Financial Development and Green Economic Growth: Evidence from ASEAN Countries

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Abstract: This research is to investigate the impact of financial development on green economic growth, where green economic growth is measured by economic growth coupled with environmental protection. The data were collected in 10 ASEAN countries, including Brunei, Indonesia, Cambodia, Laos, Myanmar, Malaysia, Singapore, Thailand, the Philippines, and Vietnam, from 2002 to 2020. This research utilizes the system Generalized Method of Moments (GMM) estimator to estimate the research model. The results reveal that financial development serves as a significant driver for promoting green economic growth of these countries. More than that, it is significantly affected by the other control variables including population growth, inflation, and control of corruption. These findings provide a reliable basis for these countries to identify appropriate solutions to promote green growth, being an essential foundation for achieving their sustainable development.

Keywords: ASEAN, financial development, green economic growth, sustainable development.

1. INTRODUCTION

The impact of financial development on green economic growth is a research topic that has been addressed in numerous empirical studies. Furthermore, this issue has become increasingly important for many countries in their pursuit of sustainable development goals (Ahmed et al., 2022). Green economic growth can be understood as promoting economic growth while ensuring that natural assets continue to provide essential environmental resources and services for our lives (Ahmed et al., 2022; OECD, 2011). With a more specific perspective, some researchers argue that green economic growth is the promotion of economic growth coupled with environmental protection (Bagheri et al., 2018; Dai et al., 2016; Jacobs, 2012; Jouvet & Perthuis, 2013). According to Ahmed et al. (2022) and Zhou et al. (2021), economic growth, energy efficiency, and environmental pollution reduction are fundamental drivers of green economic growth. Green economic growth emphasizes the quality of growth and encourages economic growth that efficiently utilizes natural resources and balances environmental protection and long-term growth (World Bank, 2012). To achieve these, green economic growth must serve as a catalyst for investment and innovation, bringing more new investment opportunities within the economy. Therefore, green economic growth is one of the foundations of sustainable development.

Nowadays, green economic growth has become a crucial strategy to many countries (Wang et al., 2019). These governments have implemented various policies to stimulate green economic growth, with financial development being one of the most significant policies (Ahmed et al., 2022). Financial development can be understood as the growth of the financial system, with a focus on financial markets and institutions (King & Levine, 1993). Financial development facilitates the process of resource allocation (Cherif & Dreger, 2016), stimulates investment (Botev & Jawadi, 2019), and thereby promotes economic growth and reduces poverty in many countries (Beck et al., 2007). Furthermore, it also contributes to improving environmental quality by encouraging investors to adopt advanced and environmentally friendly technologies (Ozturk & Acaravci, 2013; Adams et al., 2018). Therefore, it can exert a considerable effect on green economic growth. However, the empirical studies on this topic often focus on analyzing the impact of financial development on economic growth or on environmental quality. There are few empirical studies specifically examining the impact of financial development on green economic growth. The research conducted by Ahmed et al. (2022) is one of them. However, this study also has its limitations by only considering the impact of financial development on green economic growth without examining the role of control variables representing macroeconomic factors in this relation. Therefore, it is necessary to provide additional empirical evidence on this impact, particularly by considering the role of the control variables to supplement the existing literature.

It can be observed that examining the impact of financial development on economic growth is an intriguing research topic, but there still exists a big gap to be explored. Recognizing this gap, this study is conducted with the expectation of contributing to the existing literature through two approaches: (1) Firstly, the study aims to fill the gap by esti-

mating the impact of financial development on green economic growth, where the latter is broadly defined as economic growth coupled with environmental protection; (2) Secondly, this study is based on a sample of ASEAN countries, making the research findings a reliable basis for these nations to identify appropriate solutions to promote green growth. This serves as a vital foundation for pursuing sustainable development.

