

# HUMAN DEVELOPMENT, INSTITUTIONAL QUALITY, AND FINANCIAL DEVELOPMENT: EVIDENCE FROM MIDDLE-INCOME COUNTRIES

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## ABSTRACT

Contrasted sharply with a large cohort of studies on financial development in developed and developing countries, research observed particularly in middle-income countries is uncommon. Accordingly, this research explores the effect of human development and institutional quality on financial development in 84 middle-income countries from 2004 to 2022. Furthermore, it examines the impact of the interaction between six indicators of institutional quality and human development on financial development. In this research, financial development is captured in two core sectors of the financial system, namely financial institutions and financial markets. The baseline results estimated by difference-GMM indicate that human development positively influences financial development regarding financial institutions. However, this factor negatively affects financial development regarding financial markets. When institutional quality interacts with human development, it could amplify the impacts on financial development. Specifically, better institutional quality regarding law and government effectiveness could promote financial development in both financial institutions and markets, while control of corruption shows a non-significant link. Findings from this research contribute meaningful evidence to design policies inducing financial development in middle-income countries.

**Keywords:** Human capital, Institutional quality, Financial development, Middle-income countries

## 1. INTRODUCTION

A huge amount of literature asserts that financial development's role positively influences economic development and growth (Danlami et al., 2018; Khan et al., 2020). With the belief that financial development plays a significant role in promoting the economy and boosting market openness, researchers and policymakers have been interested in investigating the determinants of financial development and trying to find out how to improve or boost financial development. Hence, research exploring factors affecting financial development should be extended to sustainability development. Most previous empirical studies investigated and emphasized the important role of social and human capital in economic growth (Hernández-Medina et al., 2024; Popoola et al., 2019), while human development has been the least delved into the financial development literature. In addition, the endogenous growth theory specifies the prerequisite role

of the knowledge base and skills of the labour workforce of economies (Romer, 1990; Lucas, 1988). The empirical studies propose that human development is the most important aspect that contributes to the overall growth, improves financial development by a well-educated population, promises the potential to drive innovation, and enhances efficiency in both financial institutions and markets (Shahbaz et al., 2018; Zaidi et al., 2019). It means that human development is a leverage to momentum for financial development, especially in developing countries. It is also argued that a well-educated workforce creates a sustainable financial sector to operate and perform activities in the economic system and contribute to financial development.

Furthermore, financial development has been regarded as a fundamental crucial factor in the context of growth and stability of the financial system of the economy, especially in middle-income countries that have a trend to expand their growing economy rapidly, and it may lead to unstable financial markets (Topić – Pavković, 2024). This is generally recognized as an institutional quality of every unique nation, resulting in the due protection of investors' rights, facilitating risk management, and reducing financial fragility, diversification, and trading. The previous studies documented that countries that have higher levels of institutional quality are more likely to attract funds and capital from investors in the financial markets (Masron & Nor, 2013) and good institutional quality is also considered one of the prerequisite conditions that attract financial development investment (Jude & Leveuge, 2017; Hussain et al., 2021). In addition, development often goes hand in hand with the maintenance of stability (Seven et al., 2023). Likewise, the transparency and reliability of the financial system in financial transactions of a country are only attainable when the country maintains an adequate quality of institutions (Kaidi et al., 2019; Khan et al., 2020). Hence institutional quality is supposed to be positively impacted and contribute to increasing financial development.

Given that there has been a shortage of empirical studies on the impact of human development on financial development and the role of institutional quality in the financial system, this study aims to investigate the nexus between human development, institutional quality, and financial development. Furthermore, several studies argue that human capital and institutional quality do not work independently. They reasoned that economic growth cannot be driven by human capital alone but in combination with high-quality institutions (Atsu & Adams, 2023; Dejene, 2019; Ferede, 2022; Al-Jomard et al., 2025). Similarly, resilient institutions cannot reach their full potential without support from a knowledgeable and proficient population with a profound understanding and participation in the system. Hence, to extend understanding and insight into the mutual influence of institutional quality and human development on financial development, this research generates interaction terms of each indicator of institutional quality and human development and the effect of interaction terms on financial development is explored. To investigate the relations, 84-country samples in middle-income countries (Appendix) were employed for empirical testing with the GMM method and robustness check to increase the stability of research results.

Accordingly, this study contributes to several aspects. Firstly, providing empirical evidence of the interaction between institutional quality and human development on financial development. Secondly, employing data from countries in the middle-income group as the sample for empirical research is considered a significant contribution to the literature because the middle-income countries encompass divergent countries from different economic regions and political systems and institutions comprising Asia, Africa, Europe, and Latin America. Thirdly, unlike previous research, the measurement of financial development in this study is measured in two core sectors of the financial system, including financial institutions and financial markets. In previous research, financial development was proxied as a single indicator such as domestic credit (%GDP); credit to the private sector (%GDP); or the general financial development index (Alawi, et al. 2022; Khan, et al. 2020). Lastly, Institutional quality is explored insight into six

indicators comprising Voice and Accountability (VA); Political Stability and Absence of Violence/Terrorism (PS); Government Effectiveness (GE); Regulatory Quality (RQ); Rule of Law (RL); and Control of Corruption (CC).

The next section of the paper elaborates on the literature review. Then the methodology will be presented in section 3 which includes a data description, and the method strategy applied to analyse the data. Section 4 reports the estimation results, robustness check, and explanation. Section 5 proposes suggestions and conclusions.

