



# Impact of Foreign Direct Investment on Domestic Innovations In Developing Economies: Moderating Role of Country-Level Governance

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**Abstract:** The study aims to explore whether country-level governance moderates the relationship between foreign direct investment (FDI) and innovation in developing economies, extending beyond the typical examination of FDI's direct impact on innovation. Utilizing panel data from the World Bank Development Indicators and Worldwide Governance Indicators databases, covering 55 developing countries over a 25-year period from 1995 to 2019, the study employs a Generalized Method of Moments (GMM) system to estimate the moderating effects of governance on the FDI-innovation relationship. The analysis reveals that three of the six governance variables—political stability, the rule of law, and voice and accountability—significantly moderate the impact of FDI on innovation. Specifically, these governance factors amplify the positive effects of FDI on local innovation, indicating that improvements in governance quality enhance the benefits of FDI for innovation in developing countries. The findings suggest that traditional policy measures, such as increasing government expenditure on R&D and education to boost FDI's innovation spillovers, may be inadequate without concurrent improvements in governance quality. Strengthening governance, particularly in the areas of political stability, the rule of law, and voice and accountability, is crucial for maximizing the innovation benefits of FDI in developing economies. Policymakers in developing countries should prioritize enhancing governance quality to fully leverage the innovation potential of FDI. The study highlights the importance of political stability, the rule of law, and voice and accountability in fostering an environment where FDI can effectively contribute to local innovation. Future research should investigate the potential mediating effects of governance variables to provide a more comprehensive understanding of their role in the FDI-innovation nexus.

**Keywords:** Foreign Direct Investment, Country-Level Governance, Governance, Innovation, Developing Economies

## 1. Introduction

FDI-assisted development strategies have been used to stimulate economic development in several countries (Lall & Narula, 2004). This policy uses tax and nontax incentives to entice foreign capital to invest in local economies. Global capital flows have increased significantly over time, but competition for FDI has become more intense. A significant increase in FDI flows globally provides recipient countries with several advantages, including technical spillovers, human capital development, access to international markets, and greater competitiveness (Alakbarov, 2016). Many academics study the various ways in which FDI affects recipient economies. Some studies examine how FDI affects domestic innovation; for instance, Lin and Lin (2010) and Cheung and Lin (2004) concluded that FDI fosters innovation in host nations.

Many traditional economic factors, including R&D expenditure, R&D employment, human capital levels, market structures, and industry characteristics, influence domestic innovation. However, since the late 2000s, multiple studies have shown that governance, in addition to other factors, has a vital role in enhancing innovation activities (Tang et al., 2013; Kaasa et al., 2007; Belloc, 2010).

Good governance not only attracts inward foreign direct investment to local economies but also ensures that FDI-relevant policies are implemented effectively to achieve the desired policy effects (Zeneli, 2014; Fazio & Talamo, 2008; Mengistu and Adhikary, 2011; Muhammad, 2014; Vedantham and Kamaruddin, 2015). Multiple organisations are involved in policy implementation, each carrying out different degrees and levels of tasks. As a result, policymaking and implementing organizations require good governance to enable effective coordination among separate government and non-government agencies that execute interdependent functions (Newig and Koontz, 2014).

Multinational corporations (MNCs) are expected to provide direct benefits to host countries, such as higher domestic investments and employment. In addition, MNCs also boost productivity and technology spillovers. Local groups, such as universities, investment boards, national innovation organisations, and other government agencies,

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must collaborate to build absorptive capacities to maximise spillover benefits. As a result, excellent governance is a requirement for successful policy implementation.

Although many scholars investigate the effects of governance on FDI-related policy outcomes, few have viewed governance as a moderating variable to influence the link between FDI and economic development variables such as domestic investment and social welfare because of its critical role in ensuring effective policy execution (Farooque and Yaram, 2010; Perez-Segura, 2014).

The aim of this article aims to examine any moderating effects that country-level governance may have on the link between FDI and domestic innovation. The moderating role of governance in stimulating innovation is a significant policy issue that is frequently ignored. In addition to having direct effects on innovation, governance can also moderate the direct relationship between inward FDI and innovation. The study's main proposal is that while inbound foreign direct investment positively affects domestic innovation, effective governance strengthens or amplifies this link. Because innovation is a source of competitive advantages for a country, research into indirect or moderating roles of governance in fostering domestic innovations provides policymakers with knowledge about governance as a conduit to spur innovations from implementing FDI policies.

The remainder of the article was structured as follows. A review of the literature on FDI, governance, and innovation is presented in the section below. The sections on the research methodology, analysis, discussion, and conclusion come next.

## **2. Literature Review**

The literature review section includes three research strands relevant to our study: the role of FDI and governance in enhancing domestic innovation, the mechanism of FDI's innovation spillovers, and the moderating role of governance.

### **2.1. The Roles Of FDI And Governance In Enhancing Domestic Innovation**

The first body of research focuses on the role of foreign direct investment in fostering innovation in recipient nations. The study of innovation began with the key work of Joseph Schumpeter (Schumpeter, 1970), who contends that large enterprises and concentrated market systems foster innovation. Arrow (1962) demonstrated, however, that a monopoly protected from competition has less motivation to innovate than enterprises in a truly competitive market. There are numerous factors that influence innovation. Most research on the determinants of innovation looks at traditional factors such as R&D spending, human capital levels in a country, research funding availability, R&D sector employment, market structure, and industry characteristics (Kaasa et al., 2007).