2. LITERATURE REVIEW

Green economic growth can be defined as the expansion of economic growth, which involves promoting economic growth coupled with environmental protection (Bagheri et al., 2018; Dai et al., 2016; Jacobs, 2012; Jouvet & Perthuis, 2013). In addition to economic growth, energy efficiency and environmental pollution reduction are fundamental factors in green economic growth (Ahmed et al., 2022; Zhou et al., 2021). Green economic growth highlights the growth quality and encourages the balance between environmental protection and long-term growth. In terms of measurement, green economic growth is determined through per capita green GDP, where green GDP is measured by subtracting natural resource loss and environmental pollution loss from traditional GDP (Song et al., 2020). In fact, green economic growth serves as a catalyst for investment and innovation, providing a foundation for creating new investment opportunities in the economy and aiming for sustainable growth.

Financial development refers to the improvement of the financial system, with a focus on financial markets and institutions which is determined through three criteria: depth, efficiency, and access (Svirydzenka, 2016). In specific, financial markets involve the buying and selling of financial instruments while financial institutions consist of entities primarily engaged in providing financial services (Bui, 2023). The financial development index is published annually by the International Monetary Fund (IMF), and it is a composite index formed based on the criteria related to the depth, efficiency, and access of financial markets and institutions.

The impact of financial development on green economic growth can be explained through various theories, primarily focusing on those of economic growth. These include theories of classical growth, neoclassical growth, endogenous growth, and Keynesian growth. In particular, the theories of classical growth (Ricardo, 1817; Smith, 1776) and neoclassical growth (Solow, 1956) initially highlighted the role of capital in economic growth. According to the endogenous growth theory, in addition to capital accumulation, economic growth is influenced by the unique characteristics of each country (Nguyen & Bui, 2022; Romer, 1990). On the other hand, the Keynesian growth theory suggests that the financial system plays a crucial role in stimulating savings and investment. This theory also emphasizes the regulatory role of government through policies aimed at improving the financial system, promoting investment, and stimulating economic growth (Keynes, 1936).

The impact of financial development on green economic growth is a topic that has been explored in various empirical studies. However, most of them have focused on examining the impact of financial development on economic growth. Particularly, financial development plays a vital role in effec-

tively allocating capital (Bencivenga & Smith, 1991; Diamond, 1984; Greenwood & Jovanovic, 1990; Williamson, 1986), increasing investment (Botev & Jawadi, 2019), and particularly stimulating economic growth (King & Levine, 1993; McKinnon, 1973; Schumpeter, 1911). Therefore, the positive impact of financial development on economic growth has been found in several empirical studies, such as those of Bayar (2014), Donelli and Chiriatti (2017), and Pan and Yang (2019). On the other hand, Masoud and Hardaker (2012), Bist (2018) argue that financial development does not only stimulate economic growth but also contributes to social progress. However, financial development does not always generate positive effects on economic growth (Pagano & Pica, 2012). In fact, financial development can hinder economic growth if capital is not used effectively (Cournède & Denk, 2015; Levine, 2005).

Several empirical studies have investigated the impact of financial development on environmental quality. For instance, Ozturk and Acaravci (2013) and Adams et al. (2018) reveal a positive impact of financial development on environmental quality, as financial development encourages investors to use environmentally friendly technologies. Boutabba (2014) argue that financial development exerts a negative impact on carbon emissions. Ahmed (2017) demonstrates that financial development facilitates favorable conditions for countries to increase renewable energy sources. On the other hand, Tamazian and Rao (2010) and Shahbaz et al. (2016) suggest that financial development can lead to a rise in the number and scale of industrial zones, which may contribute to higher carbon emissions.

Admittedly, most of the current empirical studies often focus on analyzing the impact of financial development on economic growth or on environmental quality. With a different approach, Ahmed et al. (2022) reveal a positive impact of financial development on green economic growth in South Asian countries. According to their findings, financial development facilitates businesses' access to advanced and environmentally friendly technologies, thereby stimulating economic growth associated with environmental protection. In addition to financial development, the quality of institutions is also an important factor in promoting green economic growth in these countries. However, this study has limitations as it only focuses on examining the impact of financial development on green economic growth, while neglecting the role of other control variables representing macro factors in this relationship. This is a significant gap that further empirical research can explore.

