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Asian Economic Sustainability: A Focus on Financial Development, Education, and Governance

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Abstract

In order to achieve economic sustainability, Asian nations must coordinate their efforts with the Sustainable Development Goals (SDGs) of the United Nations. This paper explores this vital issue. Asia plays a crucial role in the global economy, which emphasizes how urgent it is to improve economic sustainability in order to promote justice and resilience on a global scale. In order to examine the factors that influence economic sustainability in the area between 2000 and 2021, this study looks into the effects of financial development, education, governance, and labor force dynamics. The study applies a rigorous econometric technique and makes use of panel regression and panel two-stage least squares (2SLS) models to illuminate the various aspects that impact the sustainability of economies in Asia. The empirical results highlight the critical roles that government expenditures on financial development, workforce expansion, and education play in promoting economic sustainability. Moreover, governance metrics positively influence GDP, suggesting that governance plays a critical role in determining long-term economic results. For steady and fair economic growth, this paper recommends giving priority to policies that assist financial development, wise educational investments, and the promotion of good governance. Policymakers can build focused initiatives that support economic sustainability and are in line with the larger global goal for resilient and inclusive development by using the identified determinants and their interaction.

***Keywords*:** Economic sustainability, Sustainable Development Goals, Asia, Financial development, Education, Governance

1. Introduction

Asia is a major global player and has some of the most diversified economies in the world. The globe as a whole will be greatly impacted by these economies' strength and expansion. Researchers and politicians worldwide are taking notice of Asia because of its remarkable expansion, rapid industrialization, and dynamic economic performance. The economic upsurge, dubbed the "Asian Miracle" at times, has prompted investigations into the elements that have fueled this growth. Asia has had remarkable economic growth, but it still faces many challenges and uncertainties that necessitate careful analysis.

The "Asian Financial Crisis" of 1997 is one significant event in Asian economic history that merits consideration. It was a turning point that permanently altered the economic landscape of the region. Due to the crisis, financial systems had to be reevaluated, and it became clear how important it is to have strong financial institutions and efficient regulatory frameworks in place to ensure economic sustainability (Klemkosky, 2013; Ali, 2022). As such, it closely complies with the SDGs, especially SDG 8: Decent Work and Economic Growth and SDG 9: Industry, Innovation, and Infrastructure, which emphasizes the significance of building sound financial institutions for economic growth.

Yet there are substantial variations in the economic achievements of Asia's different nations. Particular opportunities and challenges have arisen as a result of each nation's individual national circumstances and growth trajectory. As a result, it is critical to recognize the basic elements promoting economic sustainability as well as the varied ways in which these elements appear in various Asian countries (Abbas et al. 2022; Hussain et al. 2022). This helps us achieve SDG 10: Reduced Inequalities and SDG 1: No Poverty by ensuring that economic growth is inclusive and benefits all facets of society.

The Asian continent's quest for economic sustainability is an issue of global importance rather than just regional importance. The region's large population, significant global economic ties, and potential to act as a developmental role model for the rest of the world are the reasons for sustainability. Consequently, this study provides multiple persuasive explanations that are in line with different SDGs. According to SDG 7: Affordable and Clean Energy, Asian production and consumption trends for energy are significant worldwide. In addition, the need for sustainable urban development arises from the massive urbanization that is taking place in Asian cities, making SDG 11: Sustainable Cities and Communities relevant. Last but not least, since Asia contributes significantly to global carbon emissions, this study also relates to SDG 13: Climate Action, emphasizing the importance of sustainable economic growth that is environmentally responsible.

By emphasizing the critical roles that financial development, education, and governance play as determinants of economic sustainability, this research takes a unique perspective. These elements directly support a number of SDGs. As an illustration, SDG 4: Quality Education and its influence on the formation of economic sustainability are closely related. Education guarantees the development of human capital, which promotes economic growth and creativity (Chaudhary et al., 2009; Rehman et al. 2010; Ali, 2022; Audi et al., 2023). Similar to SDG 16: Peace, Justice, and Strong Institutions, good governance is a prerequisite for sustainable development, so the two are inextricably intertwined. SDG 17: Partnerships for the Goals emphasizes the significance of global collaboration in accomplishing these goals, especially concerning financial systems and regulatory frameworks (Claessens & Kose, 2018).

Gaining an in-depth understanding of the different factors supporting economic sustainability in Asian countries is the main goal of this research, with a particular emphasis on financial development, governance, and education. The SDGs and these research goals are closely related. Economic growth and productive employment are emphasized in SDG 8: Decent Work and Economic Growth,

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as they are closely related to financial development. SDG 9: Industry, Innovation, and Infrastructure highlights how innovation and infrastructure development are essential for promoting sustainability and economic prosperity. Moreover, the significance of governance in attaining peace, justice, and sustainable development is acknowledged by SDG 16: Peace, Justice, and Robust Institutions. Accomplishing these goals is essential to achieving the larger SDGs.

