FOREIGN DIRECT INVESTMENT, DETERMINANTS AND POLICY ANALYSIS: CASE STUDY OF PAKISTAN.

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ABSTRACT

The objective of this study is to understand the determinants of Foreign Direct Investment (FDI) flows and to quantify relevant policy shocks in dynamic econometric model for Pakistan economy. The study has highlighted the degree of attraction of cost related factors, investment environment factors, development strategy factors with ownership and internalization factors and other risk factors of recent FDI flows to Pakistan economy. The results show the investment environment improving factors-openness is statistically significant in short-run. While long run dynamics between FDI, openness and macro economic factors show consistency with short run results. The stable macro economic indicators, country's risk profile followed by cost related and investment environment improving factors are real determinants to attract FDI.

Introduction

Vast body of literature suggests that foreign direct investment is linked with economic environment of the host country [Dunning 1981; 1988; 1993; 2001; Fry, 1992; Borensztein et al., 1998; Bosworth and Collins, 1999; De Mello, 1999; Agosin and Mayer, 2000; Lipsey, 2000]. Economic environment, in turn, is influenced by the development strategies and macro-organizational policies of the host country's government see e.g. Dunning (1993), Choe (2003). In many country case studies the empirical evidence varies from country to country, due to variations in their national policies, the response of domestic enterprises, the type of FDI flow, and the econometric methodology employed e.g. see [Apergis et al .2006; De Mello, 1999; Agosin and Mayer, 2000]. Literature also established the fact that the nature and volume of FDI in DCs and LDCs are very different and certainly its impact in DCs and LDCs would be different e.g. see Blonigen and Wang (2005).

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The literature further suggests that following broad categories of factors that influence FDI are: i) The cost-related factors[1] ii) The investment environment improving factors[2] iii) The macro economic factors and development strategy of a country[3]. Furthermore, the political risk rating of the country cannot be ignored. An unstable political environment makes investment risky and therefore erodes the investor's confidence. The political ideology and hence development strategy of the host country plays a critical role particularly with respect to the type of investment to be undertaken. For instance, it may be a restrictive import-substitution strategy, which draws investment geared for the domestic market. Alternatively, it may be a less restrictive export-orientation strategy that promotes investment for exports e.g. see Blonigen and Wang (2005). Blonigen (2005) in his recent survey article confirms that more recent body of literature has begun to frame the frameworks and started to generate predictions of how fundamental country-specific factors aggregate country level determines the FDI behavior.

While looking at the pattern of Foreign Direct Investment in Pakistan, which has been very impressive in recent years. FDI has been increased from $ 322 million in 2000-01 to $3.52 billion in 2005-06 and expected to be $6 billion dollars in 2006-07 according to government

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[1] The presence of a significant cost factor disparity between a home country and a host country may significantly influence the choice of an investment location. Such a disparity might be particularly in which major market imperfections arise from the disproportionate cost of given unit of inputs between the developed countries and the developing countries.

[2] The FDI policy liberalization package may include, ownership policies, taxes/subsidies (including tariffs and transfer payment), convertibility of currency (including limits on dividends and royalties and fees) price controls, and performance requirements (such as export, local content and foreign exchange balancing abilities).

[3] Under the macro-economic factors, we consider factors that can in their own right influence foreign firms to consider direct investment in the host country as opposed to continuing to service it either through exports or through other means such as licensing. Here, there are two market familiar factors. i.e current market size and the potential market size. While a large domestic market size generates scale economies, a growing market improves the prospects of market potential. Therefore, the larger the current market size and the higher the market growth rate, the more likely that the investment will take place. In addition, there are factors such as the quality of the available infrastructure that facilitate the production and distribution processes of goods and services that will induce FDI inflows. Thus, the availability of skilled manpower (both technical and managerial) and good physical infrastructure will induce FDI inflows. (Markusen and Venables, 1999; Driffield and Munday, 2000).

pronouncement. Earlier, it has different trends, as Pakistan received little amount of FDI[4],

because Pakistan was heavily dependent on the debt[5]. By 1996 its share raised to almost 50

percent of net resource flows[6]. Considering the openness of the investment regime, foreign

investment activity to date has been registered a substantial increase in FDI flows. Pakistan was

among the first few countries in the region to open up the market in early nineties. Pakistan does

not only have an enviable record of accomplishment of economic growth in sixties but still it has

the potential to repeat the past. It still enjoys some economic fundamentals. The country has

often come out with pro-investment policies. The government of Pakistan under took program of

liberal economic reforms including liberalization, privatization, and deregulation to bring the

economy into a fully market-oriented system. Foreign investment is generally subject to the same

rules as domestic investment, with the exception of certain sensitive areas such as defense

production, banking, and broadcasting. However, the new Investment Policy provides equal

investment norm opportunities for both domestic and foreign investors. Enormous literature has

been written on FDI flows *vis-à-vis* Pakistan e.g.   Akhtar *et al* (2001), Khan 1996, Guisinger

(2001), Ashfaq (1997), Nishat *et al* (1998), Sharif (1997) and Khawaja (1995,2000). Earlier

studies on FDI flows are conducted in the spirit of understanding the factors responsible for low

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[4] In spite of liberalizing its formerly inward looking FDI regime, tempering or removal of obstacles to foreign investors, and according various incentives, Pakistan's performance in attracting FDI has been lackluster (Ashfaque H. Khan and Yun Hwan Kim 1999). Pakistan received very little amount of FDI when compared with the opportunities and economic   (UNCTAD-World Investment Report 1993-96).

[5] Direct government-to-government assistance was readily available during the 1960s, 1970s and 80s.. During the cold war East West competition USA and other western governments provides aids to their allies. Since 1970 the share of grants has decreased, the rise in the non- concessional loans has hardened the debt profiles. During that period, the FDI gradually increased up to 16% of all flows. In 1985, foreign private capital flows provide insignificant portion of Pakistan's external finances. FDI increased from negligible amounts in 1980s to over $500 million by 1995.

[6] This had changed dramatically since 1995 when Independent Power Projects (IPP) brought into significant amount of FDI for investment into electricity generation and recent increase in investment in telecom and oil and gas sectors.

FDI in Pakistan[7]. The earlier literature in this connection is essential but hardly substantive or convincing to understand the determinants of FDI and recent rise in FDI, no study has been conducted to study the factors responsible for recent rise in FDI, the earlier studies are either superficial or theoretical and mainly focusing the socio-political and economic constraints for low level of FDI and its reasons. No quantification model or simple OLS regression has been applied to generate the nature of relationship among the set of variables. A lot has been changed since, the accelerated economic reforms or recent stability specially after 9/11, or nuclear tests of 1998 and resultant economic sanctions and the nature and working of the key macro economic variables etc, Other than this the interrelationship of different factors, forecasting and the causality direction with respect to social and political risk index measurement still missing in earlier studies, which requires the further investigation. Consequently, this study is designed to understand the number of factors determining the recent increase in foreign investment in the country. This study has filled the gap. The objectives of the study are to investigate; i) key determinants of FDI flows to Pakistan economy ii) relationship of FDI and macro economic fundamentals in dynamic process of short run and long run iii) potential attraction factors of FDI (socio-political and economic factors, development strategy etc) iv) effect of investment and liberalization policies on FDI and the structural shocks of 1998 Nuclear tests and September 11, 2001.

Rest of the paper is organized as; Section II is literature review followed by Section III-Methodology and last section IV- Results, Conclusion and Policy recommendations.

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[7] The factors, which are identified; e.g. the lack of trained, educated, and disciplined labor force along with complicated and over protective labor laws, has inhibited business expansion and frightened away productive investment. The cultural and social taboos as well as quality of life are not conducive to attracting foregoing investors to Pakistan. The lack of welcome to foreign investors by government agencies and officials has also been a problem etc.

