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Inclusive human development and governance: a panel data analysis of selected Asian countries

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This study examines the role of governance in promoting inclusive human development across twenty-four selected Asian countries by analyzing panel data from 2010 to 2022. The World Bank's inequality-adjusted human development index is used as a measure of inclusive human development. Six governance indicators are analyzed as independent variables in each regression model, along with three control variables: trade openness, competitiveness, and developmental expenditure. The results of panel unit root tests, LLC, and ADF show that all the variables have the same order of integration. Ten different regression analyses are conducted, including six indicators, three dimensions, and an overall index. Principal component analysis is used to develop dimensions and an overall governance index. The findings of the study reveal a significant relationship between most of the governance indicators and inclusive human development in selected Asian countries. The study shows that political stability, governance effectiveness, rule of law, and control of corruption promote inclusive human development in selected Asian countries. However, voice, accountability, and regulation quality indicators are not significant. Developmental expenditure and competitiveness are identified as key factors for promoting inclusive human development. Moreover, all three dimensions of governance enhance inclusive human development in selected Asian countries.

KEYWORDS

Inclusive Human Development, Governance, Asian countries, Panel Data Analysis (PDA), Development Expenditure

1 Introduction

Many individuals have escaped extreme poverty, but unfortunately, not everyone has the means or opportunities to better their lives. Factors such as gender, social status, and parental income still significantly impact an individual's position in society (Sharma, 2007). The education and health of children are often directly affected by their parents' income. Disparities in health among different groups can begin at birth and persist throughout their lives. Children from lower-income families often face poor health and limited access to education, which frequently results in low academic achievement and high rates of absenteeism (Stylianou et al., 2023). For instance, two children born in 2000—one in a country with high human

development and the other in a country with low human development—have vastly different chances of enrolling in higher education. In countries with high human development, over half of 20-year-olds pursue advanced education, giving them a greater than 50–50 chance of attaining higher education. Conversely, the child born in a country with low human development is less likely to survive (UNDP, 2015; Rodrik, 2001). These circumstances are beyond their control and lead to different, often irreversible paths. Disparities in human development are not limited to developing countries but also exist in developed nations. These disparities can weaken social connections and foster a lack of trust in institutions and one another (Ezako, 2024; Landell-Mills and Serageldin, 1991; Stylianou et al., 2020; Boeninger, 1991). Such imbalances are detrimental to societies and should be remedied to ensure equitable opportunities for all.

The human development approach focuses on improving the wellbeing of individuals rather than just the economic growth of a country. Its goal is to provide equal opportunities and choices for every person, and to enhance their capabilities and access to opportunities. The concept of human development was first introduced in 1990 with the publication of the first human development report, which shifted the focus from economic growth to people's wellbeing. Education plays a crucial role in human development, helping to address global issues such as poverty, unemployment, illiteracy, and homelessness. The Human Development Index (HDI) is based on Amartya Sen's "capabilities" approach, which emphasizes the importance of ends over means (Sen, 1985). The HDI measures the average achievements in education, health, and living standards, but it does not measure the distribution of these achievements within the population (UNDP, 1990). Inclusive human development measures the average level of human development in a society while taking into account inequality in the distribution of health, education, and income. It is linked to at least six of the seventeen sustainable development goals (SDGs) (Asongu and Odhiambo, 2020; Akçay, 2006).

In 2010, the United Nations Development Programme (UNDP) developed a new index that takes into account inequality. This index, called the inequality-adjusted human development index (IHDI), measures the average achievements in health, income, and education while also considering the distribution of these achievements. The IHDI reveals that inequality causes a 20% loss in human development (UNDP, 2015). People at the top of the distribution have already achieved the maximum level of basic capabilities, such as primary and secondary education, low infant mortality rates, and access to basic technology. These capabilities are considered essential by the better-off sections of most societies.

Countries with high levels of human development tend to produce more carbon emissions per person and have larger environmental footprints. Environmental changes will impact human development in various ways, going beyond crop failures and natural disasters. It is estimated that by 2030 and 2050, environmental changes will lead to an additional 250,000 deaths annually from hunger, malaria, diarrhea, and heat stress. By 2050, hundreds of millions more people could be affected by extreme heat, and the geographical range for disease-carrying vectors like mosquitoes, which transmit malaria or dengue, is expected to shift and expand (UNDP, 2015; Greenaway et al., 2002).