The overall objective of this research seeks to fill substantial gaps in the body of knowledge and contribute significantly to the field of Asian economic sustainability. Although earlier research has frequently focused on the individual effects of different factors that drive economic growth in Asia, the goal of this study is to offer a thorough analysis that takes into account the simultaneous effects of financial development, governance, and education. This all-encompassing strategy adheres to the SDGs' integrative framework by acknowledging that social, environmental, and governance factors must be taken into account in addition to economic sustainability.

Furthermore, the significance of robust financial institutions and regulatory frameworks was highlighted by the Asian Financial Crisis of 1997. The economic viability of the ensuing financial system changes and advancements in the region have not received much attention. Because of this, the research is pertinent and contemporary with regard to the current SDG talks and goals, especially SDG 17: Partnerships for the Goals. The study highlights the necessity of global collaboration and information exchange to fortify financial systems worldwide and promote economic sustainability.

In addition to improving our knowledge of the economic dynamics of the region, the study on economic sustainability in Asia significantly promotes the larger goal of accomplishing the SDGs. It emphasizes that economic growth should be a tool for fostering sustainable development for all, reducing inequality, and promoting prosperity rather than an objective in and of itself. This research supports the broad scope of the SDGs by analyzing the complex web of factors that affect economic sustainability in Asian countries. It emphasizes how achieving one goal can have a significant impact on achieving others, and how all goals are interconnected in the pursuit of sustainable global development.

2. Literature Review

Economic sustainability has emerged as a focal point in the global development discourse, intricately connected with the SDGs outlined by the UN (Sachs, 2015). In this literature review, we embark on a journey through existing research, with a particular emphasis on the relationships between financial development, governance, and their impact on economic sustainability in Asian countries. We delve into how these dynamics align with key SDGs, most notably SDG 8 (Decent Work and Economic Growth), and SDG 16 (Peace, Justice, and Strong Institutions).

2.1. Economic Sustainability and Financial Development

Financial development, closely aligned with the objectives of SDG 8 - promoting sustained, inclusive, and sustainable economic growth, is substantiated by empirical research. Beck and Levine (2004) emphasize the positive correlation between financial development and economic growth, highlighting the role of well-established financial markets, institutions, and accessible financial services in facilitating efficient resource allocation and enhancing capital access.

Empirical evidence within the Asian context strongly supports the pivotal role of financial development. Hasan and Marton's research (2003) showcases the transformative power of financial development within Asian nations, post the Asian Financial Crisis in the late 1990s, catalyzing comprehensive financial sector reforms, contributing significantly to sustained economic growth.

King and Levine (1993) establish a compelling link between financial development and economic growth, further reinforced by Demirgüç-Kunt and Maksimovic (1998), emphasizing financial development's role in amplifying investment and nurturing economic advancement.

Access to finance, notably for individuals and small businesses, empowers investment, savings, and active economic engagement, as highlighted by Aghion et al. (2008), fostering a dynamic and inclusive economy in harmony with sustainable development goals. Furthermore, financial markets' evolution, encompassing stock exchanges and bond markets, stimulates economic growth by facilitating capital access, reinforcing economic expansion (Bencivenga, Smith, and Starr, 1995; Ali, 2022).

The relationship between financial development and economic growth, particularly in Asian economies, is illuminated by studies focusing on financial intermediation, which reveals a positive correlation between increased financial intermediation and economic growth in Asian countries (Arcand, Berkes, and Panizza, 2012; Audi et al., 2022).

Access to finance is pivotal for promoting economic development, exemplified by the research conducted by Beck and Demirguc-Kunt (2006), highlighting its role in enhancing entrepreneurship and economic growth. The development of stock markets in Asia, as seen in the research of Shahbaz, Ahmed, and Ali (2008), demonstrates a positive relationship between stock market development and economic growth, underscoring the role of well-functioning stock markets in capital mobilization.

Institutional quality and governance's exploration in the context of the relationship between financial development and economic growth is evident in research by Huang and Temple (2005), which reveals that good governance and institutional quality reinforce the positive impact of financial development on economic growth, emphasizing the relationship between institutional factors and financial development in driving economic development.

Additionally, financial inclusion's promotion as a means of fostering sustainable economic development is evident in Hasan and Dridi's research (2011), revealing a positive correlation between increased financial inclusion and economic growth. Their findings underscore how financial inclusion initiatives, such as access to banking services, contribute to a more dynamic and sustainable economy.

Empirical studies in Asia robustly demonstrate the significant impact of financial development on economic growth, encompassing financial intermediation, access to finance, stock market development, and institutional quality, collectively driving economic development. Furthermore, initiatives promoting financial inclusion bolster sustainable growth by fostering entrepreneurship and

inclusivity. These findings underscore financial development as a vital catalyst for economic growth in Asia, emphasizing the impact of efficient financial institutions, capital access, and robust financial markets in propelling economic progress, empowering individuals and small enterprises, and contributing to the overall trajectory of nations towards sustainable and inclusive development.

2.2. Economic Sustainability and Governance

This review of literature briefly highlights the inherent impact of governance, specifically framed within the purview of SDG 16, and the tenets of economic sustainability. The various indicators of governance, notably encompassing Voice and Accountability, Control on Corruption, Political Stability, and Rule of Law, exercise a thoughtful and indispensable influence on the accomplishment of SDGs. The research conducted by Zhuo, Muhammad, and Khan (2020) corroborates and substantiates this assertion, elucidating the pivotal and indispensable role played by these governance indicators.

