Exploring the nexus between bilateral FDI, institutional quality, and healthcare system: empirical insights from G20 countries

Abstract

A cost-efficient healthcare system is a prerequisite for the sustainable economic development of a country and an inevitable booster factor for overall macroeconomic performances, including institutional arrangements and incentive sentiments of foreign investors. Therefore, this study empirically investigates the three-way nexus between bilateral FDI, institutional quality, and health expenditure in 19 selected G20 economies from 2009 to 2017. Our analysis employs three sets of equations to address the endogeneity problem using static panel data econometrics techniques. We show the simultaneous linkage among the three variables using three static single-equation models. The results support a positive and significant bidirectional nexus between bilateral FDI and institutional quality. A negative and significant bidirectional relationship between institutional quality and health expenditure. And both negative and positive significant bidirectional links between bilateral FDI and health expenditure. The overall empirical findings show that institutional quality attracts bilateral inward FDI, and bilateral FDI, in turn, improves institutional quality. Thus, bilateral FDI can help reduce health expenditures through institutional improvement. Effective healthcare systems, in turn, improve institutional quality, which would lead to increasing bilateral FDI inflows. These findings developed the idea that countries with a prudent healthcare system and robust institutional frameworks have a substantial and positively significant effect on bilateral FDI. As per the findings of this study, policymakers should concentrate on policies and strategies directing better macroeconomic performances and bridging the gaps between the partner countries, which will boost foreign direct investment, enhance institutional quality, and reduce healthcare expenditure for rapid economic development.

Keywords: Bilateral FDI, institutional quality, health expenditure, G20 countries, panel data

JEL classification F21, F23, I15, I18, O17

Exploring The Nexus Between Bilateral FDI, Institutional Quality, And Healthcare System: Empirical Insights from G20 Countries

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Introduction

- Foreign direct investment (FDI) is prominent for global economic integration and establishes sustainable and long-term relations between countries.

- It also creates accessibility to a worldwide market and permits the host country to promote its products more widely (Agbloyor, 2019).

- FDI is financing for healthcare infrastructure and an essential vehicle to improve healthcare capacity (Verma 2021).

- Institutional quality (IQ) is a concept that captures law, individual rights, and high-quality government regulation and services.

- The presence of a good institution in a country attracts foreign investors because a better institution decreases all types of costs (Rizvi 2019).

Introduction

- A good institution improves the health system's quality with well-developed management and a stabilized and adequate supply of health services.

- Poor institutional quality and lack of effective institutions caused destabilized health investment, leading to uncertain results on healthcare goods and services (Lewis 2006).

- Healthcare system quality reduces healthcare costs through less utilization of healthcare goods and services (Ogundari and Awokuse 2018).

- An increment in healthcare spending of people due to poor health systems of countries causes a restriction on FDI inflows (Giroud and Ivarsson, 2020).

- FDI is an inevitable booster factor for overall macroeconomic performances, including institutional arrangements and the quality of the healthcare system.

Literature Review: Theoretical aspects

FDI and Institutional Quality		
Name of theories	**Description**	**Authors**
OLI paradigm	A multinational corporation (MNCs) enters host countries to capture ownership, location, and internalization advantages through an institutional lens	Dunning (1980)
Institutional Theory	Host countries' governments must improve their institutions to lower transaction costs to encourage foreign investors.	North (1990)
Feedback theory of FDI	MNCs significantly improve the institution’s organizational patterns of host countries through subsidiaries.	Westney (1993)
Institutional Quality and Health		
Mosley-Chen mortality theory	Countries must improve their institutions to provide affordable healthcare services to reduce the child mortality rate by incorporating social and medical sciences.	Mosley and Chen (1984)
Economic growth-oriented theory	The availability of good institutions helps to reduce out-of-pocket expenditure by providing more healthcare facilities.	Filmer and Pritchett (1999)
FDI and Health		
Tandon’s theory	Widespread disease frequency, higher absenteeism, and excessive health-related expenditure costs contribute to a risk factor to the country's investment environment.	Tandon (2005)
Health expenditure- Wagner’s theory	Countries that have high government expenditures on health attract foreign investors because of the lower risk related to the healthcare system.	Tsaurai (2014)

