Human Capital, Political Instability, Foreign Direct Investment, Infrastructure and Economic Growth: Heterogeneous Causal Linkages

Muhammad Azhar Bhatti1*, Rana Ejaz Ali Khan2

1 PhD Scholar, Department of Economics, The Islamia University of Bahawalpur, Pakistan.
2 Professor (Rtd.) of Economics, The Islamia University of Bahawalpur, Pakistan. raneajazalilhan@yahoo.com
*Corresponding Author’s Email Address: azhar.bhatti219@gmail.com

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ABSTRACT

This study examines the heterogeneous causal relationship between human capital, political instability, foreign direct investment, infrastructure and economic growth for 87 global economies. It used the dynamic panel GMM regression to examine the heterogeneous causal relationship among them for the time period 1984 to 2019. The results confirmed that there exists a heterogenous causal relationship among these indicators, and the findings have significant implications for economic growth by political stability, FDI, human capital and infrastructure development. The policymakers should focus on creating a situation that boosts economic growth by focusing on this heterogeneous causal relationship between human capital, political instability, foreign direct investment and infrastructure in a comprehensive and integrated manner.

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1. Introduction

Economic growth is an essential outcome of economic planning and enhances the long-term stability of development, employment generation, poverty reduction, economic infrastructure development, and human capital development. Developed and developing countries struggle to maintain sustainable growth. It is important to determine the factors which caused low economic growth. This study focused on the five important macroeconomic indicators: human capital, political instability, foreign direct investment, infrastructure, and economic growth to estimate their interlinkage.

Initially, Kuznets (1966) argued that political conditions play a significant role in economic development. Later, North (1990) claimed that society's institutional framework plays a significant role in an economy's performance. Kuznets (1966) missed the necessary component of technological progress. Technological progress is accompanied by liberal democratic organizations that provide political freedom to the citizens and free participation in the political system. This political freedom enables citizens' economic participation (Kuznets, 1973). The socio-political instability creates an uncertain political economic environment raising the risk, which reduces investment and creates hurdles in economic growth (Alesina & Perotti, 1996). The regime instability and government repression negatively impact economic growth (Chen & Feng, 1996). Some recent studies have also

On the other hand, economic growth is hampered by political unrest, so domestic and international investors are wary of placing their money in such an uncertain environment. Political instability increases inflation and unemployment, creating social unrest and uncertainty. This unrest can lead to general strikes and violence. The literature described four groups about the effect of political instability on economic growth. Firstly, the negative impact of political instability (Gurgul & Lach, 2014). Secondly, economic growth caused political instability but not vice versa (Afolabi & Bakar, 2016; Tabassam, Hashmi, & Rehman, 2016). Thirdly, it confirmed the causal relationship between political instability and economic growth (Dalyop, 2019). Finally, the last group argued that there is no causality among them (Nurudeen, Abd Karim, & Aziz, 2015; Saint Akadiri, Eluwole, Akadiri, & Avci, 2020).

Foreign direct investment is also a significant determinant of economic growth, due to inward investment, countries liberalized their policies and boosted domestic investment. Over the past few decades, most countries have liberalized their policies on inward investment. There are three different strategies for the impact of foreign direct investment on economic growth. Firstly, the government must trust the economy through the market mechanism and FDI inflows (Williamson, 2000). The second strategy restricts the geographical sector by allowing foreign investors to only operate in the designated export processing zones (Fosfuri, Motta, & Rønde, 2001; Görg & Strobl, 2005). Finally, the governments impose conditions to enter into joint ventures with domestic firms and organizations for foreign investors (Wang & Blomström, 1992).

Conversely, FDI inflow increases the host country's export capacity because the foreign firms use domestic labour and raw material and sell the products in the local and international markets. FDI also encourages domestic job creation and improved technology and boosts the host countries economic growth. Günther (2002) confirmed that local firms improve their technology by imitating the rival multinational industry's technology, so domestic firms use existing resources most efficiently and adopt new technologies to compete with international firms. Tanaya and Suyanto (2022) also argued the positive effect of FDI on economic growth as investment from abroad has a beneficial and material effect on the economy's expansion. Furthermore, Qabrati (2021) also confirmed that investment from abroad has a beneficial and material effect on the economy's expansion.

Human capital is a society's collection of knowledge, education, certifications, and abilities. It grew as a result of education and the development of professional abilities. The developing countries benefit from human capital in three ways when absorbing new technology. Firstly, increasing human capital directly enhances production and profitability. Second, employees are more capable of absorbing both codified and tacit knowledge. Third, human capital boosts employees' willingness, commitment, and motivation (Michie, 2001). The skilled labor substantially affects the growth rate (Vandenbussche, Aghion, & Meghir, 2006). Human capital-rich countries can achieve better growth rates (Fetchenhauer & Dunning, 2009). Human capital and physical and financial capital availability are important factors of economic growth (Kar & Sinha, 2014).

As concerns the linkage of human capital and FDI, the literature has explained it very well. A significant investments in educational sectors create skilled labor, attracting FDI (Khan, 2007). Developing countries rely heavily on FDI, and high-human-capital countries receive more FDI

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1 The government makes reforms to attract FDI and identify the market for the optimal use of resources.
Due to a lack of skilled labor, FDI inflows increase skilled labor wages and the incentive to get more education, so that higher education may cause FDI (Zhuang, 2008). High primary school enrollment rates increase FDI inflows (Dutta & Osei-Yeboah, 2013).

Infrastructure is the back of the economy because good infrastructure boosts economic development by attracting investment and reducing transportation costs. Transportation infrastructure boosts business and economic development, reduces product costs, and provides access to global industries, suppliers, and markets. Transportation infrastructure affects economic growth directly and indirectly (Francisco & Tanaka, 2019). The small businesses prefer to locate near public infrastructures such as roads, electricity, and telecommunications facilities (Fan & Chan-Kang, 2004).

The poor infrastructure restricts human capital development due to poor and insufficient public assets and for education and health particularly and for mobility and communication generally. On the other hand, infrastructure development is inversely affected by political instability due to timely provision of financing and the damaging effects of violent demonstrations of political parties.

