



The Impact of Corruption on Foreign Direct Investment (FDI) in Post-Conflict Countries: A Panel Causality Test

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ABSTRACT

This paper provides an additional examination on the relationship between corruption and FDI. It focuses on the impact of corruption on FDI inflows in Post-Conflict Countries (PCC) namely Algeria, Congo DR, Iraq, Kenya, Peru, Sierra Leone, South Africa, and Sudan over the period from 1984-2013. The paper applies Dynamic Ordinary Least Squares (DOLS) method in order to test for the long-run effect of corruption on inward FDI in PCC utilising E-Views 9 as a statistical package. The results show that corruption impacts negatively upon inward FDI in PCC in the long-run, and the 1 unit increase in corruption decreases inward FDI by -1.34 unit. The paper further suggests that PCC should pay more attention for institutional reform in its general notion, and for corruption in particular, given that more corrupt institutions in PCC may exacerbate their own difficulties in providing a friendly-business environment and eventually hinder their efforts in attracting FDI. As policy implications, the paper suggests that PCC should rely on both their own capabilities as well as specialized international institutions in order to achieve a better institutional reform, and learn the best international practices in fighting corruption.

Key words: Corruption, FDI, Post-Conflict Countries, Panel Causality Test.

1. Introduction

Post-conflict Countries (PCC) are facing different kinds of challenges. On the one hand, internal and external conflicts consume natural and human resources and they may reshape the political and economic structures. On the other hand, the effects of these conflicts may extend to long periods creating additional obstacles which hinder development and economic growth. The importance of FDI for PCC can be discussed via a number of points. It provides an important funding for reconstructing the country which more likely has a destroyed infrastructure. Further, it can act as an important channel to revitalize the economy and create jobs. However, attracting FDI into PCC is not an easy task since such countries tend to have destroyed institutions as well, and foreign investors account for quality of institutions as an important determinant for their investment, and corruption is one of the most important elements of institutional quality (Robinson et al., 2006). Thus, high level of corruption may decrease the opportunity for PCC to attract FDI. Countries sample in this paper comprises of 8 Post-Conflict Countries, and each of them has a history of either internal or external conflicts or both, as follows;-

- **Algeria:** Algerian Civil War started from 1992-1998, resulting in over 100,000 deaths, many massacres occurred (Cia, 2016). The Armed Islamic Group (GIA) claimed responsibility for many of them, while for others no group has claimed responsibility. In addition to generating a widespread sense of fear, the massacres effected migration from and depopulation of the worst-affected areas. The number of massacres peaked in 1997, with a smaller peak in 1994. It was also chosen that it's counted as an oil exporting countries (Martinez, 2000).
- **Congo DR:** is a vast country with immense economic resources and, until recently, has been at the centre of what some observers call "Africa's world war", which began in 1996, with widespread civilian suffering the result. The war claimed an up to six million lives, either as a direct result of fighting or because of disease and malnutrition. The war had an economic as well as a political side. It was chosen as well for another reason, fighting was fuelled by the country's vast mineral wealth, with all sides taking advantage of the anarchy to plunder natural resources (BBC, 2016).
- **Iraq:** The U.S. military and its allies were poorly prepared to undertake post-conflict operations and was followed by terrorist acts that impacted Investment environment in Iraq, which is in need for FDI due to the weak capital accumulation of its private sector. All these acts have affected the future investment in oil and gas. (Fahad, 2014:23)
- **Kenya:** From December 2007 to February 2008, Kenya experienced ethnic violence triggered by a disputed presidential election held on 27 December 2007. A country with over 70 distinct ethnic groups. Widespread and systematic violence, resulting in more than 1,000 deaths and the displacement of over 500,000 civilians. Clashes were characterized by ethnically-targeted killings. Following the conflict, evidence arose suggesting that much of the violence had been pre-meditated and planned by politicians and community leaders at both the local and national levels. The second reason for chosen this country was the Post-Crisis reforms and preventative efforts through Internal Reforms and Implementation of Preventative Steps (ICRtoP, 2016).
- **Peru:** The internal conflict in Peru, began in 1980, When Peru's military government allowed elections for the first time in a dozen years, which was followed by terrorists acts by the Shining Path in the 1980s and 1990s which turned to be an internal war. Peru represents an important case study, that it presented not only a contemporary conflict but also post-conflict societies. Peru is signatory to all relevant international treaties and has followed an exemplary transitional justice path in many ways, but has neither been able to

provide justice to victim-survivors of war-related violence, nor been able to curb peacetime violence so far (Boesten, 2014).

