0.1449	0.4680
$\ln GDP_t$	1.0000			
$\ln FD_t$	0.7852	1.0000		
$\ln IMP_t$	0.4456	0.2255	1.0000	
$\ln FDI_t$	0.4087	0.2778	0.1732	1.0000

Next step is to test the order of integration of the variables. We applied ADF, DF-GLS and Ng-Perron unit root tests. ARDL bounds testing approach to cointegration is flexible about integrating order of the variables. The variables of interest should be stationary at I(0) or (1) or I(0) / I(1). We have used unit root tests to ensure that no variable is integrated at I(2). The computation of ARDL F-statistic becomes invalid if any variable is stationary at I(2). The empirical evidence of ADF, DF-GLS and Ng-Perron unit root tests is noted in Table-2.

Table-2: Unit Root Tests Analysis

Variables	ADF Test		DF-GLS Test
	T-calculated	Prob-value	T-calculated
$\ln GDP_t$	-2.1713 (4)	0.4975	-1.9038(4)
$\Delta \ln GDP_t$	-4.2129 (3)*	0.0072	-4.3750 (2)*
$\ln FD_t$	-1.0912 (2)	0.9230	-1.1998 (2)
$\Delta \ln FD_t$	-6.5572 (2)*	0.0000	-6.2183 (2)*
$\ln IMP_t$	-1.9287 (3)	0.6290	-1.9766 (3)
$\Delta \ln IMP_t$	-5.5518 (3)*	0.0001	-4.2720 (2)*
$\ln FDI_t$	-2.1179 (2)	0.5270	-1.6776 (2)
$\Delta \ln FDI_t$	-6.9291 (2)*	0.0000	-6.1767 (2)*
Variables	Ng-Perron Test		
	MZa	MZt	MSB
$\ln GDP_t$	-1.9541 (4)	-0.9470	0.4846
$\Delta \ln GDP_t$	-17.3258 (2)**	-2.9366	0.1694
$\ln IMP_t$	-1.6980 (3)	-0.8139	0.4793
$\Delta \ln IMP_t$	-35.4587 (1)*	-4.2072	0.1186
$\ln FD_t$	-3.6375(1)	-1.2951	0.3560
$\Delta \ln FD_t$	-36.820(1)*	-4.2903	0.1165
$\ln FDI_t$	-5.7658 (1)	-1.6897	0.2930
$\Delta \ln FDI_t$	-25.8995 (1)*	-3.5984	0.1389
Note: The asterisks * (**) denotes the significant at 1% (5%) level. The figure in the parenthesis is the optimal lag structure for ADF and DF-GLS tests, bandwidth for the PP unit root test is determined by the Schwert (1989) formula			

Our empirical evidence reveals that unit root problem is found at their level form in all the series but series are integrated at order of I(1). The unique order of integration attracts us to apply ARDL bounds testing approach to cointegration to examine long run relationship between economic growth ($\ln GDP_t$), financial development ($\ln FD_t$)), foreign direct investment ($\ln FDI_t$) and imports ($\ln IMP_t$) in case of Pakistan for the period of 1990QI-2008QIV.

It is necessary to choose appropriate lag length of the variables before applying ARDL bounds testing approach. The main reason is that F-statistics is very much sensitive with the lag order. There are different methods available for lag selection like sequential modified LR test statistic (LR), Final Prediction Error (FPE); Akaike Information Criterion (AIC); Schwarz Information Criterion (SIC) and Hannan-Quinn Information criterion (HQ). Our decision about lag order is based on AIC that superior and more consistent compared to other criteria. The results reported in Table-3 reveal that optimal lag selected is 4.

Table-3: Lag Length Criteria

VAR Lag Order Selection Criteria						
Lag	LogL	LR	FPE	AIC	SIC	HQ
0	16.92554	NA	8.12e-06	-0.3693	-0.2408	-0.3182
1	276.8219	482.6646	7.65e-09	-7.3377	-6.6953	-7.0825
2	309.0597	56.1859	4.83e-09	-7.8017	-6.6453	-7.3423
3	328.5568	31.7524	4.43e-09	-7.9016	-6.2313	-7.2381
4	397.5518	104.4782*	9.96e-10*	-9.4157*	-7.2315*	-8.5481*
* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error AIC: Akaike information criterion SIC: Schwarz information criterion HQ: Hannan-Quinn information criterion						