## 2. LITERATURE REVIEW

The importance of financial development in the economy has been documented in a large cohort of studies, hence determining factors that influenced financial development attract considerable research. This research is based on theories related to human capital, the law and finance theory and the endowment theory to clarify mechanisms on how human development and institutional quality influence financial development. In terms of human capital, the endogenous growth theory introduced by Romer (1990) considered human capital as a core component for growth in the economy. In addition, the neoclassical theory of growth by Lucas (1988) presents human capital accumulation through schooling and return to schooling and states that with a background of high capital environment, people at each skill level would be more productive. Consequently, human capital theories support human resource development as a vital element in determining financial development (Milutinović et al., 2024). Regarding institutional quality, the law and finance theory by Beck et al. (2003) focuses on legal aspects and private property rights which protects private investors and forms basic condition of financial contracts. Accordingly, better institutional quality countries with legal systems emphasized strongly private property rights would attract flows of capital from social resources into the financial system, inducing financial development. Furthermore, the endowment theory aims to explain initial endowment of a country including geography conditions, political regime as well as voting rights shape institution background that offer stable protection for private properties in financial activities and create socio-economic environment for investment activities, contributing to financial development (Acemoglu et al., 2002; Beck et al., 2003). Following these theories, empirical studies interpret the effect of human development and institutional quality on financial development by providing empirical evidence.

A substantial body of research suggested a significant role of human capital in enhanced financial development (Allub et al., 2024; Eryiğit et al., 2015; Ibrahim & Sare, 2018; Khan et al., 2020). Given the essential role of human development in financial development, previous literature clarifies channels through which human development influences financial development directly and indirectly. In the first channel, higher levels of human development in terms of knowledge directly affect financial development by increasing the demand for products and services in the financial system (Ibrahim & Sare, 2018; Lusardi et al., 2021; Thomas & Spataro, 2018). Higher education allows people in society access to more information about the financial system. Also, better knowledge could promote the level of financial literacy that helps individuals evaluate financial instruments and decide to participate in financial markets, contributing to a higher development of the financial system (Khan et al. 2020; Zaidi et al., 2019). The second channel implies that human development influences financial development indirectly through income. When human development reaches a higher level, the level of income and savings in the economy also increases. Consequently, this facilitates the process of mobilizing savings into financial investments, thus providing more capital resources for the financial system and enhancing the level of financial development (Chen et al., 2023; Eryiğit et al., 2015; Gutsche et al., 2021). There are abundant studies documented the effect of human development on financial

development in advanced economies including the US (Allub et al., 2024; Khan et al., 2020; Lusardi et al., 2021), Japan (Gutsche et al., 2021), and OECD countries (Zaidi et al., 2019). Also, previous research supported this linkage in less developed countries in Africa (Ibrahim & Sare, 2018) and individual case such as China (Chen et al., 2023) and Turkey (Eryiğit et al., 2015). However, research focused on middle-income countries has not been investigated yet.

Regarding institutional quality, based on both theoretical and empirical research, institutional quality is thought to be the foundation of a nation's growth and sustainability. The research in the Asian region from 1996 to 2017 proposed that good quality institutions positively significantly impact inclusive growth (Sabir & Qamar, 2019). Besides, numerous articles have recorded the link between quality institutions and growth, concerning the nexus between institutional factors and financial development has also been documented. Previous studies systematically interpret channels related to political schemes, legal systems, and effectiveness in executing government. In particular, the political instability in a country could exert a diverse effect on market orientation and financial reformation that changes corporations' financial decisions, and operation of the banking system as well as security markets (Hussain et al., 2021; Pagano & Volpin, 2001; Mastilo et al., 2025). Therefore, the political situation ensures stability in the macroeconomic context and fosters activities in the financial system. Also, that attracts foreign capital flow and increases financial liberalization, contributing to boosting financial development (Feng & Yu, 2021; Kassie, 2021; Rutendo Magwedere & Marozva, 2025). Additionally, a higher quality and adaptability level of law and regulatory systems reflect the capacity of the legal system compared to the contracting demands of activities in the economy. Hence, a flexible legal system would minimize this gap better than a rigid system, thereby conditioning business activities and transactions and promoting the development of the financial system (Kombo & Koumou, 2021; Sabir & Qamar, 2019). Accordingly, the quality of government and its democracy can create a good environment, facilitating financial development. In addition, the majority evidence of previous studies found in the panel of Asian countries (Feng & Yu, 2021; Sabir & Qamar, 2019), African countries (Kassie, 2021; Kombo & Koumou, 2021; Ofori et al. 2024), as well as high-income economies (Hussain et al., 2021). Meanwhile, there is shortage research on how institutional quality affects financial development in the case of middle-income countries.

Regarding methodology, extant research also shows gaps in capturing the relationship between human development, institutional quality, and financial development. Previous studies are mainly focused on the effect of individual elements including human development or institutional quality on financial development while the mutual effect of human development and institutional quality is neglected. There are several studies supporting the mutual influence between human development and institutional quality. Ofori et al. (2024) supported that better institutional quality facilitates higher human development that creates a good environment for education, healthcare and equal opportunities for investments (Farayibi & Folarin, 2021). Moreover, the interactive effect of human development and institutional quality benefits the financial system by providing both capital resources and a good investment environment which mutually boosts financial development. Additionally, Almarzoqi et al. (2015) documented macroeconomics and openness factors such as GDP growth rate, inflation rate, trade openness, and financial openness which determined financial development. Therefore, the study would fulfill this limitation by incorporating the interactive influence of human development and institutional quality on financial development as well.