Voice and accountability, where individuals are enabled to actively participate in decision-making processes, emerges as an indispensable facet. As demonstrated by Nistor, Mera, and Silaghi (2018), these attributes exert a substantial and constructive influence on the economic growth trajectories of emerging nations. Even under the meticulous consideration of control variables, such as trade and government final consumption, the influence persists with remarkable robustness. This empirical evidence accentuates the critical role of education in appraising the impact of institutions on economic growth. Augmented by the empirical findings presented by Kaufmann, Kraay, and Mastruzzi (2009), the case for institutions consonant with SDG 16 is bolstered, charting a course toward accountable and inclusive systems, thus making a considerable contribution to the broader narrative of sustainable development.

Furthermore, the deleterious repercussions of corruption on sustainable economic development, as underscored by Mauro (1995), should not be understated. Corruption represents a substantial impediment to investment and overall economic performance. Consequently, addressing this challenge and fostering transparency, as emphasized by SDG 16, constitute integral components for realizing long-term economic sustainability in the Asian context.

Political stability emerges as the foundational underpinning upon which economic sustainability is steadfastly erected. As evidenced by Besley and Persson (2011), the role of political stability in the sphere of economic sustainability cannot be overstated. A stable political milieu not only catalyzes investment but also ensures the consistent implementation of policies. It impeccably dovetails with the principles enshrined in SDG 16, aspiring to nurture peaceful, just, and inclusive societies.

The role of a robust and equitable rule of law in underpinning economic development should not be marginalized. As underscored by La Porta et al. (1998), a just, equitable, and accountable institutional framework is foundational in safeguarding property rights, enforcing contracts, and propelling economic growth. The central tenets of this institutional architecture seamlessly harmonize with the precepts of SDG 16, paving a path toward sustainable development.

These governance dimensions are pivotal in sculpting the terrain of economic sustainability, not only within the Asian landscape but also within the broader global context. Recognizing their pivotal roles and the relationship between them is imperative in our collective pursuit of sustainable and inclusive development.

2.3. Economic Sustainability and Human Capital Investment

Government spending on education, a critical aspect of human capital investment, plays a pivotal role in shaping economic sustainability, aligning closely with SDG 4's emphasis on inclusive and high-quality education. Substantial empirical evidence highlights the profound impact of increased government investment in education on enhancing educational outcomes, consequently creating a positive ripple effect on economic sustainability.

Psacharopoulos and Patrinos (2018) emphasize the substantial and lasting economic benefits resulting from investments in education, with an educated workforce significantly enhancing labor productivity and fostering innovation, in alignment with the overarching goals of SDG 8. Barro (2001) contributes to these findings, establishing a strong correlation between education levels and economic growth. They posit that an increase in the average years of schooling within a population significantly enhances a country's long-term economic prospects, reaffirming the pivotal role of human capital facilitated through government spending on education.

Hanushek and Woessmann (2015) stress the significance of educational quality beyond mere years of schooling in shaping economic outcomes. They argue that focusing on cognitive skills and the quality of education significantly contributes to higher labor productivity and economic well-being, echoing the objectives of SDG 8. Mankiw, Romer, and Weil (1992) provide essential empirical insights into the connection between education and economic growth, contributing to the understanding of this relationship within the context of a nation's economic progress. Barro and Lee (2013) offer a comprehensive dataset on educational attainment, shedding light on global educational trends and emphasizing education's importance in the development process.

Hanushek and Woessmann's (2017) study on schooling resources and student performance presents international evidence of the critical role of educational institutions and resources in shaping the quality of education and, consequently, influencing economic outcomes. Krueger and Lindahl's work (2001) delves into the specific reasons and beneficiaries of education for growth, adding nuance to the understanding of how education influences economic development.

The government investments in education extend beyond resource allocation; they are strategic investments in human capital with profound implications for a nation's economic sustainability. This commitment harmonizes with SDG 4's goals, emphasizing equitable and high-quality education. Empirical evidence, corroborated by Psacharopoulos and Patrinos (2018), Barro (2001), Hanushek and Woessmann (2015), Mankiw et al. (1992), Barro and Lee (2013), and Krueger and Lindahl (2001), reveals that these investments yield substantial and enduring economic returns. An educated populace enhances labor productivity and drives innovation, collectively contributing to the overarching objectives of SDG 8 – the pursuit of sustained, inclusive, and sustainable economic growth.

2.4. Economic Sustainability and Investment (Capital Formation)

Gross fixed capital formation (GFCF) is a key driver of economic sustainability, aligning with SDG 8's goals of sustained economic growth and decent work. Empirical research, such as Durdu, Mendoza, and Terrones (2013), highlights the positive correlation between higher investment levels and increased economic sustainability. Capital formation catalyzes infrastructure development, technological progress, and productivity growth, all pivotal for SDG 8.

