Foreign Capital Inflow and Economic Growth:
A Dual Gap model for Pakistan Economy

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Abstract: The purpose of the study is to explore the relationship between 'Foreign capital inflow' and the economic growth in the framework of Dual gap approach. For this, ARDL bounds Co-integration approach is applied as econometric methodology to examine the short run dynamics into the long run equilibrium. Two models are established in which GDP growth is a dependent variable while Gross domestic saving, Foreign direct investment, Exports, Imports, CPI and Telephone lines as physical infrastructure, are taken as independent variables for the time period of 1976 to 2011. The results suggest that Foreign private inflow in the form of FDI has been supplementing the Domestic Savings in a good macroeconomic environment represented by positive impact of Inflation on growth rate. The inclusion of Export sector in the model has Replaced the 'Foreign private investment' and impact of FDI has become negative on GDP growth in the existence of poor macroeconomic condition represented by negative association between Inflation and GDP growth.

Keywords: FDI, Dual Gap model, Economic growth
JEL Classification: F21, F13, O40

1. Introduction

Since from independence, Pakistan is highly dependent on the external resources for the growth. History is evident that Pakistan's most successful 'Five-year Plan' absorbed huge amount of foreign aid for the development, and growth rate approached to 7.6 %. During 1960s and 1970s, foreign assistance was a major source of capital inflow in Pakistan. Foreign aid was 42.55% of the total investment in 1960, which rose to 53.3% of total investment in 1970. Foreign Private investment was not impressive till 1980. The post 1988 period is important for the process of liberalization and privatization, which has helped in accelerating the inflow of foreign investment from US$ 185.6 million in 1988 to US$ 939 million in 1996, but after within two years it was seemed to be declined at US$500 million in 1998.

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There are several reasons of this decline in FDI after 1997; the economic sanctions made on Pakistan after the nuclear test, freezing the foreign currency accounts and Independent power producers (IPP) controversy (Le & Ali, 2002). Further, the Asian crises had deteriorated the confidence of foreign investors. A number of policy measures were taken to restore the foreign investors' confidence like 'New Investment policy 1997' and 'corrupt business practice ordinance 1998'.

Thus, the trend has seemed to change after 1999 and the Foreign Direct Investment from 322 million dollar in 2000-01 rose to 3.52 billion dollars in 2009. Despite this considerable rise in the amount of FDI during the last decade, Pakistan's FDI inflow remained meager as compare to other developing countries. In 2007, the average capital inflow to each developing country is 7.5 per cent of GDP but in the case of Pakistan this share was only 4 per cent.

This 2000s decade is led by different problems for Pakistan. Pakistan's involvement in the so-called 'War against terrorism' has destroyed all previous policies to attract the foreign investors. MNCs are feared to engage in long run commitments in Pakistan due to uncertain and risky business environment.

Foreign capital inflow is regarded as a potential source of economic growth for capital deficient economies. Pakistan has to depend on 'Foreign capital inflow', because manufacturing productive capacity is constrained by modern technology and capital intensify goods, which leads to develop I-S gap. That's why; exports are limited to only primary goods rather than exporting manufacturing goods. Manufacturing goods have more income elastic demand than the Primary goods. This has become a reason of poor 'Terms of trade' (TOT) of Pakistan in world market, and has developed a huge 'Foreign exchange gap'. So, Pakistan needs to develop 'Import substitution

industry' and fiscal incentives should be given to the foreign investors to attract FDI. Foreign Direct Investment is highly conducive to economic growth as it is a major source of transferring foreign technology and skills to the host country. Thus, present study is undertaken to examine the effectiveness of external inflow of capital, and to analyze the savings pattern affected by the inflows of foreign resource, in the framework of 'Two gap model'.

2. Theoretical Framework

FCI (Foreign Capital Inflow) has been claimed to influence the growth process by bridging the Dual gap, transferring modern technology, skills and innovation and increasing the productivity in the host (recipient) country. The components of FCI are highly responsive to some factors of the host country, which include; the country's market size, investment environment, level of education, institutions, tax laws, trade liberalization policy, and overall macroeconomic and political scenario. (Aurangzeb & Ul Haq, 2012). Besides, the favourable impacts of FCIs, there are some side effects in the form of accumulation of huge foreign debt in the case of misallocation of foreign resources and poor macroeconomic policy frame work. Further, high dependency on external funds may lead to economic and political interference of foreign country. Usually, in poor economies, foreign capital inflows tend to liberalize the consumption behaviour and reduce the domestic savings rather than supplementing it.