Infrastructure has a favorable and considerable impact on foreign direct investment in developing countries (Straub, 2011). A developed infrastructure supports market integration and attracts foreign direct investment, whereas an inadequate infrastructure hinders market connectedness and delays FDI (Donaubauer, Meyer, & Nunnenkamp, 2016). FDI inflows are more likely to occur in nations with developed infrastructures, such as Hong Kong and Singapore. In contrast, nations with weak infrastructure (such as Pakistan and Nepal) often struggle to attract a significant amount of FDI and have experienced poor economic growth (Nunnenkamp, 2002).

According to the previous literature, it may be assumed that human capital, political instability, foreign direct investment, infrastructure, and economic growth have heterogeneous linkages. The question arises whether such interlinkages exist and, if they exist, what kind of relationship exists among these variables for a given data set of global economies. By probing this interlinkage, it will be easier for policymakers to frame the policy to boost economic growth by keeping the discussed socioeconomic indicators in mind. Furthermore, the socioeconomic indicators may also be adjusted. The detailed research questions are discussed in the next section. However, the graphical representation of the causal linkages is shown in Figure 1.

![Graphical Expression of heterogeneous causal linkages](image)

**Figure 1: Graphical Expression of heterogeneous causal linkages**

This study has important significance in both academic and policy formulation perception. First, we discuss the policy-oriented significance of the study. There are varying relationships among the variables under discussion in the literature, i.e., human capital, political instability, foreign direct investment, infrastructure, and economic growth. The relationship varies, but the studies were primarily attempted in individual countries and rarely by groups of countries, and the results are not
robust. The current study using the global economies as a panel makes the results robust.

2. Literature Reviews
This section will examine theoretical and empirical research on the relationship between human capital, political instability, foreign direct investment, infrastructure, and economic growth.

2.1. Literature on Human Capital and Economic Growth
A number of studies have focused on the relationship between human capital and economic growth by measuring human capital in different ways. Human capital plays a significant role in economic development. Zhang and Zhuang (2011) argued that tertiary education plays a significant role in attracting economic development. Falck, Fritsch, and Heblich (2011) argued that high-human-capital employees induce knowledge spillovers. These studies also confirmed the positive effect of human capital on economic growth: Pablo-Romero and Gómez-Calero (2013) for Spanish Provinces, Su and Liu (2016) for China, Fang and Chang (2016) for 16 Asia Pacific countries, and Fang and Chen (2017) for China.

Abubakar, Kassim, and Yusoff (2015) discovered that public and domestic private credit substantially impact human capital and economic growth. Ogundari and Awokuse (2018) argued that health contributes more to economic development than education. Chen and Fang (2018) and Han and Lee (2020) discovered an association between human capital and economic growth. Qadri and Waheed (2014) and Xu and Li (2020) found a weak relationship between human capital and economic growth. At the same time, Cohen and Soto (2007) confirmed the significant relationship between education and economic development, as well as the significant relationship between physical capital and economic growth. Middendorf (2008) also discovered that the return to school had a significant and deleterious impact on the educational attainment of the population (Olejnik, 2008; Tselios, 2008).

Further, Cohen and Soto (2007) confirmed the significant effect of schooling on economic growth and physical capital on economic growth. Middendorf (2008) concludes that investment in education may not necessarily benefit regions regarding economic growth. Middendorf (2008) highlights the need for investment in education, which has been overlooked in past studies on the relationship between human capital and economic growth. Furthermore, the study suggests that investment in education may not necessarily benefit regions regarding economic growth. Ramos, Suriñach, and Artís (2010) investigated the relationship between human capital and regional economic performance and found a significant correlation among them.

2.2. Literature on Political Instability and Economic Growth
There is a plethora of studies on the relationship between political instability and economic growth. They have used varying measures of political instability. For instance, Bellettini, Ceroni, and Prarolo (2013) used the political risk ratings from the ICRG to construct a political instability index for a panel of 62 countries, Tang and Abosedra (2014) measured the political instability by the

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2 Different indicators of human capital were used in these studies, including life expectancy and education expenditure for panel countries by Khan and Chaudhry (2019), years of schooling for Indonesia by Affandi, Anugrah, and Bary (2019), the average number of years spent in school, primary school enrollment, and secondary school enrollment for a panel of 120 developing countries by Uddin, Ali, and Mash (2021), and the total number of graduates in a given time period, including undergraduates, masters, Level of education in China by Khan, Khan, Jiang, and Khan (2020) and Alam and Ullah (2021) used level of education in case of Pakistan.

3 "Political instability is the lack of predictability and continuity in the exercise of political power, often manifested by abrupt changes in government, policy reversals, or widespread social discontent" (Collier & Hoeffler, 2004). "Political instability encompasses a range of factors such as social unrest, political violence, and institutional fragility, resulting in an environment of unpredictability and insecurity within the political realm" (Brancati, 2014).
number of political violence incidents, coups and regime changes for MENA countries, Tabassam et al. (2016) measured it by terrorism, election, regime and strikes in case of Pakistan, Dalyop (2019) used the Political Stability and Absence of Violence/Terrorism estimate for Africa, and Sohail, Majeed, Shaikh, and Andlib (2022) used the political stability index for Pakistan.

Similarly, different channels of effectiveness have been discussed in the literature. Xu and Li (2008) confirmed that political freedom boosts economic growth. Aisen and Veiga (2008) confirmed that higher political instability, ideological polarization, and political system fragmentation caused higher inflation volatility and lower economic growth. Bellettini et al. (2013) found an inverse relationship between political instability and economic growth. Furthermore, Tang and Aboseda (2014) found an inverse relationship for MENA countries. However, Darby, Li, and Muscatelli (2004) contradicted the above studies and argued that political instability minimizes the probability of re-election in the country, decreasing public investment and further leading to deteriorate economic growth.