3. METHODOLOGY AND DATA

Based on the current literature, financial development can affect green economic growth through the general model as follows:

$$Y_{it} = \alpha + \beta \, FD_{it} + \delta \, Control_{it} + \varepsilon_{it}$$

In specific, the dependent variable Y represents the logarithm of per capita green GDP, where green GDP is measured by subtracting natural resource and environmental pollution loss from traditional GDP (Song et al., 2020). The natural resource and environmental pollution loss include the value of energy depletion (such as coal, crude oil, and natu-

Table 1. Variable Definitions.

| Variable	Code	Definition	Source
Dependent variable			
Green economic growth	Y	The logarithm of per capita green GDP, where green GDP is calculated as the traditional GDP minus natural resource and environmental pollution loss	WDI
Independent variable			
Financial development	FD	The financial development index is determined based on the development of financial markets and institutions	IMF
Control variables			
Population growth	POP	The annual population growth	WDI
Inflation	INF	The annual growth rate of the consumer price index	WDI
Control of corruption	CC	The control of corruption index represents the effectiveness of the government's efforts in controlling corruption within a country	WGI
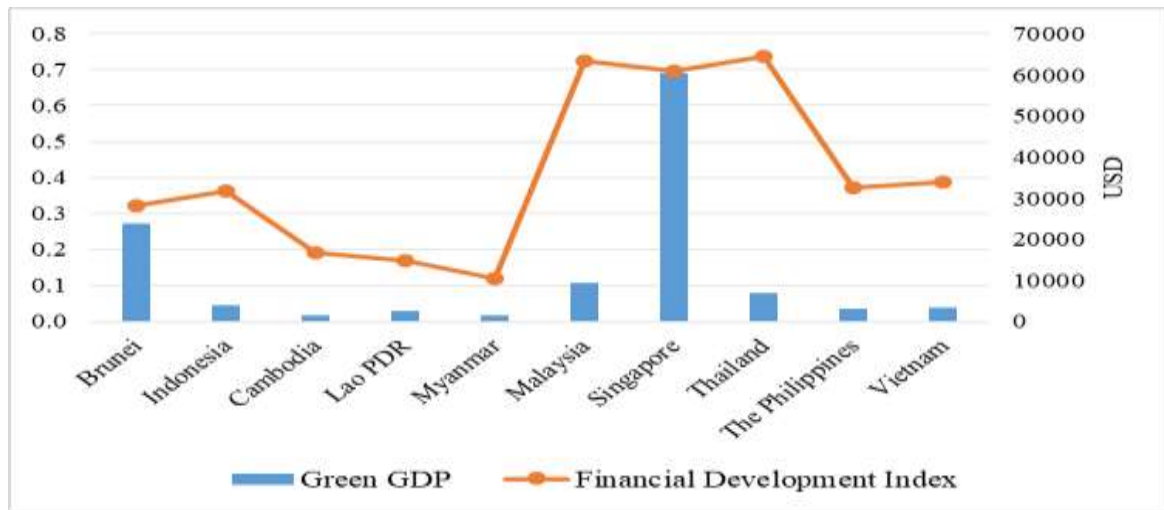
Fig. (1). Green GDP and financial development of the ASEAN countries in 2020.

ral gas), the value of net forest depletion, and the cost of damages caused by carbon dioxide emissions (Ahmed et al., 2022; Sohag et al., 2019). FD refers to the financial development index, which is published by the IMF and determined based on the development of financial institutions and markets. Based on the ideas of Tamazian and Rao (2010), Ahmed et al. (2022), and Wen et al. (2022), the control variables include population growth (POP), inflation (INF), and control of corruption (CC). The definitions of the variables in the research model are presented in detail in Table **1**.

The dataset consists of 10 ASEAN countries including Brunei, Indonesia, Cambodia, Laos, Myanmar, Malaysia, Singapore, Thailand, the Philippines, and Vietnam for the period 2002-2020. The variables are collected from the International Monetary Fund (IMF), World Development Indicator (WDI), and Worldwide Governance Indicator (WGI) databases. Specifically, the control of corruption index published in the WGI has sufficient annual data starting from 2002. Therefore, this study conducts the analysis within this period to ensure the strongly balanced nature of the dataset.