Underdeveloped country like Pakistan, in where most of foreign Aid and remittances are utilized in the form of consumption expenditures rather than going for Investment. Only FDI is seemed to be a significant source of Investment, but it is controversial in the sense that it 'gives less and takes more for its home country'. There are several dimensions to interpret the dual gap model. Dual gap refers that exports are limited because of limited production capacity that exist due to lack of technology and capital intensive goods. So, FCI tends to increase

the productive capacity and fill the I-S gap in the economy, which leads to boast up the export sector and would ultimately eliminate the Import-Export gap.

In other words, Dual gap model means that Foreign Capital Inflow is necessary to import capital goods to bridge the I-S gap, because developing countries do not have enough foreign exchange to import capital goods from abroad, because they already lie in trade deficit. So, here foreign resource inflow will bridge Saving-Investment gap by providing capital goods and indirectly supplement the Trade gap.

Most developing countries face either shortage of domestic saving to match with the required investments or shortage of Foreign exchange to finance the imports of capital and intermediate goods. Different empirical studies have shown that one of the two constraints is 'binding' or 'dominant' for a specific period in LDC. As, one of the pioneering study by Chenery and Bruno (1962) analysed that countries tend to face a dominant saving constraint in earlier stages of growth and development and a dominant foreign exchange constraint at later stages of development. In the case of developing country like Pakistan where 'Foreign exchange gap' is a binding constraint, there is a need of Capital goods, machineries and technology to be imported to establish manufacturing industries but 'foreign exchange' is not enough to purchase the capital goods for industry. Thus, in this scenario, external finance plays a vital role to overcome the foreign exchange gap and growth would be called as 'Exogenous', since it relies on foreign resources.

Figure 1: Foreign Exchange Gap and Growth
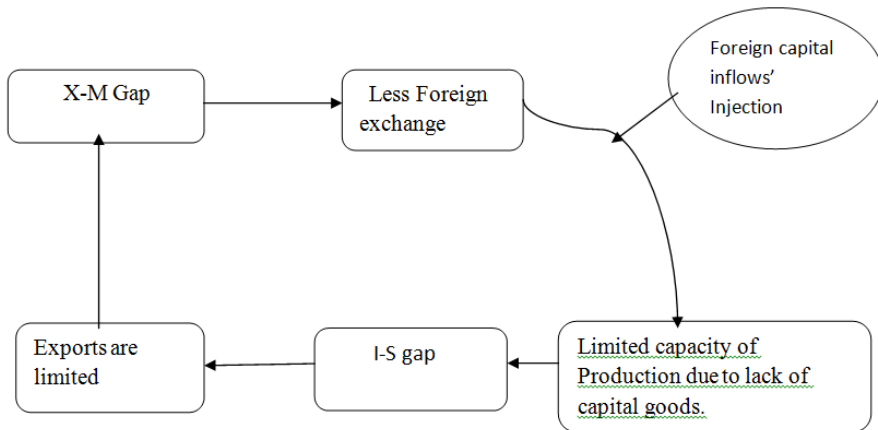
Source: Author's own formulation

3.   Literature Review

These studies were motivated by the Chenery and Strout (1966) who had laid the foundation of Dual gap model in 1966. Ahmad (1990) showed a positive relation between foreign capital inflow and economic growth, but there seems to be an inverse relationship between domestic saving and foreign inflow of capital, after regressing the simultaneous equation model for Bangladesh economy for a time period 1960/61 to 1979/80. Further, estimated results showed a "positive" relation between primary share and foreign capital inflow as a proportion of GDP, and a "negative" relation between manufacturing share and foreign capital inflow as proportion of GDP. Overall, it had concluded a "positive" contribution of foreign inflow of capital to the GDP growth, but it had led the Bangladesh government to relax saving efforts.

Le and Ataullah (2002) study was mainly focused on the trends of capital inflows in 1970s, 1980s, 1990s and comparatively analysed the patterns of growth with other countries. It has been observed that the volume of foreign aid to Pakistan is decreasing because donor countries and aid agencies have acquired the position of dictating the policies to government of Pakistan. Beside this, there is unimpressive growth in foreign private investment due to political instability, poor economic infrastructure and unsuccessful policies of attracting foreign investors.