Moreover, Ross (2001) studied the relationship between natural resources and political instability and found that natural resource wealth can incentivize rebel groups and other armed actors to engage in violent conflict over the control of resources. Furthermore, Lawal (2021) also found that corruption negatively affected economic growth, leading to political instability. Acemoglu and Robinson (2022) argued that political institutions play a crucial role in the relationship between economic growth and political stability.

2.3. Literature on FDI and Economic Growth

Alaya (2006) found a negative effect of FDI on economic growth. Furthermore, Tiwari and Mutascu (2011) concluded that FDI and exports boost economic growth in Asian economies. Mehmood and Hassan (2015) for China, Owusu-Nantwi and Erickson (2019) for South American nations, Gunby, Jin, and Reed (2017) for China, Qabrati (2021) for Kosovo, Tanaya and Suyanto (2022) for Indonesia have shown the same type of results.

Donnay (2017) confirmed that foreign direct investment encouraged export promotion and importation of imposts. Wijeweera, Villano, and Dollery (2010) concluded that FDI inflows boost economic growth in the presence of skilled labor, and Iamsiraroj (2016) also verified this for a panel of 124 countries.

According to Karimi and Yusop (2009), there is no evidence of a bidirectional relationship between FDI and economic growth. Johnson (2006) discovered that FDI had a mixed effect on economic growth. Furthermore, some research has revealed that FDI has an endogenous effect on economic growth (Durham, 2004; Hsiao & Shen, 2003). According to Alfaro (2003), FDI has an uncertain impact on the host country's economic growth. Simultaneously, other studies argued that FDI has a negative impact on economic growth due to intervening mechanisms of reliance and decapitalization. According to LE, Ngo, Nguyen, and Nguyen (2021) foreign direct investment had no effect on economic expansion.

Initially, Balasubramanyam, Salisu, and Sapsford (1996) investigated the impact of economic growth on the volume of FDI in developing countries. The findings revealed the existence of a positive association between economic growth and foreign direct investment (FDI) in emerging economies. Borenszttein, De Gregorio, and Lee (1998) investigated the endogenous growth model and proposed that the degree of human capital in the host country determines the positive impact of FDI on economic growth. Karimi and Yusop (2009) investigated the relationship between FDI and economic growth in Malaysia and concluded that there is a bidirectional causal relationship between FDI and economic growth. Foreign direct investment (FDI) inflows may aid economic development by introducing innovative technology, spawning new jobs, boosting productivity, and enhancing competitiveness in local markets (Wijeweera et al., 2010). Foreign direct investment (FDI) was
found to have a positive and statistically significant effect on economic growth in 124 nations by Iamsiraroj (2016).

2.4. Literature on Infrastructure on Economic Growth

Apurv and Uzma (2020) found insignificant effect of infrastructure on economic growth in Brazil and South Africa. At the same time, telecommunication infrastructure harmed economic growth in India. Transport infrastructure also has a negative relationship with economic growth in China. While overall results confirmed the significant but negative impact of transportation infrastructure on economic growth, while energy infrastructure leads to economic growth.

2.5. Literature on Human Capital and Infrastructure
The literature on human capital and infrastructure is comparatively scare. One of the reasons may be that infrastructure is comprised of a range of physically productive assets like railway lines, roads, banks, ports, bridges, airports, schools, universities and hospitals as well as. Many other forms of physical infrastructure are also important for the economy, like communication and delivery systems. For the human capital, the most important are the school, colleges, universities and hospitals while communication to some extent. The higher levels of human capital are associated with increased infrastructure investments (Glaeser & Kohlhase, 2004). Improving health and education infrastructure increases human capital (Sabir, Rafique, & Abbas, 2019). The study used the modified panel cointegration techniques to control regressors' endogeneity. The results indicated that there exists a long run relationship between them.

2.6. Literature on Political Instability and Infrastructure
A direct link between political instability and infrastructure is explained by the devastating effect of terrorism and violence, which are the components of measurement of political instability used in a number is studies. The terrorism and violence target the country's physical infrastructure. Furthermore, the political instability in the form of frequent changes of governments hurts infrastructure development by delaying the fund's provision and execution of the projects.

Arezki and Brückner (2012) examined the impact of political instability on infrastructure in Sub-Saharan Africa. The results confirmed that political instability negatively affects infrastructure development and hampers the provision of essential services. Bertoméu-Sánchez and Estache (2017) examined how political motivations attract public investment in Spain. They explored how political objectives, particularly the centralization of economic power, and economic objectives, such as maximizing mobility, influence infrastructure investment decisions. Moreover, they found that infrastructure investment works more consistently with political objectives (the centralization of economic power) and with economic objectives (maximizing mobility). Furthermore, they suggested that the allocation of resources towards transportation and connectivity infrastructure aims to enhance economic efficiency, facilitate trade, and improve mobility for individuals and goods.

2.7. Literature on FDI and Infrastructure
Nourzad, Greenwald, and Yang (2014) concluded that economic growth and infrastructure attract FDI. The study explored the relationship between foreign direct investment and infrastructure
construction and confirmed that FDI improves infrastructure development; Sui, Huang, and Huang (2017) and Huang, Liu, Cai, Hao, and Lei (2018) for China, Chakrabarti et al. (2017) for India and Jiang, Chen, and Wang (2018) and Wang (2019) also supported the results because they found that the host country's economic growth is boosted by improved infrastructure. However, Yamin and Sinkovics (2009) found that MNE strategies harmed infrastructure development.

Some researchers found an insignificant relationship between FDI and infrastructure, Bae, Park, and Wang (2008) concluded that public infrastructure investment has no direct interlinkage with private business firms. Asiedu (2002) argued that "good infrastructure increases investment productivity, which stimulates FDI." Donaubauer et al. (2016) found that infrastructure suffers from severe data limitations, making it difficult to evaluate the infrastructure channel comprehensively.