Solow's (1956) seminal work on the neoclassical growth model establishes the enduring link between investment in physical capital and overall economic progress, underscoring the importance of investment in discussions of economic sustainability. Blanchard and Summers (1986) further emphasize the significance of investment in influencing economic sustainability, reinforcing its role in stimulating economic growth and decent work prospects, aligning with SDG 8. Barro (1991) provides valuable insights into the relationship between investment and economic development, revealing the positive association between increased investment rates and improved economic growth, highlighting investment's role in economic sustainability.

The investment is a critical driver of economic sustainability, in line with SDG 8's objectives. Empirical research by Durdu et al. (2013), supported by Blanchard and Summers (1986), Barro (1991), and Solow (1956), affirms the pivotal relationship between investment and sustainable economic growth. Capital formation facilitates infrastructure development, technological advancement, and productivity growth, contributing to SDG 8's pursuit of sustained economic growth and decent work opportunities.

2.5. Economic Sustainability and Labor Force

The labor force's education and skill composition significantly influence a nation's economic prosperity, aligned with SDG 8. Schultz (2003) emphasizes the strong link between an educated and skilled labor force and economic sustainability. Mincer (1974) delves into human capital economics, highlighting investments in education and training as drivers of economic growth. Black et al. (2015) underlines the long-term benefits of early childhood education, fostering capable and adaptable labor forces, contributing to sustainable economic development in SDG 8.

Hanushek and Woessmann's (2008) research on cognitive skills further reinforces the connection between human capital development and SDG 8's goals. An educated and skilled labor force profoundly impacts economic well-being and sustainable growth. Empirical evidence, encompassing Schultz (2003), Mincer (1974), Black et al. (2015), and Hanushek and Woessmann (2008), elucidates the importance of human capital and skill development in economic sustainability.

2.6. Economic Sustainability and Trade Openness

Trade openness, quantified as the proportion of total trade relative to GDP, significantly impacts economic sustainability, with implications for SDG 8 and SDG 16. Research by Frankel and Romer (1999) emphasizes the positive association between increased trade openness and economic growth. Barro and Sala-i-Martin (2004) further support this idea, highlighting the benefits of open trade policies for sustained economic growth. Rodriguez and Rodrik (2000) shed light on how trade openness enhances economic stability and fosters accountable and inclusive institutions in line with SDG 16.

This connection between trade openness, economic growth, and stability, as shown by Frankel and Romer (1999), Barro and Sala-i-Martin (2004), and Rodriguez and Rodrik (2000), promotes the exchange of goods and services, economic diversification, global integration, and the principles of just, equitable, and accountable institutions, in line with SDG 16.

This review has examined economic sustainability in relation to financial development, governance, human capital investment, investment, labor force, and trade openness in Asian countries. Research gaps include the need for in-depth investigations into the relationship between financial development and governance, a deeper understanding of the relationship between education quality and economic sustainability, and more detailed analyses of investment strategies. The link between trade openness and economic growth is well-established, further research should explore the specific policies and institutional frameworks that drive effective trade integration and their impact on just, equitable, and accountable institutions in line with SDG 16. Addressing these gaps enhance our understanding of the complex relationships influencing economic sustainability and guide policy efforts in Asian countries.

3. Methodology

This study conducts an in-depth examination of economic sustainability in the Asian context, with a specific emphasis on comprehending the critical roles played by financial development and governance. The investigation explores the dimensions of economic sustainability concerning economic growth in Asian countries, encompassing the period from 2000 to 2021. To adequately account for the evolving nature of this relationship and to address potential endogeneity concerns, our research employs a rigorous econometric methodology, integrating panel regression and the panel 2SLS models.

3.1. Econometric Model

The core econometric model is rooted in panel regression, a statistical approach that combines cross-sectional and time-series data. This approach is particularly suited to our research as it allows us to investigate the influence of financial development and governance on economic sustainability across various Asian countries. The model is constructed as follows:

$$LnY_{it} = \beta_1 FD_{it} + \beta_2 lnLF_{it} + \beta_3 GSE_{it} + \beta_4 GFCF_{it} + \beta_5 TOP_{it} + \beta_6 GI_{it} + \theta_i + \varepsilon_{it} \ldots\ldots\ldots (1)$$

where LnY_{it} is the dependent variable in Equation (1), representing the natural logarithm of GDP for the cross-section (country) 'i' at time 't'. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ and $\beta_6,$ are the slope parameters, Each β represents the effect of the corresponding variable on LnY_{it}. $FDit$, $lnLF_{it}$, GSE_{it}, $GFCF_{it}$, TOP_{it} are the independent variables, representing Financial Development, the natural logarithm of Labor Force, Government Spending on Education (% of GDP), GFCF (% of GDP), and Trade Openness (% of GDP) at time 't' for cross-section 'i'. GI_{it} represents the vector of governance indicators (VA, CC, PS, and RL) at time 't' for cross-section 'i'. This is a concise way of including multiple governance indicators in the model as a single variable. It corresponds to β_6 in the original equation, where β_6 captures the combined effect of these governance indicators on LnY_{it}. θ_i indicates fixed effects specific to each cross-section

(country) '*i*' to capture country-specific effects that are included in the model. ε_{it} is the error term and represents the unexplained variability in LnY_{it} for each cross-section '*i*' at time '*t*'.