II.   Literature review

There is a vast body of empirical literature, e.g. Mac Dougall (1960), Andrea Marino (2000), Balasundram (2000), Azmat (1999), Chakrabarti, (1997, 2001), Gordon (2001), Kojima (1973), Hymer (1976), Kishor (2000), on whether foreign direct investment is beneficial to host country's growth or not and has shown the likelihood that the, market size, trade policy regime followed by host countries development policies influences significantly both the amount of inward FDI received by recipient countries and the impact of foreign direct investment on growth, as suggested by the trade theory. Fry (1993), in his paper analysis macro impacts of FDI, the results from macro econometric analyses showed that, unlike Latin American cases, FDIs in Asia lead to a direct expansion of productive stock, and rates of domestic savings and investment tend to increase together with an inflow of FDI ("co-finance effects"). Hein (1993), and Dollar (1992), found in his paper, that out-ward oriented developing economies, (i.e., those that rely on new export markets) have been successful in attracting FDI flows. Whereas, Usha *et al* (1999 - Revised 2000), used a mixed fixed and random (MFR) panel data estimation method to allow for cross-country heterogeneity in the causal relationship between FDI and growth, found that the relationship between investments, both foreign and domestic, and economic growth in developing countries is highly heterogeneous and that estimation methods, which assume homogeneity across countries, can yield misleading results. The results suggest that there is some evidence that the efficacy of FDI in raising future growth rates, although heterogeneous across countries, is higher in more open economies. Francisca *et al* (1996), suggested that market size, growth rate, labor costs, export flows and tariff barriers have shown to influence U.S. foreign direct investment in the European Union. Sung-Hoon Lim *et al* (1998), explained that Foreign Direct Investment (FDI) bring about various positive externalities such as stable inflow of

foreign capital, increase in employment, increase in gross national product, improvement in balance of payments and transferring multinational corporations' advanced managerial skill and technology to the host country. These positive externalities can be the main goal of FDI inducing policy. Saskia *et all* (1998), they have analyzed the determinants of net foreign direct investment (FDI) inflows in emerging economies between 1978 and 1995. The theoretical framework of this study is based on the concept of the Institutional FDI Fitness theory, which stipulates that FDI is determined less by intransigent fundamentals than by institutional variables more amenable to change, namely policies, laws, and their implementation. This has suggested that four institutions contributing to FDI Fitness are government, markets, education, and socio-culture[8]. Root and A. Ahmed (1979) also found that the number of regular (constitutional) changes in government leadership between 1956 and 1967 was significant. However, other political variables, such as the number of internal armed attacks, the degree of nationalism and colonialism and colonial affiliations, were not significant. Schneider and Bruno Frey (1985) found a negative relationship between the number of political strikes and riots in the host countries and FDI flows. Nigh (1985), by using the COBDAB[9] database, which constructs aggregate measures of intra country and inter-country conflicts and co-operations, founded that, for developed countries, inter-country political events are more significant determinants of FDI than intra country events. For developing countries, intra country political events had a more robust relationship with FDI. Wheeler and Moody (1992), has found a broad principal component measure of administrative efficiency and political risk as the determinants of FDI.

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[8] They tested the FDI Fitness concept in an econometric cross-section across 67 emerging economies. Their econometric analysis showed government and market variables as the most significant determinants of FDI inflows. Governmental fitness is reflected in economic openness with only minimal trade and exchange rate controls. Government fitness also means a strong rule of law and low corruption, based on legal and administrative equity and transparency.
[9] Conflict and peace data base

Lucas's (1993) by using episodic dummies for good events, such as the Asian and Olympic Games in the Republic of Korea, and President Aquino's accession in the Philippines, to be positively related to inward FDI. Conversely, negative events, such as Sukarno's rule in Indonesia, Park's assassination in the republic of Korea and Ferdinand Marco's martial law in the Philippines have had a negative effect on inward FDI. Helliener (1988), and UNCTAD-DTCI (1996) have pointed out; investment incentives created by governments appear to play a limited role in FDI decisions. Salvador (2000), paper analyzed positive spillovers related to Foreign Direct Investment (FDI) using an establishment-level panel of Spanish manufacturing industry that spans the period 1990-1994. Aggarwal, (1997), explains that economic reforms in a host country not only confer greater freedom on TNCs in their choice to internalize or not, but also affect the market conditions, which in turn, influence this choice. J. Peter (2002), this paper 'FDI and single markets' extends the theory of multinational corporations, found three distinct influences of internal trade liberalization by a group of countries on the level and pattern of inward foreign direct investment (FDI). First, the tariff-jumping motive encourages plant consolidation. Second, the export platform motive favors FDI with only a single union plant relative to exporting, and may induce a firm, which has never exported to invest. Finally, reduced internal tariffs increase competition from domestic firms, which dilutes the other motives and may induce a "Fortress Europe" outcome of multinationals leaving union markets even though external tariffs are unchanged.

Kadi (1999), synthesizes that causes of low percentage of FDI in Middle East due to many factors including chronic political instability, empirical evidence drawn from model that test cross section data of 59 countries to provide evidence of positive relationship between both

trends, FDI and economic freedom. Stephen *et al*, (1997), According to the findings of their research work the gross domestic product (GDP), imports, exports, infrastructure, political risk, are significant influences on the decisions of MNCs to invest abroad[10]. Pattama, (1999) in his thesis examined the long run relation ship between FDI and domestic investment in Thailand. The main findings of the empirical analysis are that FDI has a significantly positive long run effect on domestic investment in Thailand. This result holds true for all the cases examined, using two different estimation methods[11]. Laura (1999) explained by applying the regression that a statistically significantly positive association has been found between FDI and market size, wage differential, the stage of the transition process and the degree of openness of economy as well. However, a statistically significant negative relation has been found for proximity to Europe and the degree of industrial concentration.

Sayek Selin, (1999), in his thesis 'FDI and inflation: Theory and evidence' explained the relationship between FDIs and inflation. This research's results from an impulse response analysis supported the theoretical model, shown a 3 percent increase in Canadian inflation reducing US FDI in Canada by 2 percent and increasing USA domestic investment by 1percent. Similarly, a 7 percent increase in Turkish inflation reduces US FDIs in Turkey by 1.9 percent, increasing US domestic investment by 0.3percent. Dunning (1977, 1979, 1988 and 1993) presented OLI (ownership, location, and internalization) theory as an eclectic approach. In analyzing prerequisites for FDI to take place, Dunning asserted that a firm should have a firm-specific advantage (ownership), a location advantage to mobilize this firm specific know-how (location), and an incentive to internalize external transactions (internalization).

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[10]Using 20 years of FDI international data.
[11]The long run relationship implied by the theoretical model was implemented empirically for Thailand, using panel data for eight sectors of the economy for the period from 1971-1995.