Environmental changes will have the most significant impact on tropical regions initially, and since most developing countries are located in tropical areas, they will be affected the most. However, these

developing and poor economies have less capacity compared to wealthier countries to adapt to environmental changes and severe weather events. Consequently, environmental effects will worsen existing social and economic inequalities. Certain forms of inequality can also create difficulties in addressing climate change. For instance, high income disparities among nations can hinder the adoption of new climate-friendly technologies (Stylianou et al., 2023).

Inequality contributes to environmental disaster in various ways. However, there are opportunities to address both economic disparities and environmental disaster together, which can help nations move towards inclusive and sustainable human development. Environmental and climate degradation, along with a significant decline in biodiversity, pose a threat to the human development of present and future generations (Miranda-Lescano et al., 2024; UNDP, 1997). Improvements in human development cannot be sustained without addressing environmental degradation and atmospheric changes, which have been intensified by current HDI advancements (UNDP, 1997).

Good governance encompasses the effective management of a nation's political, economic, and social affairs to foster development (World Bank, 1993). It involves the use of political authority, regulatory power, and economic influence to address the issues within a country. Governance consists of a set of mechanisms, procedures, and frameworks that empower individuals and groups to express their interests, exercise their rights, and resolve their differences (Turner, 2011; Hulme et al., 2015; Stylianou, 2023).

Effective governance is pivotal in reducing poverty and fostering sustainable development. When complemented by inclusive and pro-poor structures and processes, it becomes a potent force for positive change. Sound governance is vital for the efficient management of natural resources and conservation efforts, with significant implications for ecological activities and outcomes (Kaufmann et al., 2003; Pradhan, 2011; Sebudubudu, 2010; Turner, 2011). Upholding the rule of law, ensuring access to information, and promoting equal access to justice are fundamental components of poverty reduction and long-term economic growth. Weak governance can lead to adverse outcomes and social issues such as corruption, marginalization, and diminished trust in authorities. Conversely, good governance facilitates the implementation of eco-friendly policies, guides individuals towards productive outcomes, and encourages sustainable resource utilization (Stylianou et al., 2023; Zahari and Sudirman, 2017). Conversely, poor governance can impede economic progress and human development, resulting in ineffective rule of law, political instability, and corruption. In order to foster economic growth and human development, sound governance is indispensable, particularly in developing countries (Tan, 2024; Turner, 2011; Falvey et al., 2012).

The aim of this study is to explore the relationship between inclusive human development, governance, trade openness, and development expenditure for a panel of twenty-four selected Asian countries between 2010 and 2022.

2 Review of literature

2.1 Human development and governance

In a study conducted by Hassan et al. (2020), the researchers investigated the connection between competitiveness, governance,

human development, and poverty. The study utilized data from 2005 to 2016 and analyzed governance indicators such as competitiveness, trade openness, and development expenditure as independent variables. Poverty was considered as a dependent variable, and data on poverty was derived from the World Development Index. Governance data was collected from the World Governance Index (WGI). The study's findings suggested that there is no significant association between poverty and governance indicators. However, development expenditure, competitiveness, and trade openness were found to have a substantial impact on poverty alleviation. In another study, [Esona \(2020\)](#) found that government size has a significant negative effect on reliability policies and a 1% increase in politics results in a 0.11% decrease in corruption. [Adams and Abhayawansa \(2022\)](#) investigated the relationship between electricity access, HDI, governance, and corruption in sub-Saharan Africa from 1990 to 2017. The results indicated that corruption has a significant negative impact on HDI, while governance and electricity access have a positive impact on HDI. Additionally, a study by [Hashem \(2019\)](#) discovered no association between governance and economic growth in Middle Eastern and North African countries. Nevertheless, the study identified a significant relationship between governance and human development. Furthermore, [Ahmad and Saleem \(2014\)](#) examined the effect of governance indicators on human development, using data collected from the World Bank for governance indicators and United Nations development data for human development. This study found that governance indicators have a substantial impact on the human development of the economy.

In a study conducted by [Pradhan \(2011\)](#), it was found that good governance is a crucial factor for the progress of human development in the Indian economy. Similarly, [Kesar and Jena \(2022\)](#) examined the role of governance indicators in human development and discovered that three indicators have a positive effect. Additionally, good governance performance has a significant impact on the HDI. [Sen \(2015\)](#) investigated the relationship between governance and development issues in Asia. The study used cross-section data on governance from the University of QOG and the World Bank, as well as development indicators in empirical analysis. It was found that governance has a significant impact on development indicators, meaning that the development indicator has a substantial impact on governance. The study also demonstrated that governance has a positive impact on development indicators.

