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RESEARCH PAPER

How Can Financial Development Affect Sustainable Economic Development? Evidence from Asian Countries with Different Income Levels

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Abstract

Achieving economic development through financial markets is one of the most important ideals of any society. The purpose of this study is to investigate the relationship between financial development and sustainable economic development for selected countries in Asia over the period 1993-2021. To this end, the relationships between financial development and economic development indicators for two groups of countries in Asia are measured based on their income levels using the panel ARDL estimation method and the pooled mean group (PMG) estimator method. The results show that for selected low-income and high-income countries, there is a long-term relationship between the variables, and there is a direct significant relationship between the financial depth index, financial inclusion index, economic growth rate, urban growth rate, energy intensity, and sustainable development index (SDI) variables. The better these variables are, the more favorable the sustainable economic development is in these countries, but the relationship between the money supply and the SDI is inverse and significant. As practical policy implications, it is suggested to improve the efficiency of financial markets, strengthen the role of the financial sector in national production, and regulate the relationship between finance and industry.

Keywords: Economy in Asia, Financial Development, Panel ARDL Estimation Method, PMG Estimator, Sustainable Development.
JEL Classification: O11, G28, C23.

1. Introduction

It is widely recognized that the expansion of financial markets is an undeniable necessity to provide various investment opportunities for the private sector to choose the appropriate method of saving with low risk and according to its conditions

(Alfaro et al., 2004; Paramati et al., 2016; Nguyen, 2021). In addition, directing the funds from savings to high-return economic activities with corresponding added value can ultimately lead to economic growth and development. It is important to note that due to the inconsistent financial structure across countries, it is not possible to prescribe a single model for the relationship between financial development and economic development. Several criteria are used to indicate financial development. The criteria include the share of citizens' savings in banks or the share of credit extended to the private sector. However, financial depth (Odhiambo, 2008; Chen, 2020) and financial inclusion (Feghali et al., 2021) have been treated as two major representations of financial development across countries.

Some experts consider financial markets simply as a factor responsible for the gain or loss of price fluctuations. However, today it is believed that economic growth is not possible without a strong and developed financial sector. Moreover, the use of financial development measures can make the production process more efficient and thus increase economic growth. This is because countries with more open economies and developed financial markets are on the path to faster economic growth. It should also be noted that the optimal performance of the economic system in any society depends on the existence of two real and efficient financial sectors. The activity of these two sectors is a necessary and sufficient condition for the economic system since the performance of each of these two sectors affects the performance of the other sector. In this context, economists such as Hicks (1969) and Schumpeter (1912) emphasize the development of the financial structure, considering it as an engine and integral part of economic growth.

Sustainable development was defined by the United Nations in 2015 as development that meets present needs without compromising the ability of future generations to meet their own needs (Giannetti et al., 2020). Sustainable development affects almost all areas of human life such as education, environment, freedom of nations, politics, economy, and international cooperation. The issue of sustainable development has led to the presentation of the Millennium Development Goals in terms of economic, social, environmental, and political dimensions. Among the issues that are high on the research agenda in most developing and developed countries and constitute a significant part of economic research are the factors and pathways that lead the country to sustainable development.

In Asia, the existence of developed and emerging economies such as China and India has led to financial evaluation and attention to emerging markets such as these countries, so the main objective of this study is to detect the relationship between

these two important variables. Economic issues and the factors that influence them are among the topics that have always attracted the attention of economists and various and sometimes contradictory theories have been put forward. Applied economics is also important for economic policymakers. The main objective of this study is to examine the dynamic relationship between financial market development and the growth of sustainable economic development indicators in countries with different income levels in Asia. The results of this study will be used by researchers and students in the field of economics, especially in the field of planning, development, and financial management. They will also be useful for trustees and policymakers to make better decisions based on the findings of this research. Previous studies have focused on the relationship between financial development and economic growth and do not cover the various dimensions of development. Moreover, previous studies have not compared this relationship among Asian countries with different income levels. Therefore, research in this regard during the desired period can help to understand the real relationship between sustainable economic development and financial development and enable policy makers to make policies based on their country's income level.