For the estimation, this study employs the basic estimation methods on panel data, including the pooled regression mod-

el (Pooled OLS), the fixed effects model (FEM), and the random effects model (REM). Based on the estimation results, the study proceeds to test the regression hypotheses. If the assumptions are violated, the study utilizes the system GMM estimator proposed by Arellano and Bond (1991) to address model issues. This approach is followed what has been done previously by Doytch and Uctum (2011).

4. EMPIRICAL RESULTS

The descriptive statistics are detailed in Table **2** as follows:

Table 2. Descriptive Statistics.

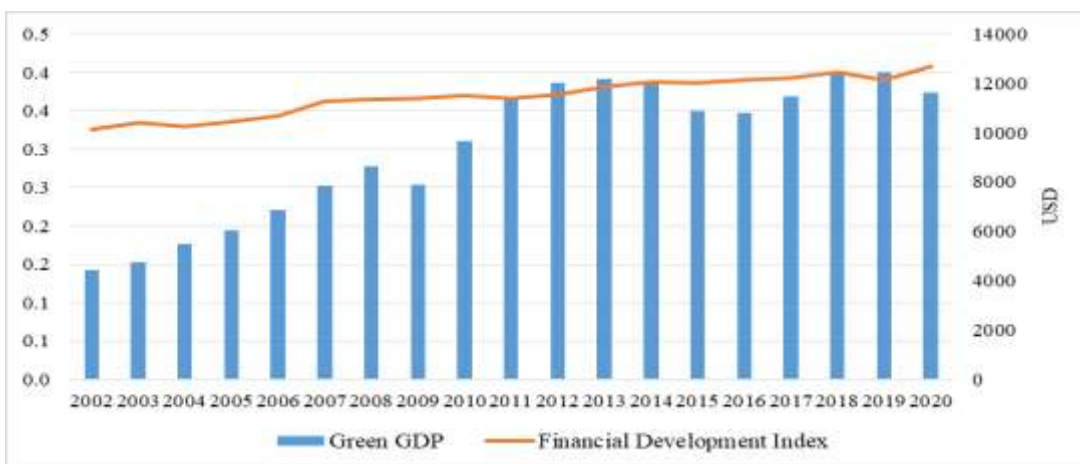| Variable	Mean	Std. Dev.	Min	Max
Y	8.08	1.48	4.70	11.11
FD	0.37	0.22	0.07	0.79
POP	1.32	0.66	-1.47	5.32
INF	4.61	6.64	-2.32	57.07
CC	-0.28	1.00	-1.67	2.30

Fig. (2). The mean of green GDP and financial development index of ASEAN countries.

Table 3. Correlation Matrix.

Variable	Y	FD	POP	INF	CC
Y	1.00				
FD	0.72*** (0.00)	1.00			
POP	0.13* (0.08)	0.05 (0.48)	1.00		
INF	-0.53*** (0.00)	-0.36*** (0.00)	-0.08 (0.30)	1.00	
CC	0.89*** (0.00)	0.74*** (0.00)	0.20*** (0.01)	-0.38*** (0.00)	1.00

Note: *significant at 10%, ***significant at 1%.

Table **2** shows that the average value of Y is 8.08 (equivalent to 9,426.4 USD), with the lowest value (4.7, equivalent to 109.51 USD) belonging to Myanmar in 2002, and the highest value (11.11, equivalent to 66,529.87 USD) belonging to Singapore in 2018. For financial development, the average value is 0.37, with the lowest value (0.07) belonging to Cambodia in 2005, and the highest value (0.79) belonging to Singapore in 2008. By 2020, Brunei and Singapore were the two countries with high levels of green GDP in the region, while Malaysia, Singapore, and Thailand have high levels of financial development index. On the other hand, Cambodia, Laos, and Myanmar are countries with relatively low levels of financial development and green GDP (Fig. **1**). The actual data shows that the average values of green GDP and financial development index for ASEAN countries have witnessed a significant upward trend in recent years (Fig. **2**).

This research conducted a correlation analysis to examine the level of correlation between the variables in the research model, and the results are presented in Table **3**. According to the results, FD shows a positive correlation with Y. Among the control variables, POP and CC are positively correlated with Y while INF is negatively associated with Y.