During the 1970s, the influence of FDI on innovation was initially examined in international trade theory, a time when institutional considerations and property rights protection were not fully grasped. Since the 1980s, the focus on institutional quality and governance has grown out of the work of Olsen (1982) and North (1990). Since the 2000s, the literature on the effects of FDI on innovation has exploded. Cheung and Lin (2004) discovered that FDI affected the number of patent applications for invention, utility, and design filed in China. Lin and Lin (2010) discovered that severe competition with MNCs can have a favourable impact on local enterprises' innovative activities. Local government corruption stifles corporate innovation in the United States, according to Huang and Yuan (2021).

Tang et al. (2013) discovered that corporate governance has an impact on the innovation activities of Chinese SMEs, as evaluated by patenting activities. By focussing on macro-level governance, Kaasa et al. (2007) discovered that good governance increases the innovation performance of Switzerland, Ireland, and Luxembourg. The national governance structure, according to Belloc (2010), impacts company innovation trends. In terms of innovation, different market models produce different results. Radical innovation is aided by market-based coordination, such as that found in the United States, the United Kingdom, and other Anglo-Saxon economies. Nonmarket forms of coordination, such as those seen in Germany and many European countries, on the other hand, promote incremental innovation.

### **2.2 Mechanism Of FDI's Innovation Spillovers**

The second strand of FDI-innovation research investigates how MNCs influence local innovation. This set of studies follows the literature on FDI and productivity spillovers. Spillovers are unintended consequences that occur when the presence of foreign affiliates improves local enterprises' capability, productivity, or efficiency. Spillovers that affect enterprises or competitors in the same industry are known as intra-industry spillovers. Financial and technological spillovers generated through vertical or backward linkages between enterprises in different sectors are referred to as inter-industry spillovers (Eden, 2009). Inward FDI has a variety of techniques through which it might influence local firm innovation and the economy. Demonstration effects, competitive pressure and disciplining effects, human mobility, and backward linking are examples of these mechanisms.

When multinational companies enter host countries with distinct advantages over local firms, such as higher operating efficiency, operational techniques, and technologies, the demonstration effect emerges. The presence of MNCs in the local economy serves as a model for local businesses since they demonstrate the possibility of introducing new technology and production techniques to local markets (Cheung and Lin, 2004; Liu and Zou, 2007). Local businesses watch and learn from their international rivals. This demonstration effect might cause

local businesses to copy and reverse engineer MNC products and practises (Saggi, 2002), or it can encourage them to innovate via learning. This may encourage local businesses to be more productive in their innovation efforts. In 26 Chinese provinces, Cheung and Lin (2004) discovered that FDI had an impact on three types of patent applications: innovation patents, utility patents, and design patents. Increased foreign direct investment has a positive impact, particularly on design patents. This is due to the ease with which design patents can be imitated.

When MNCs enter a local market, they create competitive pressure, forcing local enterprises to innovate and launch new technology or products in order to protect or keep their market share (Liu and Zou, 2007). Product innovation is influenced by the intensity of competition more than process innovation (Damanpour, 2009). Fierce competition has a disciplining impact on local firms. They fight against multinational corporations (MNCs) that have been successful in their home countries and are well-equipped with technology, forcing local businesses to innovate in order to stay competitive (Lin and Lin, 2010). As a result, MNCs can contribute to increased innovation across the economy.

However, when more MNCs enter the market, the marginal spillover effects diminish (Eden, 2009). The first foreign entry has the greatest potential for spillover benefits for host country businesses. Then, as more foreign companies join, the spillover benefits diminish. When a domestic industry becomes more congested, competition becomes more intense as the number of companies increases. Empirical research done in Romania using data from 1990 to 2001 supports this marginal spillover theory (Eden, 2009).

The advent of FDI alters the tactics of domestic businesses. This occurs when local businesses avoid direct competition with multinational corporations. When faced with significant foreign entrants, local businesses expand geographically to avoid direct competition. When native enterprises regard foreign entry as a competitive threat, this situation arises. Instead of increasing their product innovation capacity to compete directly, incumbents opt for an indirect strategic reaction by expanding their product and geographic coverage. This notion was supported by a study of 407 American and 95 German companies from 1987 to 2003 (Eden, 2009).

Another strategy to boost indigenous innovation is to increase human capital mobility. Through labour market turnovers, technology can spread to local businesses. Managers and skilled workers who formerly worked for multinational corporations (MNCs) have moved to local firms or started their own businesses. These employees' use of technology at their former employers may help their current companies innovate more effectively (Cheung and Lin, 2004; Liu and Zou, 2007). However, labour mobility may have a negative impact on local enterprises' innovation by allowing MNCs to poach the best staff from local competitors (Javorcik, 2008).

Backward linkage routes may help to boost local innovation. MNCs prevent information from leaking to competitors when competing with local enterprises in the same industry. When they demand intermediaries, however, upstream industries flourish, resulting in backward linkages. MNCs want to improve the capabilities of their local suppliers so that they can deliver goods and services that meet their quality standards. MNCs provide technical assistance and information on product enhancement and innovation to local suppliers in response to the need for high-quality products and services (Bucar, Rojec, and Stare, 2009). These connections between multinational corporations and their local suppliers have the potential to stimulate more innovation in local businesses. However, if MNCs employ fewer intermediate items from local suppliers, the backward linkage may not result in beneficial innovation outcomes for local enterprises (Javorcik, 2008).

### **2.3. The Moderating Role Of Governance**

The third strand of literature examines how governance can moderate innovation in ways that are pertinent to our study. As was previously mentioned, governance serves as a moderating component that enables many organisations to carry out multilevel operations, and it is thus essential to the effectiveness of FDI policy implementation.