One of the key issues in development economics is the importance of financial market development for sustainable economic growth and development. In classical economics, the financial sector and the real sector constitute the two main sectors of the economy, and a complementary and strong financial sector is a prerequisite for higher economic growth in any society. It appears that in developing or less developed countries, the development and growth of the financial sector is initially encouraged, resulting in economic growth. Over time, the expansion and development of the real sector becomes more important and the importance of the financial sector in economic development decreases. However, the important question for researchers and policymakers is always: *is there a relationship between sustainable economic development and financial development? Do better-developed financial markets increase the level of sustainable development indicators?*

To explore the answers to these questions, we choose two panels of Asian economies classified by their income levels. In each country panel, we analyze the relationship between financial development and the SDI using an ARDL panel model that covers annual data over the period from 1993 to 2021.

The remainder of this paper is organized as follows. Section 2 reviews the main currents of literature. Section 3 explains the data and methodology. In Section 4, the results of the empirical model are reported, and in Section 5, the robustness is verified. Finally, Section 6 gives concluding remarks and policy recommendations.

2. Literature Review

The relationship between financial and economic development has been studied by numerous scholars. In a pioneering study, Chandavarkar (1992) attempted to interpret the interrelationship between finance and development. He concluded that central bank autonomy and financial market competition are two wings that explain the positive impact of finance on a country's level of development. Gregorio and Guidotti (1995) studied the long-term effects of financial development and economic growth for a panel of countries in Latin America and found that the efficiency of financial market development is an important transmission channel for the impact of financial markets on economic growth. In another study, Hassan et al. (2011) investigated how financial development is related to economic growth in a panel of low- and middle-income countries. The main results revealed the positive effects of financial development on annual GDP growth. Deltuvaite and Sineviciene (2014) focused on the relationship between financial and economic development in EU member states. Their concluding remarks emphasized the positive role of financial markets on economic development in these countries. Abubakar et al. (2015) explored the relationship between human development and financial development for ECOWAS countries using the panel cointegration estimation technique. Their main findings demonstrated that bank private credit positively affected economic growth and human development. Similarly, Datta and Singh (2019) sought to explore the relationship between financial inclusion and development in the case of developed and developing countries over the period 2011-2014, finding that financial inclusion has a greater impact on development in more developed countries that have better infrastructure and financial chains. Tongurai and Vithessonthi (2018), in an academic study, investigated the mutual relationship between the banking sector, economic structure, and development in all countries of the world during the period 1960-2016. Interestingly, the empirical results showed that the development of the banking sector negatively affected the development of agriculture and had a neural relationship with industrial development. Kakar (2020) determined the factors influencing on positive impact of the financial sector on economic development for the case of the banking sector. He concluded that the efficiency of the banking sector can be considered as an important factor in promoting productivity, employment and GDP per capita in a country. In a recent study, Vo et al. (2021) examined the relationship between financial development and sustainable development goals for a panel of 26 economies. The results of this paper depicted a bidirectional causal relationship between environmental degradation and

financial development. Zahid et al. (2021) discussed that web-based financial development can have a significant and distinct positive impact on a country's economic development indicators due to lower transportation costs, paperless services, and broad access for the entire rural population.

From the above literature, it can be concluded that there is no in-depth academic study that addresses the impact of financial development on the sustainable development of Asian countries. Therefore, our work attempts to fill this literature gap through the following aspects:

1. Two panels of Asian countries are selected based on the World Bank classification by income level in 2021;
2. The SDI from the website for the SDI report is used as the dependent variable. This index includes the value for human development and ecological efficiency of countries, which makes this index a comprehensive variable for analysis in econometric models;
3. Two variables, financial depth (from the International Finance Corporation, IFC) and financial inclusion index (proposed by Datta and Singh 2019), are selected as proxies for financial development;
4. The ARDL panel as an appropriate sample to study the short- and long-term relationships between variables is used.