Hye *et al.,* (2010) in their article highlighted one of the major functions of foreign capital inflows is to finance the domestic saving gap and trade gap, and suggested that FDI is an effective inflow for Pakistan economy in the short run as well as long run. They have used the methodology of "co-integration technique" in ARDL model the results depicted that FDI is positively contributing to economic growth in short run as well as in long run. While foreign aid (ODA) is seemed to be effective for Pakistan economy only in long run, but not in the short run, foreign aid is becoming a hurdle in the way of economic growth.

Since FDI is relative more effective, so, policies should be focused on such growth strategy which is led by FDI, and attention must be given to create such incentives which would attract foreign investors.

Ahmed and Wahab (2011) found a negative relation between foreign assistance and real per capital GDP, which has been justified on the basis of poor macroeconomic condition, wrong allocation of resources, political instability, and frequent changes in policies and inefficiency of institution which resulted in debt stock. Beside this, there seemed a positive impact of national savings on economic growth of Pakistan. It has used "Dickey Fuller" to check the stationary, and Engle- Granger co-integration technique and Johansen's maximum likelihood procedures are applied for analysis, considering the time period of 1972 to 2010. The authors are in great favour of improving the tax base and domestic resource mobilization ensuring macroeconomic stability and reducing dependency on foreign assistance.

Aurangzeb and Ul Haq (2012) have disaggregated the foreign inflow of capital into various components to analyze the impact of foreign capital inflows on economic growth of Pakistan focusing the time period of 1981 – 2010. The significance of various factors are identified by the technique of multiple regression analysis. The results have revealed that the three independent variables; FDI, remittances and external debt are positively related with GDP growth and there exists a significant relationship. It has been also noted that the "Granger – causality test" has shown a bidirectional relationship between external debt and remittances, GDP and external debt, FDI and external debt, FDI and remittances. Further, empirical results also depict a unidirectional relationship from GDP to FDI.

The study of Nkoro and Furo (2012) has also decomposed foreign capital into foreign aid, remittances, foreign direct investment and external debt and these are taken as independent variables against the GDP, as dependent variable. Using the technique of "co-integration, variance decomposition, impulse response analysis and block

erogeneity tests", the findings support the foreign capital has led economic growth in the Nigeria. Analysing the "Error correlation model", there is seemed to be a positive relation of FDI and foreign aid with real GDP, while, remittances and external debt are negatively correlated with economic growth.

Shaheen *et al.,* (2013) attempted to explore the contribution of foreign capital inflows to meet the gap between domestic saving and investment. For this purpose, co-integration technique and ECM methods are used on time series data for the period of 1980 to 2010 to observe the long run relation between the variables for Pakistan. For this analysis, five variables are used. "Gross domestic saving" is used as dependent while FDI, remittance, trade openness and GDP per capital are taken as explanatory variables. The results depict that there is a positive and significant relationship between FDI and "grows domestic savings". Trade openness also plays a positive role in contributing in "Gross domestic savings", but remittances are negatively associated with the "Gross domestic saving". This study establishes a long run with the order of integration 1.

Umoru (2013) has empirically analysed the relative impact of capital outflows on the GDP growth of Nigeria. It has estimated three simultaneous equation model based on three approaches of measurement of capital outflows, that are, "Balance of payment" approach, "Residual approach", and "Bank deposit approach". GMM method of estimation has been applied to estimate simultaneous equation model for the time period of 1980 – 2010. Co-integration test has shown that any short run perturbation in the variables is settled at an equilibrium level. The focal result of the study is that capital flight has adversely affected the GDP growth. Capital control is analysed to be insignificant contributing in the GDP, public expenditure has significant positive impact on growth, but domestic investment is analysed to be insignificant. Further, exchange rate instability, which is measured in terms of overvaluation and undervaluation, leads to

restrain the implementation of investment plans due to uncertain domestic climate.