Table 4. Estimation Results.

Y	Pooled OLS	FEM	REM
_cons	8.50*** (0.00)	6.35*** (0.00)	7.29*** (0.00)
FD	0.65** (0.03)	5.75*** (0.00)	3.37*** (0.00)
POP	-0.10 (0.14)	-0.06 (0.31)	-0.08 (0.17)
INF	-0.05*** (0.00)	-0.03*** (0.00)	-0.03*** (0.00)
CC	1.10*** (0.00)	0.62*** (0.00)	0.68*** (0.00)
R2	84.46%	71.65%	77.82%
Significance level	249.92*** (0.00)	36.19*** (0.00)	216.13*** (0.00)

F test	22.34***
	(0.00)
Hausman test	27.78***
	(0.00)

Note: **significant at 5%, ***significant at 1%.

Next, the study estimates the model using the basic methods for panel data, namely the pooled OLS, FEM, and REM. Table **4** indicates that the FEM is more suitable than the others. Therefore, the hypotheses will be tested based on the estimation results using the FEM.

Table 5. Results of Hypothesis Testing.

Test	Result
Modified Wald test	147.35***
	(0.00)
Wooldridge test	187.95***
	(0.00)
Test of endogeneity	7.26***
	(0.00)
Mean VIF	1.75

Note: ***significant at 1%.

The results of hypothesis testing in Table **5** show that the mean VIF (Variance Inflation Factor) coefficient is relatively low (1.75), indicating that the multicollinearity in the model is not considered to be serious. However, the other tests suggest the presence of heteroscedasticity, autocorrelation, and endogeneity in the model. To address these issues, the study proceeds to estimate the model using the system GMM estimator.

Table 6. Results Using the System GMM Estimator.

Y		Coef.	P>|z|
_cons		8.29***	0.00
FD		0.64***	0.00
POP		0.13**	0.04
INF		-0.02***	0.00
CC		1.11***	0.00
Number of instruments		9	
Number of groups		10	
Significance level		8763.66***	
		(0.00)	
Arellano-Bond test	AR (1)	-2.17**	
		(0.03)	
	AR (2)	0.03	

		(0.97)
Sargan test		4.99
		(0.29)

Note: **significant at 5%, ***significant at 1%.

Table **6** shows the estimation results using the system GMM estimator are statistically significant while the other tests reveal satisfactory results. Specifically, financial development has is positively related to green economic growth. By finding this positive impact, this study confirms the previous findings of Ahmed et al. (2022). Along with promoting economic growth through improving capital allocation efficiency and stimulating investment, financial development also facilitates firms' access to advanced and environmentally friendly technologies, thereby promoting environmentally sustainable economic growth. This finding highlights the importance of pursuing sustainable development in ASEAN countries by promoting green economic growth.

Additionally, the research findings also reveal the positive effects of population growth and corruption control on green economic growth, while inflation exerts a negative impact on it. This indicates that increasing population and improving corruption control can contribute to promoting green economic growth. However, a rise in inflation can impede the process. These results are consistent with the findings of Tamazian and Rao (2010), Ahmed et al. (2022), and Wen et al. (2022).

5. CONCLUSION

The objective of this research is to examine the impact of financial development on green economic growth in ASEAN countries from 2002 to 2020. To address this objective, the study employs the system GMM to estimate the model. The results show that financial development exerts a positive effect on green economic growth. Specifically, financial development plays an essential role in green economic growth by improving capital allocation efficiency, stimulating investment, and particularly facilitating businesses' access to innovative and environmentally friendly technologies. Thus, improving the level of financial development to promote green economic growth and lay the foundation for sustainable development in these countries is crucial. This is particularly important for those with relatively low levels of financial development and green economic growth compared to the others in the region, such as Cambodia, Laos, and Myanmar. To achieve this, the ASEAN countries should promote the comprehensive development of the financial system, focusing on several key issues as follows:

- *For financial institutions:* they need to enhance their ability to provide financial resources to the economy, particularly for projects that utilize advanced technologies and are environmentally friendly. Additionally, they should pay more attention to risk prevention, being proactive in risk supervision and control for loans. They also need to diversify their income sources and reduce excessive reliance on income from lending, as this contributes to risk diversification in their operations. Furthermore, it is necessary to focus on researching and developing new services, especially those

with high technological content and distinctive features in the market to create a competitive advantage.