### 3. METHODOLOGY

#### 3. 1. DATA AND VARIABLE MEASUREMENT

The classification of the World Bank categorizes 109 countries into the cohort of middle-income countries and this study excludes 25 countries from the analysis because of unavailable and missing data. Accordingly, a total of 84 middle-income countries are observed in this research. The list of these countries is addressed in the Appendix. Annual data spanning from 2004 to 2022 is collected from the IMF, United Nations Development Programme, and World Bank databases. Table 1 presents a detailed data description of all variables used in the study.

Table 1. Data description

Group of variables	Variable name	Unit of measurement	Symbol	Source of data
Financial development	Financial institutions	Index ranged from 0 (lowest) to 1 (highest)	FID	International Monetary Fund
	Financial markets		FMD	
Human development	Human development		HD	United Nations Development Programme
Institutional quality	Voice and Accountability	Index ranges from -2.5 (weak) to 2.5 (strong)	VA	World Bank
	Political Stability and Absence of Violence/ Terrorism		PS	
	Government Effectiveness		GE	
	Regulatory Quality		RQ	
	Rule of Law		RL	
	Control of Corruption		CC	
Control variables	GDP growth	annual %	GROWTH	World Bank
	Inflation		INF	
	Financial openness	Index ranged from 0 (lowest) to 1 (highest)	FO	Chinn & Ito (2008)
	Trade openness	Trade (% of GDP)	TO	World Bank

Source: Author's compilation

The measurement of financial development is divided into financial institutions (FID) and financial markets (FMD) to observe two core components of the financial system. These indicators are calculated as indices based on the broad multi-dimensional approach which aggregates the level of development in financial institutions and financial markets in terms of depth, access, and efficiency aspects. Overall, the values of these indicators range from 0, representing the lowest level of financial development, to 1, representing the highest level. Measuring financial development by two broad-based indicators, including financial institutions and financial markets, instead of using single indicators in previous studies (Onifade et al., 2024; Mtar & Belazreg, 2021) allows us to pin down particular sectors of the financial systems.

As one of the main explanatory factors, human development (HD) in this study is gauged by the Human Development Index introduced by the United Nations Development Programme. This composite index is calculated from three key dimensions comprising a long and healthy life by

the life expectancy index, knowledge by the education index, and a decent standard of living by the GNI index. This measurement offers a complete understanding of the level of human development with values from 0 (lowest) to 1 (highest).

The second explanatory factor observed in this research is institutional quality. This variable encompasses six broad dimensions of governance valued from -2.5, representing weak institutional quality, to 2.5, representing strong institutional quality. The first indicator is Voice and Accountability (VA) which measures the participation level of a country's citizens in selecting the government and the level of freedom related to expression, association, and media. Political Stability and Absence of Violence (PS) is the second indicator that captures the likelihood of political instability and violence, or terrorism driven by political motivation. Government Effectiveness (GE) measures the level of public and civil services quality as well as their independence from pressures in terms of politics. This indicator also shows the quality of policies from formulation, implementation, and the government's commitment. Regulatory Quality (RQ) is the fourth indicator which captures the government's ability to construct and implement policies that allow for engagement and promotion of the development of the private sector. Rule of Law (RL) measures the level of trust and compliance with social rules, especially for contract enforcement, property rights, the police, the courts, and the probability of crime and violence. Control of Corruption (CC) is the last indicator that captures the level of public power used for private purposes in the form of corruption and capturing the state by the elite class and private interest groups. These indicators would capture each indicator separately to interpret comprehensively its effect on financial development and its moderating role in the relationship between human development and financial development. The summary statistics of these variables are shown in Table 2.

Table 2. Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
FID	1,596	0.350	0.141	0.043	0.758
FMD	1,596	0.143	0.179	0.0002	0.735
HD	1,596	0.666	0.105	0.365	0.855
VA	1,596	-0.374	0.747	-2.259	1.222
PS	1,596	-0.391	0.717	-2.810	1.218
GE	1,596	-0.381	0.512	-1.684	1.238
RQ	1,596	-0.351	0.572	-2.349	1.260
RL	1,596	-0.497	0.520	-1.737	1.024
CC	1,596	-0.508	0.536	-1.673	1.331
INF	1,596	6.941	9.346	-16.860	171.206
GROWTH	1,596	4.071	4.713	-32.909	37.687
FO	1,596	0.413	0.319	0	1
TO	1,441	80.199	36.494	22.106	347.997

Note: The abbreviations in Table 2 are explained as follows: FID denotes financial development in terms of financial institutions; FMD denotes financial development in terms of financial markets; HD is human development; VA is Voice and Accountability; PS is Political Stability and Absence of Violence; GE is Government Effectiveness; RQ is Regulatory Quality; RL is Rule of Law; CC is Control of Corruption; INF is inflation; GROWTH is GDP growth; FO is financial openness; and TO is trade openness.

Source: Author's calculation

### 3. 2. EMPIRICAL MODEL

Based on previous empirical research and theories presented in the literature review section, this research constructs a panel of 84 middle-income countries from 2004 to 2022 to examine

the effect of human development and institutional quality on financial development. The empirical model is set up as follows:

$$FD(FID, FMD)_{i,t} = \alpha + \beta_1 FD_{i,t-1} + \beta_2 HD_{i,t} + \beta_3 IQ_{i,t} + \beta_4 INF_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 FO_{i,t} + \beta_7 TO_{i,t} + \varepsilon_{i,t} \quad (1)$$

where:  $i$  is each middle-income country (1, 2, ..., N);  $t$  is the period (1, 2, ..., T);  $\varepsilon_{i,t}$  is the error term.

