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The Impact of Corruption on Foreign Direct Investment Inflows in Developing South Asia

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Abstract: ***This paper studies the unilateral effect of corruption on foreign direct investment inflows in developing South Asian countries between 1995-2019. Using a fixed effects approach, the paper aims to answer 2 main research questions. Primarily, it identifies the comprehensive impact and importance of corruption on FDI inflows by employing additional relevant control variables that account for region-specific advantages. It then extends analysis by studying interactional effects of locational determinants representing institutional and policy factors with the corruption variable in determining the corruption-FDI inflow relationship. The primary results suggest that corruption plays a negative, yet insignificant role towards FDI inflows in the host countries where economic and human capital factors are most significant determinants in attracting and deterring FDI respectively. Role of institutional quality on the overall relationship show mixed results of size and significance, but place emphasis on bureaucracy and lack of institutional transparency as an important consideration for foreign investors. Overall, Institutional improvement lowers corruption levels to change the role of corruption to a "helping hand" over time, and institutional policies raise corruption levels to change the role of corruption into a "grabbing hand" for FDI over time.***

Keywords: Corruption, FDI, Foreign Direct Investment, South Asia

1. Introduction

The study of the impact of corruption on foreign direct investment inflows is a growing field of theoretical and empirical research owing to its widespread implications on the economy and government policy. Corruption is largely determined by a country's institutional environment (Harms and Ursprung 2002), which has important implications on locational attractiveness. Largely acknowledged literature by (Javorcik and Wei, 2009) and (Bardhan, 1997) among many others extensively attempt to cover this field of research, with most literature assessing the topic on a global scale.

1.1 Relevance

Foreign direct investment is a long-term cross-country investment where investors residing in one country gain controlling ownership over businesses, productive assets, or real estate in another country. Post the 1990's, economic policies' liberalization and flexible FDI regimes in developing South Asia promoted conducive investment opportunities through tax incentives, reduced tariff and trade restrictions, and larger market size. This contributed towards a 9.5% increase in global FDI inflow volumes, following private remittances as South Asia's second largest form of private capital inflows (World Investment report, 2015). The increasing South Asian demand for FDI is attributed to investments driving superior economic performance, technology and management skill spillovers, expanding job opportunities, and facilitating local market competition (Shaari, 2021).

According to (World Bank, 2006), Corruption is a criminal offence undertaken by a person or organization in authority for private benefit. Corruption is regarded as a growing social evil, consistently correlated to lower economic growth and income inequality, especially characteristic of low-income and developing economies. Resultantly, (Transparency International, 2012) ranked developing South Asiaas one of the world's most corrupt economies due to growing dependence on untransparent public institutions, government influence and increased bureaucracy in the work of anti-corruption watchdogs.

Empirically, despite a 6% growth rate, inability to tackle corruption has adverse economic effects and causes more than 40% of world's population residing in South Asia to be poor(Global Corruption Barometer, 2019). However, theoretical views on economic impact of corruption are anecdotal with divergent scholastic views. Some regard it causing destructive societal and political impacts through monopolization of competitive state markets, whereas few regard the redeeming value in power-sharing as creating peaceful economies (Mauro, 1995).

Thus, parallels in recent surges in FDI and corruption demand special attention. Investors and policy makers must evaluate corruption and its responsiveness to institutional factors on FDI inflow in countries while making decisions and formulating policy reforms.

1.2 Motivation

The primary motivation of this study stems from impact of corruption on FDI inflows being highly contested in previous literature, debating a positive, negative, or insignificant relationship between the two. Most available empirical studies focus on general impacts on large cross-sectional or panel datasets, with relatively little focus on South Asia. Moreover, research emphasizes solely on general relationship between corruption and FDI, and overlooks region-specific impacts as potential stepping stones to understand the FDI-corruption relationship. This study aims to create a balance between relevant FDI determinants in South Asia to accurately understand the impact of corruption, and also explores effects of bureaucratic institutions in South Asia in determining the FDI-corruption relationship.

1.3 Outline

This project takes a dual approach to answer two research questions on the effect of corruption on FDI. It primarily finds the impact of corruption on FDI through a fixed effects regression. It then extends research to examine the added role of South Asia's institutional quality and policy/incentives on the corruption-FDI relationship by adding interactional variables to the regression. It starts with the review of literature on the topic, followed by a brief explanation on the theoretical background and dataset, and proposed research methodology. Finally, it explains obtained results and goes over concluding remarks, econometric problems, and scope for future research.

2. Literature Review

Present literature on the relationship between FDI inflows and corruption have debatable views categorized under 3 main theories – Grabbing Hand Hypothesis, Helping Hand Hypothesis, Insignificant impact; explaining a negative, positive, and insignificant impact of corruption on FDI inflows respectively. Despite most results being biased towards the former, a lack of consensus in research suggest that results vary with region and analysis methodology; raising the importance of the latter theories. This paper utilizes existing literature to find the impact of corruption on FDI with a focus on developing South Asia.

Hypothesis 1 – Corruption as a grabbing hand for FDI
Studies often back claims that corruption raises the cost of investing, lowers earnings, and causes decline in investment inflows (Alshehry, 2020; Gasanova et al., 2017; Luu et al., 2018; Nizam & Liaqat, 2022; Zander, 2021). Lack of transparency in the business environment raises costs of international business operations, discourages investors from investing because risk reduction is regarded crucial in business (Boddewyn, 1988).

Using a comparable logic, (Wei, 2000) argued that paying bribes or making surplus efforts to secure approvals of government officials to conduct business are requirements of corruption. This abuse of public office for personal benefit creates operational inefficiencies and imposes implicit taxes on businesses, driving up overhead costs and corroding investment inflows.

Maintaining previous results (Voyer and Beamish, 2004) utilized cross-sectional regressions to examine effects of corruption on Japanese FDI in 59 developing countries. Corruption lowers FDI in developing countries with insufficient comprehensive legal and regulatory structures to stop fraudulent behaviour. (Krifa-Schneider et al, 2022) discovered conflicting evidence from 80 developed and developing economies. There is a non-linear negative association between FDI and corruption. While investors in emerging countries are more tolerant of increasing corruption, advanced countries attract more FDI as corruption declines.

As an additional insight, (Javorcik and Wei, 2009) find that corruption makes it more likely that foreign investors will partner with local investors than establish completely owned subsidiaries, lowering prospects of FDI inflows. This is because, despite the fact that dilution of ownership and potential knowledge come at high costs, local partners may have advantages in dealing with dishonest officials.

Hypothesis 2 – Corruption as a helping hand towards FDI
Contradicting the Grabbing Hand Hypothesis, there exist justifications to a positive relationship between corruption and FDI inflows in the literature.

(Leff, 1964), (Bayley, 1966), (Huntington ,1968), and (Lui, 1985) justify increases in FDI levels by facilitating creation of business in countries with increasing bureaucracy and regulations by "greasing the wheels of commerce". They believe that bribery plays the role of "speed money" and reduces transaction costs.

(Bardhan, 1997) and (Méon and Sekkat, 2005) suggest that corruption may address problems caused by inefficient governments and increased FDI inflows. Bribing corrupt officials could help improve slowness of public administration and low skill levels of civil servants, escapepolicy repercussions, and enhance investment quality. Consistent with the above, In a sample of 15 developing Latin American nations between 1995 and 2003, (Bellos and Subasat, 2012) used panel data find a positive association between corruption and FDI.

(Abed and Davoodi, 2000) contrasts results and suggests that developing, low income countries are relatively incapable of dealing with widespread disadvantages of corruption and reduce investment productivity to deter FDI, whereas corruption acts as a grease to economically capable, developed countries with low corruption.

Hypothesis 3 – Insignificant Impact of corruption on FDI
Relatively few papers describe insignificant impact of corruption on FDI. Despite possible negative impact of corruption towards FDI inflows, other factors play more crucial roles in explaining the volume of FDI inflows into countries. These are explained by two arguments:

Hypothesis 3(a): Significance of institutional quality and political environment:
Using a panel of 117 developing countries, (Al- Sadig, 2009) between 1984 and 2004 to conclude that once institutional quality in host nations are controlled, negative effects of corruption become less significant. Although corruption negatively impacts corruption, foreign investors tend to prioritise institutional quality and political stability above corruption levels as a stronger determinant of expected returns from their business location.

Hypothesis 3(b): Significance of economic factors:
(Akçay, 2001) employs panel data from 52 developing nations and suggests that although corruption is an obstacle for investors, it is not considered as an important investment criterion. The most crucial factors that affect FDI through strong business advantages include market size, economic growth, inflation and corporation tax rates. These primarily contribute to high profitability in business operations abroad,

whereas corruption does not have a significant role in contributing towards FDI decisions abroad.

3. Research Questions

The study aims to answer 2 main research questions:

Q) What is the overall role of corruption in determining FDI inflows in developing South Asian countries?

Q) What role do institutions play in determining the FDI-corruption relationship?

4. Theoretical Framework and Data

The study employs annual panel data from 4 countries – India, Bangladesh, Pakistan, and Sri Lanka between 1995-2019. Choice of time period accounts for initialization of FDI inflow growth post economic liberalization in 1995, and ends at 2019, to avoid Covid-19 crisis impacts on global economic activity.