- **South Africa:** the type of post-conflict development and peace building activities has South Africa engaged in is a very successful one and it was a leading member of the African Union (AU) through its policy which worked on number of bases included: Align development with diplomacy and defense, Establish a needs assessment capacity, Invest in science and technology, and Partner with business (Gueli, 2008).
- **Sierra Leon:** The Sierra Leone civil war (1991-2002) was one of the most grotesque wars in post-independence Africa. The Sierra Leone civil war was a perfect stage for Man to show hatred for a fellow man, in the form of rape, murder, displacement and other crimes against humanity, which has left, a permanent scar to the people of Sierra Leone. External forces played a role in the Sierra Leone civil war.
- **Sudan:** The civil war has raged intermittently since 1955, until now and refers to three separated conflicts First Sudanese Civil War (1955–1972), Second Sudanese Civil War (1983–2005), and South Sudanese Civil War (2013–present) making it possibly the longest civil conflict in the world. It continues unabated, mostly outside the focus of diplomacy or the attention of international media, taking a huge and terrible human toll. Over two million people have died as a result of the war and related causes, such as war-induced famine. About five million people have been displaced, while half a million more have fled across an international border. What was interesting the way it ended in the division of the country into two with unequal division of its natural resources, mainly petrol, in the favor of newly created south Sudan (Deng, 2001).

2. LITERATURE REVIEW

2.1 DEFINITION OF CORRUPTION

The Transparency International (TI) defines corruption as “the abuse of entrusted power for private gain”. Further, the TI demonstrates that corruption involves three levels according to the amount of money paid and the sector where the occurred. The first type of corruption is high-level bureaucratic corruption which involves paying for government officials in high levels of authority. The second type is low and mid-levels bureaucratic corruption which means paying for low and mid-levels bureaucrats for the purpose of gaining goods and services. The third type is political corruption which reflects the abuse of power and country’s resources by political decision makers for the purpose of sustaining their power.

2.2 CORRUPTION AND FDI: THEORY AND EMPIRICAL FINDINGS

The relationship between corruption and FDI has a theoretical and empirical bases. In theory, two different points of view explain the relationship between corruption and FDI. One point of view suggests that the short run, corruption raises the cost of a firm’s foreign investment, since (i) firms have to pay bribes (similar to taxes), (ii) they are engaged in resource-wasting rent seeking activities and (iii) they have to bear additional contract-related risks, because corruption contracts are not enforceable in courts. Further, corruption reduces the productivity of public inputs (e.g., infrastructure) which, in turn, decreases a country’s locational attractiveness (Boycko et al., 1993, Shleifer and Vishny, 1994, Habib and Zurawicki, 2002, Lambsdorff, 2003, Ravi, 2015). In contrast, the other point of view suggests that within "bad quality" bureaucratic countries, corruption could help foreign companies in speeding up transactions such as export permits, licenses, and even gaining government contracts via paying briberies to the officials (Lui, 1985, Bardhan, 1997).

Empirically, the relationship between FDI and corruption as an element of institutional quality in host countries has been widely analyzed within the literature. It is worth mentioning that there is no consensus on a specific proxy in representing corruption, and each research utilises different proxy for measuring corruption. The negative impact point of view of corruption on FDI has been proved empirically. Quazi (2014) utilises the Corruption Perceptions Index (CPI) as a measurement of corruption. He analyzes the impact of corruption on FDI in 9 countries from East Asia and 6 countries from South Asia. The study applies a Generalized Least Squares (GLS) Panel Estimation for the period from 1995 to 2011. He finds a strong and robust evidence on the negative impact of corruption on FDI inflows in the above 15 countries., Al-Sadig (2009) applies a mix of cross-sectional and panel data analysis in a study covers 117 developing and developed countries from 1984 to 2004 using the ICRG's corruption index. The findings of this research are also mixture, he finds that within the cross-sectional analysis there is a strong evidence on the negative impact of corruption on FDI, while the panel data analysis provides different evidence, country's overall quality of institutions is found important more than corruption for foreign investors. Asiedu (2006) also analyzes the determinants of FDI in 22 countries in Sab-Saharan Africa (SSA) from 1984-2000. She consider corruption, measured by the ICRG's corruption index, as one of the potential determinants in the region. She finds that corruption and political instability have a very negative effect on FDI to Sub-Saharan Africa countries and it's not solely driven by some exogenous factors. Another evidence produced by Mathur and Singh (2013) who apply a panel data analysis for 29 transitions and developing countries over the time period 1980–2000, using the Freedom House's Freedom in the World Index as measurement of corruption. They demonstrate that perceptions of corruption are highly correlated with indices of economic freedom, but uncorrelated with indices of political freedom. Hence less corrupt countries which provide the right kind of economic environment for investors, such as personal property protection, the right to move capital in and out of the country, or the ability to trade openly in world markets receive more FDI flows emphasizing on the low correlation between the democracy index and the indices of economic freedom.