The working paper of Qayyum and Mahmood (2013) tends to explore the inter-linkage between foreign trade and Foreign Direct Investment (FDI) in case of Pakistan, taking the time period of 1985 to 2010. It considers eight major trading partners that are; Canada, France, Germany, Hong Kong, Japan, Saudi Arabia, UK and USA to analyze whether foreign trade or FDI are complements or substitute of each other. The empirical results reveal that FDI prompts foreign trade. It means increase in FDI promotes imports from the country of FDI origin, and vice versa. But FDI is not significantly enhancing the exports, while exports are seemed to attract more FDI inflow to Pakistan, which is highly significant. The study also explores the reason why FDI tends to raise the imports. The reason is that usually FDI is tied to imports of plants, machinery and other capital good from (home) parent country. Such tied imports are the major reason of increasing burden on country's import bill.

4. Data and Methodology

It includes the data description, sources, specification of model and methodology for analysis.

4.1 Data Sources and Description

The data is gathered from secondary sources that includes IMF data base; WEO, and WDI from World Data Bank for the period of 1976 to 2011.

GDP is taken as dependent variable. While FDI, Domestic savings, Telephone lines, Consumer price index, Exports and Imports are taken as independent variables. Telephone lines variable is used as a proxy for 'Physical infrastructure', and CPI is a proxy for 'Macroeconomic condition' and FDI as a proxy for 'Foreign capital inflow'. All the data are gathered for the time period 1976-2011 in the form of Time series, and regressed after taking Log to ensure the linearity of parameters.

4.2 Methodology and Model Specification

ARDL method to co-integration is used as methodology because it eliminates the problem of absent variable bias and problem of autocorrelation and estimates both short run and long run elasticities of the model. Order of integration does not matter as this approach can be used to a combination of I (0), I (1) variables and integrated of same order at I (1), but cannot be used to I (2) or higher orders.

Moreover, a dynamic Error-Correction Model (ECM) is the symbol of this model which integrates the short run dynamics into the long run equilibrium whereas stabilizing the long run information. This test eliminates the uncertainty related with the testing of order of integration of variables.

4.2.1   ARDL bounds Co-integration

The limits testing technique involves two stages.

In this stage we find long run relationship between the variables. When this relationship is confirmed, then in the second stage we assess short run and long run parameters. This technique evaluates unrestricted error correction for bounds test taking each of the variables as dependent variable, one after another.

4.2.2   Parameter stability and Diagnostic checks

With the object of testing the reliability of the error correction model, various diagnostic checks, for example tests of autocorrelation, normality and heteroscedasticity in the error term, of stability and correctness of parameters are functional.

For bounds testing technique, ordinary least square (OLS) is implemented to determine the long run association among the variables. F-test is accomplished for the combined significance of the parameters of the lagged variables. Further, If the F and Y computed value is greater than the critical value, the null hypothesis for no co-integration is rejected. If the F-static is below the lower bound, the alternate hypothesis (H_1) cannot be rejected and long run relation does not exist there. If the F-value falls between the upper and lower bound there is no conclusion found.

The variables have been used in log terms and given the nature of data, the following models are specified.

4.2.2.1 Model 1

$$LGDP = \alpha_0 + \alpha_1 \, (LTEL) + \alpha_2 \, (LFDI) + \alpha_3 \, (LSAV) + \alpha_4 \, (LCPI) + \mu_t$$
$$\dots (1)$$

4.2.2.2 Model 2

$$LGDP = \beta_0 + \beta_1 (LFDI) + \beta_2 (LCPI) + \beta_3 (LEX) + \beta_4 (LIM) + \mu_t$$
$$.....(2)$$

Where:

LGDP = Log of GDP in million $

LTEL = Log of Telephone lines as physical infrastructure in million $

LFDI = Log of Foreign Direct Investment; proxy of foreign private investment in million $

LSAV = Log of 'gross domestic savings' in million $

LEX = Log of Exports of goods and services in million $

LIM = Log of Imports of goods and services in million $

LCPI = Log of 'Consumer price index' measuring for inflation.

4.2.3   Equation of ECM

The short run dynamics of the coefficients is found by VECM (vector error correction model) after the estimation of ARDL.

4.2.3.1 Model 1

$$dLGDP = \alpha_0 + \alpha_1 (dLTEL) + \alpha_2 (dLFDI) + \alpha_3 (dLSAV) + \alpha_4 (dLCPI)$$
$$+ ECM(-1) + \mu_t \ldots\ldots\ldots\ldots..(3)$$

4.2.3.2 Model 2

$$dLGDP = \beta_0 + \beta_1 (dLFDI) + \beta_2 (dLCPI) + \beta_3 (dLEX) + \beta_4 (dLIM) +$$
$$ECM(-1) + \mu_t \ldots\ldots\ldots\ldots(4)$$

5. Results and Discussion

Now, the results of Model 1 and Model 2 are to be interpreted. Table 1 presents the unit root test, to check the stationarity. The results indicate that the LGDP and LSAV are integrated of order 1.