4.1 Theory

(Dunning, 2006) postulates a theoretical model "OLI paradigm" aiming to identify all factors evaluating incentives of profitable foreign direct investment as ownership, locational, internalization (OLI) advantages of a country. Ownership advantages explain "why" FDI inflows are impacted by the strength of a firm's capabilities and resources. Locational advantages explain "where" to locate FDI inflows relate to comparative advantages arising from the availability of efficient production factors and transparency in business. Internalization advantages stem from "how" firms internalize markets influenced by business cost reduction (refer A.3. for conceptual detail)

The theory classifies these advantages into 3 specifications: economic, institutional, and business facilitation determinants. Economic determinants describe investor motivations through market orientation and strategic asset seeking factors, achieving internalization advantages. Institutional determinants describe effects of political and business climate for investment, creating locational advantages. Business facilitation factors are understood as investor incentives and favorable environments for business activity, achieving ownership advantage objectives.

4.2 Variables

4.2 (a) Variables Choices

Table 1.1: Independent and dependent variable choices (refer F.1.)

Variable type	Variable	Variable Description
Dependent	*logFDI*	*log of FDI inflows measured in current US dollars(inward FDI stocks)*
Independent	*COR*	*Corruption levels=100-CPI(0 – Low corruption levels, 100 – high corruption levels)*

Growth trends in dependent and independent variables over time (refer F.2):

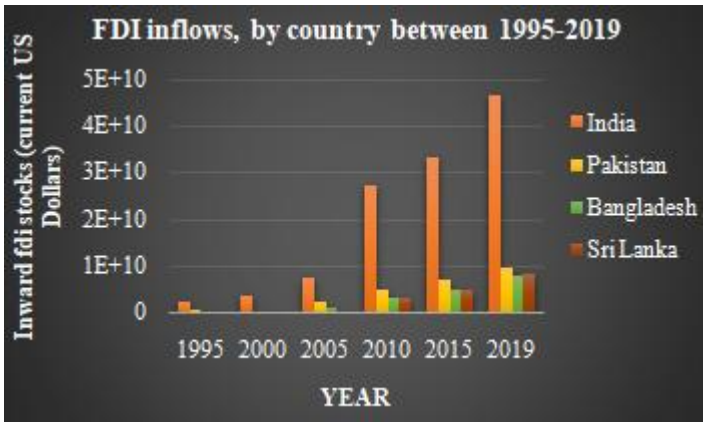

Figure 1.1: Growth in FDI inflows by country between 1995 and2019 (Source: World Bank)

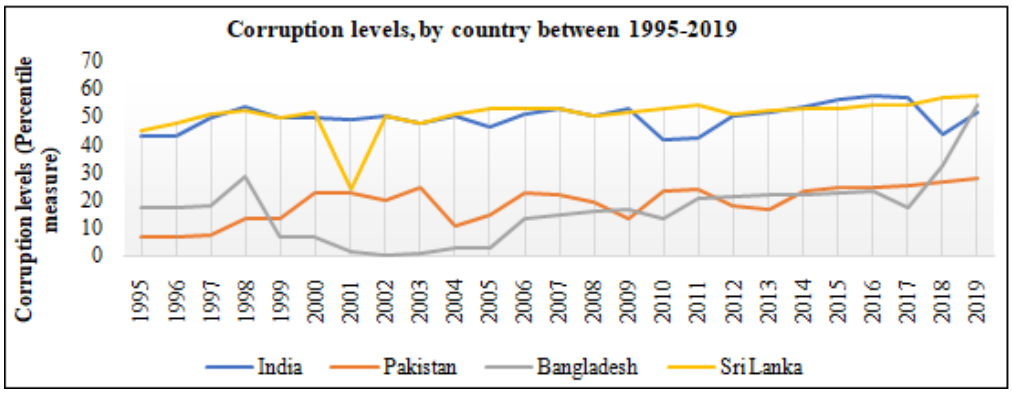

Figure 1.2: Growth in Corruption levels by country between 1995 and 2019 (Source: Transparency International)

F.2. –E = exponent operator. Example: 1E+10 = $1 \times 10^{10} = 10$ Billion USD.

Figures1.1. and 1.2. indicate overall positive growth trend with frequent minor country-specific fluctuations for corruption and FDI inflow stocks per time period(every 5and 2 years respectively)

The paper empirically builds on (Dunning, 2006)'s theory and aggregates a pool of controls representing locational, business, and institutional factors. This helps comprehensively understand the significance of FDI determinants asides corruption, to well justify of one of the 3prior hypotheses.

As an addition to previous literature, significant FDI contributors specifically in developing South Asia are included. A dummy for the presence of "Special Economic Zones" providing fiscal benefits to investors is used as an important business facilitating advantage. Supplementing Dunning's 3 OLI determinants, the study includes human capital resources as important additions to locational advantages of FDI, as South Asia predominantly comprises of labor surplus economies. Countries' location advantages can be captured through quality of human capital (Hanson, 1996).

Adummy controlling for global economic effects of financial crisis in 2009 is additionally used.

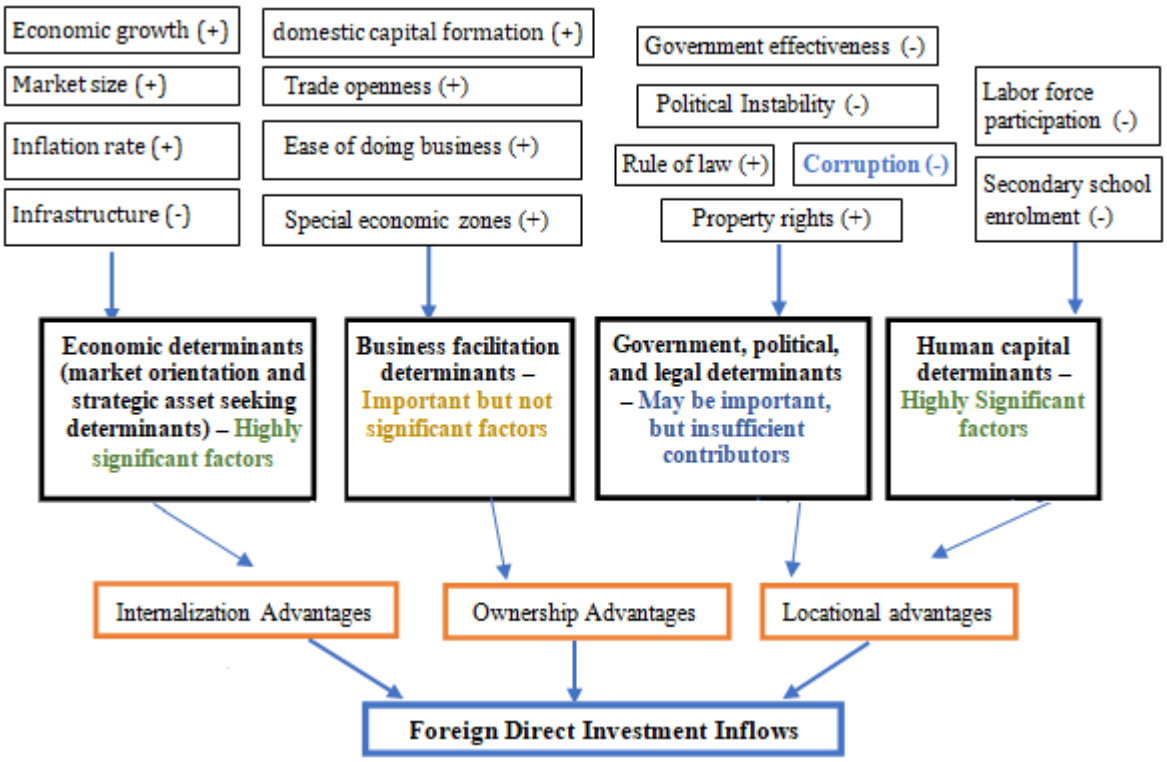

Figure 1.3: Conceptual Framework representing data structure prior to achieved results (refer A.2. for variable descriptions and sources)

Table 1.2: Summary Statistics of employed independent, dependent, and control variables

Variable	*Observations*	*Mean*	*Std. Dev*	*Min*	*Max*
logFDI	100	21.01788	1.837226	14.45545	24.64743
COR	100	32.27336	17.28123	0.5291005	54.3
logGDP	100	6.86101	0.690497	5.774823	8.3896
TRDOPN	100	2.700215	1.455399	-6.843035	0.4699193
INFLATION	100	7.326409	3.775044	2.007174	22.5645
LAW	100	39.06123	16.80857	14.42786	62.2
GOV	100	40.16996	12.74479	17.91045	64.90385
GDPG	100	5.398602	1.97718	-1.545408	8.845756
POLITICALRISK	100	4.17	0.8415354	2	6
LFP	100	54.2694	3.321496	47.98	58.942
SCH	100	55.84408	22.35273	20	100.3352
GDCF	100	25.965	7.107297	14.12063	41.9508
year2009effects	100	0.04	0.1969464	0	1
SEZ_present	100	0.49	0.5024184	0	1
INFR	100	6.529	8.086531	-18.5	51.9
PROP	100	5.277	1.591128	2	9
EASEOFBUS	100	113.59	24.5974	60	178

5. Methodology

This section proposes the methodology to answer the two research questions through primary and sensitivity regression analysis

According to (Woolridge, 2002), fixed-effects regression should be chosen over random-effects as an appropriate model (refer F.3). It accounts for unobserved heterogeneity amongst countries, where country-specific fixed effects (such asa country's culture, history, formal institutions) are predominantly time invariant. It is useful to ensure result robustness by addressing potential endogeneity issues from correlation of unobserved-heterogeneity with explanatory variables, by limiting omitted variable bias through using relevant controls to control for their impact on FDI, asides from corruption.