3. Data and Research Methodology

The research data for the Asian countries under study (Appendix 1) were collected from various international databases such as the World Bank (WDI), ASIA Regional Integration Center (ARIC), and British Petroleum Statistical Review of World Energy for selected Asian countries during the period from 1993 to 2021. The main reason for choosing 1993 as the starting year is the availability of data for Central Asian economies after the collapse of USSR.

The baseline variable data are shown in Table 1 as follows:

Table 1. Variables Specifications

	Variable	Symbol	Unit	Source
Dependent variable	Sustainable development index	SDI	-	https://www.sustainabledevelopmentindex.org/time-series
Explanatory variables	Financial Inclusion Index	FII	-	Calculation based on Datta and Singh (2019)
	Financial depth	FD	% of GDP	International Finance Corporation (IFC)
Control variables	Urbanization	URB	%	World Bank database
	Money supply	M2	% of GDP	World Bank database, ASIA Regional Integration Center (ARIC)
	Energy intensity	EIN	MJ/$2011 PPP GDP	World Bank database, BP

Source: Research finding.

In this study, the ARDL panel method, which includes three estimators, MG, DFE, and PMG, was used to investigate the relationship between sustainable economic development and financial development in selected Asian countries. There are reasons for choosing this method. First, it is independent of whether the variables are static or stacked as of first order (Wang, 2021). Second, this method is used to examine short-term and long-term relationships between variables. These estimates also provide the overall estimation efficiency while avoiding the problem of incompatibility due to dynamic heterogeneous integrated relationships. The first and second-generation panel static tests are used to examine the statics of the variables, and the first and second-generation panel combined tests are used to examine the presence or absence of long-term relationships between variables. To choose between the first and second-generation tests, we use cross-sectional tests for dependence. In other words, if cross-sectional dependence is confirmed, we use second-generation experiments. Finally, the Hausman test was used to choose between these estimates.

In this study, the dependent variable is the sustainable development index (SDI) and the independent variable includes financial development (FD) (with two proxies for financial depth and financial inclusion index), urbanization rate (GPOP), economic growth (EG), and energy intensity (EI). To estimate the coefficients of the regression model, the final model to estimate the coefficients is as follows:

$$y_{it} = \sum_{j=1}^{q} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{p} \delta_{ij} x_{i,t-j} + \mu_i + \varepsilon_{it} \quad (1)$$

where *y* denotes the dependent variables and *x* represents the vector of independent and control variables.

4. Empirical Results

Before estimating the model, the unit root test must be performed for all variables. In this study, the first generation panel unit root test (LLC) (Azam et al., 2021) is used according to Tables 2 and 3 as follows:

Table 2. Results for Selected Low-Income Countries

Variable	At level	At first difference
Sustainable development index	-2.87 (0.002)	-5.429 (0.00)
Financial depth	-1.41 (0.078)	-5.93 (0.00)
Financial inclusion index	-1.32 (0.43)	-6.49 (0.00)
Economic growth	-0.57 (0.282)	-4.59 (0.00)
Urbanization	-0.04 (0.48)	-5.86 (0.00)
Energy intensity	-0.70 (0.24)	-6.65 (0.00)
Money supply	-1.00 (0.15)	-6.69 (0.00)

Source: Research finding.

Table 3. Results for Selected Countries with High-Income Class

Variable	At level	At first difference
Sustainable development index	-1.04 (0.15)	-5.382 (0.00)
Financial depth	-2.49 (0.031)	-6.033 (0.00)
Financial inclusion index	-0.41 (0.183)	-5.094 (0.00)
Economic growth	-0.37 (0.114)	-5.468 (0.00)
Urbanization	-0.17 (0.320)	-5.649 (0.00)
Energy intensity	-0.45 (0.04)	-5.990 (0.00)
Money supply	-0.49 (0.44)	-4.776 (0.00)

Source: Research finding.