Table1: Unit Root Tests

Variables	Results
LGDP(1)	3.573***
LTEL	6.131***
LFDI	1.193***
LSAV(1)	2.193**
LCPI	13.799***
LEX	4.120***
LIM	3.520***

Note: *** 1% significance level, ** 5% significance level; (1)=first difference

Table 2: F-statistics for bounds co-integration

Significance Level	I(0)	I(1)
10%	3.02	3.51
5%	3.62	4.16
1%	4.94	5.58

Table 2 shows F-statistics (OLS) results for cointegration.

Table 3: F- Statistics for the Long run relationship

Model	F- Value	Results
1	6.043352	Co-integration
2	5.465132	Co-integration

Table 3 illustrates that there exists a long run relationship because F-statistic of all the models are greater than the upper bound as theory mentions.

**Table 4: Estimated Long Run Coefficients using the ARDL
Approach**

Variables	Model 1 (1,0,0,0,0)	Model 2 (1,0,1,0,0)
Log (Telephone lines)	-0.67664 (0.000)***	---
Log (FDI)	0.094479 (0.003)***	-0.065316 (0.014)**
Log (savings)	0.20654 (0.037)**	---
Log (CPI)	0.71414 (0.004)***	-0.044745 (0.766)*
Log (Exports)	---	0.17428 (0.050)**
Log (Imports)	---	0.55444 (0.000)***
Constant	24.0576 (0.000)***	8.9602 (0.000)***

Note: *** 1% significance level, ** 5% significance level, *10% significance level

The results of model 1 suggest that foreign capital inflow in the form of FDI is positively contributing in the economic growth, but its influence is minor on the growth. While, domestic savings are seemed relative more influential to GDP growth. So, this result reveals that FDI has Supplemented the 'Domestic savings' rather than substituting. It means that foreign inflow has raised the impact of 'Domestic savings' on Economic growth. Hence, FDI is an effective to support the 'Dom. Saving constraint to growth. Moreover, Telephone lines as a proxy of 'Physical capital' is contributing negatively in GDP in the Long run. The reason might be that it was not so much developed sector in Pakistan even in late 20th century. Thus, it is not a productive source of raising aggregate income. As after few years in 1980s and 1990s, it was replaced by modern technology (i.e. mobile phones, wireless service of internet etc.). That's why it is giving diminishing or negative returns in Long run. Beside this, inflationary pressure is positively

contributing, means that intensive demand exists in the economy which has created incentive for producers to produce more and contributing in growth positively. Further, all the results of model 1 are significant at 1 %.

In model 2, the international trade of goods and services has been included. The results suggest that FDI is negatively contributing in growth. It shows that the inclusion of 'Export sector' in the model has replaced the 'Foreign Direct Investment'. Imports are positively contributing in economic growth by importing capital and intermediate goods for manufacturing sector, but It has increased the 'Import-Export' gap. Another reason of negative impact of FDI on growth is the poor macroeconomic indicator i.e. Inflation. High price level in the economy deteriorates the foreign funds and assets, and compels the foreign firm to divert its investment plan to other country. Hence, high CPI discourages FDI that would cause decline in growth rate.

Table 5: The Error correction representation for the Selected ARDL model

Variables	Model 1 (1,0,0,0,0)	Model 2 (1,0,1,0,0)
dLog (Telephone line)	-0.41597 (0.000)***	---
dLog (FDI)	0.058082 (0.009)***	-0.044116 (0.014)**
dLog (savings)	0.12697 (0.038)**	---
dLog (CPI)	0.43903 (0.016)**	-0.030222 (0.765)*
dLog (Exports)	---	-0.044777 (0.475)*
dLog (Imports)	---	0.37448 (0.000)***
ECM(-1)	-0.61476 (0.000)***	-0.67543 (0.000)***
dConstant	14.7897 (0.000)***	6.0520 (0.000)***

R-Square	0.50418	0.78493
SE of regression	0.055433	0.037155

Note: *** 1% significance level, ** 5% significance level, *10% significance level

All the short run estimates of model 1 are statistically significant. R-square of the model is 0.50418, which is acceptable by every standard. The F-statistic is also highly significant at 1% level. The model is not spurious because DW statistic is higher than R- square value, i.e.1.5016. Further, in short run, FDI is supporting 'Domestic Savings' rather than substituting it, and both are positively and significantly contributing in economic growth. The important thing in the discussion is the ECM, which shows the speed of adjustment from short run fluctuations to attain long run equilibrium path. The coefficient of ECM(-1) term has a negative sign that is (-0.61476), which explains the high level of convergence and adjustment to equilibrium by 61%.