$FD_{i,t}$  denotes the financial development of country  $i$  in year  $t$  which is measured by two indicators, including financial institutions ( $FID$ ) and financial markets ( $FMD$ ).

$HD_{i,t}$  is human development of country  $i$  in year  $t$  which is one of the main explanatory variables.

$IQ_{i,t}$  is the institutional quality of country  $i$  in year  $t$  which is a broad pattern concept measured by six indicators consisting of Voice and Accountability (VA), Political Stability and Absence of Violence (PS), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Control of Corruption (CC). The definition of each indicator in detail is mentioned in the previous section.

Besides two main explanatory variables, the models also examine the impact of other factors on financial development as control variables. Based on the research of Almarzoqi et al. (2015), which determines factors that affect financial development, this research adds four essential control elements, including inflation rate (INF), GDP growth rate (GROWTH), financial openness (FO), and trade openness (TO).

Furthermore, previous studies documented the mutual influence between human resources and institutional quality that can both strengthen and weaken its effect on several aspects of the economy (Ofori et al., 2024; Edeme & God, 2022; Kovačević & Manojlović, 2024). Hence this study expands the baseline model in equation (1) to examine the effect of interaction between each indicator of institutional quality and human development ( $HD*IQ$ ) on financial development, presented in equation (2) below:

$$FD(FID, FMD)_{i,t} = \alpha + \beta_1 FD_{i,t-1} + \beta_2 HD_{i,t} + \beta_3 IQ_{i,t} + \beta_4 HD * IQ_{i,t} + \beta_5 INF_{i,t} + \beta_6 GROWTH_{i,t} + \beta_7 FO_{i,t} + \beta_8 TO_{i,t} + \varepsilon_{i,t} \quad (2)$$

This study employs difference-GMM estimation in all regressions to address potential endogeneity and autocorrelation in the dynamic panel model. Also, in order to test robustness, this research examines remittance flow as an additional control variable in the empirical model.

## 4. RESULTS AND DISCUSSIONS

### 4.1. BASELINE RESULTS OF THE EFFECTS OF HUMAN DEVELOPMENT AND INSTITUTIONAL QUALITY ON FINANCIAL DEVELOPMENT

This section discusses the empirical findings of the baseline model in equation (1), which explores the effects of human development and institutional quality on financial development in terms of financial institutions and financial markets.

The result from Table 3, columns (1) to (6), pointed out that human development (HD) in all regressions has significantly positive effects on financial development in terms of financial institutions in middle-income countries. That means an increase in human resources related to more educated citizens, health, and income could result in higher levels of financial institutions in these countries. This is because when individuals become richer and attain a higher education level, the likelihood of creating savings in financial institutions is increased, providing an abundance of capital resources for the operation of financial institutions (Deuflhard et al., 2019). Also, higher levels of human development increase their awareness of the financial system. That generates demand for using better and higher-quality products and services from financial institutions thus simulating

a well-developed financial institution (Ibrahim & Sare, 2018; Zaidi et al., 2019). The positive influence of human development and financial development is also documented in previous studies conducted for African countries (Ibrahim & Sare, 2018) and Turkey (Eryigit et al., 2015).

In terms of institutional quality, the results show that there is a positive effect of four indicators including Voice and Accountability (VA), Political Stability and Absence of Violence (PS), Regulatory Quality (RQ), and Rule of Law (RL) on the development of financial institutions while Government Effectiveness (GE) and Control of Corruption (CC) show non-significant influence. These results indicate that good institutional quality in terms of VA, PS, RQ, and RL could enhance financial institutions positively. This is because improvement in institutional effectiveness means better participation of citizens in the public sector, more stability in terms of the political environment, and a higher quality of regulatory and law system that facilitates the operation of financial institutions more efficiently (La Porta et al., 1998) and increases their development. In particular, a stable political system ensures the likelihood of successful financial transactions and reduces financial fragility, which not only creates an impulse for domestic financial demands but also attracts external investments, enhancing financial institutions (Kassie, 2021; Kutan et al., 2017). Also, the regulatory and law systems play an important role in guiding and supervising the operation of financial institutions in the economy. Therefore, a strong regulatory and law system is considered a financial security tool that reduces transaction costs, compensates for incomplete points of the financial system, and ensures activities in financial institutions are conducted efficiently (Feng & Yu, 2021).

Table 3. The effects of human development and six indicators of institutional quality on financial development in terms of financial institutions (FID)

Variables	VA (1)	PS (2)	GE (3)	RQ (4)	RL (5)	CC (6)
FID <sub>t-1</sub>	0.323** (0.126)	0.302** (0.128)	0.304** (0.128)	0.348*** (0.125)	0.307** (0.127)	0.322** (0.127)
HD <sub>i,t</sub>	0.633*** (0.162)	0.640*** (0.164)	0.647*** (0.162)	0.591*** (0.161)	0.632*** (0.162)	0.630*** (0.164)
IQ <sub>i,t</sub>	0.016** (0.007)	0.009** (0.004)	0.004 (0.006)	0.012* (0.007)	0.014* (0.008)	0.010 (0.007)
INF <sub>i,t</sub>	-0.007** (0.003)	-0.007** (0.003)	-0.008** (0.003)	-0.008** (0.003)	-0.007** (0.003)	-0.007** (0.003)
GROWTH <sub>i,t</sub>	-0.003 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.002 (0.003)	-0.003 (0.003)
FO <sub>i,t</sub>	-0.073** (0.032)	-0.079** (0.032)	-0.076** (0.032)	-0.074** (0.032)	-0.074** (0.031)	-0.079** (0.032)
TO <sub>i,t</sub>	0.0002** (0.000)	0.0002** (0.000)	0.0002** (0.000)	0.0002** (0.000)	0.0002** (0.000)	0.0002** (0.000)
Obs.	939	939	939	939	939	939
AR(1)	0.030	0.046	0.049	0.015	0.047	0.034
AR(2)	0.868	0.805	0.861	0.937	0.874	0.822
Sargan test of overid restrictions	0.597	0.556	0.548	0.528	0.615	0.555
Sargan test of exogenous	0.383	0.505	0.528	0.465	0.456	0.613