In some instances, FDI and governance appear to interact. According to empirical studies, governance and FDI have a positive association. Some of the research in this category i.e. Sin and Leung (2001), Globerman and Shapiro (2002), Gani (2007), and Fan et al. (2007). On the other hand, a positive correlation does not always imply that two items are simultaneously related. As a result, Mukherjee et al. (2011) chose to investigate the two-way correlations between the two, which they discovered to exist. Such links have also been discovered by Sin C. and Leung (2001). According to Shamsub (2014), when FDI inflows increase, the number of indigenous innovations increases, attracting more FDI inflows. This indicates that FDI encourages governments in developing countries to improve governance, which, in turn, attracts more FDI.

These empirical studies suggest that governance and FDI may have an interactive impact. Some studies have employed the term of FDI-governance interaction to explore the moderating effects of governance on various development indicators such as social welfare (Perez-Segura, 2014) and domestic investments (Farooque and Yarram, 2010). We use this line of research to see whether governance has a moderating effect on the relationship between FDI and innovation.

The moderating role of governance could be theoretically linked to Weber (1968)'s concept of high quality government, which is characterised by a modern rational legal governance system bounded by impersonal rules and relies on hierarchy and meritocracy. In this system, government officials do not have the right to extract rent from private citizens. Under high-quality public governance, public officials must diligently perform the functions of government and promote economic development.

Kettl (2021) connects Weberian bureaucracy to modern governance in his research, which ties bureaucracy to the function of business in the economy. Although companies aim to maximise their profits, bureaucracy is crucial in lowering uncertainty. Bureaucracy provides the stability on which the markets rely. Government policies and programmes are increasingly delivered through intricate partnerships of public, commercial, and nonprofit groups as government systems around the world become more complex. Although public authorities are legally required to carry out these plans, their practical execution depends on a complex network of interrelated institutions, many of which have their own internal hierarchies.

Public governance is required to guarantee authority accountability and the efficacy of policy results coming from policy implementation through multilayer interconnected organisations. According to Jia et al. (2019), good public governance enhances the efficiency of corporate governance processes, further lowering the agency in innovation. This is in reference to the moderating impact of public governance on innovation. Wu (2021) found that country-level governance significantly moderated associations between corporate governance and business performance.

### 3. Methodology

#### 3.1. Model Specification

Traditional FDI-innovation parameters affecting the number of economy-wide innovations were used to develop estimation models. The relationship between local innovation and inward FDI is depicted in Equation (1).

$$\text{INNOVATION}_{ij} = \text{INNOVATION}_{ij}(t-1) + \text{FDI}_{ij} + \text{GOVERNANCE}_{ij} + \text{FDI}_{ij} * \text{GOVERNANCE}_{ij} + \text{RDGDP}_{ij} + \text{GDP}_{ij} + \text{EDUGDP}_{ij} + \text{OPENNESS}_{ij} + E_{ij} \dots (1)$$

**Where:**

INNOVATION = the number of patents registered by residents

FDI = inward FDI as a percentage of GDP

RDGDP = research and development expenditure as a percentage of GDP

GDP = log of GDP

EDUGDP = education spending as a percentage of GDP

OPENNESS = trade openness, the sum of imports and exports divided by GDP

GOVERNANCE = six individual governance indicators; comprising the rule of law (ROL), regulatory quality (RQ), government effectiveness (GOEF), control of corruption (CC), political stability (STABLE), voice and accountability (VAC). Each indicator enters the equation one at a time.

As control variables, R&D spending, trade openness, GDP, and government spending on education are included in the equation. The independent variable is FDI, while the mediating variables are governance variables. The nation's absorptive capacities are represented by R&D spending and spending on education. Although many variables, such as scientific publications per year and the number of researchers per capita, represent absorptive capacities, we picked just R&D investment and spending on education because those variables have high collinearity. R&D spending is also preferable to other variables, since it symbolises innovative efforts, whereas the number of patents is the result of those efforts (Griffith, Huergo, Mairesse, and Peters, 2006).

Although inward FDI may affect local innovation through spillover effects, the extent to which spillovers assist local enterprises and the broader economy depends on the host countries' ability to absorb spillovers. The openness variable is introduced into the equation to coincide with conventional thinking and existing empirical findings that international trade causes technological spillovers.

#### 3.2. Data Collection

We use data from the World Bank Development Indicators database (2019) and the Worldwide Governance Indicators database (2019) to generate a cross-sectional time series dataset. The panel data covers a 25-year time series of 55 developing countries from 1995 to 2019. This panel data only includes 55 developing nations because many countries' crucial data are unavailable. The most recent year for which data were available in the database at the time of writing was 2019. This study examines the number of patents registered each year as a proxy for innovation based on previous research articles on economy-wide innovation (Cheung and Lin, 2004; Nadolny, 2010; Phene and Almeida, 2008).

To derive efficient estimators, we follow various literature, e.g., Law and Azman-Saini (2012), to estimate this panel data set by the generalised method of moments (GMM). We used a GMM system, which relies on both the level and difference equations. We used lagged differences of the regressors as instruments for the level equation.

## 4. Results / Analysis

### 4.1. Descriptive Statistics

The descriptive statistics of the dependent variables and the selected independent variables are presented first in the analysis section. There are six governance variables and six interaction terms, as well as the number of registered patents (INNOVATION) and FDI as a percentage of GDP (FDI). In addition, we present a governance indicator correlation matrix.