- For the financial market: it needs to operate more efficiently, creating a favorable investment environment and protecting equal rights among investors. This issue is particularly essential for emerging financial markets in the ASEAN region. In addition, the transparency and disclosure of information in the financial market should also be emphasized in these countries.

- For control variables: the findings indicate that population growth, inflation, and control of corruption have a significant impact on green economic growth. Therefore, suitable macroeconomic policy management and improvements in corruption control contribute greatly to creating a favorable investment environment and promoting green economic growth. To achieve this, the ASEAN countries need to pay more attention to enhancing the quality of human resources. In particular, macroeconomic policies should be linked to the sustainable development of financial institutions, the financial market, and green economic growth. Regarding control of corruption, it is necessary to further improve the level of corruption control, focusing on strict monitoring to detect and timely prevent corrupt practices. Anti-corruption measures should be maintained steadily and in the long term. These favorable conditions significantly contribute to promoting green economic growth.

Despite achieving its objectives, the research still has certain limitations. One of its limitations is that it lacks a deep analysis of the role of each control variable in the causal relation between financial development and green economic growth. Additionally, the sample size of the dataset is relatively small, which is another limitation of this study. Therefore, future research can explore new research directions by expanding the sample size or conducting a more in-depth analysis of the importance of each control variable in this relation.

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REFERENCES

Adams, S., Klobodu, E. K. M., & Apio, A. (2018). Renewable and nonrenewable energy, regime type and economic growth. *Renewable Energy, 125*, 755-767.

Ahmed, K. (2017). Revisiting the role of financial development for energyg-rowth-trade nexus in BRICS economies. *Energy, 128*, 487-495.

Ahmed, F., Kousar, S., Pervaiz, A., & Shabbir, A. (2022). Do institutional quality and financial development affect sustainable economic growth? Evidence from South Asian countries. *Borsa Istanbul Review, 22*(1), 189-196.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277-279.

Bagheri, M., Guevara, Z., Alikarami, M., Kennedy, C. A., & Doluweera, G. (2018). Green growth planning: A multi-factor energy input-output analysis of the Canadian economy. *Energy Economics, 74*, 708-720.

Bayar, Y. (2014). Financial development and economic growth in emerging Asian countries. *Asian Social Science, 10*(9), 8-17.

Beck, T., Demirguc-Kunt, A., & Levine, R. (2007). Finance, inequality, and the poor. *Journal of Economic Growth, 12*(1), 27-49.

Bencivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. *Review of Economic Studies, 58*, 195-209.

Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics & Finance, 6*(1), 1449780.

Botev, J., & Jawadi, F. (2019). *The nonlinear relationship between economic growth and financial development: Evidence from developing, emerging and advanced economies.* International Economics, In press, Available online 6 July 2019, 1-23.

Boutabba, M. A. (2014). The impact of financial development, income, energy and trade on carbon emissions: evidence from the Indian economy. *Economic Modelling, 40*, 33-41.

Bui, N. T. (2023). Stock market capitalization: How to manage its determinants? *Polish Journal of Management Studies, 27*(2), 23-38.

Cherif, M., & Dreger, C. (2016). Institutional determinants of financial development in MENA countries. *Review of Development Economics, 20*, 3, 670-680.

Cournède, B., & Denk, O. (2015). *Finance and economic growth in OECD and G20 countries.* OECD Economics Department Working Papers, 1223, Paris: OECD Publishing.

Dai, H., Xie, X., Xie, Y., Liu, J., & Masui, T. (2016). Green growth: the economic impacts of large-scale renewable energy development in China. *Applied Energy, 162,* 435-449.

Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *Review of Economic Studies*, *51*(3), 393-414.

Donelli, F., & Chiriatti, A. (2017). Turkish civilian capacity in Post-conflict scenarios: The cases of Bosnia and Herzegovina and Kosovo. *Journal of Global Analysis, 7*(1), 38-57.