The “helping-hand” influences of corruption on inward FDI has been also proven empirically within the literature. Egger and Winner (2005) use Transparency International's corruption index to examine the relationship between corruption and inward FDI in 73 developed and less developed countries over the period from 1995 to 1999. They apply Hausman-Taylor model and find that corruption enhances inward FDI. From a firm's level analysis in transition economies covers 1405 firms from 1989-1995, Smarzynska and Wei (2000) find that corruption promotes joint-venture FDI with local investors. Their study utilises 3 different indexes to measure corruption. Another evidence is provided from financial crises-countries by Stoddard and Noy (2015) who analyze a panel data of 40 emerging and developing countries over the period from 1987-2009. They apply panel Arellano–Bond GMM using both Freedom House and ICRG indexes to measure corruption and find that corruption stimulus FDI.

2.2.1 POST-CONFLICT COUNTRIES: MAIN FEATURES

Post-conflict environments present unique challenges to all countries, there are many reasons why fragile states deserve special attention. Civil wars do more than inflict heavy human and material costs. They also diminish the capacity of a country to deal effectively with their underlying causes, increasing the risk of future, even more costly and debilitating, conflicts. What is more, the longer they persist the greater the danger that they will destabilize, even spill over into, other states, making in the process whole regions vulnerable to inter-communal

divisions, violence and wars. Many countries are caught in a seemingly inescapable 'conflict trap'; where the social, political and economic consequences of a conflict act to perpetuate the violence. Such an environment of fragile and crisis situations introduces additional factors on people's lives. Conflict affects people in ways that natural disasters do not, and weak institutions cannot, violence leaves its own particular scars on a society (Collier, 2003).

Understanding the consequences of conflict requires defining the elements of defining a conflict in according to Uppsala Conflict Data Program (UCDP, 2010), criteria as "An armed conflict is a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths" .

There are, therefore, a number of distinctive features which distinguish post-conflict situations in particular:

- **Economic:** perhaps the most obvious economic characteristic of post-conflict environments is loss of assets. This affects enterprises, making it harder for them to resume economic activity, but also affects a substantial proportion of the population, leading to shrinkage in purchasing power and markets. This shrinkage contributes to market distortion (MacDonald, 2006). It seems naturally, therefore, if individuals and firms cannot be sure of their assets, there is little incentive or opportunity to build on them. This post-conflict environment will result in uncertainty of land tenure and other property rights, an increase risk of macroeconomic shocks which reflect in a sectoral shifts, lack of physical infrastructure and poor communications, and in total will result in reduction in both foreign and local investment.
- **Political and Security-Related:** during a conflict, the authority of the central state is necessarily challenged. The government which emerges after a conflict will therefore suffer from reduced levels of authority, and is also likely to have varying levels of support amongst different groups and factions. This usually goes with a State fragility resulting in a low level in legitimacy, practical capacity, and human resources capacity. Along with these, it characterized by Residual violence and lack of security and lack of a functioning judicial system (Mac Sweeney, 2008).
- **Social:** After a conflict, the fragmentation and factionalism which characterizes politics is likely to pervade civil society also, and this has significant implications for economic activity. This social feature result in tension between factions and groups, Weak or disrupted social networks, Fractured families and communities, Low levels of trust, Psychological trauma from violent experiences (including sexual violence), and vulnerability of conflict-affected individuals (Mac Sweeney, 2008).