Data fitnessis tested using diagnostic tests for heteroskedasticity, omitted variable bias, multicollinearity.Fixed effects estimation (tested against random effects using Hausman-Wu test) is employed (refer A.1.for results). To correct for heteroskedasciticty, the paper uses robust standard errors and the GDP and FDI variables use a log for rescaling values as large numeric values compared to the rest of the dataset lead to skewed results.

5.1 Primary analysis

To answer the first question, the relationship between FDI inflows and corruption is explored using a fixed-effects model by regressing independent variable corruption and relevant controls on FDI. Through this regression, the paper attempts to identify which of the 3 hypothesis the analysis steers into.

General regression equation:

$$(1)\quad \log FDI_{it} = \beta_0 + \beta_1 COR_{it} + \beta_2 \log(GDP)_{it} + \beta_3 GDPG_{it} + \beta_4 GDCF_{it} + \beta_5 LFP_{it} + \beta_6 INFR_{it} + \beta_7 INF_{it} + \beta_8 TRDOPN_{it} + \beta_9 EASEOFBUS_{it} + + \beta_{10} SCH_{it} + \beta_{11} LAW_{it} + \beta_{12} POLRISK_{it} + \beta_{13} GOV_{it} + \beta_{14} PROP_{it} + Y_1\ SEZ + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

α_{it} – Country specific fixed effects
and for any regressor x_{it}, $E[\varepsilon_{it}|x_{it}, \alpha_{it}] = 0$, where i = 1,2,3,4 and t = 1,2,..,24

'SEZ' and ' δ_{it}' are catagorical binary dummy variables such that:

$$SEZ = \begin{cases} 1, \text{if presence of SEZ} \\ 0, \text{otherwise} \end{cases}$$

$$\delta_{it} = \begin{cases} 1, \text{if impacted by global financial crisis in 2009} \\ 0, \text{otherwise} \end{cases}$$

F.3. – refer A.1. for panel data comparisons and intuition behind fixed effects, random effects, and pooled OLS

Variables are included as explained in section 3. '*SEZ*' is a dummy indicating the presence/absence of Special Economic Zones. It takes the value of 1 if the country has operational special economic zone(s) in a given year, 0 if not. A year fixed-effects dummy ' δ_{it} 'is used to control for the financial crisis taking the value1 when economies were impacted by the financial shock in 2009, 0 otherwise.

The paper modifies the above equation and includes simple dynamics by using one-year lags on explanatory variables. This is for two reasons.

Firstly, investors make FDI decisions in a given year (time = t) based on corruption and other controlled factors in the previous period (time = t-1) due to their delayed impact on FDI performance.

Secondly, one-period lags on corruption addresses potential endogeneity from bidirectional causation (refer A.3.) between FDI and corruption where a rise in FDI through international capital mobility could make investors exit the market if corrupt behavior isn't checked (Larrain, 2004).

The regression now takes the form:

$$(2)\quad \log FDI_{it} = \beta_0 + \beta_1 COR_{it-1} + \beta_2 \log(GDP)_{it-1} + \beta_3 GDPG_{it-1} + \beta_4 GDCF_{it-1} + \beta_5 LFP_{it-1} + \beta_6 INFR_{it-1} + \beta_7 INF_{it-1} + \beta_8 TRDOPN_{it-1} + \beta_9 EASEOFBUS_{it-1} + + \beta_{10} SCH_{it-1} + \beta_{11} LAW_{it-1} + \beta_{12} POLRISK_{it-1} + \beta_{13} GOV_{it-1} + \beta_{14} PROP_{it-1} + Y_1\ SEZ + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

5.2 Analysis Extension – Sensitivity analysis

As described in section 1, highly bureaucratic and untransparent government system, and inefficient legal activity make it difficult to control for corruption in developing South Asia.

To answer the second question, the paper performs a sensitivity analysis assessing importance of institutional environment and policy incentives towards FDI decisions by creating interactional effects with the corruption variable, to condition the FDI-corruption relationship on changes in institutional quality.

5.2 (a) Quality of institutions – How strong is the institutional environment?

Motivation to engage in corrupt activities depends on circumstances allow individuals to involve in illegal practices. Generally, stronger institutional quality implies greater probability of government officials being caught and punished, decreasing incentives to engage in corruption.

To evaluate the importance of law, individual rights, government regulation, interaction between the variable corruption variable and variables "***GOV", "LAW", "PROP***" are added in regression (2) of the primary analysis. This allows impact of corruption on FDI to vary depending on institutional quality.

The 3 regressions are described by equations (3), (4), and (5):

$$(3)\ \ log(FDI)_{it} = \beta_0 + \beta_1 COR_{it-1} + \beta_2\, log(GDP)_{it-1} + \beta_3 GDPG_{it-1} + \beta_4 GDCF_{it-1} + \beta_5 LFP_{it-1} + \beta_6 INFR_{it-1} + \beta_7 INF_{it-1} + \beta_8 TRDOPN_{it-1} + \beta_9 EASEOFBUS_{it-1} + \beta_{10} SCH_{it-1} + \beta_{11} LAW_{it-1} + \beta_{12} POLRISK_{it-1} + \beta_{13} GOV_{it-1} + \beta_{14} PROP_{it-1} + \beta_{15} COR * GOV + Y_1\, SEZ + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

$$(4)\ \ log\, FDI_{it} = \beta_0 + \beta_1 COR_{it-1} + \beta_2\, log(GDP)_{it-1} + \beta_3 GDPG_{it-1} + \beta_4 GDCF_{it-1} + \beta_5 LFP_{it-1} + \beta_6 INFR_{it-1} + \beta_7 INF_{it-1} + \beta_8 TRDOPN_{it-1} + \beta_9 EASEOFBUS_{it-1} + + \beta_{10} SCH_{it-1} + \beta_{11} LAW_{it-1} + \beta_{12} POLRISK_{it-1} + \beta_{13} GOV_{it-1} + \beta_{14} PROP_{it-1} + \beta_{15} COR * LAW + Y_1\, SEZ + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

$$(5)\ \ log\, FDI_{it} = \beta_0 + \beta_1 COR_{it-1} + \beta_2\, log(GDP)_{it-1} + \beta_3 GDPG_{it-1} + \beta_4 GDCF_{it-1} + \beta_5 LFP_{it-1} + \beta_6 INFR_{it-1} + \beta_7 INF_{it-1} + \beta_8 TRDOPN_{it-1} + \beta_9 EASEOFBUS_{it-1} + + \beta_{10} SCH_{it-1} + \beta_{11} LAW_{it-1} + \beta_{12} POLRISK_{it-1} + \beta_{13} GOV_{it-1} + \beta_{14} PROP_{it-1} + \beta_{15} COR * PROP + Y_1\, SEZ + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

Equation (3) measures the effectiveness of government's policies and decisions impact the corruption-FDI inflow relationship.
Equation (4) measures how the quality of law enforcement impacts the corruption-FDI inflow relationship.
Equation (5) measures how the degree of physical and intellectual of property rights enforcement impact the corruption-FDI inflow relationship.

5.2 (b) Institutional policy incentives – Are SEZ's successful in their purpose?

South Asian institutions initiated SEZ's to attract foreign investors by promoting fair business environments and industrial activity. However, (Sarma, 2017) finds that untransparent decision-making in zones contribute to widening corruption possibilities, incentivizing private monopoly creation that add layers of institutional opaqueness, creating illicit trade.