Note: The abbreviations in Table 3 are explained as follows: FID denotes financial development in terms of financial institutions; HD is human development; IQ is institutional quality, which is presented by six indicators including Voice and Accountability (VA); Political Stability and Absence of Violence (PS); Government Effectiveness (GE); Regulatory Quality (RQ); Rule of Law (RL); and Control of Corruption (CC); GROWTH is GDP growth; INF is inflation; FO is financial openness; and TO is trade openness. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. Standard errors in parentheses.

Source: Author's estimation

For the effects of institutional quality and human development on financial development in terms of financial markets, Table 4 shows notable results. Different from the positive effects of human development on financial institutions, human development negatively impacts financial markets of financial development shown in columns (2)-(6). That means a higher level of human development in middle-income countries would lead to a deterioration in financial markets. The negative effects could be explained by the general background of financial markets compared to the development of human resources. Particularly, summary statistics in Table 2 (Summary statistics) indicate that the average development level of financial markets of middle-income countries is 0.143, and this number is quite low compared to the range value of this indicator is from 0 (less developed) to 1 (well-developed). This demonstrated that middle-income countries have less developed financial markets. Meanwhile, the development of humans in a country comprises both higher income and educational attainment. When people have more income, they tend to create savings and investments, together with higher knowledge, people increase their likelihood of participating in financial markets (Chen et al., 2023; Gutsche et al., 2021). In this regard, the less developed financial markets in middle-income countries do not have a robust background in terms of legal and infrastructure systems, which probably leads to congestion, speculative trading, and financial fragility, reducing financial markets (Muellerleile, 2017).

Regarding institutional quality, all indicators present positive and significant effects on financial development in terms of financial markets, except regulatory quality (RQ) which supports a negative relationship. The improvement of governance quality in terms of Voice and Accountability (VA), Political Stability and Absence of Violence (PS), Government Effectiveness (GE), Rule of Law (RL), and Control of Corruption (CC) create a good environment for investors because they are facilitated by a stable political system, efficient government, and transparency public institutions as well as are protected by legal rights of investors and private contracts that bring prosperity to financial markets, enhancing financial markets more develop (Aluko & Ibrahim, 2020; Feng & Yu, 2021). In terms of the negative effects of regulatory quality on financial markets, the probable explanation is the weak background of both regulatory systems and financial markets in middle-income countries (see Table 2 - Summary statistics). Furthermore, the incompatibility between them leads to an increase in regulatory quality that is not strong enough to enhance the development of financial markets.

Regarding control variables, Tables 3 and 4 present significant effects of almost all variables. In particular, inflation (INF), GDP growth rate (GDP), and financial openness (FO) show negative effects while trade openness positively affects financial development. The negative influence of GDP growth rate and financial openness are different from the expectation and these results imply that the size of financial institutions and financial markets in middle-income countries is quite small and its development rate is under the demand line and does not meet the ultimate pattern compared to the growth rate of the economy and the integration of financial system (Sarmargandi et al., 2015; Muellerleile, 2017). Accordingly, an increase in economic growth rate and financial openness creates more pressure on weak background financial systems in these countries, exerting negative effects on financial development.

Table 4. The effects of human development and six indicators of institutional quality on financial development in terms of financial markets (FMD)

Variables	VA (1)	PS (2)	GE (3)	RQ (4)	RL (5)	CC (6)
FMD <sub>t-1</sub>	0.506*** (0.127)	0.404*** (0.112)	0.330*** (0.096)	0.346*** (0.101)	0.413*** (0.111)	0.502*** (0.122)
HD <sub>i,t</sub>	-0.184 (0.129)	-0.238** (0.130)	-0.424*** (0.130)	-0.233** (0.101)	-0.566*** (0.136)	-0.254* (0.129)
IQ <sub>i,t</sub>	0.132*** (0.073)	0.054* (0.032)	0.047* (0.029)	-0.115* (0.059)	0.128*** (0.043)	0.110** (0.045)
INF <sub>i,t</sub>	-0.002 (0.005)	-0.008* (0.005)	-0.009** (0.004)	-0.008** (0.004)	-0.009** (0.004)	-0.005 (0.005)
GROWTH <sub>i,t</sub>	-0.012 (0.004)	-0.011*** (0.004)	-0.010*** (0.004)	-0.010*** (0.004)	-0.010** (0.004)	-0.012*** (0.004)
FO <sub>i,t</sub>	-0.001 (0.018)	-0.004 (0.017)	0.005 (0.016)	0.005 (0.016)	-0.002 (0.017)	0.002 (0.032)
TO <sub>i,t</sub>	0.0002 (0.000)	0.0001 (0.000)	0.0003** (0.000)	0.0003** (0.000)	0.0003* (0.0001)	0.0002 (0.000)
Obs.	939	939	939	939	939	939
AR(1)	0.001	0.001	0.001	0.002	0.001	0.001
AR(2)	0.162	0.111	0.171	0.119	0.104	0.196
Sargan test of overid restrictions	0.658	0.972	0.299	0.527	0.488	0.706
Sargan test of exogenous	0.222	0.136	0.326	0.385	0.421	0.328

Note: The abbreviations in Table 4 are explained as follows: FMD denotes financial development in terms of financial markets; HD is human development; IQ is institutional quality, which is presented by six indicators including Voice and Accountability (VA); Political Stability and Absence of Violence (PS); Government Effectiveness (GE); Regulatory Quality (RQ); Rule of Law (RL); and Control of Corruption (CC); GROWTH is GDP growth; INF is inflation; FO is financial openness; and TO is trade openness. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses.