Narula *et al* (1998), described that the competitiveness of MNEs becoming increasingly mobile and knowledge intensive and also explained that MNEs give more attention to the availability and quality of created assets of alternative locations. He has also described that among developing countries there are considerable differences between "catching up" countries of (e.g., NICs) and "falling behind", (LDCs). Narula argued that economic structure's importance plays less important role in determining the FDI activities of industrialized countries than developing ones, there seems to be no indication that they are becoming insignifical He also described that inward investment directed towards the exploitation of natural assets and markets (in case of developing countries). Nebende *et al* (2000), stated that the cost related factors are the dominant determinants of FDI. In particular, the dominance of real wage rates and human capital suggest that the "under priced" skilled (semiskilled) labor is the deriving force behind FDI. Nabende *et al* their study investigated both the short-run and long-run locational determinants of FDI under the broad categories of cost-related, investment environment improving and other macroeconomic factors. The short-run dynamics indicated that European investment in the Thai manufacturing sector has been more responsive to the macroeconomic factors. The long-run dynamics on the other hand suggested that European investment has been more responsive to the investment environment improving factors. Steven (1995) evaluates the relationship between patterns of international technological specialization and the competition provided by FDI, he suggests that TNCs have a relatively weak over all impact on patterns of technological specialization with in and between the countries. Kwang and Singh, (1996) in their findings indicated that a qualitative index of political risk has been a significant determinant of FDI flows for countries that have attracted historically sizeable investment flows and for countries that have not been very successful in attracting such investments, socio political instability, proxies by

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negative impact on investment flows. Exports in general and manufacturing exports in particular are a significant determinant for high investment recipients. Kathryn et al (1995), concluded that there has been no statistically significant relationship between the level of the exchange rate and foreign investment relative to domestic investment after controlling for relative corporate wealth and the over all level of investment. Soboleva (1999), in her thesis by developing a dynamic structural model of a firm's location choice for its production affiliates analyzed the effect of trade policy on FDI. She has considered both tariff and non-tariff barriers to exports and explicitly model the link between investment decisions and trade policy. The results provide evidence on micro level determinants of investment decisions

The literature is largely confined within the variety of factors which determining the attraction of FDI to a host country. These factors are broadly the cost related factors, investment environment, macro economic factors, political stability/risk factors, and development strategy factors etc of the host country. Consequently, this study largely covered the period of liberalizing regime, political stability factors, governments development strategy factors along with the external shocks like nuclear tests, 11 September 2001 shock etc to determine which factors are crucial in attracting the FDI in Pakistan. The study takes all major variables of cost, investment, macro economics, risk/stability and development strategy factors in a dynamic process both in short run and long run to determine its interrelationship and long run relationship together with variety of policy variables at country level. Because the empirical literature used cross-country regressions to search for the determinants of FDI is statistically fragile, see e.g   Chakrabarti (2001).

III. METHODOLOGY

This study used the VAR (Vector Autoregressive Model) model. The VAR provides a simple means of explaining or predicting the values of a set of variables. VAR is a straightforward, powerful statistical technique, which can be applied to any set of historical data. VAR model developed by Sims (1980, 1982, and 1986), Doan *et al* (1984) and Litterman (1984), used these techniques. The VAR modeling avoids imposing potentially spurious restrictions on the model. The VAR model does not require any explicit economic theory to estimate model. Moreover, it allows one to capture empirical irregularities in the data and thereby provide insight into the channels through which the different policy variables operate. Under the VAR model methodologies, the relationship of the variables is determined with their optimal lag length effects (the order of the lag length with back shift operator). The Causality is to be determined based on one-way causality or either direction techniques suggested by Engle and Granger (1987).

To employ the VAR in orthodox format, or in the form of VEC, this is Johansen (1995) VAR incorporating (potential) error correction terms, consequent upon the potential co integration vectors. These techniques are to be accompanied with the impulse response functions and the variance decomposition functions. The standard procedure of using both of these techniques to measure the change in one of the variable and keeping all other variables constant and finding the covariance matrix of the reduce form (that is, estimated) residuals in order to orthogonal the innovations. This technique has given us the forecasting capability of each of the variables defining to the other variables. Surely, the dummy variables of structural periods like political instability, nuclear tests (1998) and the economic liberalization period (1988), 11 September

2001 are used to testify the structural change and the significant effect of these periods on key variables. The necessary model checking and identification procedure is applied for the suitability of the model, optimal lag lengths based on criterion used by the FPE (Final Prediction Error), AIC (Akakai's information Criterion). Other necessary tests have been applied to check the econometric assumptions related to residual terms. The unit roots and order of the integration of the variables using Augmented Dickey Fuller (ADF) and Phillips-Person tests have been applied. There are lots of issues discussed while applying the VAR technique. i) The variables, which are exogenous, included as conditioning variables. ii) The order of the lag has been determined on the bases of identification criterion. iii)The order of the integration of the endogenous variables has been checked and then has been used. iv) If any co integration between the endogenous variables has found in the system VECs has been used rather than straight VARs. In addition, if not whether latter been used for levels or first differences of the variables has been used. v) In any, VAR or VEC what type of error decompositions has been used in order to identity the structural errors from the reduced form estimated errors. For policy analysis, a model has been nested based on 2SLS/ 3SLS to capture the relationship between FDI and its determinants. A system of equations based on the relationship has been adjusted with the monetary policy variables, trade related policy and fiscal policy variables.

The Hypotheses

The hypotheses are built on the existing literature that proposes that the determinants of FDI flows are positively influenced by four broad categories of factors namely; i) the cost related factors, ii) the investment environment improving factors, iii) macro economic factors and iv) the development strategy of the country and structural shocks of 1988, Nuclear tests 1999 and Sept. 11, 2001. Data and econometric methodology makes it practicable to test all the theorized

factors. Consequently, a model is designed to test collectively the significance of three of the cost-related factors, i.e. wage rate, interest rate, and foreign exchange rates; investment environment improving factors i.e. openness of the economy and liberalization; macro economic factors i.e., output growth, market size, human capital, and the quality of infrastructure; political factors combine cumulative risk indicator[12] and development policy factor, i.e., export led policy. Specifically the model is based on the above said hypotheses.

Estimation

We have employed the following estimation techniques. First, a structural model is based on a three stage least square (3sls) employed to capture the short-run relationship between FDI and its determinants. Second, a co-integration estimation technique is employed to analyze the long-run dynamics.

The Structural Model

A system of equations based on the relationship expected direction of the relationship between the dependent and independent variables setup (see Table No: 01, positive unless specified) are developed. In this model, the variables on the cost factors/ supply side have been endogenized, while the exogenous policy variables have been asserted under monetary policy, trade related policy and fiscal government policy, development policy variable and along with combined cumulative risk index of political policy variable for political stability.

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[12] Combined cumulative risk is the combination of political risk, financial risk and economic risk by (Erb- Harvey-Viskanta).

Table No: 01
Expected Direction of the Relationship between the Dependent and Independent variable

Dependent Variables	Endogenous	Explanatory Policy Variables			Development policy/ structural dummies
		Monetary Policy	Trade Related Policy	Fiscal and Govt: Policy	
FDI	Wage Rate (-) Openness, Output Growth, Human Capital	Interest Rates (-)	Liberalization Foreign exchange rate (-)	Expenditure on Infrastructure	Exports, cumulative combined risk index (-)/ Dummies 1988, 1999 (nuclear tests) and sept11/2001
Output Growth	FDI, Openness, Employment, Capital Formation, Human Capital		Liberalization	Expenditure on Infrastructure	Exports, cumulative combined risk index (-)/Dummies 1988, 1999 (nuclear tests) and sept11/2001
Wage Rate	Output Growth(-)		Foreign Exchange Rates (-)		Exports, Cumulative Combined Risk Index (-)/Dummies 1988, 1999 (nuclear tests) and sept11/2001
Openness	FDI, Output Growth	Interest Rates (-)	Liberalisation, Foreign Exchange Rates (+/-)		Exports, Cumulative Combined Risk Index (-)/Dummies 1988, 1999 (nuclear tests) and sept11/2001
Employment	FDI (+/-) Output Growth (+/-) Human Capital (+/-)	Interest Rates (-)	Foreign Exchange Rates (+/-) Inflation (-)	Expenditure on Infrastructure	Exports, Cumulative Combined Risk Index (-)/Dummies 1988, 1999 (nuclear tests) and sept11/2001
Capital Formation	FDI, Output Growth, Openness	Interest Rates (-)	Liberalization, Foreign Exchange Rates (+/-)	Expenditure on Infrastructure, Savings	Exports, Cumulative Combined Risk Index (-)/Dummies 1988, 1999 (nuclear tests) and sept11/2001
Human Capital	FDI, Output Growth, Employment	Interest Rates (-)		Government Expenditure on Education, Savings	Exports, Cumulative Combined Risk Index (-)/Dummies 1988, 1999 (nuclear tests) and sept11/2001