3. Methodology, Data, and results

3.1 METHODOLOGY

The objective of this paper is to examine the impact of corruption upon FDI inflows in 8 Post-Conflict Countries over the period from 1984-2013. The Dynamic Ordinary Least Square (DOLS) method developed by Pedroni (2001) and Kao and Chiang (1999) is the estimation method to achieve the objective above using E-views 9 statistical package. The DOLS is asymptotically unbiased and normally distributed estimator and it accounts for controlling for the potential endogeneity of the variable corruption in PCC, and it also helps in estimating the single cointegration vector and measures the long-run relationship between corruption and FDI in PCC. According to Stock and Watson (1993), one advantage of using DOLS is that it can estimate the direct relationship between variables in a mixture level of integration, in the sense that it can be performed to estimate the long-run relationship between variables in level I(0) and variables integrated in first order I(1). Another advantage is that DOLS accounts and corrects for endogeneity problem within small sample size of panels.

Applying DOLS normally requires three steps; integration, cointegration, and DOLS itself. However, we further apply the Dumitrescu and Hurlin panel causality (DH) test developed by Dumitrescu and Hurlin (2012) to prove the direction of causality from corruption towards FDI in PCC. Accordingly, the first step involves performing integration (stationarity) test in order to determine the level of integration between FDI and corruption in PCC. Two common stationarity tests are utilised for stationarity test, these are the Augmented Dickey-Fuller test (Dickey and Fuller (1979) and the Phillips-Perron (PP) of Phillips and Perron (1988). The second step is testing for cointegration between the variables utilising Pedroni's heterogeneous panel co-integration test, Pedroni (1999, 2004). After confirming the existence of a long-run relationship between FDI and corruption in PCC, the third step is to investigate the direction of causality between the variables. the Dumitrescu and Hurlin panel causality (DH) test (Dumitrescu and Hurlin, 2012) is used in this stage. The last step is estimating the long-run cointegration vector by applying the Dynamic Ordinary Least Squares estimator (DOLS) method by Pedroni (2001) and Kao and Chiang (1999). The DOLS takes the following formula:

$$FDI_{it} = \delta_i + \delta_i t + bCorr_{it} + \sum_{j=-k}^k \Phi_{it} \Delta Corr_{it} + \varepsilon_{it}$$

Where Φ_{ij} are coefficients of current, lead, and lag differences in the variable corruption which accounts for potential endogeneity in the panel, and provides unbiased and normally distributed estimates.

3.2.2 DATA

This paper tests for the causality relationship between corruption and FDI in 8 post-conflict countries namely; Algeria, Congo DR, Iraq, Kenya, Peru, Sierra Leone, South Africa, and Sudan over the period from 1984-2013. The variables in this paper are FDI and corruption. FDI is proxied by the net FDI inflows in millions US Dollars at current prices and current exchange rates, and the source of the data is the United Nations Conference on Trade and Development (UNCTAD). The variable corruption is an index value takes a score of 6 points = very low risk, and a score of 0 points = very high risk, and the source is The International Country Risk Guide (ICRG), from the PRS group. Given that corruption is an index value constructed from other sub-variables, and following the literature, this variables will be left as it is without any

transformation. While the variable FDI is transformed into its logarithm using a special formula following Busse and Hefeker (2007) and Ren et al. (2012) in order to overcome the problems of Zero and negative values. The formula is:

$$y = \ln[x + \sqrt{(x^2 + 1)}]$$

3.2.3 STATIONARITY TESTS

We first perform stationarity test to check the level of integration between FDI and corruption. Two common stationarity tests are used; The Augmented Dickey-Fuller (ADF) (Dickey and Fuller (1979) and the Philips-Perron (PP) of Phillips and Perron (1988). The Null hypothesis (H0) here is that the variables FDI and corruption are not integrated (they are not stationary). The alternative hypothesis (H1) is that the variables FDI and corruption are integrated in the same order (they are stationary). Table 1 shows that over the majority of tests, both variables are non-stationary in level I(0) and they become stationary when first difference applied. That indicates that the variables FDI and corruption are integrated in order 1 I(1).