[Cheema and Maguire \(2001\)](#) concluded that external factors influence the strategic offerings of democratic governance and they use indicators to measure their relative progress. Indicators can be useful tools for informing external partners and recipients of aid about what works, what does not work, and why. [Asongu and Nwachukwu \(2017a,b\)](#) studied the impact of globalization on inclusive development. The study focused on the income aspects of countries, their legal frameworks, landlockedness, and political stability. They used econometric techniques like fixed effects and tobit regressions for their analysis. The study found that proper domestic and foreign policies, along with financial resources, should be associated with the development of governance to promote globalization and inclusive human development. [Hasin \(2023\)](#) measured the role of government effectiveness in human development. In the past, human development was improved by economic growth, but in the current situation, human development could be improved by government performance. The government has the responsibility to pay attention to labour

quality and the welfare of the people, and if it does so, human development will improve. Furthermore, [Kesar and Gökmen \(2005\)](#) investigated the relationship between governance and human development in the case of 33 members of the European Union from 2002 to 2012. The study found that better governance has a positive impact on human development and better governance leads to better performance for any country.

[Ouma and Nadzanja \(2019\)](#) conducted a study to measure the impact of government expenditure and governance on human development in the common markets of eastern and southern African countries. They used a random effect model and the two-step generalized method of moments (GMM) to arrive at their conclusion. Their study revealed that fiscal policy and governance have a significant and positive impact on human development. This finding is not limited to economic conditions but also focuses on the social conditions of these African countries. In [Pahlevi \(2017\)](#) conducted a study in Indonesia to measure the impact of governance and expenditure on human capital. This study focused on the expenditures made in health and education on human development in 33 provinces from 2008 to 2012. The study concluded that expenditure and governance have a significant and positive effect on human development. Similarly, [Pradhan](#) conducted a study in 2012 in Nepal to measure the relationship between corruption and HDI. The study identified some reasons behind the relationship between corruption and HDI, such as weak rule of law, political parties lacking, a culture of science, and a lack of government intervention. The study also found a "W"-shaped correlation trend between HDI and corruption based on past interfaces. [Caron et al. \(2012\)](#) conducted a study to examine the changes in the quality of governance in twenty-seven European countries at the state level. They measured the proportion of good governance based on the indicators of governance voice and accountability, corruption, government effectiveness, and protection of the law. The study concludes that there is a significant relationship between the governance index and social variables. The author also concludes that good governance has a significant impact on economic growth.

[Scholl and Schermuly \(2020\)](#), examined the relationship between corruption, GDP, and HDI. The study found that corruption has a negative impact on HDI, whereas GDP has a positive impact on HDI. [Gomes and Barros \(2019\)](#), studied the impact of corruption and HDI on the Brazilian economy from 2010 to 2018. The research found that public corruption is more harmful than private corruption because of accountability and transparency in the public sector. The data shows that countries with greater corruption have a lower human development index, which may suggest accountability issues in the private sector. In another study, [Brada et al. \(2019\)](#) measured the relationship between corruption and HDI in developing nations and used corruption, GDP, and FDI as dependent variables. The study found that corrupt countries receive less foreign direct investment, and GDP has a significant relationship with HDI, whereas corruption has a negative effect on HDI.

[Shahzad \(2017\)](#) conducted a study to measure the impact of corruption, governance, and sustainable development on the Pakistani economy using data from 2000 to 2015. The study employed the GMM and OLS methods and found that democratic accountability and law-of-order corruption have a negative impact on HDI. However, globalization has a positive impact on HDI. In a separate study, [Akram et al. \(2011\)](#) examined the relationship between poverty, governance,

and income inequality in Pakistan, using data from 1984 to 2008. The authors used the ARDL approach for the estimation of the result, and the data has been taken from a world development indicator. The study found that there is a significant association between poverty and income inequality. Poor governance has a significant relationship with poverty in the long term, but in the short term, it does not have a positive impact on poverty. The authors explained that there is a positive relationship between the variables. Uddin and Joya (2007) conducted a study to examine the connection between governance and development. The study concludes that good governance leads to high *per capita* income, which in turn improves social indicators. The study further explains that strong political institutions lead to good governance, which will eventually result in a high *per capita* income.