Ibrahim and Sare (2018) found that the effect of infrastructure is doubled in emerging economies because it promotes FDI, which significantly impacts business owners. Addison and Baliamoune-Lutz (2016) acknowledged that this situation is only possible in developed nations, not developing nations. Some other studies have shown the same type of relationship. For instance, Abbas, Moosa, and Ramiah (2021) for Pakistan, Kaulihowa and Adjasi (2019) for BRICS economies, Akpan, Isiak, and Asongu (2014) for BRICS and MINT nations, Barua and Naym (2017) for a panel of 81 countries. Haughwout (2001) concluded that public infrastructure minimized private firms' costs even though there was no direct effect of infrastructure on production performance and firms' costs. Privatization has become a useful source of attracting inward FDI (Mlambo, 2006).

2.8. Literature on Human Capital and FDI

There is plenty of literature on the relationship between human capital and FDI. The studies have varying results as well. Checchi, De Simone, and Faini (2007) found a negative effect of FDI on the secondary enrollment rate and a positive effect on tertiary enrollment. Zhuang (2008) concluded that there is an increase in average schooling, but this is not significant because it is a broad measure of human capital. On the other hand, human capital also determines the amount of FDI which could be attracted. Checchi et al. (2007) argued that skilled domestic labor is sufficient for the inward flow of foreign capital. A number of studies have shown the same type of results. For instance, Majeed and Ahmad (2008) found for 23 developing, Heyuan and Teixeira (2010) for China, Adefabi (2011) for Sub-Saharan African countries, and Kar (2013) for India and Meersman and Nazemzadeh (2017) for Argentina.

Literature suggested that human capital increases the FDI inflows, increasing the demand for skilled and trained labor and professionals and ultimately increase the technical, managerial, and professional positions (Volker & Handy, 2021). Skilled and professional labor can adopt technological innovations (Khan, 2007), higher human capital nations attract FDI inflow (Dutta & Osei-Yeboah, 2013), the presence of unskilled labor increases the demand for labor, increasing FDI inflow and the wage rate of skilled labor and individual encouragement to gain a higher education level (Zhuang, 2008).

Dutta and Osei-Yeboah (2013) re-investigated the relationship and confirmed that the literacy rate significantly and positively affects FDI inflows. Majeed and Ahmad (2008) found that health expenditure positively impacts FDI inflow. Cleeve, Debrah, and Yiheyis (2015) found that all measures of human capital have the same results as the traditional indicator of FDI inflow.

2.9. Literature on Political Instability and FDI

The literature on political instability and FDI have shown varying degrees of implications. Globerman and Shapiro (2003) found that political instability has an insignificant effect on the probability of the nation receiving. On the other hand, Li and Zhou (2005) found that political instability hurts FDI. Political instability damages the FDI inflows of the recipient country. A number
of studies found the same type of results, for instance, Jakobsen and De Soysa (2006), Samimi, Moghaddasi, and Azizi (2011) for 16 OIC countries and Anwar and Afza (2014) for Pakistan.

Asiedu (2006) concluded that political instability negatively affects FDI, but this relationship is moderated by the quality of institutions and financial development. Busse and Hefeker (2007) confirmed that political instability has an adverse effect on FDI because politically unstable nations are less likely to attract foreign direct investment. Busse and Hefeker (2007) examined the effect of political risk, including political instability on FDI flows. The results explained that political instability negatively affects FDI, indicating that investors are cautious when considering countries with higher levels of political instability. Asiedu and Lien (2011) also confirmed that political stability is an important factor for attracting foreign investment in the case of the Sub-Saharan Africa.

2.10. Literature on Political Instability and Human Capital
In the literature, both the indicators like political instability and human capital are found affecting each other. Fedderke and Klitgaard (1998) distinguished between "regime threatening" and "non-regime threatening" political instability and found a negative effect of human capital on political instability. Maloney (2002) also found a negative effect of human capital on political instability in Latin America. Similarly, Francis (2007) found an inverse relationship between human capital and political instability. Brown and Hunter (2004) found a significant effect of political instability on human capital formation.

Vieira and Teixeira (2006) found an indirect effect of political instability on human capital and explained that due to unstable political conditions, it is corruption, which harms the education level. Bhattacharyya (2009) found a positive effect of political stability on human capital through the use of rule of law (proxied to political stability). Some other studies like (Barro & Lee, 2001) for 138 countries and Baum and Lake (2003) for 128 countries also confirmed the same results. Feng (2003) analyzed the indirect effect of political stability on human capital. The study explained that democracy in the presence of a politically stable country positively impact human capital. De Haan and Klomp (2013) examined how political regimes affect human capital and concluded that democracy positively affected human capital, while political instability negatively affected human capital.

3. Data and Methodology
The study aims to see the heterogenous causal linkage among macroeconomic indicators like human capital, political instability, foreign direct investment, infrastructure, and economic growth. The study used a panel of 87 global developed and developing economies covering the time period from 1990 to 2018 and the data was collected from the World Development Indicators (WDI) and World Governance Indicators (WGI).

3.1. Model specification
According to theoretical justification, a bi-directional relationship exists between economic growth, political instability, human capital, FDI, and infrastructure. The functional form of the models are:

\[ \text{EGROWTH} = f(\text{PINSTAB}, \text{HCAP}, \text{FDI}, \text{INFRA}) \]  \hspace{1cm} (1)

\[ \text{PINSTAB} = f(\text{EGROWTH}, \text{HCAP}, \text{FDI}, \text{INFRA}) \]  \hspace{1cm} (2)

\[ \text{HCAP} = f(\text{PINSTAB}, \text{EGROWTH}, \text{FDI}, \text{INFRA}) \]  \hspace{1cm} (3)
FDI = f (PINSTAB, HCAP, EGROWTH, INFRA) ........................................ (4)
INFRA = f (PINSTAB, HCAP, FDI, EGROWTH) ................................. (5)

The description and definition of variables are given in Table 1.