Literature Review: Empirical aspects

FDI and Institutional quality	
Bénassy-Quéré et al., 2007; Demir and Hu, 2015; Ullah and Khan, 2017; Cieślik et al., 2021; Sabir et al., 2019	Institutional quality determinants like strong bureaucracy, high-quality government regulation, legal institutions, good governance, political stability, and the rule of law are the most prominent factors for attracting inward FDI in countries like OECD, ASEAN, SAARC, and Central and Eastern European Economies.
Malesky, 2008; Dang, 2013; Contractor et al., 2020	FDI significantly influences institutional performance, including competence level, regulatory frameworks, property rights, and accountability. And force existing politicians to implement reform of the institutions by threatening to boycott the host country and withdrawing jobs and tax revenue.
Institutional Quality and Health	
Anyanwu and Erhijakpor, 2009; Olayinka et al., 2013; Aliyu and Amadu, 2017	Institution quality is a prominent factor in improving health sector performance, such as increasing healthcare funding, improving the health position of the population in low-income countries, availability, and accessibility of health services to the citizenry.
Rizvi, 2019; Dhrifi, 2020	The quality of an institution is crucial in the intermediate role of the interlinkage between health spending and improving health outcomes.
FDI and Health	
Globerman and Shapiro, 2002; Parvez's, 2017; Herzer and Nunnenkamp, 2012	The availability of good healthcare systems increases the inward FDI to host countries. Foreign investors also assist in upgrading health infrastructure in the host countries, giving their workers more excellent social assistance.
Zeng, 2012; Giammanco and Gitto, 2019	Foreign investors help to boost the physical capacity of the healthcare sector, increasing the availability of hospital wards, and raising the specialty-care provision.

Objectives

- To investigate the bidirectional relationship between bilateral FDI and institutional quality, institution quality and health expenditure, and bilateral FDI and health expenditure on each other.

- To explore the triplex nexus between bilateral inward FDI, institutional quality, and health expenditure in a simultaneous framework in the G20 countries.

Data and Variables

- The study has used panel data for Group of Twenty (G20) economies, excluding the European Union (EU), followed over nine years from 2009 to 2017.

- The G20 represents 90% of the world's gross world product (GWP), 80% of global trade, around half of the global land area, and two-thirds of the world's population (IMF 2017).

- The three major dependent variables of our study are bilateral inward FDI, institution quality, and health expenditure of G20 countries.

Data and Variables

Variables	Description	Representation	Source
i	Host countries	19 countries	
j	Source countries	19 countries	
T	Time period	Year 2009-2017	
FDI	Bilateral FDI	Inward bilateral FDI stock (US $, Millions)	CDIS, IMF
INST	Institutional quality	The IQ index has been constructed by compiling 31 variables* and used factor analysis to obtain the composite institutional Quality.	Heritage and WSJ, ICRG, WB WGI, Freedom House, Fraser Institute, Polity IV, Transparency international, Political terror scale
DINST	Difference of Institution	Difference of host and Source countries Institutional Quality Index	Authors' calculation
HE	Health Expenditure	Health Expenditure (% of GDP). Health care goods and services are consumed each year.	WDI, WB
DHE	The difference in Health expenditure	Difference of Health expenditures of host countries and source countries	Authors' calculation

Data and Variables

- The independent and other control variables of our study are as follows:

Variables	Description	Representation	Source
GDPPC	GDP per capita	GDP per capita (Constant 2010 US$)	WDI, WB
DGDPPC	The difference in GDP per capita	GDP per capita (Constant 2010 US$) i-j	Authors' calculation
FD	Financial development	Private sector credit	GFD, WB
TRADE	Trade openness	total export and import of goods and services as a percentage of GDP	WDI, WB
RESOURCE	Natural resources	Natural resource depletion (% of GNI)	WDI, WB
INFL	Inflation	Inflation (GDP deflator annual %)	WDI, WB
INFR	Infrastructure	Individuals using the internet (% of the population)	WDI, WB
POP	Population	Total number of residents in a nation.	WDI, WB
Distance	Distance	Geographical distance	CEPII
POPAGE	Population ages	Population ages 65 and above (% of the total population)	WDI, WB
LIFEXP	Life expectancy	Life expectancy at birth, total (years)	WDI, WB
SCHOOLTER	School enrollment, tertiary	School enrollment, tertiary (% gross)	WDI, WB