2.2 Human development index and development expenditure

In a study carried out by Haq and Zia (2009), the focus was on exploring the relationship between governance and the limited growth of Pakistan. Using time series data covering the years 1996 to 2005, the researchers sought to establish this connection. The findings revealed an increase in poverty and income inequality, coupled with a decrease in the income share and consumption of the poor. Employing the interpolation method and ordinary least squares, the authors estimated the link between governance and pro-poor growth. Ultimately, the study affirmed that governance significantly influences pro-poor growth, suggesting that good governance could play a role in reducing poverty and inequality. Moving forward to 2017, Sudirman conducted a study to examine the link between education, health expenditure, and the human development index. This research, based on data from 2001 to 2015 in the provinces of Jambi, demonstrated that there is no positive correlation between education and human development, instead highlighting that health expenditure has a pronounced impact on human development.

Omodero (2019) conducted a study to examine the correlation between general government spending and human development in Nigeria using time-series data from 2003 to 2017. The results indicated that capital expenses have a negative impact on the human development index, while corruption does not seem to affect human development. In a separate study, Sulistyowati et al. (2017) investigated the impact of government expenditure on human development (HDI) using the two-stage least squares method for estimation. This study underscored that significant improvements in income, education, health, and infrastructure can contribute to higher levels of human development.

2.3 Human development index and competitiveness

In a study by Muchdie (2017), it was concluded that there is a significant association between happiness and human development. Radenović and Krstić (2017) examined human capital development and competitiveness in European countries and Serbia using data from the human development index and the WEF, finding a positive relationship between the human development index and competitiveness. Ülengin et al. (2011) explored the connection

between the competitiveness of a state and the development of a nation, concluding that competitiveness positively impacts the human development of a country. Lonska and Boronenko (2015) illustrated the link between competitiveness and human development, emphasizing that the study is based on secondary world comparative research using data collected from surveys of micro and macroeconomic foundations. Lastly, Reyes and Useche (2019) studied the relationship between competitiveness, human development, and economic growth in twenty countries from 2006 to 2015, and concluded that there is a strong connection between competitive human development and economic growth.

2.4 Human development index and trade openness

Several research studies have been carried out to examine the link between trade openness, economic growth, and human development in Asian nations. Mustafa et al. (2017) conducted an analysis of data from 1990 to 2011 from 12 Asian economies, revealing a positive relationship between trade openness and both economic growth and human development in Asia. The study also emphasized the success of trade liberalization policies in the region, which have contributed to increased growth, enhanced income distribution, and improved human development. Similarly, Fakhri and Sheikhbahire (2008) investigated the impact of openness, growth, and development in East Asia using data from 1975 to 2005. Their findings indicated that trade openness has a favorable influence on economic growth and development. Furthermore, the study revealed that more developed nations experienced slower growth.

In a comprehensive study, Mustafa et al. (2017) thoroughly examined the relationship between openness, economic growth, and human development in South Asian countries, using data spanning from 1990 to 2007. The results unequivocally demonstrated a robust, positive impact of openness and FDI on economic growth. Similarly, Afza and Nazir's (2007) investigation into the impact of economic competitiveness and HRD in the South Asian region left no doubt that proficient human resource management significantly bolsters economic competitiveness in the region. Furthermore, Rizavi et al. (2020) meticulously measured the effects of growth, human development, and trade in 12 developing Asian countries from 1970 to 2011, unearthing compelling evidence of human development's positive contribution to economic growth in the case of Asian growth, despite its seemingly equivocal influence on human development.

3 Data and methodology

3.1 Data sources and variable construction

The study selected 24 Asian countries based on data availability. The sample period ranges from 2010 to 2022. This study follows the study of Keser and Gökmen (2005), who developed the following econometric model to find out the relationship between inclusive human development and governance indicators by adding several control variables. The intention behind this modelling is to explore the individual effect of each governance indicator on inclusive human

development in selected Asian countries. Equation 1 represents the general model as follow:

$$IHDI_{i,t} = \beta_0 + \beta_1 COM_{i,t} + \beta_2 VAC_{i,t} + \beta_3 PS_{i,t} + \beta_4 GE_{i,t} + \beta_5 RQ_{i,t} + \beta_6 ROL_{i,t} + \beta_7 COC_{i,t} + \beta_8 TO_{i,t} + \beta_9 DE_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where, inequality adjusted human development index (IHDI), competitiveness (COM), development expenditure (DE), trade openness (TO), governance effectiveness (GE), control of corruption (COC), political stability (PS), rule of law (ROL), voice and accountability (VAC), and regulatory quality (RQ).