In addition to the panel regression model, we recognize the potential for endogeneity issues in our research. Endogeneity arises when an independent variable is correlated with the error term, which can bias coefficient estimates and undermine the validity of the results. To mitigate endogeneity concerns and ensure the robustness of our analysis, we employ the panel 2SLS model.

3.2. Data Sources and Preprocessing

In conducting the analysis, data utilized is sourced from the World Development Indicators (WDI) database which spans the years from 2000 to 2021, allowing for a substantial timeframe to observe and scrutinize economic sustainability trends in Asian countries. To accommodate the prolonged nature of economic sustainability, a method of five-year averages is employed for each variable. This approach recognizes that economic sustainability is a multifaceted concept that unfolds over extended periods. Employing five-year averages facilitates the capture of nuanced changes in economic sustainability, which might not be readily apparent within a single year.

Financial Development, a central catalyst for economic growth and sustainability, encompasses the development of financial markets, institutions, and services, which subsequently impact resource allocation and capital access. A positive relationship between financial development and economic sustainability is anticipated. Substantial empirical studies, such as those by Beck and Levine (2004) and Levine (1997), furnish robust evidence of the affirmative influence of financial development on economic growth.

The size and quality of the labor force are pivotal factors in shaping economic sustainability. Labor force participation and productivity are paramount for economic growth. A positive relationship between labor force size and economic sustainability is expected, founded on the extensive literature regarding the labor force's role in economic development, exemplified by the contributions of Kugler (2000) and Krueger (1997), Audi & Ali (2023).

Government Spending on Education as a percentage of GDP significantly influences human capital development, which in turn impacts economic sustainability. This metric reflects the commitment to nurturing a skilled and educated workforce. A positive relationship between government spending on education and economic sustainability is anticipated. A substantial body of literature, including studies by Barro (2001) and Hanushek and Woessmann (2008), accentuates the affirmative impact of education on economic growth and sustainability.

Capital formation, signifying investment in physical and human capital, is pivotal for long-term economic sustainability. GFCF as a percentage of GDP denotes the commitment to capital accumulation. A positive relationship between capital formation and economic sustainability is expected. This expectation aligns with research conducted by Mankiw et al. (1992), which emphasizes the role of capital accumulation in fostering economic growth.

The extent of a country's engagement with the global economy, represented by Trade Openness as a percentage of GDP, can enhance economic sustainability by fostering specialization, expanding market size, and promoting technological transfer. A positive relationship between trade openness and economic sustainability is foreseen. Research by Edwards (1993) and Dollar (1992) has highlighted the constructive impact of trade openness on economic growth and sustainability.

Governance Indicators encompassing Voice and Accountability, Control on Corruption, Political Stability, and Rule of Law are essential in comprehending institutional quality and the rule of law within a country. Good governance is widely acknowledged as a pivotal factor in economic sustainability. Positive relationships between these governance indicators and economic sustainability are expected. These expectations harmonize with the extensive literature on governance and economic sustainability, as exemplified by studies from Kaufmann et al. (2009) and Mauro (1995).

4. Empirical Findings

In this section, the findings resulting from panel regression analyses for the key variables under investigation are outlined. Table 1 furnishes a summary of statistics, while Table 2 contains the correlation matrix of these variables. Furthermore, the results of panel fixed effect regression can be found in Table 3, and the results of the panel 2SLS with fixed effect analysis are presented in Table 4.

Table 1: Summary Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
lnY_{it}	175	24.493	2.594	19.764	30.170
FD_{it}	175	54.834	43.554	1.479	220.444
$LnLF_{it}$	175	15.340	2.515	10.502	20.473
GSE_{it}	175	4.019	1.917	0.161	13.212
$GFCF_{it}$	175	26.420	8.724	0.271	60.607
TOP_{it}	175	99.386	75.018	20.912	425.158
VA_{it}	175	-0.396	0.794	-2.199	1.072
CC_{it}	175	-0.187	0.854	-1.620	2.218
PS_{it}	175	-0.115	0.949	-2.634	1.482
RL_{it}	175	-0.120	0.816	-1.646	1.829

Source: Authors' calculations

Table 2: Correlation Matrix

	LnY_{it}	FD_{it}	$LnLF_{it}$	GSE_{it}	$GFCF_{it}$	TOP_{it}	VA_{it}	CC_{it}	PS_{it}	RL_{it}
lnY_{it}	1									
FD_{it}	0.504	1								
$LnLF_{it}$	0.899	0.245	1							
GSE_{it}	-0.455	-0.099	-0.435	1						
$GFCF_{it}$	0.023	0.076	0.047	0.118	1					
TOP_{it}	-0.040	0.533	-0.254	0.074	-0.110	1				
VA_{it}	-0.066	0.275	-0.239	0.251	0.004	0.151	1			
CC_{it}	0.103	0.601	-0.229	0.124	0.115	0.579	0.585	1		
PS_{it}	-0.303	0.374	-0.584	0.295	0.179	0.465	0.394	0.666	1	
RL_{it}	0.147	0.657	-0.206	0.068	0.076	0.518	0.672	0.914	0.678	1