**Table 1:** Descriptive Statistics of FDI and Innovation

Variable	N	Mean	SE Mean	Minimum	Maximum
FDI*	1350	4.528	0.219	-40.414	173.45
INNOVATION**	1350	2.1698	0.0267	0	6.1478

Notes: \* FDI as a percentage of GDP. \*\* log of the number of patents registered.

**Table 2:** Mean Values of Individual Governance Indicators from 1995 to 2019

Variable	Mean	SE Mean	Minimum	Maximum
ROL	-0.2132	0.0174	-1.6924	1.5965
RQ	0.0151	0.0188	-1.8515	1.6749
STABLE	-0.2656	0.0219	-2.8121	1.6981
VAC	-0.1321	0.0207	-1.8296	1.5911
CC	-0.2821	0.0155	-1.4153	1.5636
GOEF	-0.0714	0.0161	-1.495	1.669

*N=1,350*

The 25-year mean values of all individual governance variables, except RQ, are negative. STABLE shows the highest dispersion, with a minimum value of -2.8121 and a maximum value of 1.6981, followed by VAC, RQ, ROL, CC, and GOEF.

**Table 3:** Mean Values of Individual Governance Indicators by Year

	ROL		RQ		STABLE		VAC		CC		GOEF	
Year	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1995	-0.24	0.09	0.06	0.10	-0.25	0.12	-0.12	0.10	-0.32	0.08	-0.12	0.08
1996	-0.28	0.09	0.02	0.10	-0.30	0.11	-0.16	0.09	-0.32	0.08	-0.16	0.08
1997	-0.27	0.09	0.02	0.09	-0.28	0.11	-0.15	0.09	-0.32	0.07	-0.16	0.08
1998	-0.25	0.09	0.04	0.09	-0.24	0.11	-0.13	0.10	-0.30	0.08	-0.13	0.08
1999	-0.27	0.09	0.02	0.09	-0.27	0.10	-0.13	0.10	-0.31	0.07	-0.14	0.07
2000	-0.27	0.09	0.01	0.09	-0.28	0.11	-0.13	0.10	-0.31	0.08	-0.13	0.08
2001	-0.24	0.08	-0.01	0.09	-0.22	0.11	-0.13	0.10	-0.30	0.07	-0.11	0.08
2002	-0.24	0.09	-0.05	0.10	-0.21	0.12	-0.14	0.11	-0.33	0.08	-0.11	0.08
2003	-0.22	0.09	-0.04	0.09	-0.24	0.13	-0.13	0.11	-0.24	0.07	-0.07	0.08
2004	-0.20	0.08	-0.01	0.09	-0.32	0.11	-0.11	0.11	-0.26	0.08	-0.08	0.08
2005	-0.22	0.09	-0.04	0.09	-0.26	0.11	-0.12	0.10	-0.26	0.08	-0.10	0.08
2006	-0.24	0.09	-0.01	0.09	-0.29	0.12	-0.14	0.11	-0.25	0.08	-0.07	0.08
2007	-0.23	0.09	0.02	0.09	-0.24	0.11	-0.14	0.11	-0.26	0.07	-0.05	0.08
2008	-0.22	0.09	0.04	0.10	-0.28	0.12	-0.16	0.11	-0.28	0.07	-0.06	0.08
2009	-0.22	0.09	0.03	0.10	-0.30	0.12	-0.17	0.11	-0.31	0.08	-0.08	0.08
2010	-0.21	0.09	0.05	0.10	-0.31	0.12	-0.18	0.11	-0.31	0.08	-0.05	0.08
2011	-0.21	0.09	0.05	0.10	-0.30	0.11	-0.16	0.11	-0.29	0.08	-0.05	0.08
2012	-0.22	0.09	0.03	0.10	-0.29	0.11	-0.14	0.10	-0.28	0.08	-0.06	0.08
2013	-0.22	0.09	0.01	0.10	-0.30	0.11	-0.15	0.10	-0.26	0.08	-0.06	0.09
2014	-0.15	0.09	0.03	0.10	-0.23	0.11	-0.12	0.11	-0.26	0.08	0.00	0.08
2015	-0.15	0.09	0.00	0.10	-0.26	0.11	-0.08	0.11	-0.25	0.08	-0.01	0.08
2016	-0.13	0.09	0.01	0.09	-0.27	0.11	-0.10	0.11	-0.25	0.08	-0.01	0.08
2017	-0.15	0.08	0.02	0.09	-0.24	0.11	-0.12	0.11	-0.26	0.08	-0.02	0.08
2018	-0.14	0.09	0.03	0.10	-0.22	0.11	-0.10	0.11	-0.26	0.08	0.01	0.08
2019	-0.15	0.09	0.03	0.09	-0.22	0.10	-0.10	0.11	-0.26	0.08	0.02	0.08

Note: *N= 55 for all years.*

In our dataset, developing countries receive 4.653% of FDI inflows as a proportion of GDP, as seen in Table 1. The average number of patents per year is 2,908 patents. Except for regulatory quality, the mean values of the 25-year mean of the 25-year mean of the 25-year mean of the 25-year mean of the individual governance measures are negative, as shown in Table 2. The yearly mean values in Table 3 follow the same pattern as the 25-year

average. The mean values for corruption control, political stability, the rule of law, and voice and accountability are all negative. Except for 2014, all years had negative mean values for government effectiveness. Although it has a positive 25-year mean score, regulatory quality has fallen into negative territory for several years.