The calculated F-statistics is reported in Table-4. This implies that calculated F-statistics i.e. 4.523 is greater than upper critical bound i.e. 4.258 at 10 percent level of significance. We have used critical bounds tabulated by Turner (2006). The critical values generated by Pesaran et al. (2001) and Narayan (2005) are inappropriate for small sample data sets like our case. Our empirical evidence confirms the validation of cointegration for long run relationship between economic growth $(\ln GDP_t)$, imports $(\ln IMP_t)$ and foreign capital inflows $(\ln FC_t)$ in the country. The ARDL model passes the classical assumptions regarding normality of error term, serial correlation, autoregressive conditional heteroscedisticity, white heteroscedisticity and function form of the model. The lower segment of Table-4 shows the results of diagnostic tests. The results indicate that error term is normally distributed and there is absence of serial correlation between

the variables in the model. There is existence of autoregressive conditional heteroscedisticity, white heteroscedisticity in the model. The Ramsey RESET statistics show that model is well specified.

Table-4: The Results of Cointegration Test

Panel I: Bounds testing to cointegration		
Estimated Equation	$\ln GDP_t = f(\ln IMP_t, \ln FD_t, \ln FC_t)$	
Optimal lag structure	(4, 3, 4, 4)	
F-statistics	6.775***	
Significant level	Critical values ($T = 72$)[#]	
	Lower bounds, $I(0)$	Upper bounds, $I(1)$
1 per cent	4.922	6.328
5 per cent	3.920	4.904
10 per cent	3.182	4.258
Panel II: Diagnostic tests	Statistics	
R^2	0.9887	
Adjusted- R^2	0.9828	
F-statistics (Prob-value)	168.412*	

After finding the cointegration between the variables, next step is to find out the long run impact of imports and foreign capital inflows on economic growth. Table-5 report the long run coefficients. The results indicate that there is positive effect of financial development on economic growth is found and it is statistically significant at 1% level of significance. Financial development has strong contribution to boost economic growth in the country. A 1% increase in real domestic credit to private sector is linked with 0.1813% increase in economic growth. This result is consistent with findings by Shahbaz (2009a) and Shahbaz et al. (2010).

Table-5: Long Run Analysis

Dependent Variable = $\ln GDP_t$			
Variable	Coefficient	Std. Error	T-Statistic
Constant	10.0341	0.3167	31.6799*
$\ln FD_t$	0.1813	0.0337	5.3801*
$\ln IMP_t$	0.1355	0.0623	2.1720**
$\ln FDI_t$	0.0398	0.0167	2.3760**
R-Squared = 0.9242 Adjusted R-Squared = 0.9210 S.E. of Regression = 0.0707 Akaike info Criterion = -2.4057 Schwarz Criterion = -2.2812 F-Statistic = 284.708* Durbin-Watson = 2.2972			
Diagnostic Tests	**Statistics**		
J-B Normality test	0.3342 [0.8461]		
ARCH LM test	1.2906 [0.2598]		
White Heteroscedisticity	1.1477 [0.3360]		
Ramsey RESET	3.2072 [0.0467]		
CUSUM	Stable**		
CUSUMsq	Stable**		

Note: * and ** denote significance at the 1% and 5% levels, respectively.

A positive and significant effect of imports on economic growth is found. A 1 percent rise in real imports will stimulate economic growth by 0.1355 percent. This finding is the same as noted by Blomstrom and Wolf (1994), Iscan (1998), Damooei and Tavakoli (2006) and Kim et al. (2007). They reported positive and significant impact of imports on economic growth. The effect of foreign direct investment is positive with 1 percent significance level. This shows that foreign direct investment also contributes to economic growth, and a 1% increase in foreign direct investment enhances economic growth by 0.0398%. This finding is corroborated with Falki (2009) and Shahbaz and Rahman (2010) for Pakistan. The difference in coefficients may be due to different data spans used in both studies. This may be documented that financial development and imports have contributed to economic growth dominantly rather than foreign direct investment. Long run model passes all diagnostic tests against normality of error term, autoregressive conditional heteroscedisticity, white heteroscedisticity and specification of model.