To measure how operational SEZ's impact the on corruption-FDI relationship in South Asia, an interaction term between the corruption variable and dummy variable "***SEZ"*** is added in regression (2). This is described by equation (6):

$$(6) log\, FDI_{it} = \beta_0 + \beta_1 COR_{it-1} + \beta_2\, log(GDP)_{it-1} + \beta_3 GDPG_{it-1} + \beta_4 GDCF_{it-1} + \beta_5 LFP_{it-1} + \beta_6 INFR_{it-1} + \beta_7 INF_{it-1} + \beta_8 TRDOPN_{it-1} + \beta_9 EASEOFBUS_{it-1} + \beta_{10} SCH_{it-1} + \beta_{11} LAW_{it-1} + \beta_{12} POLRISK_{it-1} + \beta_{13} GOV_{it-1} + \beta_{14} PROP_{it-1} + \beta_{15} COR * SEZ + Y_1\, SEZ + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

6. Results

Table 1.3: Summarizes 'Fixed Effects' Regression results (refer F.4) from:

Regression (2): Primary analysis (research question 1)

Regressions (3)-(6): Sensitivity analysis (research question 2)

Dependant Variable = **log*FDI***
All discrete independent control variables lagged by one year
*/**/*** denotes significance at the 10%/5%/1% level. T-statistics in parenthesis

Table 1.3: Fixed effects regression analysis

Variable	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
COR	**-.0027073(-0.20)**	-.0185159(-0.36)	-.0288386(-0.68)	-.0512344(-1.97)	.0023837(0.22)
L1.logGDP	1.557446***(3.49)	1.595391**(3.76)	1.680156**(3.57)	1.608644**(4.52)	1.574656***(4.81)
L1GDPG	.0576811(1.33)	.0623176(1.11)	.0659387(1.12)	.0595767(1.22)	.0586608(1.13)
L1.TRDOPN	.0071824(0.08)	.010002(0.15)	.0061333(0.11)	.0306707(0.39)	.0218395(0.36)
L1.INF	.0452376**(1.75)	.0423188***(2.92)	.0423997**(3.82)	.046251**(2.94)	.048395**(4.14)
L1.GDCF	.0695547(2.93)	.0692694*(1.74)	.0713627(1.65)	0.0726315(1.82)	.0786552(1.74)
L1.INFR	-.0046815(-0.42)	-.0045773(-.045)	-.004706(-0.45)	-.0073783(-0.67)	-.0051761(-0.55)
L1.EASEOFBUS	.0010608(0.17)	.0010983(0.48)	.0006122(0.38)	.0005746(0.30)	-.0010391(-3.00)
L1.LFP	-.1431881**(-2.24)	-.1411215*(-2.37)	-.1515431(-2.08)	-.1545903*(-2.53)	-.1426556**(-2.60)
L1.SCH	-.0366364**(-2.30)	-.0374628*(-2.35)	-.0373921(-2.30)	-.0404324*(-2.60)	-.0331359**(-2.84)
L1.LAW	.0102946(0.50)	.0125381(0.58)	-.014375(-0.60)	.0234649(1.39)	.0052033(0.33)
L1.GOV	-.0168493(-0.72)	-.0291351(-0.56)	-.0148527(-0.66)	-.0236658(-0.88)	-.008439(-0.29)
L1.PROP	-.013518(-0.13)	-.0125929(-0.10)	-.0119053(-0.09)	-.3375151(-1.92)	.027562(0.24)
L1.POLITICALRISK	-.0215578(-0.23)	-.0340158(-0.36)	-.0320958(-0.31)	-.0504951(-0.56)	-.0129715(-0.10)
SEZ_present	.3113045(0.78)	.2766292(1.43)	.2784541(1.87)	.3529955(4.34)	.7553007***(6.13)
year2009effects	-.0592977(-0.15)	-.03191(-0.15)	.0492678(0.15)	-.0594238(-0.27)	-.0702737(-0.30)
CORGOV		**.0005102(0.40)**			
CORLAW			**.0009319(0.78)**		
CORPROP				**.0096383(2.29)**	
CORSEZ					**-.0161541(-1.40)**
Individual fixed effects	18.00269(3.37)	17.9075(6.44)	17.98808(6.62)	19.85644(6.40)	17.18559(9.78)
Observations	100	100	100	100	100
R^2	0.3988	0.4442	0.4188	0.4417	0.4122

F.4 – coefficients highlighted in blue and green represent key variables of interest/explanation in primary and sensitivity analysis respectively

The obtained R^2 value above 0.4 in each regression is indicative of sufficiently high correlation between dependent and independent variables which show goodness of model fit (refer A.1.)

Since we use log on the left-hand side of all regressions, results must be transformed using $100(e^{\beta}-1)$ to interpret coefficients as percentage changes.

6.1 Primary Result

This section analyzes results from regression (2) of the primary analysis in section 5.1. It evaluates impact of corruption as a locational determinant on FDI, and compares results to the 3 hypotheses in section 2.

Testing against the random effects model by using the Hausman-Wu test (Appendix), it is concluded that fixed effects should be used.

6.1 (a) Focused Discussion of key findings

"***COR***" takes a small negative coefficient value of -0.002. Holding all else constant, a 1% increase in corruption decreases FDI inflows by 0.2 %. This implies that after the inclusion of relevant controls and removal of unobserved heterogeneity within countries, corruption is negatively correlated with FDI. This suggests that risks on investment profitability through raised corruption deter FDI inflows in South Asia. However, statistically insignificant coefficient suggests investors place overall low importance to corruption while formulating FDI decisions, hence deters FDI inflows insignificantly.

Results validate (Akçay, 2001)'s sub hypothesis under "insignificant impact of corruption on FDI" highlighting importance of economic determinants. Consistent with his study, corruption has a negative but insignificant effect on FDI. The positive coefficients on economic determinants (proxied as ***GDP, INFLATION***) are statistically significant at the 1% level, and strongly attract FDI, forming the most essential drivers of FDI. This suggests that a rise in corruption decreases locational advantages by lowering investment productivity through raised investment costs, but is given comparatively lower priority in evaluating FDI decisions in South Asia. The economies possess internalization competitive advantages that create economic incentives, benefiting investors from high investment returns. These have a leveraged importance over corruption, and consequently subdue corruption-related transparency problems.

Findings partly oppose the grabbing-hand theory by (Boddewyn, 1988), suggesting a direct and strong negative correlation between corruption and FDI. Although there is similarity in an overall negative impact, the obtained coefficient is statistically insignificant. It can be regarded that higher cost through business risks and operational costs that put investors off, however they are not prioritized. While investors consider growing corruption as a potential drawback limiting profitability, greater focus is applied on economic strengths that more than offset corruption to largely enhance investor returns.

Findings completely contradict "helping hand hypothesis" suggesting corruption acts as 'speed money' in business facilitation. However, this is not unexpected as (Abed and Davoodi, 2000) contrast corruption impacts on FDI depending on an economy's development levels. As developing South Asia predominantly has low-income countries, it can be regarded incapable of dealing with widespread corruption effects, thus deterring FDI.

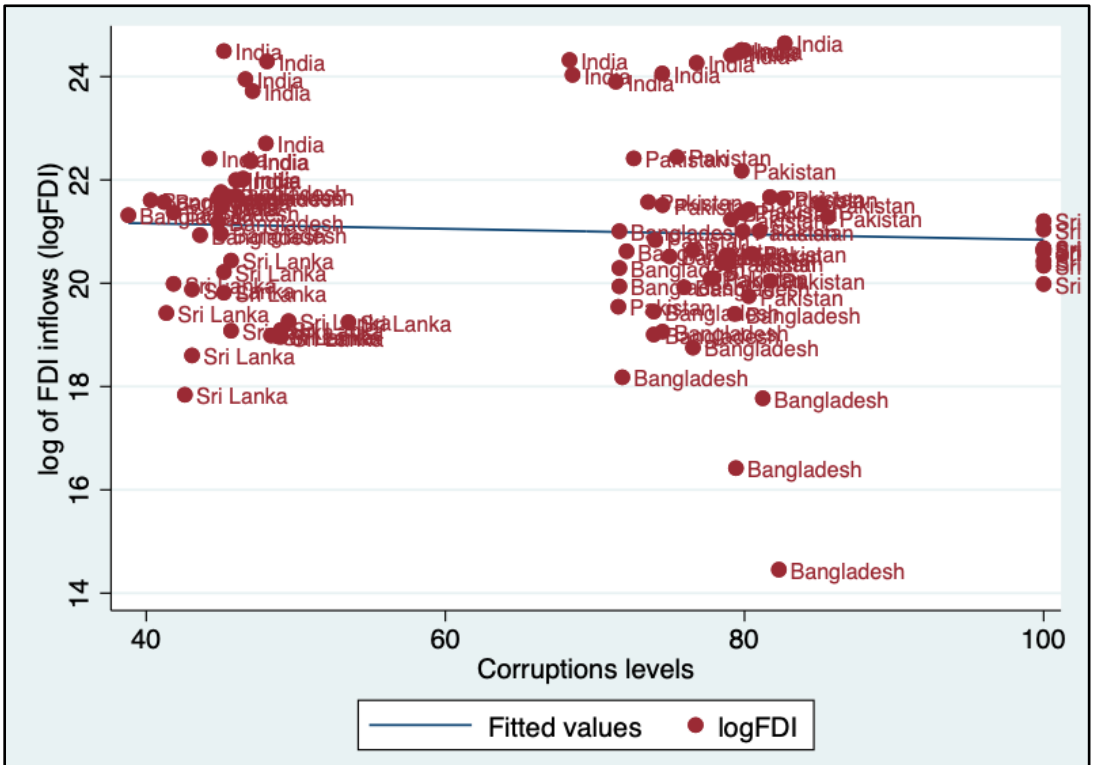

Figure 1.4: Figure shows a correlational plot of FDI inflows (On the Y-axis) against corruption (On the X-axis) which seems to indicate overall negative relationship. A low slope suggests insignificant effect of corruption on FDI inflows.

6.1 (b) Auxiliary Findings

Asides from the statistical significance of economic variables ***"GDP"*** and ***"INFLATION",*** other economic factors also positively shape FDI inflows. However, "***INFR***" is negative, possibly due to extreme volatility in infrastructure investment till early 2000's from fiscal constraints on investors, banks being risk-averse in long-term projects.