**Table 4:** Mean Values of Six Interaction Terms

Variable	Mean	SE Mean	Minimum	Maximum
CC*FDIGDP	-0.506	0.201	-30.589	181.112
GOEF*FDIGDP	0.359	0.245	-26.191	223.206
ROL*FDIGDP	0.004	0.291	-35.16	276.918
RQ*FDIGDP	1.147	0.257	-23.24	208.583
STABLE*FDIGDP	0.246	0.248	-30.491	220.485
VAC*FDIGDP	0.421	0.246	-16.161	214.69

Source: Calculated by the author *Note: N= 1,350*

Although all governance factors, except regulatory quality, have negative 25-year mean values, the average of individual interaction in terms of all but CC\*FDIGDP has positive values.

Following that, we present a six-variate governance correlation matrix. Each governance variable is highly correlated with each other, according to the correlation coefficients presented in Table 5.

**Table 5:** Correlation matrix of governance variables

Correlation	CC	GOEF	STABLE	RQ	ROL	VAC
CC	1	.851**	.612**	.761**	.882**	.681**
GOEF	.851**	1	.578**	.846**	.881**	.684**
STABILITY	.612**	.578**	1	.551**	.641**	.598**
RQ	.761**	.846**	.551**	1	.814**	.774**
ROL	.882**	.881**	.641**	.814**	1	.709**
VAC	.681**	.684**	.598**	.774**	.709**	1

Source: Calculated by the author

## 4.2. GMM Analysis

Table 6 shows the results of the GMM analysis based on Equation (1). Governance indicators comprise six variables. Although it is reasonable to include six components in the base model to investigate their impact on innovation simultaneously, this is not feasible because of the close correlation between the six variables. As a result, Models 1 to 6 were created by adding one unique governance variable to the base model at a time. Model 1 is a formula that includes variables from both the base model and the VAC. The initial model is combined with ROL, STABLE, RQ, CC, VC, and GOEF to form Models 2 through 6.

**Table 6:** Results of the GMM Analysis

Model Independent Variables	Base (S.E.)	1-VAC (S.E.)	2-ROL (S.E.)	3-RQ (S.E.)	4-GOEF (S.E.)	5-STABLE (S.E.)	6-CC (S.E.)
Innovation (-1)	0.605361*** 0.01435	0.575967*** 0.019546	0.579577*** 0.01933	0.578119*** 0.01745	0.573998*** 0.01700	0.546826*** 0.01671	0.58046*** 0.02062
FDI	0.002759*** 0.00055	0.003503*** 0.00111	0.003435** 0.00138	0.002639** 0.00116	0.002913*** 0.00082	0.00332*** 0.00088	0.00283*** 0.00085
RDGDP	0.400738*** 0.04807	0.427304*** 0.085446	0.446782*** 0.08437	0.431577*** 0.06622	0.413997*** 0.05815	0.478142*** 0.05789	0.430446*** 0.06614
GDP	0.00001 0.00003	0.00001 0.00005	0.00000 0.00001	0.00001 0.00001	0.00001 0.00003	0.00005 0.00003	0.00001 0.00004
EDUGDP	-0.00035 0.00955	0.007373 0.008774	0.00510 0.01182	0.00298 0.00696	0.00182 0.00821	-0.00182 0.00837	0.004343 0.00788
OPENNESS	-0.04749 0.03953	-0.0466 0.056656	-0.04956 0.12156	-0.087634* 0.04744	-0.062336 0.03816	-0.061671* 0.03558	0.00001 0.03639
VAC		0.144265*** 0.033764					
ZVAC*FDI		0.06785* 0.03564					
ROL			0.030524*** 0.01411				

Model Independent Variables	Base (S.E.)	1-VAC (S.E.)	2-ROL (S.E.)	3-RQ (S.E.)	4-GOEF (S.E.)	5-STABLE (S.E.)	6-CC (S.E.)
ZROL*FDI			0.034194*				
			0.01942				
RQ				-0.076339			
				0.05892			
ZRQ*FDI				-0.021437			
				0.02687			
GOEF					0.04706		
					0.02978		
ZGOEF*FDI					-0.022563		
					0.019775		
STABLE						0.044742**	
						0.02349	
ZSTABLE*FDI						0.048651***	
						0.01685	
CC							0.039797
							0.04407
ZCC*FDI							-0.026386
							0.02273
J-statistics	47.54754	46.22897	47.11404	47.50511	47.10934	47.148	47.41789
Prob(J-statistic)	0.491289	0.462801	0.426748	0.411134	0.426937	0.425384	0.414598

Source: Calculated by the author. **Notes:** \*\*\*Significant at less than 1%, \*\*Significant at less than 5%, \*Significant at less than 10%. All models share the same dependent variable, INNOVATION. Model 1 measures the impact of VAC, in the presence of FDI and FDI-governance interaction term, on INNOVATION. Models 2 to 6 measure the effects of ROL, RQ, GOEF, STABLE, and CC on INNOVATION, respectively.

Table 6 shows that the FDI coefficients are statistically significant in all models. FDI affects local innovation. The RDGDP coefficients are also statistically significant in all equations. Spending on research and development increases innovation in local economies.

The findings on the impact of FDI and RDGDP on innovation are consistent with conventional wisdom and the existing literature that capital flows and research and development expenditure stimulate indigenous innovation. The coefficients of each governance variable show its direct impact on innovation. Only three governance indicators are statistically significant across the six models. The VAC, ROL, and STABLE coefficients are statistically significant in the presence of FDI, indicating that political stability, the rule of law, and voice and accountability favour local innovations.