The next issue is to examine the impacts of the variables in short run and we have used error correction method (ECM). The results are according to our expectations and reported in Table-6. The empirical evidence reveals that differenced and lagged differenced terms of imports have positive and negative effect on economic growth and it is statically significant at 1 percent level of significance. The negative impact of lagged differenced term of imports implies that imports of advance technology require time for positive spillover effects to economic growth. Financial development is positively correlated with economic growth. The impact of foreign direct investment on economic growth is positive and significant at 1 percent significance level. The results show that in short span of time, imports and financial development have dominant role to stimulate economic growth rather than foreign direct investment.

Table-6: Short Run Analysis

Dependent Variable = $\Delta \ln GDP_t$			
Variable	Coefficient	Std. Error	T-Statistic
Constant	-0.0355	0.0079	-4.4847*
$\Delta \ln IMP_t$	0.1598	0.0435	3.6671*
$\Delta \ln IMP_{t-1}$	-0.1857	0.0492	-3.7708*
$\Delta \ln FD_t$	0.1108	0.0148	7.4456*
$\Delta \ln FDI$	0.0416	0.0111	3.7490*
ECM_{t-1}	-0.6699	0.0921	-7.2694*
R-Squared = 0.8848 Adjusted R-Squared = 0.8761 S.E. of Regression = 0.0434 Akaike info Criterion = -3.3540 Schwarz Criterion = -3.1643 F-Statistic = 101.452 Durbin-Watson = 1.8275			
Diagnostic Tests	**Statistics**		
J-B Normality test	0.5261[0.7686]		
Breusch-Godfrey LM test	0.4345 [0.5121]		
ARCH LM test	0.3737 [0.5430]		
White Heteroscedisticity	0.8096 [0.5470]		
Ramsey RESET	2.2718 [0.1366]		
CUSUM	Stable**		
CUSUMsq	Stable**		

Note: * and ** show significant at 1% and 5% levels respectively.

The sign of estimate of lagged error term i.e. ECM_{t-1} is negative and it is statistically significant at 1% significance level. This validates our established long run relationship between the variables. It indicates the process of monotonic convergence to the equilibrium path of economic growth in case of Pakistan. The coefficient value of estimate of ECM_{t-1} is -0.6699 implying that changes from short run to long span of time run is corrected almost by 67% over each quarter.

VECM Granger Causality Analysis

The existence of cointegration between financial development, imports, foreign direct investment and economic growth leads us to investigate the causal relationship between the variables using VECM framework to make clear picture for policy makers to design comprehensive policy to sustain economic growth by attracting FDI and imports of necessary and advance technology and making the domestic financial sector more strong and sound. The results regarding VECM granger causality test are reported in Table-6. Since the variables are cointegrated, causality can be divided into long-and-short runs. The significance of coefficient of ECM_{t-1} indicates long run granger causality using t-statistic. The short run granger causality is indicated by joint significance of the LR test.

Table-6: The Results of Granger Causality

Dependent variable	Type of Granger causality								
	Short-run				Long-run	Joint (short- and long-run)			
	$\Delta \ln GDP_t$	$\Delta \ln FD_t$	$\Delta \ln IMP_t$	$\Delta \ln FDI_t$	ECM_{t-1}	$\Delta \ln GDP_t, ECM_{t-1}$	$\Delta \ln FD_t, ECM_{t-1}$	$\Delta \ln IMP_t, ECM_{t-1}$	$\Delta \ln FDI_t, ECM_{t-1}$
	F-statistics [p-values]				[T-statistics]	F-statistics [p-values]			
$\Delta \ln GDP_t$	–	25.9084** [0.0000]	23.8743* [0.0000]	5.8973* [0.0045]	–0.5751*** [–3.7369]	–	35.0413* [0.0000]	18.1183* [0.0000]	6.5344*** [0.0006]
$\Delta \ln FD_t$	41.8753* [0.0000]	–	1.11536 [0.3221]	1.0029 [0.3726]	-0.0459*** [-1.6905]	27.9500* [0.0000]	–	2.7248*** [0.0516]	1.5683 [0.2059]
$\Delta \ln IMP_t$	4.7342** [0.0121]	1.5390 [0.2225]	–	0.8542 [0.4305]	-0.8597* [-5.3048]	11.0476** [0.0000]	11.1135* [0.0000]	–	9.4561* [0.0000]
$\Delta \ln FDI_t$	4.2985** [0.0178]	1.8798 [0.1611]	0.6731 [0.5137]	–	-0.3648* [-3.2622]	5.8958* [0.0013]	5.3978* [0.0023]	3.6954** [0.0162]	–
Note: The asterisks *, ** and *** denote the significant at the 1, 5 and 10 per cent levels, respectively.									