Coefficients on human capital determinants are negative but significant at the 5% level. As developing South Asia is abundant in unskilled labour, an increase is linked to low efficiency in workplaces and negatively influences investment decisions. Higher labour participation translates into high wages, raising investment costs thus discouraging investors. However, lack of suitable data on labour quality is an expected reason for the high significance in negative results (refer .3.)

Coefficients on business facilitating factors have a positive but statistically insignificant effect in attracting FDI. Most institutional determinants have negative coefficients, each statistically insignificant. The implementation of policies is a slow-moving and ineffective process. Thus, ownership and locational advantages are necessary but insufficient in determining FDI.

Dummy "***year2009effects***" is negative as expected since the financial crisis adversely impacted FDI through decreased economic activity.

F.3. - section 7.2. explains the issue in more detail refer A.4 for auxiliary interpretations

Figure 1.5: Conceptual Framework of variables after primary results (graphical representation of statistically significant controls in A.5.)

6.2. Sensitivity Analysis Results

This section analyzes results from sensitivity analysis in regressions (3), (4), (5), (6) in section 5.2. In each analysis, results are drawn basis overall, as well as changes in values of coefficient size, significance and sign on "***COR***" before and after interactions with respective institutional variables.

Taking the marginal derivative of FDI with respect to corruption, the elasticity/sensitivity of the FDI-corruption relationship to institutional quality changes are measured. Essentially, we solve for: $\frac{dln\,(FDI_{it})}{d\,COR_{it}} = 0$(referA.3. for mathematical intuition)

In regressions (3) and (4), "***CORGOV'*** *and* ***"CORLAW"*** take small positive values of 0.0005 and 0.0009 respectively, both of which are statistically insignificant. All else constant, with an improvement in legal and governance systems, 1%increase in corruption increases FDI by 0.05% and 0.09% respectively. Evaluating changes in "***COR***", the negative sign changes to positive with a drop in coefficient size and no observable change in prior statistical significance. This suggests corruption is initially detrimental to FDI, but gradually becomes beneficial as countries adopt stronger legal and government institutions. However, corruption contributes to only slight increases in FDI inflows and overall insignificance suggests institutions vary little over time, accruing to untransparent laws and weak anti-corruption penalties easy for citizens to violate.

This is consistent with (World Bank, 2018) and suggests that added bureaucracy ensures locational advantages from improved institutions do not effectively eradicate corruption to incentivize FDI.

Results are similar to (Al-Sadig, 2009), finding insignificant impact of bureaucratic or democratic institutions in explaining the corruption-FDI relationship on a panel of 117 developing countries.

$$\beta_1 + \beta_{15} GOV_{it-1} \begin{cases} <0, \text{if } GOV_{it-1} \leq 37 \\ >0, \text{otherwise} \end{cases}$$

$$\beta_1 + \beta_{15} LAW_{it-1} \begin{cases} <0, \text{if } LAW_{it-1} \leq 32 \\ >0, \text{otherwise} \end{cases}$$

Where $GOV_{it} \in [0,100]$
$LAW_{it} \in [0,100]$ (refer F.5.)

The corruption-FDI relationship is sensitive to institutional change with low statistical significance. As institutions improve over time, impact of corruption on FDI changes from negative to positive on crossing quantitative threshold indices of 37 and 22 respectively.

In regression (5), "***CORPROP***" takes a small positive value that is statistically significant at the 10% level. All else constant, establishment of robust property rights cause a 1% increase in corruption to increase FDI by 1%. Evaluating the changes on "***COR***", the coefficient sign changes from negative to positive with a raised statistical significance and coefficient size. As property rights improve over time, the initial restricting effect of corruption is overcome to strongly promote FDI inflows. Consistency in well-protected rights directly reduce corruption by counteracting the source of corrupt-free ownership problems, crucial for incentivizing investors by creating superior locational advantages that improve investment returns. This is consistent with (Globerman and Shapiro, 2022) theory, suggesting a prioritized role of improved property rights on FDI in corrupt countries. They raise investors' bargaining power, reducing ownership-uncertainty linked with corruption to attract FDI.

F.5. –indices can be any real number between and including 0 and 100

$$\beta_1 + \beta_{15} PROP_{it-1} \begin{cases} <0, \text{if } PROP_{it-1} \leq 5 \\ >0, \text{otherwise} \end{cases}$$

Where $PROP_{it} \in [0, 10]$

The corruption-FDI relationship is sensitive to changes in property rights with 10% statistical significance. As protection from rights increase over time, corruption impact on FDI changes from negative to positive on crossing a quantitative threshold value 5.

All institutional characteristics promote reduction in corrupt activities to attract FDI. High statistical significance on ***"COR"*** only with improved property rights is counterintuitive, but suggests consistency high investor protection opportunities. Overall, with institutional quality improvement, results support (Abed and Davoodi, 2000) under hypothesis 2, as corruption changes into **"helping hand"** for FDI over time, where consequences of lower corruption can be dealt with easily to enhance business facilitation.

In regression (6), "***SEZ_present***" takes a small negative value of-0.016, which is not statistically. All else constant, in the presence of SEZ, a 1% increase corruption declined FDI inflows by 1.6% relative to absence of SEZ. Evaluating the changes in "***COR",*** the coefficient size and statistical significance are sufficiently raised (by 0.603 percentage points), with no changes in the prior negative sign. This suggests that as countries establish SEZ's, raised corruption cause the size of initial detrimental effect on FDI to intensify. This supports (Sarma, 2017)'s evidence on SEZ's added effect on increasing cumulative corruption levels. Overall low statistical insignificance however, suggests corruption levels are not raised substantially to deter FDI, and investors place higher priority towards high investment returns from business facilitating SEZ advantages.

$$\beta_1 + \beta_{15} SEZ < 0$$

Where $SEZ \in [0, 1]$

The corruption-FDI relationship is sensitive to presence of SEZ but with overall low statistical significance. Since ***"COR"*** and ***"SEZ"*** are both negative, presence of SEZ unambiguously reduces FDI inflows. However, raised significance in prior negative impact increases business cost and operational-inefficiencies, consistent with (Boddewyn, 1988) and (Wei, 2000) under hypothesis 1, where corruption moves towards '**grabbing hand**" for FDI.

Results can be summarized using a margins-plot:

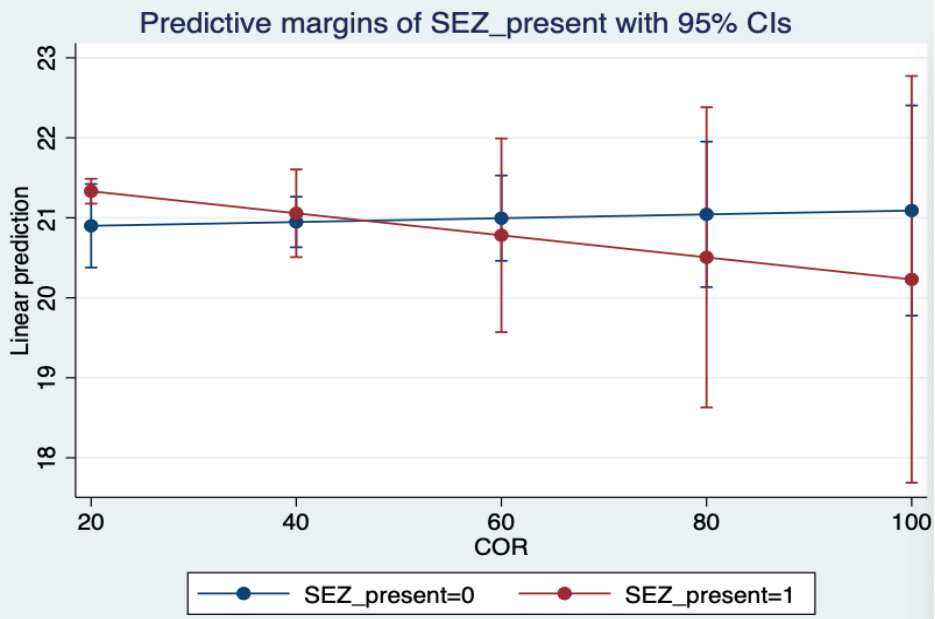

Figure 1.6: Shows a margins plot of linear predictions depicting impact of corruption (on the X-axis) on FDI (on the Y-axis), using categorical dummy "SEZ" as a moderator. The slope of the line is almost flat in absence of SEZ (SEZ_present =0), and is negative and downward sloping in presence of SEZ (SEZ_present =1). This suggests a more significant negative effect of corruption on FDI in the presence of SEZ, than in absence.