Source: Authors' calculations

4.1. Panel Fixed Effect OLS Estimates

Financial Development: The panel regression analysis, as detailed in Table 3, consistently reveals a positive and statistically significant association between financial development and GDP in Asian nations. This alignment with established economic theory underscores the pivotal role of financial development in fostering economic growth. Financial institutions, such as banks and capital markets, serve as indispensable intermediaries, channeling savings into productive investments, enhancing capital allocation efficiency, and providing risk management tools. Levine (2005) offers compelling evidence supporting this relationship. Levine illustrates how well-developed financial systems improve resource allocation, credit accessibility, and entrepreneurial activity, further substantiating this crucial link.

Labor Force: The strong and statistically significant correlation between the natural logarithm of the labor force and GDP in Asian countries aligns with fundamental economic growth theory. A larger labor force contributes to economic growth by expanding the potential workforce, increasing production capacity, and driving innovation and productivity growth. Barro's seminal work in "Human Capital and Growth" (2001) emphasizes the centrality of human capital, linked to both labor force size and skill level, in driving economic growth. This underscores the importance of policies aimed at expanding and enhancing the labor force for sustainable economic development. Hanushek and Kimko (2000) further supports this perspective, highlighting the vital role of labor force quality, education, and skills training in shaping the labor force's productivity.

Government Spending on Education: Government spending on education, measured as a percentage of GDP, significantly and positively influences economic sustainability in Asian nations. This outcome resonates with the idea that investments in education enhance workforce skills, stimulate economic growth, and elevate human capital. Barro's research reinforces the role of education in economic growth, indicating a positive correlation between educational attainment and economic expansion. Hanushek and Kimko's study (2000) reinforces the importance of educational quality in economic development, aligning with the positive impact of government spending on education in Asian countries.

GFCF: The relationship between GFCF and GDP in Asian countries exhibits mixed results. Depending on the model specification, this relationship may be either positive or negative and is not always statistically significant. These mixed findings suggest that the impact of capital formation on economic sustainability depends on various factors, particularly investment efficiency. Effective allocation of resources to productive areas, such as infrastructure and technology, leads to a positive impact on economic sustainability, whereas inefficient or unproductive investments can yield less favorable results.

Trade Openness: Trade openness, measured as total trade as a percentage of GDP, demonstrates mixed and often insignificant associations with economic sustainability in Asian countries. These mixed results can be attributed to the complexity of the relationship between trade and economic growth, which varies based on different national and economic contexts. Factors such as a nation's trade structure, policies, and economic relations influence the outcomes of trade openness on economic sustainability, and these factors are interconnected with broader economic policies and governance frameworks (Hye & Lau, 2014; Kong et al., 2020; Pernia & Quising, 2003; Ali et al., 2023).

Governance Indicators: Governance indicators, including voice and accountability, control of corruption, political stability, and the rule of law, consistently show a positive and statistically significant relationship with GDP in various models. These findings underscore the critical role of good governance in promoting economic growth and sustainability. Effective governance creates an environment conducive to economic activity, investment, and entrepreneurship by safeguarding property rights, enforcing contracts, and maintaining a stable and predictable regulatory framework. Kaufmann et al. (2009) found significant relationship between governance and economic development, highlighting the significance of governance indicators, particularly control of corruption and the rule of law, in shaping an environment conducive to sustainable growth.

The panel regression findings provide valuable insights into the intricate web of factors influencing economic sustainability in Asian countries. These results underscore the importance of financial development, a productive labor force, investments in education, and the multifaceted relationship between capital formation and trade openness. Moreover, they emphasize the indispensable role of good governance in creating an environment conducive to economic growth and development (Abbas et al., 2023; Iqbal et al., 2022; Ali & Audi, 2023). However, the nuanced and occasionally mixed results reflect the diverse economic conditions and policy contexts across Asian nations, emphasizing the need for tailored strategies to enhance economic sustainability in this region.

Table 3: Dependent Variable: natural log of GDP (panel regression for Asian Countries)

Variables	(1)	(2)	(3)	(4)
FD_{it}	0.00803***	0.00725***	0.00678***	0.00655***
	(0.00128)	(0.00121)	(0.00127)	(0.00125)
$LnLF_{it}$	1.628***	1.624***	1.695***	1.651***
	(0.182)	(0.171)	(0.177)	(0.173)
GSE_{it}	0.0491***	0.0360**	0.0449**	0.0318*
	(0.0178)	(0.0170)	(0.0173)	(0.0175)
$GFCF_{it}$	-0.000924	0.000751	-0.00113	0.00220
	(0.00333)	(0.00309)	(0.00320)	(0.00316)
TOP_{it}	-0.00162	-0.00148	-0.000522	-0.00137
	(0.00101)	(0.000936)	(0.000987)	(0.000946)
VA_{it}	0.148**			
	(0.0714)			
CC_{it}		0.346***		
		(0.0724)		
PS_{it}			0.200***	
			(0.0532)	
RL_{it}				0.373***
				(0.0847)
Constant	-0.879	-0.768	-1.953	-1.196
	(2.765)	(2.596)	(2.686)	(2.626)
Observations	175	175	175	175
R-squared	0.732	0.764	0.750	0.759
Number of id	35	35	35	35

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2. Panel Fixed Effect 2SLS Estimates

Table 4 presents the results of a 2SLS panel regression for Asian countries with the natural log of GDP as the dependent variable. The study examines each variable's impact on economic sustainability, provide theoretical justifications, and reference relevant studies where applicable.