Methodology

- This study employs different panel static models like fixed effect (FE), random effect (RE), and Hausman-Taylor regression (HT) for the study period.
- The FE estimator is inappropriate for time-invariant factors like distance, an underlying factor in the bilateral inward FDI perceptive (Cheng and Wall 2005).
- The random effect techniques are applied to the panel static approach in this study, which considers the data's time series and cross-transversal nature.
- The Hausman test rejects the null hypothesis and prefers the fixed effect over random. It becomes unsuitable for single-time variables like distance, a fundamental variable in the bilateral FDI context (Kahouli and Maktouf 2015).
- To solve this drawback of FE, we employ the Hausman and Taylor (1981) regression in our static model.
- The HT estimator solves the endogeneity problem among independent variables and allows time-fixed and time-varying variables.
- Unlike FE estimates, the HT method can provide consistent and efficient forecasts for the time-in varying factors (Kahouli and Omri 2017).

Methodology

This study formulates the following framework for empirical study:

- $lnFDI_{ijt} = \alpha_0 + \alpha_1 lnINST_{it} + \alpha_2 lnDINST_{ijt} + \alpha_3 lnHE_{it} + \alpha_4 lnDHE_{ijt} + \alpha_5 lnGDPPC_{it} + \alpha_6 lnDGDPPC_{ijt} + \alpha_7 lnTRADE_{it} + \alpha_8 lnFD_{it} + \alpha_9 lnRESOURCE_{it} + \alpha_{10} lnINFL_{it} + \alpha_{11} lnINFR_{it} + \alpha_{12} lnPOP_{it} + \alpha_{13} lnDINST_{ij} + \epsilon_{ijt} \dots\dots\dots\dots (1)$

- $lnINST_{ijt} = \lambda_0 + \lambda_1 + lnDINST_{ijt} + \lambda_2 lnFDI_{ijt} + \lambda_3 lnHE_{it} + \lambda_4 lnDHE_{ijt} + \lambda_5 lnGDPPC_{it} + \lambda_6 lnDGDPPC_{ijt} + \lambda_7 lnPOP_{it} + \lambda_8 lnFD_{it} + \lambda_9 lnTRADE_{it} + \lambda_{10} lnRESOURCE_{it} + \lambda_{11} lnINFL_{it} + \lambda_{12} lnINFR_{it} + e_{it} \dots\dots\dots\dots\dots (2)$

- $^{ln}HE_{ijt} = \beta_0 + \beta_1 {}^{ln}DHE_{ijt} + \beta_2 {}^{ln}INST_{it} + \beta_3 {}^{ln}DINST_{ijt} + \beta_4 {}^{ln}FDI_{ijt} + \beta_5 {}^{ln}GDPPC_{it} + \beta_6 {}^{ln}DGDPPC_{ijt} + \beta_7 {}^{ln}INFR_{it} + \beta_8 {}^{ln}HC_{it} + \beta_9 {}^{ln}TRADE_{it} + \beta_{10} {}^{ln}POP_{it} + v_{it} \dots\dots\dots\dots\dots ({}^{3})$

- The above equations (1) to (3) are static models where, i stands for the host country, j stands for the source country, t stands for the time, and D stands for the difference, ln stands for natural logarithm.