Table 1: Description and Definition of Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Operational Description</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Growth (EGROWTH)</td>
<td>GDP growth (annual %)</td>
<td>WDI (2021)</td>
</tr>
<tr>
<td>Political Instability (PINSTAB)</td>
<td>Political stability and absence of violence/terrorism range (2.5 to 2.5)</td>
<td>WGI (2021)</td>
</tr>
<tr>
<td>Human Capital (HCAP)</td>
<td>The composite index of primary, secondary, and tertiary education. The PCA (Principal Component Analysis) is used to make the composite index of human capital.</td>
<td>WDI (2021)</td>
</tr>
<tr>
<td>Foreign Direct Investment (FDI)</td>
<td>Foreign direct investment, net inflows (% of GDP)</td>
<td>WDI (2021)</td>
</tr>
<tr>
<td>Infrastructure (INFRA)</td>
<td>Index of rail lines (total route-km), fixed telephone subscriptions, transport services (% of service exports, BoP), transport services (% of service imports, BoP), air transport, passengers carried, electricity production from oil, gas and coal sources (% of total).</td>
<td>WDI (2021)</td>
</tr>
</tbody>
</table>

3.2. Estimation Techniques
Arellano and Bond (1991) claimed that the difference, GMM decreased endogeneity and autocorrelation, resulting in objective and effective results. The data transformation resolved endogeneity using lagged variable values to resolve the fixed effect. Later, Blundell and Bond (1998) pointed out that difference GMM is ineffective when using lagged instruments and small T because the instruments are invalid in the first difference case, when the variables are close to a random walk, and because small T variables are highly persistent (Alonso-Borrego & Arellano, 1999). According to Arellano and Bover (1995); Blundell and Bond (1998), dynamic bias and endogeneity in the model were addressed by system GMM. Because the instruments are not tied to a fixed effect, the first difference case GMM is more effective (Roodman, 2009). In our investigation, T is significant, and GMM eliminated endogeneity and autocorrelation using a dynamic system (Arellano & Bover, 1995; Blundell & Bond, 1998, 2000). The system GMM equations are as follows:

\[
EGROWTH_{it} = \alpha_1 EGROWTH_{i,t-1} + \alpha_2 PINSTAB_{it} + \alpha_3 HCAP_{it} + \alpha_4 FDI_{it} + \alpha_5 INFRA_{it} + \epsilon_{it} \\
PINSTAB_{it} = \beta_1 PINSTAB_{i,t-1} + \beta_2 EGROWTH_{it} + \beta_3 HCAP_{it} + \beta_4 FDI_{it} + \beta_5 INFRA_{it} + \epsilon_{it} \\
HCAP_{it} = \gamma_1 HCAP_{i,t-1} + \gamma_2 PINSTAB_{it} + \gamma_3 EGROWTH_{it} + \gamma_4 FDI_{it} + \gamma_5 INFRA_{it} + \epsilon_{it} \\
FDI_{it} = \delta_1 FDI_{i,t-1} + \delta_2 PINSTAB_{it} + \delta_3 HCAP_{it} + \delta_4 EGROWTH_{it} + \delta_5 INFRA_{it} + \epsilon_{it} \\
INFRA_{it} = \theta_1 INFRA_{i,t-1} + \theta_2 PINSTAB_{it} + \theta_3 HCAP_{it} + \theta_4 FDI_{it} + \theta_5 EGROWTH_{it} + \epsilon_{it}
\]

4. Results and Discussion
Table 2 shows the descriptive statistics of the variables used in this study.
Table 2: Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>STDEV</th>
<th>Min</th>
<th>Max</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGROWTH</td>
<td>3.146155</td>
<td>4.190304</td>
<td>-16.54</td>
<td>19.45</td>
<td>N 3132</td>
</tr>
<tr>
<td></td>
<td>Between</td>
<td>-0.65208</td>
<td>9.344092</td>
<td>n</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Within</td>
<td>-15.0301</td>
<td>20.0714</td>
<td>T</td>
<td>36</td>
</tr>
<tr>
<td>PINSTAB</td>
<td>4.450792</td>
<td>2.097036</td>
<td>0</td>
<td>12</td>
<td>N 3132</td>
</tr>
<tr>
<td></td>
<td>Between</td>
<td>1.239722</td>
<td>7.910562</td>
<td>n</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Within</td>
<td>-0.43671</td>
<td>11.21801</td>
<td>T</td>
<td>36</td>
</tr>
<tr>
<td>HCAP</td>
<td>90.34982</td>
<td>18.59604</td>
<td>17.17969</td>
<td>252.6812</td>
<td>N 3132</td>
</tr>
<tr>
<td></td>
<td>Between</td>
<td>48.33282</td>
<td>155.0607</td>
<td>n</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Within</td>
<td>40.86247</td>
<td>187.9703</td>
<td>T</td>
<td>36</td>
</tr>
<tr>
<td>FDI</td>
<td>3.838501</td>
<td>8.099423</td>
<td>-17.0661</td>
<td>86.5891</td>
<td>N 3132</td>
</tr>
<tr>
<td></td>
<td>Between</td>
<td>-0.35362</td>
<td>38.2107</td>
<td>n</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Within</td>
<td>-21.9355</td>
<td>75.05713</td>
<td>T</td>
<td>36</td>
</tr>
<tr>
<td>INFRA</td>
<td>5.710326</td>
<td>0.824748</td>
<td>3.49376</td>
<td>8.018742</td>
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<td>7.898401</td>
<td>n</td>
<td>87</td>
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<td>3.437531</td>
<td>7.391642</td>
<td>T-bar</td>
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Summary statistics of global economies are presented in Table 2. Economic growth is measured by GDP growth, its mean value is 3.14, and the standard deviation is 4.19, while the minimum value is -16.54 and the maximum value is 19.45. The minimum value belonged to Poland⁴ in 1988 and the maximum growth rate from Botswana in 1988. The mean value is 3.14, the median of the values confirming that most countries lie in the median range.

The political instability’s mean value is 4.45 with 2.09 standard deviations; the minimum value is 0, and the maximum is 12. A higher value shows that the county is politically unstable, and a minimum value shows that the country is politically stable. The mean value confirms that most nations have a median politically stable situation. In the dataset the countries having the zero value alternatively politically stable countries are Algeria, Argentina, Australia, Croatia, Belarus, Botswana, Cameroon and Germany, while the highly unstable countries are Chile, Congo, Rep., Czech Republic, Ethiopia, Russian Federation, Serbia and Sudan.