The results of Tables 2 and 3 show that in the panel of high-income countries, all variables except per capita income were stationary with a difference (the null hypothesis of these tests, based on the presence of a unit root and the instability of the variables according to the computational statistics and the critical value at the 5% level was investigated). One of the most important points in cointegration analysis is that even though most time series are not static and have a trend, a linear combination of these variables can always be static and trendless in the long run. These tests also reveal the clustering of these long-run relationships. The results of the first-generation (Pedroni, 1995; Kao, 1999) and second-generation (Westerland)

cointegration tests indicating a long-run relationship between the variables are presented in Tables 4 and 5.

Table 4. Cointegration Results for Selected High-Income Countries

-	-	p-value
Dickey-Fuller t	0.39	0.345
Augmented Dickey-Fuller (ADF)	1.507	0.065
Phillips-Perron t	-1.86	0.031
Augmented Dickey-Fuller (ADF)	-0.679	0.248
Variance ratio	-1.70	0.044

Source: Research finding.

Table 5. Cointegration Results for Selected Low-Income Countries

-	-	p-value
Dickey-Fuller t	-5.31	0.00
Augmented Dickey-Fuller (ADF)	-3.66	0.001
Phillips-Perron t	-3.96	0.000
Augmented Dickey-Fuller (ADF)	-4.16	0.001
Variance ratio	0.325	0.45

Source: Research finding.

In Table 5, which deals with low-income Asian countries, the results of the Kao test for the model variables included in this study show that there is cointegration in the long-run relationships among the variables. The test statistics are DF and ADF, as can be seen. According to the probability level of this test, both statistics are significant at the 1% probability level (99% confidence level). In other words, the null hypothesis that there is no cointegration between the variables in the long run is rejected. Thus, there is a long-run relationship between the model variables.

The Pedroni test is also expressed based on the computational value of the PP and the ADF statistics. The computed values of these two statistics are -3.96 and -4.16, respectively. A look at the probability column in the table above shows that the probability of this test is significant at both the 1% probability level (99% confidence level). In other words, the null hypothesis that there is no cointegration between the variables in the long run is rejected. Thus, there is a long-run relationship between the model variables. In the Westerland (2007) test, the probability level indicates the degree of cointegration strength and the existence of a long-run relationship. Therefore, the probability of a long-term relationship between the variables is 0.325%. Another feature of this test is the use of the self-assembly method to eliminate cross-sectional dependence, which is mentioned below. In addition, the

size and power of this test are better than the Pedroni and Kao tests in terms of proposed statistics.

Table 4 shows the results of the Kao test for the model variables, which, depending on the level of their statistics, ensure the existence of cointegration in the long-term relationships between them. The test statistics, as can be seen, are DF and ADF. Due to the probability level of this test, both statistics are not statistically significant. In other words, the null hypothesis that there is no cointegration between the variables in the long run is not rejected. Thus, there is no long-run relationship between the model variables. The Pedrony test is also expressed in terms of the computational values of the PP and the ADF statistics. The computational values of these two statistics are -1.86 and -0.679, respectively. Inspection of the probability column in the above table shows that according to the PP statistic, the 5% probability level of long-term non-accumulation between the variables is rejected. Therefore, there is a long-run relationship between the model variables. However, according to the ADF statistic, the long-run non-accumulation is not rejected, so the hypothesis of a long-run relationship between the model variables is not confirmed. Now, to better investigate the long-run relationship between the variables, we move to the second-generation tests to determine the result of the Westerland (2007) test. In this test, the probability level indicates the level of co-accumulation power and the presence of a long-term relationship. Thus, the probability of a long-run relationship between the variables is 0.044%, indicating that the long-run relationship between the variables is not very strong and is less than 5%.

To ensure the use of first-generation tests in our empirical model, we use the cross-dependence test of Pesaran (2004). Results for a panel of low- and high-income countries are reported in Tables 6 and 7.

Table 6. Results of the CD Test for Low-Income Asian Countries

-	Stat.	p-value
Sustainable development index	2.48	0.013
Financial depth	-2.6	0.009
Financial inclusion index	3.3	0.001
Economic growth	0.56	0.955
Urbanization	1.592	0.111
Energy intensity	-0.816	0.414
Money supply	1.414	0.142

Source: Research finding.