The short run analysis for model 2 shows that the exports have inverse and statistically insignificant relation with growth because of poor and volatile inflationary fluctuations, but in long run it has been positively and significantly adjusted with economic growth. Imports have positive relation with growth even in short run.

Overall results are seemed significant as F-statistic is 17.0313. The model is not spurious because DW statistic is higher than R- square value that is 1.9, which is nearly equal to 2 means 'no autocorrelation'. Value of ECM (-1) is above 67%, which shows high speed of adjustment towards equilibrium after fluctuations in short run disequilibrium.

Table 6: The Diagnostic Stability Tests

Tests	Model 1	Model 2
Serial Correlation $\chi 2$ (1)	2.4112 [0.120]*	0.0048804 [0.944]*

Functional Form χ^2 (1)	3.1688 [0.075]**	1.1866 [0.276]*
Normality χ^2 (2)	1.6765 [0.432]*	1.5081 [0.470]*
Heteroscedasticity χ^2 (1)	2.0288 [0.154]*	0.43625 [0.509]*
CUSUM	Stable	Stable
CUSUMQ	Stable	Stable

Note: *** 1% significance level, ** 5% significance level, *10% significance level

The diagnostic stability tests for the above models are provided in Table 6.

6. Conclusions and Policy Recommendations

It has been analysed in the Model 1 that foreign private inflow in the form of FDI has complemented the 'Domestic savings' in a good macroeconomic condition represented by positive impact of inflation on growth rate. Thus, FDI is an effective inflow which has raised the contribution of 'domestic savings' and provided support to finance the 'Domestic Saving gap' in the economy. The value of ECM (-1) is 61% which shows a high level of adjustment towards equilibrium after a short run fluctuations.

While model 2 is based on the 'Foreign sector' including Import-exports. It has been analysed that inclusion of Export sector has replaced the Private inflows in the economy, in the poor macroeconomic situation, i.e. high inflation and its negative impact on the economic growth. Imports are contributing in the development process because they support manufacturing sector by importing capital goods from abroad, but they tend to increase the 'Import-Export gap' in the economy. 67% value of ECM (-1) indicates a high level of convergence towards equilibrium.

Thus, overall it can be concluded that 'saving-Investment' gap has been supplemented by 'Foreign private inflow', but 'Import-Export'

gap tend to rise due to poor macroeconomic condition and huge imports of Capital goods from abroad to support the domestic manufacturing industry.

Some recommendations are discussed below:

- Relative huge Imports (than Exports) are contributing in growth process positively. As Imports of Capital & intermediate goods provide support to the domestic manufacturing industry to raise its productive capacity. It is 'Supplementing' the 'Saving-Investment' gap but is seemed to raising the 'Import-Export' gap. For this purpose, Pakistan needs to develop its 'Import Substitution Industry' (ISI), to minimize the dependence on imported Capital goods for its domestic industry. Further, for the encouragement of SMEs, easy loan facility on minimum interest rates is to be granted to local investors to boost up the domestic investment.

- This research has also analysed the 'Limited Absorption Capacity' for the inflows of Foreign capital in Pakistan due to underdeveloped Financial markets, which leads to depreciation of currency and increasing inflation. So, Stock market, bonds market, commercial banks and other financial institutions need to be well established and central bank should manage inflows through effective monetary policy and 'Sterilization technique'.

- Observing the overall trend of socio-economic indicators in Pakistan's history. Political instability, Poor infrastructure, Unsuccessful policies to attract the FDI, Insufficient Human capital, Terrorism and Risky market situations are the hurdles in the way of 'Foreign capital inflows' in Pakistan. So, good governance and good Law & order situation within a proper institutional framework is essentially required to restore the confidence of foreign investors.

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