The study used principal component analysis for the construction of three dimension of governance and finally overall governance index. Equation 2 is the general form of the model adding the three dimensions of governance.

$$IHDI_{i,t} = \beta_0 + \beta_1 EG_{i,t} + \beta_2 IG_{i,t} + \beta_3 PG_{i,t} + \beta_4 COM_{i,t} + \beta_5 TO_{i,t} + \beta_6 DE_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where economic governance (EG), institutional governance (IG), and political governance (PG).

Finally, by adding the overall governance index the model is as follow;

$$IHDI_{i,t} = \beta_0 + \beta_1 GovI_{i,t} + \beta_2 COM_{i,t} + \beta_3 TO_{i,t} + \beta_4 DE_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where governance index is GovI. The Table 1 shows the variable descriptions, their types, and data sources.

3.2 Empirical methodology

3.2.1 Panel unit root tests

It is common practice to use simple unit root tests in time series analysis to overcome the problem of spurious results, but panel unit

root has become exceptionally popular in econometric analysis since the 1990s. There is vast research work on the stationarity of panel data due to the availability of new datasets like Penn World tables. Panel unit root tests possess higher power and consider heterogeneity problems, while simple unit root tests do not exhibit this property. The power of the test depends on the variation of the data, and panel data has significantly more variations across cross sections and time due to the higher number of observations and larger cross sections. Whereas heterogeneity is concerned with panel data because of several cross-sections, time series analysis deals with a single entity.

Quah (1992, 1994) developed the panel unit root test; initially, Breitung and Meyer (1994) promoted the same idea. Levin and Lin, 1993 also contributed to the literature, but these tests have several limitations, such as the Quah (1992, 1994) test, which does not consider the issue of serial correlation and considers infinite N and T. Similarly, the application of Breitung and Meyer (1994) requires infinite N and fixed T, which is not suitable for panel data because micropanel data have been changed to macropanel data these days. It also ignores the heterogeneous residual distribution of individual effects. Levin et al.'s (2002) test removes the drawbacks of previous tests with some modifications. Furthermore, there are two categories of panel unit root tests. This classification is based on the cross-sectional dependence criterion. The tests that are based on cross-sectional independence are known as first-generation tests. Among first-generation tests, some exhibit a common unit root process, while others are based on individual unit root processes. These are further divided into two categories known as non-stationarity tests and stationarity tests based on differences in the null hypothesis. Second-generation tests allow cross-sectional dependence, and these tests are further subdivided into factor structure approaches and other approaches. The second-generation tests are still under development and are not used commonly yet because of the unavailability of statistical software. The first-generation tests have some similarities and differences. The LLC and IPS both follow the ADF procedure, but both have different alternative hypotheses. Levin, Lin, and Chu (LLC), Breitung, and Hadri tests have a common unit root process, meaning that all cross sections possess common autocorrelation coefficients,

TABLE 1 Definition and data sources of variables.

| Abbreviation | Variable name | Variable type | Data source |
|--------------|-----------------------------------|----------------------|-------------|
| IHDI | Inclusive Human Development Index | Dependent Variable | World Bank |
| GovI | Governance Index | Independent Variable | WGI |
| VAC | Voice and Accountability | Independent Variable | WGI |
| PS | Political stability | Independent Variable | WGI |
| GE | Government effectiveness | Independent Variable | WGI |
| RQ | Regulatory quality | Independent Variable | WGI |
| ROL | Rule of Law | Independent Variable | WGI |
| COC | Control of Corruption | Independent Variable | WGI |
| COM | Competitiveness | Independent Variable | WGI |
| TO | Trade openness | Independent Variable | WDI |
| DE | Development Expenditure | Independent Variable | WDI |
| EG | Economic Governance | Independent Variable | WGI |
| IG | Institutional Governance | Independent Variable | WGI |
| PG | Political Governance | Independent Variable | WGI |

whereas Im, Pesaran, and Shin and the Fisher-ADF and PP tests follow individual unit root processes. These differences in tests can generate different results; therefore, researchers should use two or more tests for better results. The study employs LLC and IPS tests. However, IPS performs better than LLC because it resolves the issue of serial correlation in LLC and permits heterogeneity.