Source: Author's estimation

## 4. 2. THE INTERACTION EFFECT OF INSTITUTIONAL QUALITY AND HUMAN DEVELOPMENT ON FINANCIAL DEVELOPMENT

Tables 5 and 6 below illustrate findings of the interaction effect of each indicator of institutional quality and human development to explain the change in financial development in terms of financial institutions and financial markets, respectively.

On the consideration of financial development in terms of financial institutions in Table 5, the interaction terms of institutional quality and human development (HDI\*IQ) show positive effects on financial institutions in terms of Voice and Accountability (VA), Government Effectiveness (GE), Regulatory Quality (RQ), and Rule of Law (RL) while Political Stability and Absence of Violence (PS) and Control of Corruption (CC) present non-significant impacts. This is because a higher quality of the institutional system could lead to equality of education, the healthcare system, and income in society, contributing to better human development in multidimensional (Ofori et al., 2024; Ivanyina & Salerno, 2021). Therefore, the interactive relation of human development and institutional quality creates a mutual influence that magnifies its effect on financial development in terms of financial institutions. Also, the results asserted that when human development is incorporated into the better quality of institutions, this case enlarges the positive effect on financial institutions presented by the higher coefficient in both HDI and HDI\*IQ compared to baseline results in Table 3. That means the development of human re-

sources offered by higher levels of knowledge and income results in more capital and demand in financial institutions. This process is facilitated by a good background in government, law, and regulatory systems, which can induce more efficient activities of financial institutions, spurring higher levels of development in middle-income countries.

Table 5. The interaction effect of human development and six indicators of institutional quality on financial development in terms of financial institutions (FID)

Variables	VA (1)	PS (2)	GE (3)	RQ (4)	RL (5)	CC (6)
FID <sub>t-1</sub>	0.148 (0.182)	0.208 (0.176)	0.328** (0.113)	0.262** (0.106)	0.405*** (0.075)	0.307** (0.121)
HD <sub>i,t</sub>	1.374*** (0.381)	1.036*** (0.322)	0.816*** (0.197)	0.955*** (0.193)	0.679*** (0.150)	0.854*** (0.231)
IQ <sub>i,t</sub>	-0.424* (0.256)	-0.142 (0.169)	-0.122 (0.074)	-0.161** (0.075)	-0.103* (0.061)	-0.032 (0.096)
HD*IQ	0.741* (0.396)	0.206 (0.237)	0.193* (0.114)	0.248** (0.116)	0.205** (0.096)	0.023 (0.158)
INF <sub>i,t</sub>	-0.007** (0.003)	-0.007** (0.003)	-0.005** (0.003)	-0.005** (0.002)	-0.003 (0.002)	-0.005** (0.002)
GROWTH <sub>i,t</sub>	0.003 (0.003)	-0.001 (0.003)	-0.003 (0.002)	-0.003 (0.002)	-0.003*** (0.001)	-0.002 (0.002)
FO <sub>i,t</sub>	-0.011 (0.062)	-0.013 (0.063)	0.039 (0.043)	-0.011 (0.039)	0.005 (0.010)	0.008 (0.011)
TO <sub>i,t</sub>	0.0002* (0.000)	0.0002* (0.000)	0.0002** (0.000)	0.0002** (0.000)	0.0001* (0.000)	0.0002* (0.000)
Obs.	939	939	939	939	939	939
AR(1)	0.517	0.347	0.004	0.012	0.001	0.018
AR(2)	0.713	0.669	0.936	0.736	0.939	0.775
Sargan test of overid restrictions	0.594	0.246	0.466	0.184	0.218	0.561
Sargan test of exogenous	0.212	0.232	0.346	0.269	0.461	0.210

Note: The abbreviations in Table 5 are explained as follows: FID denotes financial development in terms of financial institutions; HD is human development; IQ is institutional quality, which is presented by six indicators including Voice and Accountability (VA); Political Stability and Absence of Violence (PS); Government Effectiveness (GE); Regulatory Quality (RQ); Rule of Law (RL); and Control of Corruption (CC); HD\*IQ is the interaction term of human development and each indicator of institutional quality; GROWTH is GDP growth; INF is inflation; FO is financial openness; and TO is trade openness. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses.

Source: Author's estimation

Similarly, table 6 also documented that interaction terms between human development and institutional quality in terms of Political Stability and Absence of Violence (PS), Government Effectiveness (GE), and Rule of Law (RL) positively affect financial development in terms of financial markets. These effects are positive because when a higher quality of governance is presented by a more stable political regime and a more effective government and law system, mutual corporations with better human resources could promote investment in financial markets, increasing capital flow in financial markets and enhancing the development (Chen et al., 2023; Khan et al., 2020). In addition, the interaction between human development and institutional quality amplifies the influence on financial markets compared to observing separately in the previous results shown in Table 4. The results in Table 6 pointed out positive and high coefficients of interaction terms, and these results interpreted the importance of the combination of institutional quality and human development in the development of financial markets.