The interaction terms of governance variables and FDI show the moderating effects of governance on innovation. The interaction between voice and accountability and FDI (VAC\*FDI), the rule of law and FDI (ROL\*FDI), and political stability and FDI (STABLE\*FDI) are statistically significant. This means that the relationship between FDI and innovation is moderated by voice and accountability, the rule of law, and political stability.

Regarding the magnitude of the moderating effects, we look at the coefficients of FDI in the presence of the interaction terms. Moderating effects occur if the interaction terms change the magnitude of the FDI coefficients. We can observe that the existence of the three governance variables in Equation 1 (Table 6) causes the FDI coefficient to increase. The coefficient of FDI is 0.002759 in the base model (the second column of Table 6). In the presence of voice and accountability and its interaction terms, the coefficient of FDI in Model 1 increases from its original value to 0.003503, accounting for a 27% increase. In Model 2, the rule of law and its interaction term leads the coefficient of FDI to surge from its original value to 0.003435, representing a 25% surge. In Model 5, the addition of political stability and its interaction term to the model causes the coefficient of FDI to increase to 0.00332 from its original value in the base model. This accounts for a 25% increase. This shows that the direct relationship between FDI and innovation is positively moderated by voice and accountability, the rule of law, and political stability. In other words, voice and accountability, the rule of law, and political stability strengthen the impact of FDI on innovation.

To summarize, the findings imply that foreign direct investment positively impacts innovation. Spending on research and development also positively affects levels of innovation in the FDI-recipient countries. Regarding governance variables, political stability, the rule of law, and voice and accountability all have a direct impact on innovation. These three governance variables are also important in moderating the relationship between FDI and

innovation. This conclusion implies that improvements in governance will magnify the effect of FDI on innovation.

## 5. Discussion

The following are the main conclusions of the paper. In developing countries, a rise in the flow of FDI increases the number of innovations. This is an advantage that FDI has for the host economy. Second, only three of the six governance variables moderate the FDI-innovation relationship. These are voice and accountability, political stability, and the rule of law.

The influence of FDI on innovation is amplified by the moderating effects of the three factors. These three factors reinforce the effects of FDI on local innovation for a variety of reasons.

First, social tensions are reduced when there is stability and no violence. Stability attracts FDI and encourages local businesses to develop new ideas and creative services and products in order to compete with MNCs or become a part of their supply chain. In a harmonious society, this leads to more innovative activities.

Second, the rule of law measures how much economic actors trust and follow the laws of society, such as property rights, the police, and the legal system. MNCs are more likely to invest in countries with strong legal systems. Property rights protection is one of the essential elements for American multinational investment decisions, according to Biglaiser and Staats (2010). While economies with strict rule of law attract more inbound FDI, economic players who follow the law reduce investment risks. The rule of law has a moderating influence on the impact of FDI on innovation because it reduces investment risk, which encourages multinational companies and domestic enterprises to expand their operations. As a result, more novel activities are produced.

Third, citizen voice and accountability allow residents to successfully express their opinions. It includes things like freedom of speech, access to the media, political rights, and civil liberties. As a result, there is more room for experimentation. Local enterprises with more freedom of expression may become more innovative in reaction to more MNC investments, resulting in moderating effects.

Fourth, good governance at the national level makes corporate governance tools work better, reduces agency risk in innovation, and ultimately improves innovation performance (Jia, Huang, and Zhang, 2019). Effective public governance guarantees that policy outcomes from the execution of FDI policy through multilayer interconnected public and private entities are effective.

The ramifications of our findings are policy relevant. Policymakers should recognize that the conventional policy prescription, such as boosting government expenditure on R & D and education, to enhance FDI's innovation spillovers may not be sufficient without changes in governance quality. According to our research, strengthening governance quality complements the benefits of traditional economic factors. Increasing governance quality will encourage more domestic innovations as a result of the execution of FDI policies, increasing competitiveness because innovation is a source of competitive advantages for a country.

However, to encourage FDI's innovation spillovers, not all dimensions of governance are equally crucial. The three important governance indicators revealed in this study: political stability, the rule of law, and voice and accountability, must be improved as a top priority by the government if it wants to increase the spillover of innovation to local economies. In addition to having a considerable impact on the innovation spillovers from FDI, political stability, the rule of law, and voice and accountability further magnify the favourable association between FDI and innovation.

## 6. Conclusion

While much of the existing research explores the impact of inward FDI on recipient-economy innovation, others investigate whether governance plays a role in enhancing country-wide innovation. The findings reach the consensus that both FDI and governance improve innovation in the host economies. This paper examines whether individual country-level governance moderates the relationship in developing economies. The results of the study show that three of the six governance variables –political stability, the rule of law, and accountability have moderating effects on the positive relationship between governance and innovation.

The findings imply that developing countries must strengthen their governance, particularly political stability, the rule of law, and voice and accountability, to increase the spread of innovation spillover. Policymakers should recognize that the conventional policy prescription, such as boosting government expenditure on R&D and education to enhance FDI's innovation spillovers, may not be sufficient without changes in governance quality. To encourage FDI innovation spillover, political stability, the rule of law, and voice and accountability should be improved as a top priority. This is because these three governance indicators magnify the positive impact of FDI on local innovations.

## 7. Limitations And Future Recommendations

The major limitation of this study is that it has not investigated the possible mediating effects of governance variables; instead, it focuses only on the moderating effects. This leaves room for future research to investigate the role of governance as a mediator in the relationship between FDI and innovations.