The mean value of human capital is 90.34 with an 18.59 standard deviation, while its minimum value is 17.17 and the maximum value is 252.6812. A higher value of human capital confirms that there is human development in the economy, while the minimum value shows less human development in that economy. The mean value confirms that most countries are not investing in or improving their human development globally. The minimum value was from Ethiopia in 1983 and the maximum was from Brazil in 1984.

The FDI inflows percentage of GDP measures foreign direct investment. Its mean value is 3.83, with an 8.09 standard deviation. The minimum value of FDI is -17.06, and the maximum is 86.58. A higher value confirms the higher amount of FDI inflow in the nation, while a lower value confirms the lower amount of FDI inflow in the nation compared to the other countries. The mean value confirms that most nations lie in the first 25 percentile. The minimum value was from Croatia in 1984 and the maximum was from the Netherlands in 2007.

The mean value of the infrastructure is 5.71, with a 0.82 standard deviation. Its maximum value is

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⁴ The other countries having the negative growth rate are Argentina in 2018, Australia in 1991, Austria in 2009, Belgium 1993, Canada in 1991, Chile in 2009 and etc. we have included all the values in the analysis, although all these are extra ordinary values. Such type of variations is minimized by the dynamic panel GMM econometrics model and it gives the unbiased estimates.
8.01, while the minimum value is 3.49. The higher-value shows that the country has good infrastructure, while the minimum value shows the nation's poor infrastructure. The mean value of infrastructure confirms that most nations have good infrastructure because its mean value is greater than the median of the data. The minimum value belongs to Congo, Dem. Rep. in 2006 and the maximum value belongs from the United States in 1996. While the good infrastructure countries are Algeria, Argentina, Australia, Austria, Belarus, Belgium, Brazil, Canada and Chile and the poor infrastructure countries are Congo, Dem. Rep., Gabon, Paraguay and Zambia.

The results for the heterogeneous causal relationship among economic growth, political instability, human capital, FDI and infrastructure are given in Table 3. The table also contains the model diagnostics.

Table 3: Generalized Methods of Moments (GMM) Results

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
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<tr>
<td>c</td>
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Model Diagnostics

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</table>

Note: ***, **, * represents 1, 5 and 10 percent significance level.

The first row of each variable gives the coefficient, the second row represents the standard error value, and the third row represents the t-stats value. While in the model diagnostics section, probability values are given.

4.1. Results of Model 1 (Economic Growth)

According to Table 3, Model 1 the economic growth is an endogenous variable, while political instability, human capital, FDI, and infrastructure are exogenous indicators. Political instability has a negative and significant effect on economic growth, while human capital, FDI, and infrastructure
have a positive and significant impact on economic growth. All the results of the model are theoretically justified. The explanation and support of these results are given below.

Political instability harms economic growth, and some economists found that an unstable political situation harms economic activities in the nations, distracting local and foreign investors from investing in unstable economical environment. Moreover, a politically unstable environment increases inflation and unemployment, resulting in a decrease in economic growth (Khan & Farooq, 2019; Uddin, Ali, & Masih, 2017). Darby et al. (2004) argued that unstable political situations minimize the likelihood of re-election, decreasing public investment and subsequently there occurs lower economic growth. Further, terrorism hurts market activities. It restricts or abounds investment activities which decrease the production level. It increases the pressure on the economy's aggregate demand, inflation, and unemployment. So, unstable political environment reduces economic growth (Tabassam et al., 2016).

Human capital significantly and positively affects economic growth (Su and Liu (2016). The average annual growth of regional GDP per employee increases by creating the share of employees with the tertiary education level, so high human capital employees induce knowledge spillover (Falck et al., 2011) and (Zhang & Zhuang, 2011). Private physical capital boosts the effect of human capital on economic growth (Chen & Fang, 2018; Fang & Chen, 2017; Ogundari & Awokuse, 2018). At the same time, Xu and Li (2020) argued that human capital has a significant but small effect on economic development.

The results have shown increasing effect of FDI on economic growth. A number of studies supports it. Foreign direct investment positively affects economic growth because domestic growth attracts FDI inflows (Chowdhury & Mavrotas, 2006). Basu, Chakraborty, and Reagle (2003) found a positive effect of FDI on economic growth in closed economies while an inverse relationship in open economies. Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004) conclude that an excellent financial system is gained from FDI. Further, Alalaya (2010) found that FDI inflows attract advanced mods of technology, which minimize the production cost and enhance the production level and domestic economic growth. Gunby et al. (2017); Qabrati (2021); Tanaya and Suyanto (2022) also argued for a positive and significant effect of FDI inflows on economic growth.

Good infrastructure directly affects economic growth because it minimizes the cost of production, and cheaper electricity minimizes the cost of production. Similarly, water infrastructure minimizes irrigation and production costs, benefiting farmers and ultimately economic growth. The excellent port and railways infrastructure improved labor productivity and economic growth (Bogetić & Fedderke, 2005). Jiang, He, Zhang, Qin, and Shao (2017) found that transportation infrastructure positively affects economic growth at the national and provincial levels. Meersman and Nazemzadeh (2017) infrastructure plays an essential role in international trade and economic growth because it generates employment and value-added directly and indirectly by spill-overs to up- and downstream sectors.

4.2. Results of Model 2 (Political Instability)
According to Table 3, Model 2 economic growth, foreign direct investment, human capital and infrastructure negatively affect political instability. All of the results are theoretically justified and may be explained as follows: economic growth harms political instability, Tabassam et al. (2016) argued that political instability (terrorism) distracts economic activities. It creates an uncertain and volatile environment that distracts local and foreign investors. They restrict investment and postpone or cancel all investment activities in such a risky environment. At the same time, Bellettini et al. (2013) red tape production costs (the longest period of political entities in the office bearers) harm economic growth. Okabe and Kam (2017) also found a negative effect of economic growth on
political instability.