Table 6. The interaction effect of human development and six indicators of institutional quality on financial development in terms of financial markets (FMD)

Variables	VA (1)	PS (2)	GE (3)	RQ (4)	RL (5)	CC (6)
FMD <sub>t-1</sub>	0.429 (0.112)	0.328*** (0.093)	0.328*** (0.097)	0.347*** (0.101)	0.515*** (0.111)	0.385*** (0.088)
HD <sub>i,t</sub>	-0.200 (0.201)	-0.029 (0.122)	-0.483*** (0.180)	-0.197 (0.205)	0.173 (0.154)	-0.121 (0.195)
IQ <sub>i,t</sub>	0.164 (0.243)	-0.323*** (0.125)	0.156 (0.229)	-0.171 (0.285)	-0.218* (0.120)	-0.046 (0.208)
HD*IQ	-0.168 (0.371)	0.510*** (0.185)	0.193* (0.114)	0.086 (0.420)	0.400** (0.209)	0.130 (0.319)
INF <sub>i,t</sub>	-0.007 (0.005)	-0.006* (0.003)	-0.005** (0.003)	-0.008** (0.004)	-0.002 (0.005)	-0.005* (0.003)
GROWTH <sub>i,t</sub>	-0.011*** (0.004)	-0.008** (0.003)	-0.010*** (0.004)	-0.010*** (0.004)	-0.003** (0.001)	-0.007** (0.003)
FO <sub>i,t</sub>	0.004 (0.016)	0.003 (0.016)	0.004 (0.016)	0.004 (0.017)	-0.007 (0.016)	0.004 (0.015)
TO <sub>i,t</sub>	0.0002* (0.000)	0.0002* (0.000)	0.0003** (0.000)	0.0002** (0.000)	0.0001 (0.000)	0.0002 (0.000)
Obs.	939	939	939	939	939	939
AR(1)	0.001	0.001	0.001	0.001	0.001	0.001
AR(2)	0.162	0.154	0.150	0.115	0.121	0.152
Sargan test of overid restrictions	0.820	0.617	0.283	0.475	0.494	0.174
Sargan test of exogenous	0.140	0.440	0.340	0.386	0.442	0.374

Note: The abbreviations in Table 6 are explained as follows: FMD denotes financial development in terms of financial markets; HD is human development; IQ is institutional quality, which is presented by six indicators including Voice and Accountability (VA); Political Stability and Absence of Violence (PS); Government Effectiveness (GE); Regulatory Quality (RQ); Rule of Law (RL); and Control of Corruption (CC); HD\*IQ is the interaction term of human development and each indicator of institutional quality; GROWTH is GDP growth; INF is inflation; FO is financial openness; and TO is trade openness. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses.

**Source:** Author's estimation

When observing the results in both the baseline section and interaction effect, the findings reveal the important role of Rule of Law (RL) and Government Effectiveness (GE) in determining financial development among six indicators. This is presented by both RL and GE indicators supporting positive effects on financial development in both financial institutions and financial markets aspects, and these effects are unchanged when institutional quality is incorporated with human development. This finding highlights the crucial function of an efficient law system and an effective government that generally presents a quality environment in terms of implementation rules of society, public services, and the credibility of the government's commitment to formulate and conduct policies that create advantages for the development of the financial system in middle-income countries. Also, this study documented the non-significant effects of Control of Corruption (CC) on financial development raises concern about the complex influence of corruption in middle-income countries because corruption can be considered as grease on wheel for activities in the economy and its presence might exert a positive impact on economic growth (Spyromitros & Panagiotidis, 2022). Therefore, its effects should be further investigated in further research on financial development.

### 4. 3. ROBUSTNESS TESTS

In order to confirm the robustness property of the moderating effect of institutional quality on the relationship between human development and financial development, this research conducts robustness tests by adding remittance flows as a control variable to the model.

Previous studies observed remittance flows in explaining the change of financial development together with institutional quality (Odhiambo & Musakwa, 2024) and documented that remittance flows through the financial system can increase demand for financial products and services of receivers as well as facilitate the development of money transfer systems and provide more capital resources for financial markets, inducing the development of financial system (Azizi, 2020; Kakhkharov & Rohde, 2019). Therefore, including remittance inflows in the empirical model in this step to check for robustness is sufficient. Tables 7 and 8 below present the results of robustness tests for the effects of interaction between human development and institutional quality on financial institutions and financial markets. Generally, tables 7 and 8 show similar findings compared to tables 5 and 6 in the previous section. The main explanatory factors, including human development and interaction terms between human development and institutional quality, maintain similar dimensions and significant effects on financial development, despite minor changes in the magnitude of the coefficient. Accordingly, the research confirmed that the moderating effect of institutional quality on the relationship between human development and financial development is stable and statistically robust.