Table: 1
Stationarity Test

Variable	Panel Specifications	Test	Levels	1 st difference
LogFDI	Individual intercept and trend	ADF	0.0597	0.0000
			25.6	183.4
		PP	0.0078	-
			32.8	
	Individual intercept	ADF	0.0000	-
			61.3	
	PP	0.0000	-	
		79.4		
Corr	None	ADF	0.9481	0.0000
			8.02	246.829
		PP	0.1844	0.0000
			20.8	539.1
	Individual intercept and trend	ADF	0.0665	0.0000
			25.1	101.4
	PP	0.7451	0.0000	
		11.9	91.7	
Individual intercept	ADF	0.1343	0.0000	
		22.2	84.6	
	PP	0.2826	0.0000	
		18.7	75.6	
None	ADF	0.0134	0.0000	
		31	139.8	
	PP	0.2723	0.0000	
		18.9	140.9	

3.2.3 COINTEGRATION TEST

When two variables are integrated in the same order, they are expected to be cointegrated accordingly, in the sense that they move together over a specific period of time (Engle and Granger, 1987). Thus, the variables FDI and corruption are expected to have a long-run relationship. Pedroni's panel cointegration test (Pedroni, 2004) is performed to check for cointegration between FDI and corruption in PCC. Pedroni's null hypothesis (H0) is that there is no cointegration between FDI and corruption in PCC over the period of study, while the alternative hypothesis (H1) is that there is cointegration between FDI and corruption in PCC over the that period. Table 2 shows that 6 out of the 7 Pedroni's panel cointegration test have a significant P value. Thus, the null hypothesis of no cointegration between FDI and corruption is therefore rejected, and we can conclude that FDI and corruption are cointegrated.

Table 2
Pedroni's panel cointegration test
Variables: logFD and Corr

Test statistics	Individual intercept and trend	Individual intercept
Within dimension		
Panel v-ST.	0.2205	0.4806
	0.7	0.04
Panel rho- ST.	0.0000	0.0000
	-6.8	-8.3
Panel PP- ST.	0.0000	0.0000
	-6.7	-10.6
Panel ADF- ST.	0.0000	0.0000
	-3.9	-9.1
Between dimension		
Group rho- ST.	0.0000	0.0000
	-5.09	-4.8
Group PP- ST.	0.0000	0.0000
	-6.4	-10.2
Group ADF- ST.	0.0000	0.0000
	-4.38	-8.2

3.2.4 DIRECTION OF CAUSALITY

After confirming that the variables FDI and corruption are cointegrated, they are expected to have at least one direction of causality between them (Fugarolas Álvarez-Ude et al., 2007). In order to check the direction of causality between our variables, the Dumitrescu and Hurlin panel causality (DH) test (Dumitrescu and Hurlin, 2012) is used. Performing causality test requires the variables to be stationary, otherwise the results become spurious (Granger and Newbold, 1974). Thus, we utilise the first difference for both FDI and corruption variables. The null hypothesis of DH causality test is there is no causality between FDI and corruption, and the alternative hypothesis is that there is a causality relationship between them. Table 3 shows the DH panel causality test. For the first part of the DH causality test, since the p value is significant at the 1% level, the null hypothesis is rejected. This lead us to conclude that there is a causality relationship running from corruption towards FDI. The second part of the test shows there is no causality running from FDI towards corruption (since the p value is insignificant).

Table 3
Dumitrescu Hurlin Panel Causality Tests
Sample: 1984 2013
Lags: 2

Null Hypothesis:	W- Stat.	Zbar- Stat.	Prob.
DCORR does not homogeneously cause DLOGFDIMILLION	5.67	4.07	0.0000* **
DLOGFDIMILLION does not homogeneously cause DCORR	3.15	1.13	0.2564

*** indicate a rejection of the null hypothesis of no causality at the 1% level.

Lag length is determined according to Akaike information criterion (AIC) and Schwarz information criterion (SC).