Results can be summarized as follows:

Table 1.4: Sensitivity analysis summary table

Interactional Term	*Coefficient sign*	*Coefficient significance*
*COR*GOV*	+	Not statistically significant
*COR*LAW*	+	Not statistically significant
*COR*PROP*	+	Statistically significant at the 10% level
*COR*SEZ_present*	-	Not statistically significant

7. Conclusion

There is lack of consensus on the impact of corruption on FDI inflows, widely debated between 3 hypotheses explaining a grabbing hand, helping hand, or insignificant role of corruption. This study examines impacts of corruption on FDI in developing South Asian countries (India, Bangladesh, Pakistan, Sri Lanka) by employing a fixed effects panel regression method over 1995-2019. The primary findings support the insignificant impact hypothesis, where increased corruption negatively impacts FDI, but is not prioritized while forming FDI into South Asia. Instead, economic determinants play the most significant role in attracting investment through internalization economic advantages, and human capital determinants are found to strongly deter FDI inflows through decreased workplace performance. Sensitivity results on institutional quality suggest a positive but overall weak role of governance and law in increasing FDI via their impact on corruption, whereas property rights directly reduce ownership related corruption issues to significantly attract FDI over time. Thus, institutional improvements change the role of corruption to positive, by acting as a "helping hand" for FDI. Lastly, as SEZ's are established in countries, impact of corruption on FDI becomes stronger and more negative, but changes are still overall insignificant. However, raised significance suggests corruption moving towards a "grabbing hand" for FDI.

Thus, although it is important for investors to exercise caution in accounting for locational disadvantages created by corruption and low institutional capabilities in South Asia, rigor in evaluating the pros and cons from superior economic advantages in estimating expected investment returns is important.

7.1 Overall Contribution

The paper contributes to prior literature by focusing analysis specifically towards developing South Asian countries and covers a longer time period to more recent years. It extends methodology to evaluate effects of institutional quality and policies on corruption as potentially attracting/deterring FDI inflows. It also applies and modifies (Dunning, 2006)'s existing framework of data and differentiates by identifying controls as important FDI contributors in South Asia to achieve accurate results to proposed research questions.

7.2. Empirical problems

One limitation of this study unavailability of suitable data on human capital. 'Labor wage rate' and 'flexibility of labor laws' directly determine labor quality that directly enhance company competitiveness and ability to tackle demand and supply forces prevailing in the market. Reliable data sources such as ILO (International Labor Organization) provides data for these variables only between 2006-2022. Therefore, highly significant negative impact by proxied variables "***SCH***" and "***LFP***" can be attributed to insufficiently capturing labor quality indices.

There is lack of data on establishment date and feasibility of general investor incentives. For example, India's research and development incentives, Bangladesh provides incentives

to establish joint ventures with local partners. The study uses variable 'ease of doing business' representing conduciveness of business regulations in providing general investor incentives. These are only limited to 10 parameters and do not well capture country-specific incentives (refer A.2.). Additionally, lack of data causes the 4 factors proxied for OLI advantages are unable to capture non-quantifiable factors of market competitiveness, barriers to entry, labor quality and government intervention effectively. Resultantly, the regression suffers from omitted variable and biased coefficient estimates of corruption variable.

7.3. Extensions

Possible analysis extensions stem from the study's limitations of data availability.

Firstly, as economic factors are found as significant in FDI determination, future research can conduct this study using project-based FDI data to examine contrasting economic FDI motives of strategic-asset/economic-resource seeking and market-expansion incentives to find differences between corruption promoting or hampering investor profits and in each case. This study uses aggregated data for measuring FDI inflows. However, investors in different countries have varied sensitivity to changes in corruption depending on industry specialization and business capabilities. Thus, studying corruption impacts on FDI characterized by industry size or sectors for investors to understand where profitability lies is useful. Lastly, since developing South-Asia witnesses immense growth in FDI inflows, bidirectional causality can be studied to examine if FDI is also a potential contributor towards rapidly growing corruption for governments to formulate future economic policies to maximize social and economic welfare.

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References

[1] Abed, G 2001, *Corruption, Structural Reforms, and Economic Performance in the Transition Economies*, International Monetary Fund , viewed 25 May 2021, <https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Corruption-Structural-Reforms-and-Economic-Performance-in-the-Transition-Economies-3697>.
[2] Acemoglu, D &Verdier, T 1998, 'Property Rights, Corruption and the Allocation of Talent: a General Equilibrium Approach', *The Economic Journal*, vol. 108, no. 450, pp. 1381–1403.
[3] Al-Sadig, A 2009, 'The Effects of Corruption on FDI Inflows', *Cato Journal*, vol. 29, no. 2.
[4] Asongu, S, Akpan, US &Isihak, SR 2018, 'Determinants of foreign direct investment in fast-growing economies: evidence from the BRICS and MINT countries', *Financial Innovation*, vol. 4, no. 1.
[5] Azam, M, Atif Nawaz, M & Riaz, M n.d., *Does Corruption and Terrorism Affect Foreign Direct Investment Inflows into Pakistan?*
[6] Azam, M, Hassan, S, Malaysia-Malaysia, U & Campus-Pakistan, V 2013, 'Corruption, Workers Remittances, Fdi and Economic Growth in Five South and South East Asian Countries: A Panel Data Approach', *Middle-East Journal of Scientific Research*, vol. 15, no. 2, pp. 184–190, viewed 22 April 2023, <https://www.idosi.org/mejsr/mejsr15(2)13/3.pdf>.
[7] Bardhan, P 1997, 'Corruption and Development: A Review of Issues', *Journal of Economic Literature*, vol. 35, no. 3, pp. 1320–1346.
[8] Bellos, S &Subasat, T 2011, 'CORRUPTION AND FOREIGN DIRECT INVESTMENT: A PANEL GRAVITY MODEL APPROACH', *Bulletin of Economic Research*, vol. 64, no. 4, pp. 565–574.
[9] Boddewyn, JJ 1988, 'Political Aspects of MNE Theory', *Journal of International Business Studies*, vol. 19, no. 3, pp. 341–363, viewed 4 August 2022, <https://www.jstor.org/stable/155130>.
[10] Boğa, S 2019, 'Determinants of Foreign Direct Investment: A Panel Data Analysis for Sub-Saharan African Countries', *EMAJ: Emerging Markets Journal*, vol. 9, no. 1, pp. 80–87.
[11] D H , B 1966, *Bayley, D. H. (1966). The Effects of Corruption in a Developing Nation. The Western Political Quarterly, 19, 719-732. - References - Scientific Research Publishing*, scirp.org, The Western Political Quarterly, viewed 22 April 2023, <https://scirp.org/reference/referencespapers.aspx?referenceid=3236426>.
[12] *Developments in South Asia* 2018, World Bank, The World Bank.
[13] Edgardo Campos, J, Lien, D & Pradhan, S 1999, 'The Impact of Corruption on Investment: Predictability Matters', *World Development*, vol. 27, no. 6, pp. 1059–1067.
[14] Egger, P & Winner, H 2005, 'Evidence on corruption as an incentive for foreign direct investment', *European Journal of Political Economy*, vol. 21, no. 4, pp. 932–952.
[15] *Fighting corruption in South Asia - News* 2019, Transparency.org, Transparency International.
[16] Gray, P 2001, *The eclectic paradigm: the next generation*, unctad.org.
[17] Habib, M &Zurawicki, L 2002, 'Corruption and Foreign Direct Investment', *Journal of International Business Studies*, vol. 33, no. 2, pp. 291–307.
[18] Helmy, HE 2013, 'The impact of corruption on FDI: is MENA an exception?', *International Review of Applied Economics*, vol. 27, no. 4, pp. 491–514.
[19] Hensel, P 2018, *Oxford Research Encyclopedias* , Oxford.com.
[20] Jain, AK 2001, 'Corruption: A Review', *Journal of Economic Surveys*, vol. 15, no. 1, pp. 71–121.
[21] Jan, MS, Ali, S & Ali, A 2019, 'Does Corruption Affect Foreign Direct Investment: Evidence From East Asian Countries', *Review of Economics and Development Studies*, vol. 5, no. 3.
[22] Krifa-Schneider, H, Matei, I & Sattar, A 2022, 'FDI, corruption and financial development around the

world: A panel non-linear approach', *Economic Modelling*, vol. 110, no. 50, p. 105809.
[23] Lestari, D, Lesmana, D, AzizilYudaruddin, Y &Yudaruddin, R 2022, 'The impact of financial development and corruption on foreign direct investment in developing countries', *Investment Management and Financial Innovations*, vol. 19, no. 2, pp. 211–220.
[24] Méon, P-G &Sekkat, K 2005, 'Does Corruption Grease or Sand the Wheels of Growth?', *Public Choice*, vol. 122, no. 1/2, pp. 69–97.
[25] NGO, MN, CAO, HH, NGUYEN, LN & NGUYEN, TN 2020, 'Determinants of Foreign Direct Investment: Evidence from Vietnam', *The Journal of Asian Finance, Economics and Business*, vol. 7, no. 6, pp. 173–183.
[26] Ravi, SP 2015, 'Does Corruption in a Country Affect the Foreign Direct Investment? A Study of Rising Economic Super Powers China and India', *Open Journal of Social Sciences*, vol. 03, no. 07, pp. 99–104.
[27] Ruiz-Brunschwig, S, Carrasco, B & Hayashi, T 2011, *The Global Financial Crisis: Impact on Asia and Emerging Consensus*, *www.adb.org*, Asian Development Bank.
[28] Saad Alshehry, A 2020, 'The Impact of Corruption on FDI in Some MENA Countries', *International Journal of Applied Economics, Finance and Accounting*, vol. 7, no. 1, pp. 39–45.
[29] Sarma, EAS 2007, 'Help the Rich, Hurt the Poor: Case of Special Economic Zones', *Economic and Political Weekly*, vol. 42, no. 21, pp. 1900–1902, viewed 22 April 2023, <https://www.jstor.org/stable/4419627>.
[30] Shaari, MS, Esquivias, MA, Ridzuan, AR, Fadzilah Zainal, N &Sugiharti, L 2022a, 'The impacts of corruption and environmental degradation on foreign direct investment: new evidence from the ASEAN+3 countries', *Cogent Economics & Finance*, vol. 10, no. 1.
[31] — 2022b, 'The impacts of corruption and environmental degradation on foreign direct investment: new evidence from the ASEAN+3 countries', *Cogent Economics & Finance*, vol. 10, no. 1.
[32] The Heritage Foundation 2022, *Index of Economic Freedom: Promoting Economic Opportunity and Prosperity by Country*, Heritage.org, Index of Ecnomic Freedom.
[33] The World Bank 2022, *World Development Indicators | DataBank*, The World Bank.
[34] The World Bank 2022, *WGI-Home*, Worldbank.org.
[35] Voyer, P 2004, *The impact of corruption on Japanese Direct Investment* , researchgate.net, Journal of business Ethics.
[36] Yahyaoui, I 2023, 'How Corruption Mitigates the Effect of FDI on Economic Growth?', *Journal of the Knowledge Economy*