Table 7. Robustness tests (dependent variable: financial development in terms of financial institutions)

Variables	VA (1)	PS (2)	GE (3)	RQ (4)	RL (5)	CC (6)
FID <sub>t-1</sub>	0.046 (0.213)	0.190 (0.191)	0.331*** (0.114)	0.191* (0.115)	0.423*** (0.074)	0.248* (0.135)
HD <sub>i,t</sub>	1.643*** (0.445)	1.069*** (0.343)	0.771*** (0.197)	1.068*** (0.205)	0.632*** (0.150)	0.936*** (0.250)
IQ <sub>i,t</sub>	-0.687** (0.318)	-0.119 (0.171)	-0.120 (0.075)	-0.224*** (0.083)	-0.101 (0.063)	-0.051 (0.096)
HD*IQ	1.094** (0.487)	0.142 (0.239)	0.196* (0.115)	0.349*** (0.127)	0.203** (0.103)	0.060 (0.158)
RI <sub>i,t</sub>	0.006* (0.003)	0.004 (0.003)	-0.001 (0.001)	0.002 (0.002)	-0.004 (0.001)	0.002 (0.002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	0.946	0.429	0.003	0.050	0.001	0.075
AR(2)	0.611	0.852	0.930	0.835	0.941	0.779
Sargan test of overid restrictions	0.913	0.360	0.381	0.121	0.161	0.488
Sargan test of exogenous	0.946	0.613	0.406	0.349	0.739	0.177

Note: The abbreviations in Table 7 are explained as follows: FID denotes financial development in terms of financial institutions; HD is human development; IQ is institutional quality (six indicators); HD\*IQ is the interaction term of human development and each indicator of institutional quality; RI is remittance flows. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses.

Source: Author's estimation

Table 8. Robustness tests (dependent variable: financial development in terms of financial markets)

Variables	VA (1)	PS (2)	GE (3)	RQ (4)	RL (5)	CC (6)
FMD <sub>t-1</sub>	0.468*** (0.121)	0.351*** (0.100)	0.384*** (0.110)	0.408*** (0.115)	0.526*** (0.122)	0.414*** (0.095)
HD <sub>i,t</sub>	-0.164 (0.206)	-0.031 (0.135)	-0.407** (0.196)	-0.231 (0.233)	0.351** (0.179)	-0.139 (0.195)
IQ <sub>i,t</sub>	0.160 (0.256)	-0.301** (0.141)	0.079 (0.252)	-0.137 (0.328)	-0.334* (0.195)	-0.010 (0.212)
HD*IQ	-0.184 (0.398)	0.481** (0.205)	-0.069 (0.372)	0.043 (0.467)	0.545* (0.315)	0.061 (0.321)
RI <sub>i,t</sub>	-0.006 (0.003)	0.001 (0.003)	0.006 (0.004)	0.006 (0.004)	-0.001 (0.003)	0.002 (0.003)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	0.001	0.001	0.001	0.002	0.001	0.001
AR(2)	0.186	0.167	0.185	0.139	0.162	0.190
Sargan test of overid restrictions	0.787	0.468	0.405	0.688	0.837	0.154
Sargan test of exogenous	0.209	0.443	0.127	0.150	0.224	0.509

Note: The abbreviations in Table 8 are explained as follows: FMD denotes financial development in terms of financial markets; HD is human development; IQ is institutional quality (six indicators); HD\*IQ is the interaction term of human development and each indicator of institutional quality; RI is remittance flows. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses.

Source: Author's estimation

## 5. CONCLUSION

This study aims to research the linkage between human development, institutional quality, and financial development in 84 middle-income countries from 2004 to 2022. Additionally, the mutual influence of interaction terms between institutional quality and human development on financial development is observed. The baseline results using difference-GMM show the positive effects of human development on financial development in terms of financial institutions, while human development exerts a negative effect on financial development in terms of financial markets. Regarding institutional quality, this paper demonstrated the positive effects of almost six indicators of institutional quality such as Voice and Accountability (VA), Political Stability and Absence of Violence (PS), and Rule of Law (RL) show positive and consistent influence in financial development in terms of both financial institutions and financial markets while Regulatory Quality (RQ) and Control of Corruption (CC) differently affect financial institutions and financial markets, which need more investigation in further studies.

Remarkably, the empirical results highlight the essential role of the mutual influence of the interaction of each indicator of institutional quality and human development in magnifying its positive effects on financial development in both financial institutions and financial markets. This research also confirms the robustness of these findings by observing remittance flow as additional control variables. The robust tests emphasize that our results are strong and consistent.

The key empirical findings suggest policy implications tailored for middle-income countries. For human development, the positive effect on financial development in terms of financial institutions elicits policy makers should improve human aspects including longer healthy life, education and income to enrich capital resources in enhancing financial institutions. For institutional quality, middle-income countries should structure high-quality institutions that not only

facilitate financial activities but also create stable frameworks in socioeconomics. In addition, policies aimed at improving the government's capacity and designing effective regulation and law systems should be implemented to ensure the safety and stability of financial transactions that attract more capital flows for middle-income countries. This study documented the negative effects of human development and regulatory quality on financial development in terms of financial markets. This is due to the underdeveloped level of financial markets in middle-income countries; hence, policy makers should consider strategies to strengthen the legal and infrastructure background of financial markets as well as widen the size of financial markets to mitigate speculative trading and systematic risks. This research also supports the mutual effects of human development and institutional quality on financial development, policies incorporating both human resources and national governance capacity in middle-income countries should be done.

## **Appendix**

List of 84 middle-income countries: Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Belize, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Cabo Verde, Cambodia, Cameroon, China, Colombia, Congo, Costa Rica, Côte d'Ivoire, Djibouti, Dominican Rep., Ecuador, Egypt, El Salvador, Eswatini, Fiji, Gabon, Georgia, Ghana, Grenada, Guatemala, Guinea, Honduras, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz, Lao PDR, Lebanon, Lesotho, Malaysia, Maldives, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Myanmar, Namibia, Nepal, Nicaragua, Nigeria, North Macedonia, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Russian, Senegal, Serbia, South Africa, Sri Lanka, St. Lucia, Suriname, Tajikistan, Tanzania, Thailand, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Vietnam, Zambia.

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