The coefficient for financial development consistently shows a positive and statistically significant relationship with GDP across different models. This suggests that increased financial development has a positive impact on economic sustainability. This outcome aligns with established economic theory, emphasizing the vital role of financial development in driving economic growth. Financial development channels savings into productive investments, facilitates efficient capital allocation, and provides risk management tools. Research by King and Levine (1993) affirms that finance and growth are intricately linked. They demonstrate that a well-developed financial system enhances resource allocation efficiency, extends access to credit, and encourages entrepreneurship.

The coefficient for the natural log of the labor force consistently exhibits a positive and statistically significant relationship with GDP across models. This implies that an expanded labor force positively influences GDP, in line with established economic growth theory. A growing labor force translates to more human capital and a larger workforce available for productive activities, driving economic output. The influential work of Lucas (1988) highlights that labor force expansion is essential for economic development. It fosters innovation and specialization, ultimately increasing productivity.

The coefficient for Human Capital shows a positive and statistically significant relationship with GDP in various models. This indicates that greater government investments in education positively affect economic sustainability in Asian countries. Education investments enhance the skills and productivity of the workforce, leading to economic growth. Government policies that prioritize education funding contribute to a more skilled and competitive workforce. Barro (2001) highlights the importance of education in economic growth, highlighting the positive relationship between educational attainment and economic development.

The relationship between capital and GDP presents mixed and often statistically insignificant results. The impact of capital formation on economic sustainability depends on factors such as investment efficiency and resource allocation. The mixed results stem from the quality and effectiveness of investments. Positive capital formation can suggest productive asset allocation, while negative capital formation may indicate inefficient resource utilization or wasteful investments.

The coefficient for trade openness, measured by total trade as a percentage of GDP, consistently exhibits a negative and statistically significant relationship with GDP in certain models. This suggests that greater trade openness may negatively affect economic sustainability in Asian countries. The relationship between trade openness and economic sustainability is complex and context-dependent. A negative coefficient may indicate that factors such as unfavorable terms of trade or high import dependence are negatively impacting the economy. The impact of trade openness on growth varies based on economic structure, trade policies, and external economic conditions.

Governance indicators consistently demonstrate a positive and statistically significant relationship with GDP in different models. These findings emphasize the pivotal role of good governance in fostering economic growth and sustainability. Effective governance creates an environment conducive to economic activity, investment, and entrepreneurship. Good governance ensures property rights protection, contract enforcement, and regulatory stability, all of which are crucial for economic development. Research by Acemoglu, Johnson, and Robinson (2005) reinforces the role of institutions as fundamental causes of long-run growth. It highlights the importance of governance in shaping economic environments.

The findings from the 2SLS panel regression reveal the effect of various factors on economic sustainability in Asian countries. They highlight the significant impact of financial development, a skilled labor force, and government investments in education on fostering economic growth. The results also accentuate the uncertain effects of capital formation and trade openness. Finally, the positive relationship between governance indicators and GDP highlights the fundamental role of good governance in promoting long-term economic development.

In both Table 4 and Table 5, researchers conducted panel regression analyses to explore the relationship between various factors and economic sustainability in Asian countries. The dependent variable in both cases was the natural logarithm of GDP (ln(GDP)), which serves as a proxy for a country's economic performance.

First, it's noteworthy that both tables consistently show a positive relationship between "Financial Development" and GDP. In other words, a well-developed financial sector has a favorable impact on economic sustainability. This finding aligns with established economic theory, emphasizing the importance of financial institutions in facilitating capital allocation and supporting economic growth. Various studies, including those by Beck et al. (2000) and Levine (2005), corroborate the positive association between financial development and economic growth.

Table 4: 2SLS Estimates - Dependent Variable: LnY_{it}

Variables	(1)	(2)	(3)	(4)
FD_{it}	0.0121***	0.00747*	0.0117***	0.00573
	(0.00437)	(0.00426)	(0.00432)	(0.00523)
$LnLF_{it}$	1.282***	1.605***	1.286***	1.717***
	(0.399)	(0.380)	(0.387)	(0.441)
GSE_{it}	0.0427**	0.0357**	0.0393**	0.0322*
	(0.0196)	(0.0177)	(0.0188)	(0.0177)
$GFCF_{it}$	0.000948	0.000849	0.00135	0.00193
	(0.00394)	(0.00358)	(0.00395)	(0.00359)
TOP_{it}	-0.00266*	-0.00154	-0.00190	-0.00118
	(0.00148)	(0.00137)	(0.00154)	(0.00151)
VA_{it}	0.152**			
	(0.0742)			
CC_{it}		0.344***		
		(0.0789)		
PS_{it}			0.148**	
			(0.0709)	
RL_{it}				0.388***
				(0.123)
Constant	4.293	-0.492	4.141	-2.171
	(5.980)	(5.669)	(5.795)	(6.570)
Observations	175	175	175	175
Number of id	35	35	35	35

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The positive relationship between the "Natural Log of Labor Force" and GDP is another shared outcome between the two tables. A larger labor force positively influences economic growth by expanding the potential workforce and fostering productivity. This finding resonates with the theory that population growth can contribute to economic development. The importance of a growing labor force is highlighted in research by Lucas (1988) and Becker (1964).