Appendix

A.1. Robustness results

1.1. R^2 indicates the proportion of variance in the dependent variable that the independent variables in the model explain. Generally, values above 0.4 (4%) are linked to high correlation between the dependent and independent variables, hence the model fits observations well.

```
Test of H0: Difference in coefficients not systematic

   chi2(17) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            =  81.53
Prob > chi2 = 0.0000
(V_b-V_B is not positive definite)
```

1.2. Hausman specification test

The null hypothesis of equality of coefficients between FE and RE is rejected. Therefore, FE is suggested to be a better specified model.

Note on Panel data: The panel data approach is sued to obtain information on multiple individuals over a given period of time. The pooled OLS estimation method for panel data enables utilization of the provided information in the dataset, however does not account for the unobserved time-invariant heterogeneity that cause the individual cross-sections (In this case, countries) to differ within the data which often leads to biased results.

In order to overcome this issue, the Hausman test is accounts for the unobserved heterogeneity by testing the accuracy of a fixed effects estimation against a random effects estimation method. The test determines efficiency of fixed effects model over random effects model when the time-invariant unobserved heterogeneity is correlated with the explanatory variables, and considers random effects as a preferred model over fixed effects when the time-invariant heterogeneity is uncorrelated with the explanatory variables.

```
Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of logFDI

H0: Constant variance

    chi2(1) =   7.29
Prob > chi2 = 0.0069
```

1.3. Breusch-Pagan test for heteroskedasticity

The null hypothesis of homoskedasticity is rejected. There is strong evidence indicating the presence of heteroskedasticity under various specifications.

Variable	*VIF*	*1/VIF*
COR	2.58	0.387597
logGDP	1.41	0.70922
TRDOPN	3.04	0.328947
INFLATION	1.79	0.558659
LAW	11	0.090909
GOV	11.06	0.090416
GDPgrowth	11.46	0.08726
POLITICALRISK	1.16	0.862069
LFP	5.7	0.175439
SCH	9.46	0.105708
GDCF	3.57	0.280112
year2009effects	1.15	0.869565
SEZ	6.44	0.15528
INFR	1.38	0.724638
PROP	3.78	0.26455
EASEOFBUS	3.96	0.252525
Mean VIF	**4.93**	

1.4. Variance inflation test for multicollinearity

Mean VIF for independent variable = 4.93 is indicative of low collinearity amongst regressors.

Generally, mean variance inflation factor (VIF) values under 5 are considered as tolerable for a regression, while mean VIF values above 10 indicate severe collinearity.

```
Ramsey RESET test for omitted variables
Omitted: Powers of fitted values of logFDI

H0: Model has no omitted variables

F(3, 77) =  10.63
Prob > F = 0.0000
```

1.5. Ramsey RESET test for omitted variables and incorrect model specification.

The null hypothesis of no omitted variables is rejected.

However, the study tries to reduce the issue by employing fixed effects making use of characteristic control variables as proxies and removing time-invariant controls/heterogeneity in the fixed-effects regression analysis.

Note on Omitted variable bias: Omitted variable bias occurs when a relevant independent variable/variable is left out of the analysis, which causes under-specification of the model and biased coefficient estimates. Generally fixed effects regression is used as an appropriate model as it allows us to measure changes across groups over time, by including proxy variables as

controls. However, the lack of suitable data can hinder possibilities of achieving accuracy in results (In this case, on investor incentives and labor cost).

2. Control variables

2.1. Variable descriptions

Economic determinants

Variable Name	Description	Significance for analysis	Obtained sign after results
log(GDP)	**Log of GDP per capita** measured in current US dollars	Indicator of market size	+
GDCF	**Gross Domestic Capital Formation** measured as a percentage of GDP	Estimate of the net capital expenditure in private and public sectors	+
GDPG	**Annual GDP growth rate** measured as a percentage of GDP	Indicates growth in market power and potential	+
TRDOPN	**Degree of trade openness** measured by the averaged sum of imports and exports as a percentage of GDP	Indicative of a liberalized trade regime and engagement with global trade	+
INF	**Inflation rate** measured as an annual percentage	Measures the increase in the economy's prices and government commitment to the country's macroeconomic performance	+
INFR	**Investment in Infrastructure** measured by the real government expenditure per real GDP	Indicative of market access, connectivity, productivity of labor and private capital	-

Institutional, political, and legal determinants

Variable Name	Description	Significance for analysis	Obtained sign after to results
POLRISK	**Political Risk** measured on a political terror scale (1– lowest, 6– highest)	Implies instability in government structure and institutional decision making	-
LAW	**Rule of law** as a percentile rank (0 – lowest, 100 – highest)	Indicates degree of protection of citizen's fundamental rights and confidence in law	-
GOV	**Government Effectiveness** as a percentile rank (0 – lowest, 100 – highest)	Measures government capacity to formulate sound policies and independence from political pressures	+
PROP	Average of **intellectual and physical property rights** as a percentile rank (0 – lowest, 100 – highest)	Protection as an indicator of innovation and competitive advantage in business via business ownership advantages	+

Business facilitating determinants

Variable Name	Description	Significance for analysis	Obtained sign after results
EASEOFBUS	**Ease of doing business** measured as a rank against 190 economies	Indicative of a conducive regulatory environment for carrying out business operations. Generally, these include ease of starting business, Construction Permits, Getting Electricity, Registering Property, Getting Credit, Protecting Minority Investors ,Paying Taxes, Trading across Borders, Enforcing Contracts, Resolving Insolvency	+
SEZ	Dummy variable for the presence of **special economic zones**	Strongest government incentives in the form of fiscal and non-fiscal investor advantages. Incentives include tax incentives, relief on import duties, competitive infrastructure, and duty- free procurement of raw materials.	+
TRDOPN	**Degree of trade openness** measured by the averaged sum of imports and exports as a percentage of GDP	Indicative of a liberalized trade regime and engagement with global trade	+

Human capital determinants

Variable Name	Description	Significance for analysis	Obtained sign after analysis
SCH	**Secondary school enrolment** measured as a gross percentage	Measure of overall education system capacity	-
LFP	**Labor force participation** (% of total population between the ages 15-64)	Measures relative labor resource availability for production of goods and services	-

Interactional variables

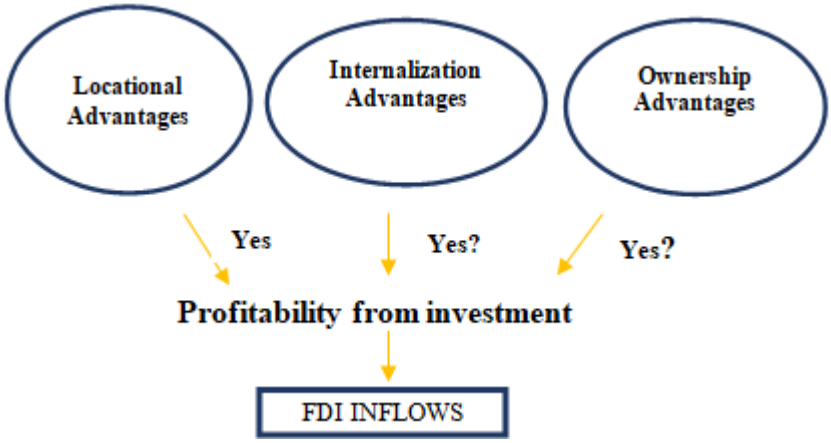
Variable Name	Definition	Obtained sign after analysis
CORGOV	COR*GOV	+
CORLAW	COR*LAW	+
CORPROP	COR*PROP	+
CORSEZ	COR*SEZ_present	-

2.2. Variable Sources

Data for the dependent, independent and majority of the control variables is extracted from World Bank's "World Development Indicators" and "World Governance Indicators". Variable 'corruption levels' as a 'Corruption Perceptions Index' is extracted from "Transparency International". Variable 'political risk' is obtained from the "Gibney and Dalton 1996 index of political risk", and 'property rights' is obtained from "The Heritage Foundation Data". Data on specific years of establishment for dummy 'Special Economic Zones' is obtained from individual country's government websites. Accurate years of impact for dummy 'financial crisis' on the respective countries was obtained from the "Asian Development Bank".