Empirical Results

Panel Regression Results						
Dependent Variable	**Model 1 FDI**		**Model 2 INST**		**Model 3 HE**	
Independent variables	**FE**	**HT**	**FE**	**HT**	**FE**	**HT**
FDI			0.016*	0.020**	0.044**	0.043**
			(0.010)	(0.009)	(0.050)	(0.047)
INST	0.060*	0.073*			-0.109**	-0.103**
	(0.036)	(0.036)			(0.094)	(0.089)
HE	0.007	0.002	-0.007*	-0.008**		
	(0.007)	(0.007)	(0.003)	(0.004)		
DINST	-0.071**	-0.064*	0.770***	0.005	0.057*	0.071**
	(0.036)	(0.035)	(0.011)	(0.039)	(0.094)	(0.089)
DHE	-0.236**	-0.483***	-0.087	-0.072	-1.571***	-1.578***
	(0.119)	(0.099)	(0.062)	(0.057)	(0.316)	(0.281)

Empirical results

Panel Regression Results						
	Model 1		Model 2		Model 3	
Dependent Variable	FDI		INST		HE	
Independent variables	FE	HT	FE	HT	FE	HT
DISTANCE		-0.587*** (0.085)		0.005 (0.039)		0.013* (0.277)
DGDPPC	-0.046 (0.035)	-0.064* (0.033)	-0.044** (0.019)	0.688 (0.431)	-0.082** (0.093)	-0.057* (0.086)
GDPPC	-0.413 (0.559)	-0.227 (0.531)	1.032*** (0.293)	0.785*** (0.283)	0.487** (0.296)	0.739*** (0.260)
POP	0.574** (0.285)	0.085 (0.065)	0.474*** (0.150)	-0.040 (0.030)	-3.490*** (0.868)	-0.141* (0.234)
INFR	-0.091 (0.638)	-0.767 (0.599)	2.443*** (0.332)	1.920*** (0.300)	0.584* (1.643)	0.117* (1.520)
TRADE	-0.221 (-0.219)	-0.323 (0.207)	-0.133 (0.115)	-1.155* (0.662)	-2.909*** (0.580)	-2.839*** (0.534)
RESOURCE	0.107 (0.288)	-0.034 (0.278)	-0.549*** (0.151)	-0.497*** (0.146)		
INFL	0.022 (0.019)	-0.025 (0.019)	-0.095*** (0.010)	-0.026*** (0.010)		
FD	-0.031*** (0.010)	-0.033*** (0.009)	-0.003 (0.005)	-0.007 (0.004)		

Empirical result

- Model 1 demonstrates the impact of IQ and HE on BFDI stock in G20 countries. We found that IQ plays a crucial role in attracting inward FDI (Aziz, 2020). The health expenditure demonstrates a negatively significant effect on BFDI.

- Model 2 demonstrates that more inward FDI into host countries can improve the IQ performance of the host nations. The increase in health expenditure negatively affects the IQ performance of G20 countries.

- Model 3 indicates that bilateral FDI has a positive and significant effect on health expenditure. This implies that more inward FDI increases the health expenditure of the host countries. In addition, a good IQ can improve the health infrastructure, which helps to reduce HE (Aliyu and Amadu, 2017).

- The prominent independent variables in our study are market size, distance, human capital, trade, inflation, infrastructure, financial development, and natural resources, have a positive and significant effect on the bilateral FDI, institutional quality, and health expenditure.

Conclusion

- The study found a positive and significant bidirectional association between bilateral inward FDI and the institution's quality.
- This study confirms a negative and significant two-way relationship between the institutional quality index and health expenditure.
- It also finds a significant and both positive and negative inter-linkage between bilateral inward FDI and health expenditure.
- Our result shows that the presence of strong institutional quality in a county attracts more inward foreign investment.
- The increase in foreign investment harms population health in host countries and therefore increases health expenditure.
- On the other hand, more inward FDI increases institutional quality and reduces population healthcare expenditure through the mechanism of institutional improvement.

Conclusion

- Bilateral gravity factors like distance, the difference in GDP per capita, the difference in health expenditure, and the difference in institutional quality play a prominent role in influencing host countries' stocks of bilateral FDI, quality of health system, and performance of institutions.

- Other macroeconomic indicators, including financial development, population size, human capital, trade openness, inflation, GDP per capita, natural resources, and infrastructure, significantly affect the FDI-institution-health system inter-linkage in G20 economies.

- Governments should enforce concomitant policies for bringing FDI and enhancing the institution's quality to take benefit of this positive bidirectional inter-linkage.

- Policymakers should concentrate on policies that are implemented simultaneously to attract foreign investment, improve institution quality, and reduce health expenditure.

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