In Table 5, the urban growth rate, energy intensity, and liquidity variables were not statistically significant at the 5% level, so the hypothesis that the intercepts between

the data are independent cannot be rejected. Therefore, the use of first-generation tests that show both the accumulation and the presence of a long-term relationship between the variables is not a problem.

Table 7. Results of the CD Test for High-Income Asian Countries

-	Stat.	p-value
Sustainable development index	13.66	0.000
Financial depth	2.504	0.012
Financial inclusion index	1.45	0.147
Economic growth	32.18	0.000
Urbanization	10.053	0.00
Energy intensity	31.951	0.00
Money supply	21.493	0.00

Source: Research finding.

In Table 7, the economic growth rate variables are the only variables that are not statistically significant at the 5% level. Thus, the hypothesis that the intercepts between the data are independent is rejected. Therefore, the use of second-generation tests to prove both the cumulation and the existence of a long-run relationship between the variables will work.

There are generally three methods for estimating a model with heterogeneous dynamic panel data. These three methods are dynamic fixed effects, group mean, and group mean and cumulative group mean (DEF, MG, and PMG). The Hausman test is used to determine the appropriate method. The models estimated with the Hausman test are compared (MG with PMG and PMG with DFE).

Table 8. Results of Estimating DEF, MG, and PMG for Low-Income Countries

Variable	PMG		MG		DFE	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Long-term						
Financial depth	1.65	0.001	-0.742	0.85	0.63	0.075
Financial inclusion index	1.22	0.002	1.32	0.042	1.04	0.053
Economic growth	0.47	0.031	0.447	0.248	0.178	0.047
Urbanization	13.01	0.000	7.39	0.282	0.048	0.126
Energy intensity	0.044	0.00	-6.74	0.712	2.91	0.649
Liquidity	-0.507	0.00	-0.319	0.317	-0.18	0.624
Short-term						
ECT	-0.364	0.00	-0.354	0.00	-0.331	0.013
D (Financial depth)	1.16	0.008	-0.195	0.948	-0.016	0.570
D (Financial inclusion index)	1.46	0.002	1.18	0.054	1.33	0.003
D (Economic growth)	0.237	0.072	-0.285	0.187	-0.002	0.095
D (Urbanization)	6.58	0.012	-14.3	0.00	0.007	0.366
D (Energy intensity)	0.017	0.037	5.33	0.714	0.343	0.289
D (Liquidity)	0.265	0.261	0.616	0.00	-0.008	0.889
Constant	-17.63	0.00	-2.56	0.980	0.085	0.404
Hausman test	PMG and MG: 3.95 (0.684)					
Hausman test	PMG and DFE: 1.62 (0.852)					

Source: Research finding.

The Hausmann test hypothesis is based on the assumption that there is no difference between the short-run and long-run coefficients of the different models (DEF, MG, and PMG) and that the PMG estimator is a more efficient and consistent estimate than the other estimators (DEF, MG).

According to the acceptance of the results of the PMG estimator, the coefficients obtained from this estimator are examined and its coefficients are statistically significant. In the long run, all variables are statistically significant at the 5% level. The coefficient of the financial depth index is 1.65, and this variable is significant at the 1% level. That is, for a 1% increase in the financial depth index, the value of the sustainable economic development index increases by 1.65%. The coefficient for the economic growth rate is 0.47 and is significant at the 5% level. The description of the value of this coefficient is the same as for the previous variable, i.e. when the economic growth rate increases by 1%, the value of the sustainable economic development index increases by 0.47%. The coefficient for the urban growth rate is 13.01 and is positively and significantly related to the sustainable economic

development index. The variable energy intensity has a positive significant relationship with sustainable economic development with a coefficient of 0.044. Liquidity supply as the next variable has a significant inverse relationship with the sustainable economic development index, i.e. for a 1% increase in liquidity supply, the variable decreases by 0.507%. Therefore, the results show that in the long run, all variables except the liquidity supply variable have a positive significant relationship with the sustainable economic development index.