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## References

- Alakbarov, Y. B. (2016). Corruption and Foreign Direct Investments in Emerging Market Economies. *ECOFORUM*, 5(2): 303-308.
- Arrow, K. J. (1962). The Economic Implication of Learning by Doing. *Review of Economic Studies*, 29:155-173. <https://doi.org/10.2307/2295952>
- Belloc, F. (2012). Corporate Governance and Innovation A Survey. *Journal of Economic Surveys*, 26(5): 835-864. <https://doi.org/10.1111/j.1467-6419.2011.00681.x>
- Biglaiser, G., & Staats, J. L. (2009). Do Political Institutions Affect Foreign Direct Investment? A Survey of U.S. Corporations in Latin America. *Political Research Quarterly*, 63(3), 508-522. <https://doi.org/10.1177/1065912909331428>
- Bucar, M., Rojec, M., & Stare, M. (2009). Backward FDI linkages as a channel for transferring technology and building innovation capability: The case of Slovenia. *European Journal of Development Research*, 21: 137-153. <https://doi.org/10.1057/ejdr.2008.11>
- Cheung, K.-y., & Lin, P. (2004). Spillover effects of FDI on innovation in China: Evidence from the provincial data. *China Economic Review*, 15: 25-44. [https://doi.org/10.1016/S1043-951X\(03\)00027-0](https://doi.org/10.1016/S1043-951X(03)00027-0)
- Damanpour, F. (2009). An Integration of Research Findings of Effects of Firm Size and Market Competition on Product and Process Innovations. *British Journal of Management*, 21: 996-1010. <https://doi.org/10.1111/j.1467-8551.2009.00628.x>
- Eden, L. (2009). Letter from the Editor-in-Chief: FDI Spillovers and Linkages. *Journal of International Business Studies*, 40: 1056-1069. <https://doi.org/10.1057/jibs.2009.46>
- Fan, P.-H. J., Wong, T., & Zhang, T. (2007). Politically connected CEOs, corporate governance, and Post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics*, 84(2): 330-357. <https://doi.org/10.1016/j.jfineco.2006.03.008>
- Farooque, O. A., & Yarram, S. R. (2010). Corporate governance and foreign direct investment inflows: cross-sectional international evidence. *American Journal of Finance and Accounting*, 2(1), 1-15. <https://doi.org/10.1504/AJFA.2010.034564>
- Fazio, G. and Chiara Talamo, G.M. (2008), "How "attractive" is good governance for FDI?", Choi, J.J. and Dow, S. (Ed.) *Institutional Approach to Global Corporate Governance: Business Systems and Beyond (International Finance Review, Vol. 9)*, Emerald Group Publishing Limited, Bingley, pp. 33-54. [https://doi.org/10.1016/S1569-3767\(08\)09002-X](https://doi.org/10.1016/S1569-3767(08)09002-X)
- García, F., Jin, B. & Salomon, R. (2010). Does inward foreign direct investment improve the innovative performance of local firms? *Research Policy*, 42(1): 231-244. <https://doi.org/10.1016/j.respol.2012.06.005>
- Griffith, R., Huergo, E., Mairesse, J., & Peters, B. (2006). Innovation and Productivity across Four European Countries. *Oxford Review of Economic Policy*, 22(4): 483-498. <https://doi.org/10.1093/oxrep/grj028>
- Hsu, W. H. L., Wang, G. Y., Tsai, H. L., & Lu, C. W. (2012, April). The moderating and mediating effects of corporate governance on firm performance. In *Proceedings of the 11th WSEAS international conference on Applied Computer and Applied Computational Science* (pp. 113-119).
- Hu, J., Wang, Z., Huang, O., & Zhang, X. (2019). Environmental Regulation Intensity, Foreign Direct Investment, and Green Technology Spillover-An Empirical Study. *Sustainability*, 11,10:2-15. <https://doi.org/10.3390/su11102718>
- Huang, Q., & Yuan, T. (2021). Does Political Corruption Impede Firm Innovation? Evidence from the United States. *Journal of Financial and Quantitative Analysis*, 56(1). 213-248. <https://doi.org/10.1017/S0022109019000966>
- Gani, A. (2007). Governance and Foreign Direct Investment Links: Evidence from Panel Data Estimations. *Applied Economics Letters*, 14: 753-756. <https://doi.org/10.1080/13504850600592598>
- Globerman, S., & Shapiro, D. (2002). Global Foreign Direct Investment Flows The Role of Governance Infrastructure. *World Development*, 3(11): 1899-1919. [https://doi.org/10.1016/S0305-750X\(02\)00110-9](https://doi.org/10.1016/S0305-750X(02)00110-9)
- Javorcik, B. S. (2008). Can Survey Evidence Shed Light on Spillovers from Foreign Direct Investment? *The World Bank Research Observer*, 23(2): 139-159. <https://doi.org/10.1093/wbro/lkn006>
- Jia, N., Huang, K. G., & Man Zhang, C. (2019). Public governance, corporate governance, and firm innovation: An examination of state-owned enterprises. *Academy of Management Journal*, 62(1), 220-247. <https://doi.org/10.5465/amj.2016.0543>