Human capital also harms political instability because improving human capital through education augments political awareness, leading to political stability. On the other hand, the country's human capital shortage leads firms to hire people who lack professional expertise, job-related skills, and ethical awareness. Employees lacking human capital are more likely to engage in ethnic behavior, corruption, shirking labor, and inefficient performance. It fails the government and causes political instability. So, increased human capital contributes to less political instability. Okafor (2017) confirmed that improved human capital improves governance and decreases terrorism, social unrest, and political instability (Naqvi, Waheed, Mahmood, & Rafique, 2017). Furthermore, Zallé (2019) suggested that if the government fails to accumulate human capital, it will risk political instability. The political instability can be avoided by improving human capital.

In Model 2, FDI has shown a negative impact on political instability. It may be explained as FDI inflows in the local nations offering employment opportunities, directly improving the nation's GDP. Increased affluence leads to increased political awareness, which ultimately reduces political instability. FDI helps to hire efficient officials, provide adequate financial resources, raise salaries, successfully implement political plans, and implement social responsibility legislation. As a result, FDI decreases political instability (Bakar & Afolabi, 2017). Similarly, Bano, Zhao, Ahmad, Wang, and Liu (2019) and Bitar, Hamadeh, and Khoueiri (2020) suggested that a fall in FDI leads to financial instability, terrorism, energy scarcity, and political instability.

The infrastructure has shown a negative effect on political instability. A lack of infrastructure within the country and a lack of communication leads to poor information management, ineffective execution of rules and regulations, and a slower economy, which leads to government failure or political instability. According to Donnay (2017), economic growth, foreign direct investment, human capital, and infrastructure might help reduce political instability. In addition, Khattak and Mustafa (2019) claimed that if a good infrastructure improves communication networks and management effectiveness and increases dedication and honesty, it controls political instability. This theory is supported by Díaz (2020), who argued that the success of infrastructure projects leads to reduced political instability.

4.3. Results of Model 3 (Human Capital)

According to Table 3, Model 3 the economic growth, FDI, and infrastructure positively affect human capital, while political instability harms human capital. The results may be explained as follows: economic growth increases the demand for input factors like employment and physical capital (Schultz, 1961). Foders (1998) found that for poor economic situations in countries stuck in a poverty trap, growth is the only way to overcome this condition because it enhances economic reforms, which endowment human capital reforms. Middendorf (2008) argued that skilled labor could not find a suitable job due to bad economic situations. They are more productive in good economic conditions at the aggregate level compared to their unqualified counterparts. Furthermore, higher economic growth provides funds for education, health and skill development of the people.

In model 3, FDI has shown a positive impact on human capital. Checchi et al. (2007) found that FDI promotes higher education levels and skilled labor. While Blomström, Kokko, and Mucchielli (2003) concluded the small effect of FDI on primary and secondary education while having a significant effect on the tertiary education level because the demand for skilled labor is higher in engineering, natural sciences, and business sciences multinational companies. Finally, the infrastructure significantly and positively impacts human capital, confirming that the infrastructure improvement increases the human capital level. While human capital depends on education and health sectors, so if education and health infrastructure improve, it leads to improvement in education and health facilities. Hence, improving health and education infrastructure leads to increased human capital.
In model 3, political instability has a negative effect on human capital. Kottaridi, Louloudi, and Karkalakos (2019) found that political stability is key in enabling organizations to focus on their employees' skills and competence development. This is because political stability reduces uncertainty and risk, which allows organizations to plan for the future and invest in their employees. As a result, countries that experience political stability tend to have higher levels of human capital development. Brown and Hunter (2004); Hunter and Brown (2000) measured human capital by education spending and found a significant effect of political instability on human development.

4.4. Results of Model 4 (FDI)

According to Model 4 in Table 3, the economic growth, human capital, and infrastructure significantly and positively impact FDI. In contrast, political instability hurts the FDI inflow of the country.

In Model 4, the economic growth measured by GDP growth has shown a positive impact on FDI inflows. It explains that foreign investors are more inclined towards growing economies. It is supported by a number of studies. In the earlier studies, Balasubramanyam et al. (1996) concluded that economic growth creates new market opportunities for foreign firms. As country's economy grows, its population and demand for goods and services increases. It creates new opportunities for foreign firms to invest in the country and sell their products or services to the growing market. Borensztein et al. (1998) explained that economic growth can positively impact FDI. Karimi and Yusop (2009) also found a positive effect of economic growth on FDI through trade policies, especially export policies.

Political instability negatively affects FDI inflows (Barro, 1995). Alesina and Perotti (1996) concluded that investors are less attracted to invest in politically unstable countries. Younis (2011) found an adverse effect of political instability on the FDI level. Moreover, political instability affects investors' willingness, and they are not comfortable and unwilling to invest in risky environments (Brada, Kutan, & Yigit, 2006). Investors are mainly dependent on the political condition. If the political condition is not stable or risky, they are not likely to invest in that country.

The results of Model 4 demonstrate that human capital positively influences the inflow of FDI. The theory and empirical evidence support it. Lucas (1990) summarized that lack of human capital discouraged FDI in the least developing nations. Zhang and Markusen (1999) confirmed that skilled labor in the host nation attracts FDI inflows. Furthermore, Dunning (1988) found that educated and skilled labor attracts FDI inflows. Dasgupta, Mody, and Sinha (1996) concluded that local skilled labor and high human resources capabilities attract FDI inflows (Noorbakhsh, Paloni, & Youssef, 2001). Dutta, Dutta, and Karmakar (2017) found that human capital significantly attracts FDI to host countries. Dorozynska and Dorozynski (2015) argued that a minimal level of education is compulsory for the nation to attract foreign direct investment in the country. Morita and Sugawara (2015) explained that if the human capital in developing nations faced an availability problem, the firms would hesitate to invest in that nation. Similarly, Yussof and Ismail (2002) confirmed that human capital attracts FDI with the increased demand for local skilled labor and human resource capabilities. Educated and Skilled labor attracts FDI inflows (Zhang & Markusen, 1999).