The specifications of the structural model of seven equations are self evident from the rows of the table no: 01. The equations are taken in order. In the output growth equation, openness of foreign trade and liberalization are expected to influence productivity and that kind of influence is also embedded in FDI. Similarly, an increase in the employment, capital formation, human capital, and infrastructure should promote productivity and hence output growth. As for the wage rate equation, output growth might influence and increase in wage rate and this expectedly negative relationship. An increase in wage rate and an increase in foreign exchange rate would cause similar effect, while wage rate would be positively related. With regard to the openness equation, FDI, output growth (economic development) and liberalization are concomitant with an open foreign trade environment. However, an increase in foreign exchange rate would have mixed effects depending on whether international trade is dominated by exports (positive) or imports (negative). While an increase in interest rate would generate negative effects. Turning to the employment equation, FDI, output growth and human capital are expected to have mixed effects depending on whether they are promoting employment intensive production (positive) or capital intensive production (negative). Similarly, an increase in wage rates may motivate more people to seek employment. Like wise, an increase in the foreign exchange rates might negates the exports of existing investors and hence employment, or may encourage new capital investment and hence employment. Investment and inflation would generate negative effects through respective impact on investor's cost of capital and costs of production. Under the capital formation equation, an increase/ improvement in FDI, output growth, openness, liberalization, savings and infrastructure are expected to be concomitant with an increase in capital formation. However, an increase in interest rates would deter it; while infrastructure and foreign exchange rates would have mixed effects depending on whether the capital formation is being dominated

by the public (positive) or private (negative) sector, and on whether the capital is reinvested from exports (negative) or comes in new investments (positive). Lastly, human capital should be positively influenced by FDI, output growth and employment level particularly by making the population more aware of the benefits of education, and through the process of learning by doing. Similarly, government expenditure and savings should make it more likely for individuals to invest in education. However, an increase in interest rates makes it more difficult to finance education/ training. Further, an important issue in econometrics is the need to integrate short-run dynamics with the long-run equilibrium. The co-integration technique has been applied.

Measurement and notation of variables, Data sources and limitations:

The measurements of variables and data sources[13] are reported in Appendix (A). The following notation has been adopted for ease of presenting the empirical results. Foreign Direct Investment (FDI), Wage Rate (WRATE), Output Growth (OG), Openness (OPEN), Employment/labor force (EMPL), Human Capital (H C), Capital Formation (CF), Liberalisation (LIB), Interest Rate (IR) , Infrastructure (INFRA), Savings (SAVINGS) , Inflation (INFRATE), Govt: Expenditure on Education(GEE), Combined Cumulative Index(CCR), Exports (EXPORTS). Some of the endogenous, exogenous, policy variables require some explanation. For example, secondary school enrolment ratio is used as variable for a human capital of country, which is used by Noorbakhsh et al (2001), Root and Ahmed (1979), Schneider and Frey (1985), Levine and Renelt (1992) and other empirical literature such as Mankiw, Romer, and Weil (1992), used this variable as an average in growth literature and Barro (1991) also used this variable as 'at some initial period'. Growth and size of the market is recognized as a major determinant of FDI,

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[13] Annual data series from 1971-2005 has been taken for the analysis.

(Root & Ahmed, 1979; Schneider & Frey, 1985; Torrisi, 1985; UNCTAD, 1998, 1999; UNCTAD-DTCI, 1993; UNCTC, 1992). Rate of growth of GDP is used as a proxy for the growth of market size in Pakistan which is used in many empirical studies, see Gastanaga, Nugent, and Pashamova (1998), Knickerbocker (1973), Lim (1983), Root and Ahmed (1979), Ryckeghem (1998), Singh and Jun (1995), and Torrisi (1985). Real wage is also used as a proxy of a cost of labor, which is also recognized an important determinant in the studies Flamm (1984), Lucas (1993), Schneider and Frey (1985), Wheeler and Mody (1992) , Shamsuddin (1994) and Singh and Jun (1995), real wage variable is used by dividing nominal wage with GDP deflator. The variable openness is measured by the ratio of total trade to GDP; which is used in empirical studies, see Haufbauer, Lakdawalla, and Malani (1994), Ryckeghem (1998) and UNCTAD (1999) .Liberalization is also recognized as an important variable (for example, see Haque, Mathieson, & Sharma, 1997; Schadler, Carkovic, Bennett, & Kahn, 1993). The dummy variable with 0 representating the pre-liberalization period 1971-87 and 1 representing the period 1988-2005 as post liberalization. Infrastructure is also concern for foreign investors (UNCTAD, 1998), some survey studies confirm that this is one of the main factors that influence foreign investment location decisions (see, for example, Area Development, 1998; Business International Corporation, 1970), level of government expenditure on economic services (which by definition includes, transport and communication, electricity gas and water, industry and agriculture)/GDP*100 used as a   variable for infrastructure.(government expenditure on education was also included in this ratio). The economic literature suggests that, in addition to the variables. Risk could be an important deterrent to investment, both domestic and foreign. Fear of political instability, risk of policy reversal and fear of government action could make investment excessively risky (Collier & Pattillo, 2000). Certain political and economic

characteristics of host countries could be among these factors (see the surveys by Przewoski & Limongi, 1993; Sirowy & Inkeles, 1990) and other studies (Lansbury et al., 1996; Levis, 1979; Singh & Jun, 1995; UNCTAD, 1998; Wheeler & Mody, 1992, Brunetti, Kisunko, & Weder, 1997b; Edwards, 1991; UNCTC, 1992). Combined cumulative risk factors of social, economic, financial and political index are used for the purpose. In addition to this annual average inflation rate is also used as a proxy for economic stability factor. We tested the CCR index as a determinant of FDI. Besides this, using dummy variable also tests impact of structural shocks of nuclear tests and September 11 events. Some fiscal monetary, trade and development policy instruments like interest rate, exchange rate, inflation, savings, expenditure on infrastructure and education is also used to determine the significance of these variables.

IV.   Empirical results: Short-run Dynamics

We have tested unit roots for each converted variable and the order of integration of the variables using the Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests have been applied to find out trend and order of integration. To handle the simultaneity 3SLS has been applied. A 3SLS has the advantage of not only being asymptotically maximum likelihood and of giving more efficient parameter estimates, but also performing the regressions simultaneously on all the equations in the model (Table No: 02) rather than one to one at a time. This estimation technique has been therefore adopted in this analysis. Since the data is of annual nature we have found a few significant lag relationships among the set of variables. However, we have omitted to include the lag periods in 3sls estimation, but we have tried the lag variables in the VAR, VEC and Granger causality models. A system of the best-fit variables is then estimated using the 3SLS technique. Due to the limitation of the degree of freedom, only those regressions with significant co-efficient were retained, and the system re-estimated. For detail see the model at table no: (02).

TABLE No: 02   EQUATIONS

FDI	=	OG	OPEN	IR	EXPORTS	CCR	WRATE
WRATE=		EMPL	IR	INFRATE			
OG	=	OPEN	HC	WRATE	IR		
OPEN	=	OG	HC	IR	INFRATE	INFRA	
EMPL	=	WRATE	FDI	IR			
CF	=	OG	FDI	IR	INFRATE	LIB	
HC	=	FDI	INFRATE				

Consequent upon the experimentation, this linear structural form of the system emerged.

$$A_t = \beta_o + \beta_1 A_t + \beta_2 A_{t-1} + \beta_3 B_t + \beta_4 B_{t-1} + \in_t \tag{1}$$

Where A = [FDI, WRATE, OG, OPEN, EMPL, CF]

B = [LIB, IR, INF, EINFRA, EXRATE, HC, GEE, SAVINGS, EXPORTS, CCR]

$\in$ is 7 by I vector of disturbances.