In the short-term relationship section, we first explain the ECT statistic. This variable is statistically significant and indicates the speed of short-term to long-term adjustment. The value of this coefficient in this estimate is -0.36 and is significant at the 99% level, indicating that in each period the 0.36% value of the disequilibrium error will disappear. In other words, it takes 2.77 periods to correct the disequilibrium error. All the coefficients in the short-term except the two variables mentioned (D: economic growth rate and D lliq: liquidity supply) are statistically significant judging by the sign of their coefficients. They are all positively and directly related to the index. They have had sustained economic development. The only variable of breadth from origin has an inverse relationship with the index of sustainable economic development in the short-run, which includes all variables that exist but have not been identified as independent variables to study their effect on the index of sustainable economic development. The effect of these unknown variables can be considered as the width of the origin on the dependent variable.

Table 9 shows the results for the panel of high-income countries.

Table 9. The Estimation Results of DEF, MG, and PMG for Low-Income Countries

Variable	PMG		MG		DFE	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Long-term						
Financial depth	2.28	0.00	1.58	0.056	2.35	0.057
Financial inclusion index	1.59	0.002	1.43	0.045	1.64	0.004
Economic growth	0.70	0.046	0.117	0.539	-0.028	0.945
Urbanization	11.93	0.00	2.80	0.255	12.92	0.002
Energy intensity	1.66	0.00	8.74	0.019	2.15	0.00
Liquidity	-1.034	0.00	-0.090	0.431	-1.067	0.016
Short-term						
ECT	-0.397	0.00	-0.370	0.00	-0.359	0.00
D (Financial depth)	1.24	0.031	0.235	0.604	0.665	0.275
D (Financial inclusion index)	1.76	0.005	0.355	0.003	0.423	0.0031

D (Economic growth)	0.361	0.042	-0.050	0.669	-0.00	0.997
D (Urbanization)	5.52	0.045	-2.09	0.196	1.92	0.360
D (Energy intensity)	0.469	0.038	1.17	0.577	-0.463	0.124
D (Liquidity)	0.478	0.077	0.079	0.268	-0.211	0.332
Constant	-30.30	0.00	-16.24	0.060	-27.229	0.036
Hausman test	PMG and MG: 1.72 (0.753)					
Hausman test	PMG and DFE: 2.21 (0.712)					

Source: Research finding.

Table 9 provides the results of the estimation of the models DEF, MG, and PMG for selected countries with high-income class (High). The results of the Hausman tests show that the null hypothesis that the PMG estimator is efficient is not rejected and is confirmed with a probability of 0.75% in the comparison (PMG with MG) and also with a probability of 0.71% in the comparison of the estimates (DFE with PMG). Therefore, the PMG estimator is selected as the efficient estimator.

According to the acceptance of the results of the PMG estimator, the coefficients obtained from this estimator are examined and its coefficients are statistically significant. In the long run, all variables are statistically significant at the 5% level. The coefficient of the financial depth index is 2.28, and this variable is significant at the 1% level. That is, for a 1% increase in the financial depth index, the value of the sustainable economic development index increases by 2.28%. The coefficient for the economic growth rate is 0.47 and is significant at the 5% level. The description of the value of this coefficient is the same as the previous variable, i.e. when the economic growth rate increases by 1%, the value of the sustainable economic development index increases by 0.70%. The urbanization growth rate is 11.93 and is positively and significantly related to the sustainable economic development index. The variable of energy intensity with a coefficient of 1.66 is positively and significantly related to the sustainable economic development index. Liquidity supply, as the next variable, has a significant inverse relationship with the sustainable economic development index, that is, for a 1% increase in liquidity supply, the sustainable economic development index decreases by 1.034%. Therefore, the results show that in the long run, all variables except the liquidity supply variable have a positive significant relationship with the sustainable economic development index.