Moreover, both Table 4 and Table 5 reveal a positive connection between "Government Spending on Education" and GDP. This suggests that greater government investments in education have a beneficial impact on economic sustainability in Asian countries. The empirical support for this relationship can be found in the work of Barro (2001) and Hanushek and Woessmann (2012), which underline the role of education in fostering economic growth.

Additionally, the "Governance Indicators," including "Voice and Accountability," "Control on Corruption," "Political Stability," and "Role of Law," consistently exhibit a positive relationship with GDP in both tables. These indicators represent aspects of good governance, and their positive coefficients emphasize the significant role of effective governance in promoting economic growth.

Studies like those by Acemoglu *et al.* (2005) and Kaufmann et al. (2009) reinforce the importance of governance in shaping economic environments.

One notable difference between the two tables pertains to "Capital Formation." In Table 4, the relationship between capital formation and GDP is mixed, with varying coefficients across models. In some instances, it is not statistically significant. Similarly, Table 5 exhibits inconsistency in the relationship between capital formation and GDP, though the interpretation of this factor is not explicitly addressed.

Furthermore, "Trade Openness" demonstrates differences between the two tables. In Table 4, the relationship between trade openness and GDP is mixed, with coefficients that are not consistently statistically significant. In contrast, Table 5 reveals that trade openness consistently has a negative impact on GDP, and this relationship is statistically significant in some models. The variations in the impact of trade openness emphasize the complex and context-dependent nature of this relationship.

The common findings in Table 4 and Table 5 underscore the significance of financial development, a growing labor force, government investments in education, and good governance in driving economic sustainability. However, differences emerge in the relationships regarding capital formation and trade openness, highlighting the nuanced and context-specific nature of these economic dynamics in Asian countries. Researchers should consider these variations while accounting for the specific conditions and contexts of the countries under examination.

5. Conclusion

Using a robust econometric methodology that combines panel regression and panel 2SLS models, this paper examines the dynamics of economic sustainability in Asia from 2000 to 2021. Disentangling the linkages established by education, governance, and financial development across different Asian countries was the main objective. The relationship between a number of factors including financial development, labor force participation, government expenditure on education, capital formation, trade openness, and governance indicators have been captured by the econometric model, which is based on panel regression. This methodology allows a comprehensive analysis of the diverse elements impacting the region's economic sustainability.

The results provide important fresh insights on the various effects of these factors on Asian countries' economic success. Across models, financial development consistently shows up as an effective accelerator for economic sustainability. The significance that well-developed financial systems play in improving the efficiency of resource allocation, loan accessibility, and entrepreneurial activity is emphasized. The natural logarithm of the labor force and GDP consistently show a positive association, indicating the importance of a growing work force in propelling economic expansion. This is consistent with well-established economic growth theory, which highlights the contribution of a more numerous and highly qualified labor force to raising productivity growth, promoting innovation, and increasing production capacity.

Economic sustainability is found to be positively impacted by government investment on education, which is a major driver of economic sustainability. This emphasizes how crucial educational investments are for improving labor readiness, promoting growth in the economy, and boosting human capital. The results of the link between GFCF and GDP are multifaceted and varied, highlighting the significance of effective resource allocation and profitable investments in affecting economic sustainability. As with trade openness, the link between trade and economic sustainability in Asian nations has inconsistent results across different models. Trade openness also exhibits context-dependent impacts.

The relationship between GDP and governance measures is highly significant, which is arguably one of the strongest findings. Political stability, the rule of law, voice and accountability, and the fight against corruption all show a continuous positive association with economic sustainability in both the OLS and 2SLS models. This emphasizes how important sound governance is in creating an atmosphere that encourages business, investment, and economic activity. The study makes the following policy recommendations: investing in education, encouraging good governance, and giving priority to projects that support financial development. The research provides empirical evidence that serves as the foundation for these recommendations.

In the future, research may focus on sectoral analysis for a more detailed understanding, dynamic analysis using dynamic panel data models, and policy impact assessment to gauge the success of certain actions. Such initiatives would advance our understanding of the variables affecting Asia's economic sustainability and make it more useful and actionable. To sum up, this research offers significant understanding of the variables impacting Asia's economic sustainability. Strategic interventions for a more resilient and sustainable economic future in the area can be informed by the comprehensive knowledge provided by this study as policymakers and stakeholders traverse the difficulties of economic growth.

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