The results show that all *ECMs* have negative sign with significance. This confirms the existence of long run granger causality between the variables. This shows that in the long run, there is bidirectional causality between financial development and economic growth, financial development and imports, financial development and foreign direct investment, imports and economic growth, foreign direct investment and economic growth and imports and foreign direct investment etc. It reveals that feedback hypothesis works for each pair. For instance, feedback hypothesis between financial development and economic growth indicates that financial development boosts economic growth by supplying financial resources to profit oriented investment projects i.e. supply side, and as a result, financial development is increased because of rising the demand of financial services due to stimulation in economic growth process i.e. demand side. This evidence supports the findings of Sofia et al. (2010) who reported that financial development leads economic growth in case of Pakistan.

The bidirectional causality between imports and economic growth reveals that imports lead economic growth through productivity-enhancing effect and in turn, economic growth process require more advanced technology to sustain economic growth rate and granger-causes imports to increase total factor productivity. The results are the same with empirical findings by Barisik and Cetintas (2009) for the case of transition economies[3] and Lee (2010) for Pakistan. The feedback hypothesis is validated trough bidirectional causal relationship between foreign direct investment and economic growth. This shows that relationship between foreign capital inflows is complementary. Foreign direct investment leads economic growth through spillover effects and foreigners are attracted to make investment in profit oriented ventures. The existence of bidirectional causality between foreign capital inflows and economic growth confirms findings evidenced by Iqbal and Shaikh (2010) for Pakistan. In short span of time, bidirectional causal relation is found between economic growth and financial development, economic growth and imports, and economic growth and foreign direct investment. The significance of Joint (short- and long-run) analysis also supports our above explained findings.

V. Conclusion and Policy Implications

The present study explores the relationship between financial development, imports, foreign direct investment and economic growth in case of Pakistan using quarterly data for period of 1990QI-2008QIV. In doing so, ARDL bounds testing approach to cointegration was applied to investigate long run relationship between the variables. ADF, DF-GLS, Ng-Perron unit root tests were used to test stationarity properties of the series. VECM granger causality test was used to detect the nature of direction of causal relationship between the series.

The empirical evidence indicates cointegration between financial development, imports, foreign direct investment and economic growth that validated the existence of long run relationship between the variables for the period of 1990QI-2008QIV. The results reported that financial development and imports play their role to sustain economic

[3] Armenia, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russia, Slovak Republic and Slovenia.

growth. Foreign direct investment also positively linked with economic growth although its role is minor. The ganger causality analysis showed that there is bidirectional causal relationship is found between financial development, imports, foreign direct investment and economic growth.

The following policy implications can be drawn based on these research outcomes: Pakistan government should introduce further financial reforms to improve the efficiency of the domestic financial sector which is pre-requisite for the achievement of positive spillover of FDI. The capital account should also be further liberalized to enhance the FDI. Care must be taken to ensure efficiency of delivery of services and increase productivity of public investment. In the long run, foreign saving should be supplemented but should not replace the domestic savings.

It is noted that contributions of imports and foreign capital inflows are linked with macroeconomic environment and availability of relevant infrastructure in the host country. The government policy also plays a vital role to exploit the maximum benefit from imports and FDI. Pakistan may sustain the rate of economic growth by importing advanced technology to increase domestic output, improve quality of local products, reduce average production cost and enhance international market share by increasing exports. Therefore, the government of Pakistan should direct its policy to import advanced technology, more capital and intermediate goods to enhance its production base and diversify exports. The government must create a good macroeconomic environment, develop infrastructure, and reduce/eliminate all sorts of barriers to attract more FDI as these will not only increase local production but also generate competition and efficiency in the economy. The absorption capacity of Pakistan's economy must increase to take full advantage of FDI. The honest and concerted efforts of the government and non-government organizations can ensure the best results for optimum growth from financial development, imports and FDI.

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