The Results:

Before commencing the empirical results' discussion, it is appropriate to first point out the meaning of the direction of the relationships. To begin with, since the variables are measured as log, a unit change in the policy variable causes a rate of change or acceleration (deceleration) on the endogenous variable. As for FDI, which is measured by log (Foreign Direct Investment rupees in millions), a unit change in the policy variable imparts a change in acceleration (deceleration) on it. The results of FDI are present in table no: (03).

Table No: 03
Determinants, Elasticity and Co- integrating Vectors of FDI

DEPENDENT VARIABLES

Dependent variable / Independent variable		FDI	Wage Rate	OG	Openness	EMPL	HC	CF	Elasticity FDI	Co-integrating
COST RELATED FACTORS	WRATE	1.30*	-	1904***	-	-0.077**	-	-	1.30*	-1.23**
	IR	5.39	7.10***	-21677***	-6.68**	0.68**	0.098***	-0.481	13.75**	-
	EXRATE	-	-	-	-	-	-	-	-	
Investment Environment Improving	OPEN	2.00***	0.55***	2.89***	-	0.05***	-		2.00***	
	LIB	-	-	-	-	-	-	-7.854*	-6.10**	-62.566*
MACRO ECONOMIC	OG	-	-	-	-	-	-	0.435*	0.0**	0.45*
	INFRA	-	-		-	-	-	-		
	HC	5.810***	-	9305*	-	-	-	-	5.810***	-5.30**
	SAVINGS	2.586***	3.35**	-	-	-	-	-0.246**	2.586***	
	GEE	-	-	-	-	-	-	-0.157*	8.674***	
	EMPL	8.674***	-5.67***		4.89*	-	-	-	-	-4.56*
	INFRATE	-	-		0.77**	-	-	-	-	
	EXPORTS	-6.10**	-		-	-	-	-	-	
	CF	-	-	0.242**	-	-	-	-	-	-2.96**
	FDI	-	-	-	-	0.01	-	0.068***	-	-
Political Risk	CCR	-7.19***	-	-	-	-	-	-	-	-
STATISTICS					-	-	-	-	-	-
R^2		0.8244	0.272	0.655	0.550	0.795	0.9806	0.22879	-	0.791

We start the discussion with the cost-related factors. Interest and wage rates are positively determining the FDI. This suggests that discount rate/ bank rate and wage rates are more favorable for investment while exchange rate is not defining the variation on the FDI. The reason for non-variation is because of Pakistan's exchange rate is controlled up to 1990's. Under the investment environment improving factors openness is statistically significant by affecting the

FDI, suggesting that more open the economy stimulates further investment in the short-run. Turning to the macro economic factors human capital, savings, employment and exports are stimulating the FDI in short-run. The response mostly is significant. The combined cumulative risk (CCR) variable is highly significant variable showing the variation to FDI that sum of the cumulative; financial, economic, social and political factors indexed is highly significant and negatively affecting the FDI. This shows the robustness as human capital availability is another major variable and is statistically significant to define FDI. In summary, besides cost related factors the macro economic variables are tempting for FDI and output growth and investment. While discussing the other equations table; the wage rate is determined by labor force, interest rate, openness and savings. The variation explained by labor force is straightforward and statistically significant with right sign. While the interest rate and openness is explained the 7.10% and 0.55% of variation at 1 percent level of significant. Since, the interest rate is explaining the 7% variation to FDI and savings is also explaining the variation on wage rate. The output growth is explained by openness, human capital, wage rate and interest rate, which is straightforward relationship among the variables. The openness equation is explained by inflation rate and employment. Most of the above variables are statistically significant. The employment equation is explained by wage rate negatively and statistically significant at 5%. Where as, the interest rate and openness are statistically significant and defining the employment at 5% and 1% respectively. The capital formation is explained by output growth, FDI and educational expenditure. The rest of the equations results are presented in table no (03).

Elasticity of FDI

The measurement of elasticity is based on the statistical significant co-efficient variables, which gives us a good quantitative picture of the degree of response to the tested hypotheses. These

results are reported in table no: (03). Pakistan's FDI is more elastic to the availability of employment followed by negative sign of combined cumulative risk, (-7.19) which is high elastic and showing the degree of elasticity among the cost related factors interest rate followed by wage rate which show highly significant variation. However, the savings, openness and output growth are showing the elasticities within the variation of two percent. Elasticity for employment is a unit change in employment will accelerate the FDI at 8.67%. The FDI is most responsive to labor force/ employment, political index variable followed by investment, savings, human capital, output growth and wage rate. However, a unit increase in openness accelerates the FDI by two units. In general it appears that the short-run degree of response is combined CCR index and macro economic factors and followed by cost-related factors. Since, we have found no structural dummy of nuclear tests, September 11, 2001 is statistically significant so we have dropped the dummies from the rest of the analysis.

VAR, VEC and Co-integration

It is not realistic of course, to envisage FDI as responding to a set of exogenous variables, given those in the country of origin, and to ignore the feed back effect between those variables and FDI, and further more the interdependencies between the factors themselves. To do so is to ignore the possible spillover effects of FDI, where potential existence is such a strong motivator for the country attempts to attracts FDI, equation (02).

FDI= [[WRATE,IR,EXRATE],[OPEN, LIB],[GDP,OG,HC], [EXPORTS, CCR]]   **(02)**

Above, the expectations must be that if macro economic factors are strong pull factors for FDI, then these factors, such as national output or its growth rate, human capital, employment and savings will in turn be influenced by FDI. The literature on FDI has obviously considered the

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links between it and macro economic performance of country, but it has tended, indeed, to do so, on the basis of one-way causality, in either direction. The exploration of two-way causation is only just beginning. In various studies and papers, on single country studies the authors employed a 'model' framework. Hence, because of the possible limitations of such a framework, certainly in the context of panel data studies, we have relied upon the much-favored VAR and VEC methodologies.

Empirical Results:

VAR model has been applied to all the endogenous variables and policy variables at different orders. However, we have also tried different orders of VAR model, at needed selection criterion of AIC and SBC. The results are reported in table No. 04. Since, our focus is to analyze the effect of different policy variables at impulse and variance decomposition levels. We have worked on limited number of thirty observations; we have tried all different variables while eliminating/dropped insignificant variables at later stage. For simplicity we have only reported two lag period's results of (1) and (2) ordering in table no.04, but we have also tried different ordering to capture best impulse response and variance decomposition results.

TABLE No: 04
Model selection criterions

Order	SC	AIC criterion
1	9.51	8.86
2	9.15	6.63

VAR ordering:

[WRATE, OG, OPEN, EMPL, CF, HC, FDI, CCR, LIB, IR, INFRATE, SAVINGS, AND EXPORTS]

[FDI, WRATE, OG, OPEN, EMPL, CF, HC, LIB, IR, SAVINGS, EXPORT]

[WRATE, OG, CF, HC, FDI, EMPL, OPEN, EXPORTS, SAVINGS, INFRATE, AND EINF]

Impulse response function and variance decompositions:

Because of limited space we are confined to discuss only limited impulse response function results to FDI, Output Growth, Wage rate, Openness, Labor/Employment, Capital Formation, and Human Capital. The result in table no.05 shows the impulse response of other variables to FDI. Theoretically, impulse response function is one standard deviation shock to policy variables taking other variables constant. While looking at the results disregarding the impact of FDI itself, the most important sources of impulse are output growth, wage rate, employment, openness, human capital and capital formation. For simplicity, we have only reported the results of one ordering as the order does matter in the VAR ordering process. The impulse response function in combined graphs and are standard shocks are reported in figure 01.