4 Results and discussion

4.1 Results of panel unit root

The study utilized two panel unit root tests in order to address the problem of stationarity in the data (see Table 2). Most of the panel series have trend and intercept; the stationarity of the data has been checked with trend and intercept. The second column of the table shows the results of the LLC panel unit root test, which depict that all the variables are stationary at $I(0)$. The calculated value of LLC has been compared with the tabulated values computed using an asymptotic Chi-square distribution. Some variables are stationary at $I(0)$ at 1% significance, while others are at the 5% significance level. Similarly, the results of the ADF-Fisher panel unit root test show the same results, as all the variables have $I(0)$ at 1 and 5% significance levels. The results of both tests confirm that all the variables have $I(0)$.

4.2 Results of econometric model by indicators

The Table 3 shows the result of panel regression analysis after checking the fixed and random effects. Six models have been estimated based on the econometric models discussed in the data and methodology section. In each regression, the study has changed the governance indicator, but control and dependent variables remain the

same for all models. There are three major dimensions of governance: political governance, economic governance, and institutional governance. Each dimension is based on two indicators, as discussed in the data and methodology section.

The second column of the table shows the result of the regression analysis when the study used political stability as a governance indicator. The results of the first model depict that all the variables are significant except trade openness. The study found that political stability enhances inclusive human development in selected Asian countries. The results show that if there is political stability in the country, there will be inclusive human development. Furthermore, developmental expenditure and competitiveness also enhance inclusive human development in selected Asian countries.

The third column shows the results of the second model, in which voice and accountability have been used as indicators of governance. This variable is negatively and insignificantly related to inclusive human development. Similar to the results of the first model, developmental expenditure and competitiveness are again positively related to inclusive human development in selected Asian countries.

The fourth column shows the result of the third model, in which regulation quality has been used as an indicator of inclusive human development. The results explore that regulation quality is positively and insignificantly related to inclusive human development in selected Asian countries. Developmental expenditure and competitiveness are positively and significantly related to inclusive human development. The fifth shows the results of a regression analysis in which governance effectiveness has been used as an indicator of inclusive human development for selected Asian countries. The variable of governance effectiveness is positively related to inclusive human development. Similar to the previous regression results, developmental expenditure and competitiveness are positively and significantly related, while trade openness is negatively and insignificantly related to inclusive human development.

The sixth column depicts the results of regression analysis, in which the rule of law has been used as an indicator of governance. The rule of law has positive effects on inclusive human development as it is positively related to dependent variables. Again, developmental expenditure and competitiveness have positive impacts on inclusive human development in selected Asian countries.

The last column of the table shows the results of the regression analysis in which control of corruption has been used as an indicator of governance. The results indicate that controlling corruption enhances inclusive human development in selected Asian countries. Similar to the previous regression results, trade openness is insignificant, while developmental expenditure and competitiveness enhance inclusive human development. In all six models, there is a random effect, as checked through the Hausman test. All the diagnostic tests show that the results are reliable, and there is good precision in the estimates. All the governance indicators are positively enhancing inclusive human development for selected Asian countries, except voice, accountability, and regulation quality. The results are in line with the existing literature on governance and growth relationships. The study by Asongu and Odhiambo (2020) also found that governance indices enhance inclusive growth in sub-Saharan African countries. Another study by Asongu and Nwachukwu (2017a,b) also highlighted the fact that stability in governance indicators confirms inclusive human development. The literature

TABLE 2 Results of unit root tests.

| Variables | Levin, Lin & Chu | ADF—Fisher Chi-square |
|------------|------------------|-----------------------|
| IHDI | −18.0358* | 64.1987* |
| COM | −11.0333* | 27.8355* |
| DE | −4.56698* | 26.5048* |
| TO | −3.10754** | 14.6128*** |
| GE | −6.76706* | 34.8641* |
| COC | −4.29074* | 26.8834* |
| PS | −17.7264* | 42.7354* |
| ROL | −8.06792* | 40.1437* |
| VAC | −6.19445* | 33.0448** |
| RQ | −4.26079* | 15.6878** |
| EG | −18.1208* | 57.3753* |
| IG | −24.4516* | 62.4627* |
| PG | −16.3474* | 58.3481* |
| Governance | −18.1209* | 57.3757** |

Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. * shows 1 percent significance level, ** 5 percent significance level.