Infrastructure has also shown a positive impact on FDI. Fung, Garcia-Herrero, Iizaka, and Siu (2005) concluded that infrastructure attracts FDI in emerging nations. Donaubauer et al. (2016) argued that the economy attracts FDI inflows with good transport infrastructure, advanced communication systems, and efficient energy infrastructure. Asiedu (2002) stated that "good infrastructure increases the productivity of investments and stimulates FDI." Moreover, Barua and Naym (2017) argued that electricity availability (infrastructure) significantly and positively impacts FDI inflows in developing countries. Excellent and efficient infrastructure attracts FDI inflow.
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(Akpan et al., 2014; Rehman, Ilyas, Alam, & Akram, 2011). Furthermore, Khadaroo and Seetanah (2008) claimed that infrastructure growth significantly reduces transportation costs. Moreover, the public infrastructure minimizes foreign investors' business costs, leading to profit maximization. These findings are validated by Quéré (2007) as they confirmed that public goods significantly impact cost structure and private firm productivity.

4.5. Results of Model 5 (Infrastructure)

According to the results of Model 5 in Table 3, the economic growth, human capital, and FDI significantly affect infrastructure, while political instability negatively affects infrastructure. Economic growth's positive role on infrastructure development may be explained as follows: for a nation to achieve rapid economic growth, it must first begin developing new infrastructure, which can be speeded up by increasing its financial and physical resources. According to Wang, Lim, Zhang, Zhao, and Lee (2020), rapid economic growth significantly increases the government's revenue from taxes levied on production and commerce. To achieve the economy's advancement, the government may use these funds to construct basic physical infrastructures, such as the construction of roads, buildings, and bridges. Volker and Handy (2021) stated that strong economic growth helps to raise the overall level of domestic infrastructure. Xu, Das, Guo, and Wei (2021) verified the existence of a good correlation between economic growth and infrastructure investment.

Human capital boosts infrastructure because human education, motivation, and skills affect infrastructure engineering and the efficient application of infrastructure facilities. It is possible to progress in developing and upgrading infrastructure in a country where human resources are operating well and where many initiatives for developing human capital are being carried out with positive outcomes. Bronzini and Piselli (2006) confirmed that human capital directly affects regional productivity and regional productivity affects infrastructure. Ogunjobi (2021) suggested that improving human capital contributes to forming the physical infrastructure necessary for generating, transforming, and distributing energy.

As concern the impact if FDI on infrastructure, Esfahani and Ramirez (2003) argued that in the 1980s and 1990s, the main part of foreign investment in the telecommunication sector improved the infrastructure of the nation, which affected economic growth (Qingwang et al., 2006; Ramirez, 2006). Good infrastructure is based on FDI inflows in most of the developing nations (Agénor & Moreno-Dodson, 2006; Hulten et al., 2006), by transaction efficiency (Michaels, 2008) and spillover effect (Zhang et al., 2012). Nourzad et al. (2014) stated that the country's infrastructure comprised of telecommunication, power generation, and roads network, mainly depends on foreign investment or aid. Further, Sui et al. (2017) explained that good infrastructure is based on FDI inflows in the country. Moreover, Wang (2019) also found that the FDI of ASEAN nations improved the infrastructure level.

Finally, political instability hurts infrastructure, which means that if there exists an unstable political situation, it harms infrastructure development. Bertoméu-Sánchez and Estache (2017) found a positive effect of political motivations on infrastructure along with economic objectives. Amitendu and Shounkie (2007) found that the negative impact of political instability on FDI is stronger in countries with lower levels of economic development. The foreign firms are more likely to invest in countries with stable political environments and are less likely to face risks such as expropriation or nationalization. Yamin and Sinkovics (2009) found that FDI inflows boost the infrastructure development in the nation and Sui et al. (2017) support that hypothesis for ASEAN countries.

6. Conclusion and Policy Recommendation

Economic growth is a significant focus of policymakers, and some economic indicators, directly and indirectly, affect economic growth. So, this study examined the heterogeneous causal relationship
with the help of the Generalized Method of Moments (GMM) between human capital, political instability, FDI, infrastructure, and economic growth for overall global countries.

The results of the first model confirmed that human capital, FDI and infrastructure positively affect economic growth, while political instability negatively affects economic growth. The second model’s results confirmed that economic growth, human capital, FDI, and infrastructure negatively affect political instability. Third model results showed that economic growth, FDI, and infrastructure positively affect human capital, while political instability negatively affects human capital. Fourth model results confirmed that economic growth, human capital, and infrastructure positively affect FDI, while political instability has negative effects. Furthermore, finally, the fifth model result confirmed that economic growth, human capital, and FDI positively affect infrastructure while political instability has negative effects, as explained in Figure 2.

![Figure 2: Illustration of Results of the Heterogenous Causal Relationship](image)

The policymakers and regulatory authorities must tackle two core variables: political instability and infrastructure. By controlling the political instability, the economic uncertainty decreases in the nation, enabling the business environment and directly affecting the nation's economic growth.

Secondly, a sustainable business environment attracts foreign donors to invest in that healthy environment. It increases the level of FDI inflow, and FDI inflows directly affect economic development, infrastructure, and human capital.

The increase in FDI in domestic nations leads to improved infrastructure, like creating or improving hospitals, schools, roads, and telecommunication infrastructure. The construction of new hospitals or improvement in hospital services leads to improving the people's health and, ultimately the human capital. Moreover, people work more efficiently, which leads to economic development. The same is the case with schools, providing the schools, training institutes, universities and improving the education level, and the people to get skilled labor, ultimately increases the nation's economic growth.

While the government and the regulatory authorities should focus on developing the infrastructure. A better infrastructure creates the people's trust in the politicians, creating political stability in the nations. Moreover, foreign investors do not hesitate to invest in a politically stable environment, leading to increased FDI inflow in the domestic nation and economic growth.

Good infrastructure improves health and education, ultimately improving the nation's economic growth. Overall, policymakers should aim to create an environment that fosters economic growth by
addressing the heterogenous causal relationship between human capital, political instability, foreign direct investment, and infrastructure in a comprehensive and integrated way.

References


Muhammad Azhar Bhatti, Rana Ejaz Ali Khan