Figure No: 01   Combined impulse response function graphs.
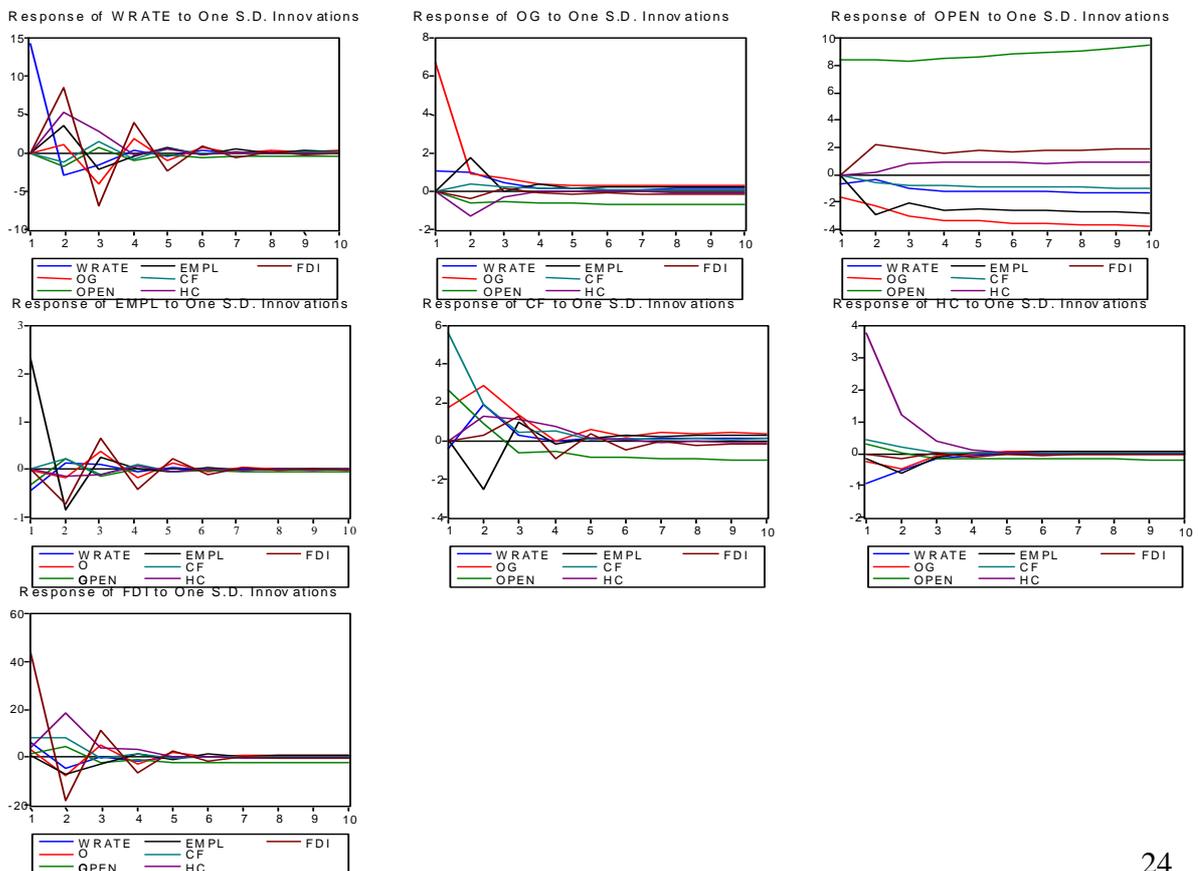
Table No: 05   Average Impulse Response Functions

	FDI	OG	WRATE	OPEN	EMPL	CF	HC
FDI	2.469	-1.795	0.150	-1.279	-1.67	1.605	3.95
OG	-0.039	0.879	0.22	-0.294	0.43	-0.21	-0.077
WRATE	0.507	-0.194	.885	-0.299	0.285	-0.140	0.62
OPEN	-0.203	-4.275	0.418	5.096	-3.430	1.60	0.709
EMPL	0.021	0.074	-0.056	0.051	0.144	-0.043	-0.019
CF	-0.072	0.408	0.176	-0.185	-0.231	0.704	0.424
HC	-0.021	-0.230	-0.137	-0.196	-0.024	0.245	0.360
EXPORTS	0.114	-0.16	0.086	-0.36	0.481	-0.344	-0.426
LIB	-0.017	-0.070	0.004	0.027	-0.0493	0.030	0.025
INTRATE	-0.056	-0.344	0.125	-0.31	0.289	-0.222	0.312
SAVINGS	-0.039	0.363	0.286	-0.265	0.141	0.081	0.079

Variance Decomposition

The variance decomposition is showing the variation explained by the other variables to the policy variables. In our results FDI is being shown how the other variables are showing variance to FDI, nearly all the variables are showing the variation to FDI largely by the labour force, capital formation followed by openness, wage rate and output growth. The results are reported in table No.06. The variation is clearly being shown at combined and multiple graphs in figure no.2:

Table No 06   Average Variance Decomposition

	FDI	WRATE	OG	OPEN	EMPL	CF	HC	IR
FDI	71.79	1.776	2.169	4.843	4.078	1.668	7.65	2.312
WRATE	26.23	52.51	1.473	4.509	2.47	1.31	5.22	2.47
OG	3.155	5.029	59.83	7.083	6.098	1.856	4.109	7.622
OPEN	6.441	0.717	3.819	78.245	5.522	0.072	0.283	2.72
EMPL	18.19	6.322	2.558	3.035	63.895	1.357	0.167	0.533
CF	3.093	6.222	10.451	19.1993	9.722	39.767	2.928	2.84
HC	2.789	5.39	7.017	6.22	2.123	5.564	58.55	0.286
INTRATE	4.13	4.039	5.474	18.819	4.25	26.562	4.18	26.04
INFRATE	1.03	2.11	7.946	7.843	3.37	4.761	2.56	11.70
SAVINGS	3.965	12.035	5.882	2.682	8.071	6.216	5.879	7.027
EXPORTS	3.645	5.234	9.728	22.828	4.886	5.504	1.743	17.29