3.2.5 THE LONG-RUN EFFECT OF CORRUPTION ON FDI IN PCC

Having established that corruption has an impact upon FDI in PCC, we now apply the dynamic ordinary least squares estimator (DOLS) in order to estimate the long-run effect of corruption on FDI. The DOLS estimator is developed by Pedroni (2001) and Kao and Chiang (1999), and it allows both individual and group-mean panel estimations. One of the main advantages of applying the DOLS model is that it accounts for endogeneity and serial correlation issues and it is therefore produces asymptotically unbiased and normally distributed estimations (Herzer and Nunnenkamp, 2012). Table 4 presents both individual and group mean long-run cointegration vector of DOLS estimator. It shows that, in the long-run, corruption have a negative impact upon FDI in PCC. The panel vector for all PCC is found to be significant at the 10% level with a negative sign (-1.34), that means that an increase in corruption by 1 unit decreases FDI inflows by 1.3 units in PCC. The majority of individual cointegration vector are also significant and signifying negative sign.

Table 4
Dynamic Ordinary Least Squares (DOLS) results

Country	Coefficients	Std.Error	T-Statistic	Prob.
Algeria	4.969050	2.077273	2.392102	0.0257
Congo DR	-7.789362	1.126546	-6.914377	0.0000
Iraq	1.752192	2.531846	0.692061	0.4961
Kenya	-2.054402	0.614626	-3.342525	0.0029
Peru	4.900313	1.442578	3.396913	0.0026
South Africa	-4.292743	0.667002	-6.435875	0.0000
Sierra Leon	-1.925580	0.958334	-2.009298	0.0569
Sudan	6.899507	1.510231	4.568509	0.0002
Panel	-1.346416	0.655800	-2.053091	0.0415

Dependent variable: LogFDImillion

4. Conclusion

Considering 8 Post-Conflict countries, this paper aimed to explore the impact of corruption on FDI inflows. The stationarity test showed that the variables corruption (measured in the ICRG's index) and FDI (measured in million US Dollars) are non-stationary in level and they become stationary in order 1 I(1). Having established that corruption and FDI are integrated in order 1(1), they are now expected to be co-integrated in the sense that there is a long-run relationship between corruption and FDI in the long-run. Pedroni's panel cointegration test confirmed the cointegration between the variables in 6 out of its 7 tests. After confirming the cointegration, corruption and FDI should have at least one direction of causality, in the sense that either corruption does cause FDI or FDI does cause corruption. The Dumitrescu and Hurlin panel causality test shows that the causality run from corruption towards FDI. The last step was estimating the coefficient vector of the relationship between corruption and FDI. The DOLS estimation clearly confirmed the existence of a negative impact of corruption on FDI in PCC. The 1 unit increase in corruption level decreases FDI inflows by -1.346416 units. In light of the above findings, corruption represents a real challenge for attracting FDI in PCC. Further, governments and policymakers in PCC should set up serious institutional reform strategies in order to reassure foreign investors that they have genuine endeavors for reform. The PCC can gain benefits from the international institutions' support by directing part of that support for institutional reform.

At the country level, the DOLS reveals mixed results. The variable corruption is found to be significant with a negative sign on FDI inflows in four out of the eight PCC. It is found that a 1 unit increasing in corruption reduces FDI by 7.7 units in Congo DR, by 2.05 units in Kenya, by 4.2 units in South Africa, and by 1.9 units in Sierra Leon. These findings come consistent with the theoretical point of view which suggests that corruption has negative implications upon country's attractiveness for FDI. In the sense that foreign investors in the above mentioned four post-conflict countries view corruption as a kind of additional costs for their investment, and these countries are, therefore, lose FDI inflows due to high corruption level. The surprising results are within Algeria, Peru, and Sudan. Corruption in these three countries is found to be statistically significant but with a positive sign, indicating that corruption plays a promoting role in attracting FDI in these countries. It is found that a 1 unit increasing in corruption increases FDI inflows by 4.9 units in Algeria, by 4.9 units in Peru, and by 6.8 units in Sudan. These findings have been also examined within the theory as explained in the literature review of this paper. In some cases, especially within 'bad' bureaucratic, foreign investors prefer to pay bribes in order to speed-up their transactions within such an environment. With respect to Iraq, despite the coefficient vector is positive at the 1.7 but the P value is insignificant at the 0.4961, indicating that corruption does not explain FDI inflows in Iraq in the long-run.

Finally, the results which obtained from the eight countries panel provide a more robust, reliable, and comprehensive results compared with the results obtained from individual countries estimations. Corruption may play a positive role in a particular country over a particular period of time, but on the long-run it plays a role in destroying the institutional quality of the country in whole, hindering FDI-growth opportunities in the country.

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