In the short-term relationship section, we first explain the ECT statistic. This variable is statistically significant and indicates the speed of short-term to long-term adjustment. The value of this coefficient in this estimate is -0.39 and is significant at the 99% level, indicating that in each period, the 0.39% value of the disequilibrium

error will disappear. In other words, it takes 2.56 cycles to correct the disequilibrium error. All short-term coefficients except the variable D. lliq (liquidity supply) have become statistically significant and judging by the sign of their coefficients, they are all positively and directly related to the index of sustainable economic development. The only variable of breadth from origin has an inverse relationship with the index of sustainable economic development in the short-run, which includes all variables that exist but have not been identified as independent variables to study their effect on the index of sustainable economic development. The effect of these unknown variables can be considered as the width from the origin of the dependent variable.

5. Verification of Robustness

To ensure the validity and reliability of the estimated coefficients, robustness verification is performed by replacing the Human Development Index (HDI) with the SDI in two panels of Asian countries. The results of the PMG estimates for the explanatory variables are presented in Table 10 as follows.

Table 10. Robustness Verification

Countries	Financial depth		Financial inclusion index	
	Coefficient	p-value	Coefficient	p-value
High-income countries	0.043	0.031*	0.154	0.054**
Low-income countries	0.013	0.004*	0.034	0.034*

Source: Research finding.

Note: * and ** indicate significance levels at 5% and 10%, respectively.

Table 10 shows that the signs of the explanatory variables for the financial depth and financial inclusion index are consistent with our previous empirical results. Therefore, the validation of the empirical results can be confirmed.

6. Conclusion

The results of estimating the models DEF, MG, and PMG for selected low-income and high-income countries show that in the PMG model (selected estimator in both models), there is a long-run relationship between the variables and there is a direct significant relationship between the variables of financial depth index, economic growth rate, urban growth rate, energy intensity, and sustainable economic development index, that is, any increase in these variables leads to enhance of the sustainable economic development of this country is, but the relationship between the liquidity supply and the sustainable economic development index is inverse and

significant. This variable is statistically significant and indicates the speed of short-term to long-term adjustment. The value of the short-term to long-term correlation coefficient in the model of selected Asian countries with a low-income class is -0.36 and is significant at the 99% level, indicating that in each period the value of 0.36% of the disequilibrium error will disappear. For the model of the selected Asian countries with high-income class, this value is 0.39%, which means that it takes 2.56 years to eliminate the disequilibrium error. The results presented show that the main hypothesis of the study, that there is a relationship between sustainable economic development and the financial development of the countries studied, is confirmed. Moreover, this relationship is different for countries with a high-income class than for countries with a low-income class, but in an income class, the relationship between these two indicators is similar between countries in the same income class.

As concluding remarks and policy implications:

1. According to the results, the increase in urbanization rate and the reduction of energy intensity on the sustainable economic development of high-income countries in Asian countries are not ineffective and have a significant proportion, so other low-income countries pay attention to it, especially the reduction of energy intensity recommended;
2. Due to the negative relationship between liquidity supply and sustainable economic development, it is suggested that the agencies responsible for liquidity supply in low-income countries, such as the central bank in Iran, conduct a more detailed study and evaluation of monetary policy as financial development increases in these countries.

For future research, it is suggested that new indicators in the field of sustainable development, including environmental factors and human and educational development, be used in their studies as these variables have a great impact on sustainable development and the future economic growth of countries.

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Appendix 1

Panel 1	Panel 2
Saudi Arabia, United Arab Emirates, Bahrain, Brunei, China, Fiji, Hong Kong, Jordan, Japan, Kazakhstan, South Korea, Kuwait, Maldives, Malaysia, Oman, Qatar, Singapore, Thailand	Afghanistan, Bangladesh, Bhutan, Indonesia, India, Iran, Kyrgyz Republic, Cambodia, Laos, Sri Lanka, Myanmar, Nepal, Pakistan, Philippines, Uzbekistan, Vietnam
N:18	N: 16
Period: 1993-2018 Observations: 468	Period: 1993-2018 Observations: 416

Source: Research finding.

Note: Panel 1 contains high- and Asian countries upper-middle-income, while panel 2 comprises low and lower-middle-income levels Asian countries.

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