FIGURE No: 02   COMBINED VARIANCE DECOMPOSITION GRAPHS

Variance Decomposition of

Variance Decomposition of

Variance Decomposition of

— WRAT — EMPL — FD
— OPE   — H

— WRAT — EMP — FD
— OPE   — H

— WRAT — EMP — FD
— OPE   — H

Variance Decomposition of

Variance Decomposition of

Variance Decomposition of

— WRAT — EMP — FD
— OPE   — H

— WRAT — EMP — FD
— OPE   — H

— WRAT — EMP — FD
— OPE   — H

Variance Decomposition of

— WRAT — EMP — FD
— OPE   — H
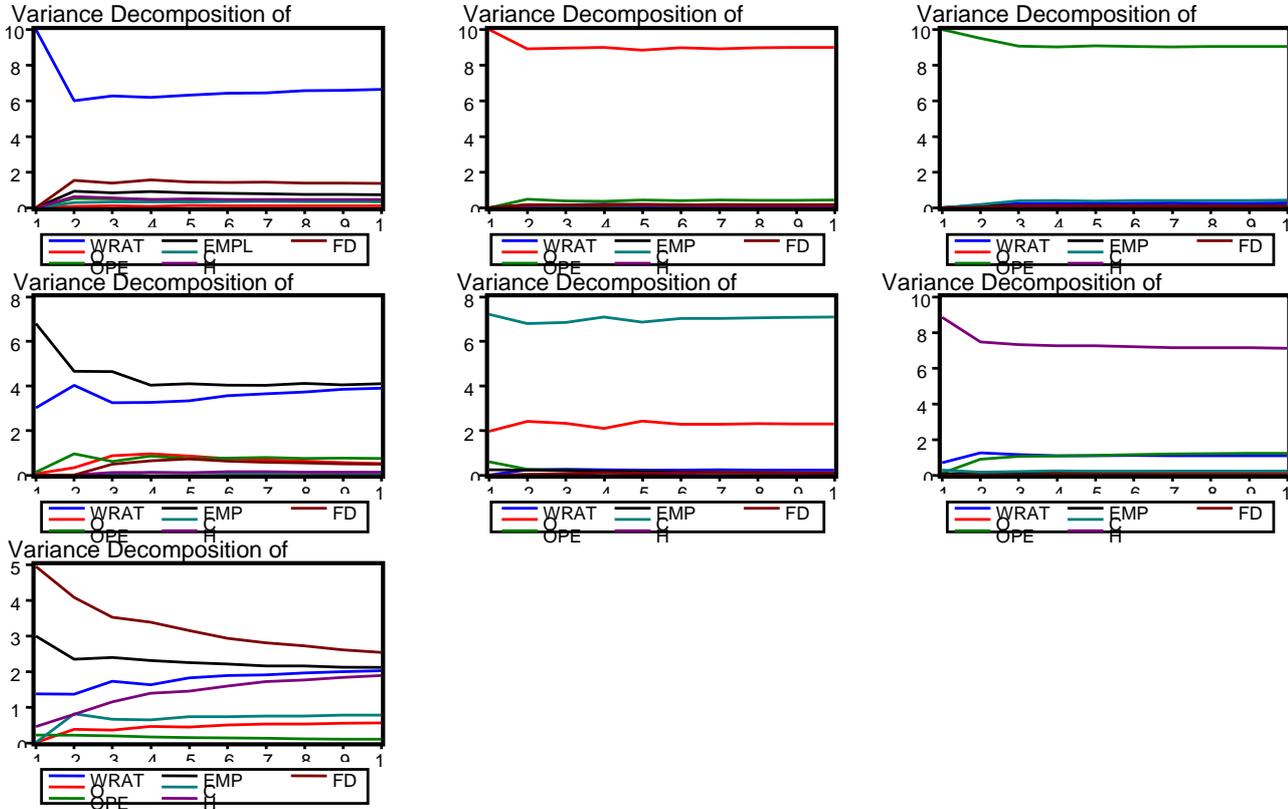
Long-run dynamics & co-integration

Since the theoretical model suggests a long-run relationship between the variables in equation 1 and 2 which are al1 non- stationary, we seek to test whether the relation is co- integrated using recent developments in the econometric analysis of non-stationary variables as applied to historical/time series data. The basic idea of co-integration is that if there is **a** long-run relationship between two or more non-stationary variables, a regression containing all these relevant variables--the co-integrating equation-will have a stationary error term, even if none of the variables taken alone is stationary. In other words, in order for the variables to be related in the long run, they must be co-integrated. Thus the test for co-integration of variables in the relation is also a test for the presence of any long-run equilibrium relationship among these

variables. The trace static reported in Johensen co-integration test illustrate co-integration r=3. We have estimated the VEC model by putting the two co-integration equations into the system.

Results of Dynamics Vector Error Correction model

From cost related factors, only the wage rate is showing the long run relationship with FDI. See Table No: (03 last column). The macro economic factors; output growth, employment, capital formation, and human capital exhibit long-run relationship with FDI. The results illustrate the long-run dynamics between FDI, openness and macro economic factors consistently.

Compare Diagnostics:

It is evident that macro economic factors followed by cost-related factors emerge as the dominant factors both in short-run dynamic relationship between FDI and its determinants. Openness emerges as dominant factor in long-run dynamics also. There is also strong evidence to suggest that determinant variables that exhibit short-run dynamics may also exhibit long-run dynamics and vice versa. In general, however, the macro economic factors seem to be playing a comparatively significant role in determining FDI then cost-related factors both in short-run and long run dynamics.

Impulse Response Function

Impulse response function some times also called innovation accounting. The ordering of the variables in VAR (VEC) (particularly the direction of response) also influences the results. Therefore, FDI indicates substantial variation by the different variables. FDI is most sensitive to Openness, Employment, Wage rate, Output Growth and other macro economic variables. The time path of showing the 10 period effect of FDI and other variables (for space limit we are reporting only FDI results- Table No.07) and combined graphs of all shocks in table no.8

Table No: 07 Average Impulse Response Functions

	FDI	WRATE	OG	OPEN	EMPL	CF	HC
FDI	4.1	11.26	-4.78	13.55	5.21	11.00	8.60
WRATE	1.85	11.75	1.60	0.61	2.06	-0.80	-0.50
OG	-0.1	0.10	3.05	-0.06	0.35	-0.07	-0.16
OPEN	0.27	-0.42	-0.82	52.65	-0.21	0.05	-0.03
EMPL	0.1	-0.85	-0.28	0.62	0.72	-0.11	-0.05
CF	0.42	1.52	0.95	1.88	1.45	1.55	1.02
HC	-0.091	-0.92	-0.50	1.05	-.125	1.35	1.23

Variance Decomposition:

Variance decomposition is a more discerning test of causality based on the variance decomposition of a variable forecast error variance. The decompositions are generated from the moving average representation of VEC system and show the proportion of forecast error variance for each variable that is attributable to both its own innovations and therefore the other variables. This relationship among the variables may be evaluated in terms of degree of causality.

Table No: 08 Average Variance Decomposition

	FDI	WRATE	OG	OPEN	EMPL	CF	HC
FDI	15.55	15.70	11.12	23.27	9.18	15.78	9.36
WRATE	8.28	74.48	9.46	0.80	5.00	1.59	0.351
OG	0.085	1.20	92.81	0.25	2.48	1.21	1.93
OPEN	1.99	4.90	15.55	74.05	1.21	1.33	0.94
EMPL	3.72	22.30	18.54	9.24	42.08	2.08	2.01
CF	1.43	17.76	14.76	19.17	17.52	22.34	6.98
HC	1.00	12.50	14.25	16.90	1.53	26.43	27.37

Because of the limitations of space we are only confined to discuss, limited results.

In particular (disregarding the input of FDI itself), the most important sources of variation are: Openness, Wage rate, Employment, Output Growth followed by Human Capital and Capital Formation Wage rate: the important sources of variation are: (Disregarding the input of OG itself), the most important sources of variation are OG, FDI, Employment followed by capital formation, Openness and human capital. Openness: (disregarding the input of openness itself),

the most important sources of variation are, OG, Wage rate followed by FDI, capital formation, employment and human capital. Employment: (disregarding the input of employment itself), the most important sources of variation are, wage rate, output growth, followed by openness, FDI, capital formation and, human. Output Growth: (disregarding the input of wage rate itself), the most important sources of variation are, employment followed by Human Capital, Wage rate, capital formation, openness and, FDI human capital.

Human capital: (disregarding the input of human capital itself), the most important sources of variation are capital formation followed by, openness, output growth, wage rate, employment and FDI. Capital formation: (disregarding the input of capital formation itself), the most important sources of variation are, openness followed by wage rate, employment, human capital and FDI.

Point and Interval Forecast:

The VEC model has been solved for forecasting while keeping in view getting point and interval forecast by minimizing forecasting mean squared error. The point and interval forecast are reported table no.09. The forecast of dynamic solutions is also showing the consistency between the actual and forecasted series.