TABLE 3 Panel regression analysis.

| Independent variables | Political governance | | Economic governance | | Institutional governance | |
|-----------------------|-------------------------|--------------------------|-----------------------|--------------------------|--------------------------|-------------------------|
| | Political stability | Voice and accountability | Regulation quality | Governance effectiveness | Rule of law | Control of corruption |
| COM | 0.035922* [0.0043] | 0.037284* [0.0030] | 0.037234* [0.0031] | 0.038239* [0.0025] | 0.039880* [0.0037] | 0.037219* [0.0031] |
| DE | 0.028008*** [0.1006] | 0.032401*** [0.1127] | 0.053057 [0.9168] | 0.026867*** [0.1016] | 0.027367*** [0.1041] | 0.032724 [0.6985] |
| TO | −0.016472 [0.5879] | −0.017291 [0.5711] | −0.064557 [0.9493] | −0.010464 [0.7360] | −0.011988 [0.7003] | −0.019490 [0.8233] |
| PS | 0.006920* [0.02414] | | | | | |
| VOC | | −0.009768 [0.3717] | | | | |
| RQ | | | 0.024752 [0.9612] | | | |
| GE | | | | 0.008791*** [0.1044] | | |
| ROL | | | | | 0.006674** [0.0627] | |
| COC | | | | | | 0.004405*** [0.0957] |
| C | 0.466315* [0.0000] | 0.455260* [0.0000] | 0.457636* [0.0000] | 0.454241* [0.0000] | 0.445634* [0.0000] | 0.457643* [0.0000] |
| Chi-Sq. Statistic | 10.476119 [0.0331] | 14.942414 [0.0048] | 10.264753 [0.0362] | 11.187854 [0.0245] | 11.580511 [0.0208] | 10.315551 [0.0354] |

| Fixed/Random Effect | Random effect | Random effect | Random effect | Random effect | Random effect | Random effect |
|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| R-square | 0.986805 | 0.986759 | 0.986694 | 0.986741 | 0.986713 | 0.986694 |
| F-statistics | 454.2590 | 452.6446 | 450.4178 | 452.0466 | 451.0686 | 450.4192 |
| Observations | 288 | 288 | 288 | 288 | 288 | 288 |

IHDI is the dependent variable in all models; *p*-values are given in parenthesis. *shows 1 percent significance level, ** 5 percent significance level, *** 10 percent significance level.

shows that not all the indicators of governance are positively related to inclusive human development; some of the governance indicators are even negatively related, like political stability, while others are insignificant, like regulation quality.

4.2.1 Results of econometric model by dimensions

The study further moved towards the analysis of dimensions of the governance index after analyzing the six indicators of governance. For this purpose, the study utilized the methodology of principal component analysis (PCA) for the construction of three dimensions of the governance index for selected Asian countries (Table 4). By using the study, we developed three dimensions of the governance index and later developed an overall governance index through these three dimensions, i.e., political governance, economic governance, and institutional governance. The second column shows the results of the regression analysis in which political governance has been used as a governance dimension. The results depict that strong political governance enhances inclusive human development in selected Asian countries.

Developmental expenditure and competitiveness have significantly contributed to inclusive human development. The second column also shows that economic governance enhances inclusive human development in selected Asian countries. The fourth column shows the results of the regression analysis in which institutional governance has been used as a governance dimension. The results indicate that institutional governance, developmental expenditure, and competitiveness are positively related to inclusive human development.

The last column shows the results of the regression analysis in which the overall governance index has been used. The results depict that governance enhances inclusive human development in selected Asian countries. The impact of trade openness remains insignificant throughout our analysis, while developmental expenditure and competitiveness are positively related to inclusive human development. The results of this study are in line with the existing literature on governance dimensions and growth relationships. The studies by Asongu and Odhiambo (2020) and Asongu and Nwachukwu (2017a,b) also show that governance dimensions are positively related to inclusive human development in sub-Saharan African countries.