- Kaasa, A., Kaldaru, H., & Parts, E. (2007). Social Capital and Institutional Quality as factors of Innovation: Evidence from Europe. *Tartu: Tartu University Press*. <https://doi.org/10.2139/ssrn.1017754>
- Kettl, Donald. F. (2021) Weberian Bureaucracy and Contemporary Governance. *Perspective on Public Management and Governance*, 5: 111-120. <https://doi.org/10.1093/ppmgov/gvab026>
- Lall, S. & Narula, R. (2004). Foreign Direct Investment and Its Role in Economic Development: Do We Need a New Agenda? *The European Journal of Development Research*, 16(3): 447-464. <https://doi.org/10.1080/0957881042000266589>
- Lin, H.-l., & Lin, E. S. (2010). FDI, Trade, and Product Innovation: *Theory and Evidence*. *Southern Economic Journal*, 77(2): 434-464. <https://doi.org/10.4284/sej.2010.77.2.434>
- Liu, X., & Zou, H. (2007). The impact of greenfield FDI and mergers and acquisitions on innovation in Chinese high-tech industries. *Journal of World Business*, 43:352-364. <https://doi.org/10.1016/j.jwb.2007.11.004>
- Law, S. H., & Azman-Saini, W. N. W. (2012). Institutional quality, governance, and financial development. *Economics of governance*, 13, 217-236. <https://doi.org/10.1007/s10101-012-0112-z>
- Mengistu, A. A. & Adhikary, B. K. (2011). Does good governance matter for FDI inflows? Evidence from Asian Economies. *Asia Pacific Business Review*, 17(3): 281-299. <https://doi.org/10.1080/13602381003755765>
- Modugu, K. P., & Dempere, J. (2020). Country-level governance quality and stock market performance of GCC countries. Modugu, Kennedy P. and Dempere, Juan M. (2020). "Country-Level Governance Quality and Stock Market Performance of GCC Countries." *Journal of Asian Finance, Economics, and Business*, 7(8), 185-195. <https://doi.org/10.13106/jafeb.2020.vol7.no8.185>
- Muhammad, F. (2014). Leadership, Governance and Public Policy Implementation Competencies in the Broader Public Sector. *European Journal of Business and Management*, 6(36): 66-74.
- Mukherjee, A., Wang, Leonard F.S., Tsai, Y. (2011). Governance and Foreign Direct Investment: Is There a Two-Way Relationship? *Discussion Research Paper 11/02, University of Nottingham, School of Economics, U.K.*
- Nadolny, A. J. (2010). Rethinking The "Innovative Firm": Innovation Creation In The Australian Water Technology Industry. *Journal of Knowledge Management Practice*, 11(1): 1-15.
- Newig, J. & Koontz, T. M. (2014). Multi-level Governance, Policy Implementation, and Participation: the EU's Mandated participatory Planning Approach to Implementing Environmental Policy. *Journal of European Public Policy*, 21(2): 248-267. <https://doi.org/10.1080/13501763.2013.834070>
- North, G. C. (1990). Institutions, Institutional Change, and Economic Performance. New York: Cambridge University Press. <https://doi.org/10.1017/CBO9780511808678>
- Olson, M. L. (1982). The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities. New Haven: Yale University Press.
- Perez-Segura, A. 2014. FDI and Human Development: What is the Role of Governance?, unpublished Ph.D. Dissertation, Lund University, Sweden.
- Phene, A., & Almeida, P. (2008). Innovation in Multinational Subsidiaries: The Role of Knowledge Assimilation and Subsidiary Capabilities. *Journal of International Business Studies*, 39, 901-919. <https://doi.org/10.1057/palgrave.jibs.8400383>
- Saggi, K. (2002). Trade, Foreign Direct Investment, and International Technology Transfer: A Survey. *The World Bank Research Observer*, 17(2): 191-235. <https://doi.org/10.1093/wbro/17.2.191>
- Schumpeter, J.A. (1970). Capitalism, Socialism, and Democracy. London: Irwin University Books.
- Sin, C-Y. & Leung, W. (2001). Impact of FDI Liberalization on Investment Inflows. *Applied Economics Letters*, 8: 253-56. <https://doi.org/10.1080/135048501750104015>
- Shamsub, H. (2014). Interrelationships between Inward FDI and Indigenous Innovation in Developing Economies, *Global Business and Economic Review*, 16(3): 296-309. <https://doi.org/10.1504/GBER.2014.063074>
- Tang, Y., Shapiro, D., Wang, M., & Zhang, W. (2015). The Effects of Corporate Governance on the Innovation Performance of Chinese SMEs. *Journal of Chinese Economic and Business Studies*, 13(4): 311-335. <https://doi.org/10.1080/14765284.2015.1090267>
- UNESCAP. (2020). What is Good Governance? <https://www.unescap.org/sites/default/files/good-governance.pdf>. Accessed 4 January 2020.
- Vedantham, V. Mallika & Kamruddin, S. (2015). Good Governance and Public Policy in India, *International Journal of Social Sciences*, Special Issue, 1(1): 787-889. <https://doi.org/10.20319/pijss.2015.s11.878889>
- Weber, M. (1968). Economy and Society. New York, NY: Bedminster.
- World Bank. (2015). World Development Indicators. <http://data.worldbank.org/data-catalog/world-development-indicators>. Accessed 0 January 2020.
- World Bank (2015). Worldwide Governance Indicators. [http://info.worldbank.org/governance/wgi/sc\\_country.asp](http://info.worldbank.org/governance/wgi/sc_country.asp). Accessed 2 January 2020.
- Wu, Chiu-Hui. (2021). On the Moderating Effects of Country Governance on the Relationships between Corporate Governance and Firm Performance. *Journal of Risk and Financial Management* 14: 140. <https://doi.org/10.3390/jrfm14030140>
- Zeneli, V. (2014). The Role of Institutions and Good Governance for Attracting Foreign Investments: Evidence from Southeast Europe. *Business and Economics Journal*, 5(2): 1-20. <https://doi.org/10.4172/2151-6219.100092>