3. Note on conceptual specifications

3.1 OLI paradigm – (Dunning, 2006)'s OLI paradigm can be illustrated as follows:



3.2. Marginsplot: A margins plot is used to graph predictions from complex models that use interactional terms. It graphs the marginal effect of the independent variable on the dependent variable, using a third purely **continuous** or **categorical** variable as a moderator (In this case, log(FDI), corruption, and SEZ).

To calculate interactional effects, we take the marginal derivative of FDI with respect to corruption in each variable, and find the values of the respective institutional variable of interest such that the value of FDI inflows is greater than or equal to 0.

Empirically, we solve for:

$\frac{dln\,(FDI)}{dCOR} = 0.$

In each case, the derivative = $\boldsymbol{\beta_1 + \beta_{15} X_{it-1}}$, where x represents the variable of interest

Note: It can be difficult to interpret the specific meanings of β_0 and β_1 in a given marginal derivative. Instead, many studies such as (Lopez-Villavicencio and Mingon, 2011) choose to interpret the sign of these values as indicating an increase or decrease in elasticity dependent on the variable (in this case, institutional measure) value.

3.3. Bidirectional causality – Bidirectional causality refers to a two-way causality problem where the predicted variable causes an effect on the dependent variable, and the dependent variable causes an effect on the predicted variable. The two-way relationship causes a simultaneity issue, leading to endogeneity issues through biased coefficient estimates in the regression.

4. Auxiliary interpretations

Correlation plots between statistically significant control variables and FDI derived from auxiliary results:

4.1. Strong positive correlation between economic determinants and FDI:

Figures (1) and (2) show a plot of FDI inflows against GDP and inflation levels which indicates an overall positive relationship between the two. An increase in the levels of GDP and inflation is associated with an increase in the FDI inflows.

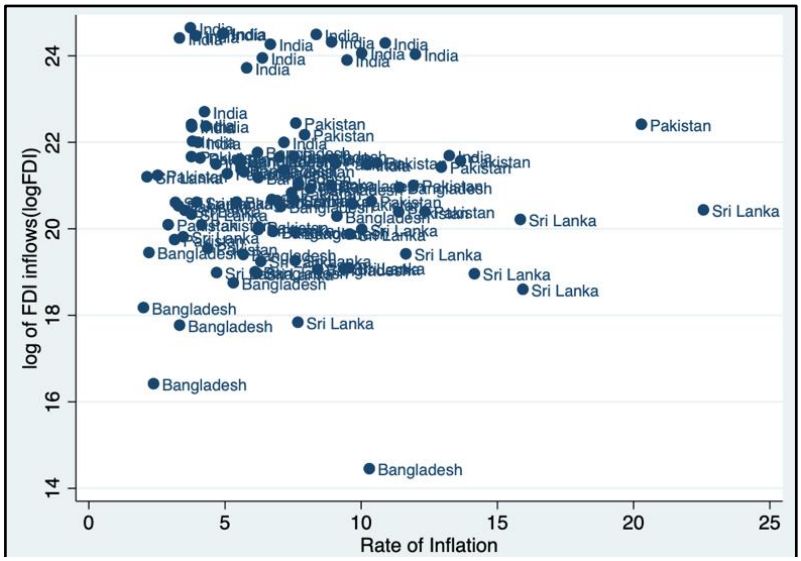


Figure 1: Correlation plot between rate of inflation and log(FDI)

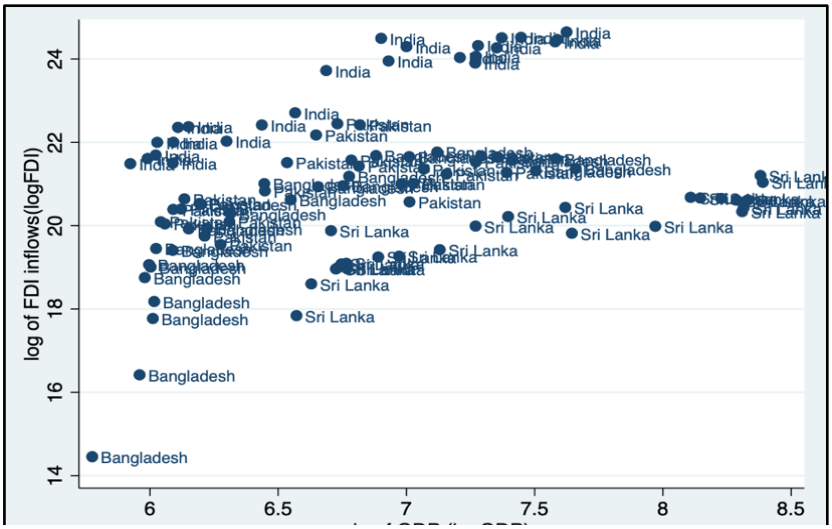


Figure 2: Correlation plot between rate of log(GDP) and log(FDI)

4.2 Strong negative correlation between human capital determinants and FDI:

Figures (3) and (4) show a plot of FDI inflows against secondary school enrolment and labor force participation which indicate an overall negative relationship between the two. An increase in the levels of labor force participation and secondary school enrolment is thus associated with a decrease in FDI inflows.

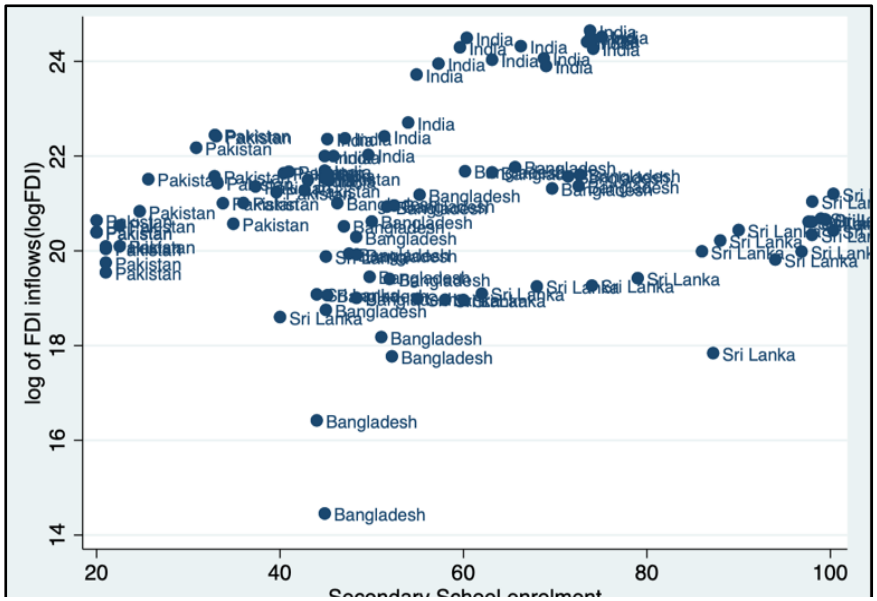


Figure 3: Correlation plot between secondary school enrolment and log(FDI)

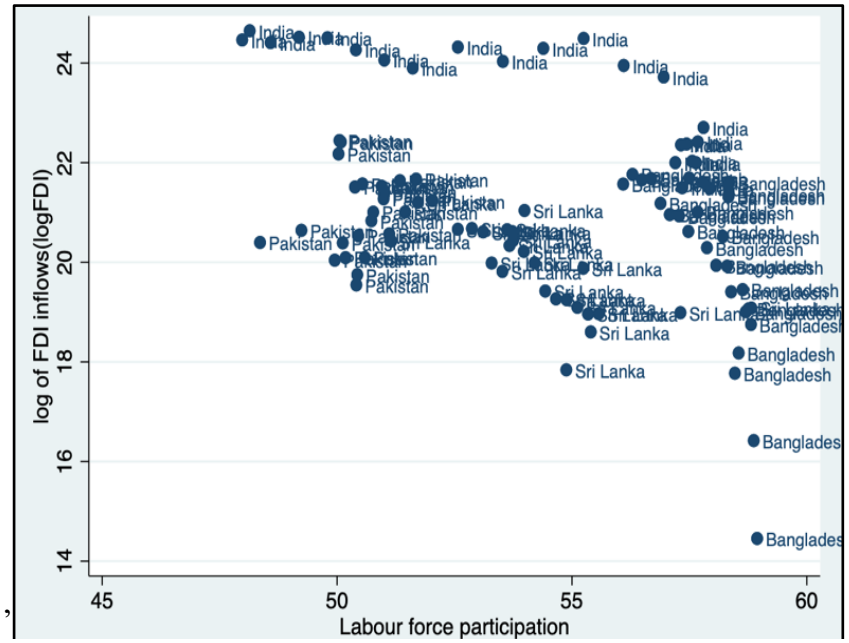


Figure 4: Correlation plot between labor force participation and log(FDI)