Doytch, N., & Uctum, M. (2011). Does the worldwide shift of FDI from manufacturing to services accelerate economic growth? A GMM estimation study. *Journal of International Money and Finance, 30*(3), 410-427.

Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income", *Journal of Political Economy, 98*(5), 1076-1107.

Jacobs, M. (2012). *Green growth: Economic theory and political discourse, No. 92.* London: Grantham Research Institute on Climate Change and the Environment.

Jouvet, P., & Perthuis, C. (2013). Green growth: from intention to implementation. *International Economics, 134*, 29-55.

Keynes, J. M. (1936). *The general theory of employment, interest, and money.* London: Macmillan.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, *108*(3), 717-737.

Levine, R. (2005). *Finance and growth: theory and evidence, in: ed. Aghion, P., and Durlauf, S.N. (Eds.).* Handbook of Economic Growth, Elsevier, Amsterdam, 865-934.

Masoud, N., & Hardaker, G. (2012). The impact of financial development on economic growth. *Studies in Economics and Finance, 29*(3), 148-173.

McKinnon, R. I. (1973). *Money and capital in economic development.* Washington, DC: The Brookings Institution.

Nguyen, M. -L. T., & Bui, N. T. (2022). Government expenditure and economic growth: does the role of corruption control matter? *Heliyon*, *8*(10), e10822.

OECD (2011). *Towards green growth: a summary for policy makers.* Paris.

Ozturk, I., & Acaravci, A. (2013). The long-run and causal analysis of energy, growth, openness and financial development on carbon emissions in Turkey. *Energy Economics, 36*, 262-267.

Pagano, M., & Pica, G. (2012). Finance and employment. *Economic Policy*, *27*(69), 5-55.

Pan, F., & Yang, B. (2019). Financial development and the geographies of startup cities: evidence from China. *Small Business Economics, 52*(3), 743-758.

Ricardo, D. (1817). *On the principles of political economy and taxation.* London: John Murray.

Romer, P. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5), S71-S102.

Schumpeter, J. A. (1911). *The theory of economic development.* Harvard University Press, Cambridge.

Shahbaz, M., Rehman, I. U., & Afza, T. (2016). Macroeconomic determinants of stock market capitalization in an emerging market: fresh evidence from cointegration with unknown structural breaks. *Macroeconomics and Finance in Emerging Market Economies, 9*(1), 75-99.

Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations, 1st ed.* London: W. Strahan.

Sohag, K., Tas,kın, F. D., & Malik, M. N. (2019). Green economic growth, cleaner energy and militarization: Evidence from Turkey. *Resources Policy, 63*, 101407.

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics, 70*(1), 65-94.

Song, Y., Chen, B., Tao, R., su, C. -W., & Umar, M. (2020). Too much or less? Financial development in Chinese marine economic growth. *Regional Studies in Marine Science, 37,* 101324.

Svirydzenka, K. (2016). *Introducung a new broad-based index of financial development.* IMF Working Paper.

Tamazian, A., & Rao, B. B. (2010). Do economic, financial and institutional developments matter for environmental degradation? Evidence from transitional economies. *Energy Economics, 32*(1), 137-145.

Wang, L., Yu, J. X., & Shao, Y. H. (2019). Foreign direct investment and regional green total factor efficiency. Financial Research*, 30*(10), 17-30.

Wen, Y., Song, P., Yang, D., & Gao, C. (2022). Does governance impact on the financial development-carbon dioxide emissions nexus in G20 countries. *PLoS ONE, 17*(8), e0273546.

Williamson, S. D. (1986). Costly monitoring, financial intermediation, and equilibrium credit rationing. *Journal of Monetary Economics*, *18*(2), 159-179.

World Bank (2012). *Inclusive green growth.*
https://documents1.worldbank.org/curated/en/368361468313515918/pdf/691250PUB0Publ067902B09780821395516.pdf

Zhou, X., Wang, L., & Du, J. (2021). Institutional environment and green economic growth in China. *Complexity, 2021*, 6646255.