TABLE 4 Panel regression analysis for governance and its dimensions.

| Independent variables | Political governance | Economic governance | Institutional governance | Governance |
|---------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
| Competitiveness | 0.037437* [0.0029] | 0.036424* [0.0038] | 0.036141* [0.0035] | 0.036423* [0.0038] |
| Developmental expenditure | 0.026918*** [0.1019] | 0.028752*** [0.1407] | 0.019213 [0.3488] | 0.028752*** [0.1607] |
| Trade openness | −0.013269 [0.6647] | −0.015692 [0.6063] | −0.002777 [0.9272] | −0.015692 [0.6063] |
| Political governance | 0.001344* [0.0548] | | | |
| Economic governance | | 0.001823* [0.0438] | | |
| Institutional governance | | | 0.005139* [0.0179] | |
| Governance | | | | 0.001823* [0.0438] |
| C | 0.456588* [0.0000] | 0.461252* [0.0000] | 0.461811* [0.0000] | 0.461252* [0.0000] |
| Chi-Sq. Statistic | 12.472055 [0.0142] | 10.489802 [0.0329] | 12.717859 [0.0127] | 10.489802 [0.0329] |

| Fixed/random effect | Random effect | Random effect | Random effect | Random effect |
|---------------------|---------------|---------------|---------------|---------------|
| R-square | 0.986724 | 0.986743 | 0.987142 | 0.986743 |
| F-statistics | 451.4413 | 452.0894 | 466.3359 | 452.0895 |
| Observations | 288 | 288 | 288 | 288 |

IHDI is the dependent variable in all models. *p*-values are given in parenthesis. *shows 1 percent significance level, ** 5 percent significance level, *** 10 percent significance level.

5 Conclusion and policy options

Governance is quite an ancient concept and considered as one of the main elements for wealthy development in any country. In the current development literature researchers are being progressively used this term, particularly good governance. Mostly, the term governance refuge all those aspects of the way a country is governed (Sharma, 2007; Graham et al., 2003). Governance has a significant role towards economic stability, strong legal system, better education, good health, environment protection, and creation of a good business environment and many more (Landell-Mills and Serageldin, 1991; Boeninger, 1991). For conquering the better economic growth and human development, in any economy, presence of good governance is vital, particularly in developing nations (Turner, 2011). The governance has important effect on endure the economic growth, development as well as human welfare, in long run Kaufmann et al. (2003), Pradhan (2011), Sebudubudu (2010), and Turner (2011), Wardani and Sulistyowati (2023).

This study tries to examine the role of governance on inclusive human development in case of twenty-four selected Asian countries by using the panel data from 2010 to 2021. Inequality adjusted human development index, developed by World Bank, has been used as a proxy of inclusive human development. Six indicators of governance have been used as independent variable in each regression model along with three control variables, i.e., trade openness, competitiveness, and developmental expenditure. There are three major dimensions of governance, political governance, economic governance, and

institutional governance. Each dimension is based on two indicators, as political governance is based on two indicators, i.e., political stability and voice & accountability. Economic governance is based on two indicators, i.e., regulation quality and governance effectiveness while institutional governance is based on two indicators, i.e., rule of law and control of corruption. Principal component analysis has been used to develop dimensions and overall governance index.

The study used two panel unit root tests, LLC and ADF, to check the problem of stationarity in the data. The results of panel unit root test depict that all the variables have same order of integration. Furthermore, all the variables are stationary at I(0). Moreover, the study used Pearson Correlation matrix to find out the association among variables. The findings show mixed level of correlation among variables as some of the variables are highly correlated such as DE and COC, ROL and DE, TO and RQ, TO and COC, ROL and COC, TO and DE. Furthermore, some of the variables have low correlation among each other like PS and COM, PS and IHDI, RQ and PS. Some of the variables have moderate correlation among each other whose value is greater than 50 percent and less than 90 percent.

The analysis comprised 10 regression analyses, encompassing six indicators, three dimensions, and an overall index. The study unequivocally demonstrated that political stability, governance effectiveness, rule of law, and control of corruption significantly promote inclusive human development in selected Asian countries. Moreover, it confidently established that voice and accountability as well as regulation quality indicators hold no significance. Additionally,

it firmly concluded that developmental expenditure and competitiveness exert a substantial impact on inclusive human development. Throughout the analysis, trade openness consistently demonstrated insignificance. Furthermore, the study definitively proved that overall governance, political governance, economic governance, and institutional governance all play pivotal roles in enhancing inclusive human development in selected Asian countries. The results of the Hausman test emphatically confirmed the presence of random effects throughout the analysis.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: World Bank and <https://www.worldbank.org/en/publication/worldwide-governance-indicators>.

Author contributions

TS: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. RN: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MW: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology,

Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. UN: Conceptualization, Validation, Visualization, Writing – original draft, Writing – review & editing.

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