Table No: 09.   Point and Interval Forecast results

Forecasting Period	Point Forecast	Interval Forecast
FDI (1) ± 1.96 s.e (12.33)	-40.99	± 24.17
FDI (2) ± 1.96 (17.73)	-27.14	± 34.76
FDI (3) ± 1.96 (8.43)	-52.14	± 8.43
FDI (4) ± 1.96 (25.0)	-46.10	± 49.07
FDI (5) ± 1.96 (4.19)	-40.55	± 8.22
CF (1) ± 1.96 (2.19)	6.7	±4.30
CF (2) ± 1.96 (2.36)	2.04	±4.62

CF (3) ± 1.96 (6.33)	6.45	± 12.41
CF (4) ± 1.96 (4.42)	1.96	± 8.67
CF (5) ± 1.96 (4.92)	-4.68	± 9.65
WRATE (1) ± 1.96 (3.85)	19.6	± 7.56
WRATE (2) ± 1.96 (4.32)	-8.99	± 8.47
WRATE (3) ± 1.96 (8.72)	21.90	± 17.00
WRATE (4) ± 1.96 (3.30)	5.37	± 6.47
WRATE (5) ± 1.96 (5.32)	12.29	± 10.43
EMPL (1) ± 1.96 (4)	3.23	± 7.84
EMPL (2) ± 1.96 (3.20)	3.50	± 6.27
EMPL (3) ± 1.96 (1.97)	-1.49	± 3.85
EMPL (4) ± 1.96 (2.28)	1.38	± 4.47
EMPL (5) ± 1.96 (0.44)	-1.76	± 0.87
HC (1) ± 1.96 (0.42)	-2.86	± 0.83
HC (2) ± 1.96 (0.56)	-0.96	± 1.11
HC (3) ± 1.96 (2.28)	-3.45	± 4.45
HC (4) ± 1.96 (1.33)	-3.48	± 2.62
HC (5) ± 1.96 (0.96)	-1.23	± 1.89
OG (1) ± 1.96 (2.79)	1.48	± 5.48
OG (2) ± 1.96 (5.17)	7.67	± 10.14
OG (3) ± 1.96 (3.22)	2.41	± 6.31
OG (4) ± 1.96 (4.80)	8.29	± 9.54
OG (5) ± 1.96 (4.05)	3.04	± 7.94
OPEN (1) ± 1.96 (42.18)	138.53	± 82.68
OPEN (2) ± 1.96 (42.69)	141.11	± 83.68
OPEN (3) ± 1.96 (44.84)	147.98	± 87.89
OPEN (4) ± 1.96 (49.14)	167.34	± 96.32
OPEN (5) ± 1.96 (44.79)	153.10	± 87.79

Granger -causality

FDI has been the major concern to economists and politicians because of its potential effects on the macro- economic factors of the country. Among the location factors investigated in the foregoing section, there is a possibility of causation between FDI and some of the macro economic variables. FDI might impact on for instance output growth (GDP), human capital and

international trade; investigated above under different contexts. We are therefore in a position to investigate this as well as by normalizing each of these variables as 1 in the respective co-integrating relationship. However, since some of the variables are eliminated during the co-integration analysis, we do not have results for the above variables. We therefore employ Granger causality methodology to complement the results.

Results

Granger-causality between FDI and other determinants are reported in table no.10.

Table No: 10.   Granger-causality Equation

I.	FDI	$= IR^3 +$	$INFRA^3$					
II.	OG	$= OPEN +$	$IR^2 +$	$SAVINGS^3$	$+ LIB$			
III.	OPEN	$= EMPL$						
IV.	WRATE	$= FDI^3 +$	HC^2					
V.	CF	$= OG^3 +$	$OPEN^3 + IR^3$		$+ INFRATE^3 +$	$EMPL^3 +$	GEE^3	
VI.	HC	$= OPEN^3 +$	$CF^3 +$	$INFRA^2$				
VII.	EMPL	$= OG^3 +$	$FDI^2 +$	LIB^3				

Note: ^{3} show the causation on three lag, ^{2} shows the causation on 2 lag and others on one lag.

While discussing the Granger-causality results, the results exhibit the consistency with the earlier results, showing the lag relationship among the set of variables. Each variable's lag period inclusion is showing the significance of dependent variables prediction power. While looking at the first equation FDI is being caused by interest rate and infrastructure by three lag periods. While out put growth is being caused by openness, interest rate on two lag savings two lag and liberalization one lag period. While capital formation is being caused by output growth, openness, interest rate, inflation rate, employment and education expenditure all by three lag periods. While wage rate is being caused by FDI by three lag periods and human capital by two lag periods. While openness is being caused by, Employment/Labor by one lag period. While human capital is being caused by openness and capital formation by three lag periods and

infrastructure investment by two lag periods. While employment is being caused by out put growth by three lag periods, FDI by two lag periods and liberalization by one lag period.

Conclusion and Policy recommendations

It has been found that cost related factors, macro economic factors and country's profile of political risk index are the major determinants emerge in short-run analysis. It has been found that macro economic factors followed by cost related factors emerges as the dominant factors both in short run dynamic relationship between FDI and its determinants. Among the cost-related factors only wage rate is showing the long run relationship with FDI. Among the macro economic factors, the output growth, employment, capital formation, and human capital exhibit long run relationship with FDI. The results showing/ illustrates the long run dynamics between FDI, openness and macro economic factors consistently. Openness emerges as dominant factor in long run dynamics also. There is also strong evidence to suggest that determinant variables that exhibit short run dynamics may also exhibit long run dynamics and vice versa. In general, however, the macro economic factors seems to be playing a comparatively significant role in determining FDI then cost related functions both in short run and long run dynamics. The relationship among the variables has been evaluated in terms of degree of causality. The results exhibit the consistency with the earlier results, showing the lag relationship among the set of variables. On the policy front, it becomes apparent that FDI is the important source to induce economic activity and hence growth. If a country has to feel FDI's spillover effects and economic growth, the country needs to attract FDI formulating a bundle of policies (such as those that are included in the model that caters for the interests of all the potential investors from different countries). This means that country needs stable macro economic indicators improvement, country's risk profile followed by cost related and investment environment

improving factors. Further, the country can indeed realize benefits from present attributes to have

to keep of FDI friendly atmosphere by improving the country's macro economic, socio-political

and financial profile.

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Appendix 'A'

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Variables Measurement of variables:

FDI- net FDI flows into the manufacturing/ GDP* 100
Real wage rates- real wage rates
Output growth- $(GDP_t – GDP_{t-1})/GDP_{t-1}* 100$
Openness- (Exports+ Imports)/ GDP*100
Labour force- employment level in the manufacturing sector
capital formation- Fixed capital formation/ GDP*100
Human capital- Secondary school enrolment
Liberalization- A dummy variable with 0 representing the pre liberalization, period-1971-87 and 1 representing the period 1988-2005
Foreign exchange rates- annual average of the exchange rate between one   Pakistani Rupee and the equivalent in Dollar

Interest rates- average annual lending interest rates.

Real wage rates- average hourly wage rates.

Infrastructure- level of government expenditure on economic services (which   by definition includes, transport and communication, electricity gas and water, industry and agriculture)/GDP*100.(government expenditure on education was also included in this ratio)

Savings- end of year annual amount of time and savings and deposits in   commercial banks/GDP*100

Inflation- implicit GDP inflator

Government expenditure on education- Annual recurrent and capital expenditure on education/GDP*100

GNP- GNP at market prices.

Political Risk indicator- 5-point scale indicating stability of government and market oriented policies (1= lowest, 5= highest).

Market potential- annual average GDP per capita (US. $)

Annual average GDP growth%

Economic stability- annual average inflation rate (%)