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A Review on Malaysia's Financial Development Trade-off with Environmental Pollution

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Abstract
Purpose: The purpose of this study is to review the past literature on financial development - environmental pollution nexus.
Design/methodology/approach: 18 papers that specifically investigate the financial development - environmental pollution nexus was chosen and then tabulated in the form of literature matrix. The comparison has been made to determine similarity, inconsistency, and the gap in the literature.
Findings: This finding suggested that the financial development-environmental pollution relationship are varies (remains mixed and controversial). Also, the controversial occur because each country faced a different stage of financial development.
Research limitations/implications: Instead of focusing on financial development - environmental pollution nexus, this study narrowing the scope by selecting those with econometric based.
Practical implications: By determining the gap, this study will open opportunities to develop the best fit model for accurate and reliable policy implication. The policy maker accelerates the R&D investment, speed up growth and hence affect the dynamic of environmental performance.
Originality/value: -

Keywords: Environmental Pollution, Carbon Emissions, Financial Development, Environment Sustainability

Introduction

The impact of economics and social activities on environment conditions has been the subject of wide debate among academician, environmentalist and policymakers for over four decades (Umar et al., 2020; Abokyi et al., 2019; Zaidi et al., 2019). On the other hand, the nexus between economics activities and performance of the financial sector also has been extensively distributed with in economics and financial modelling literature with the sometimes controversial and ambiguous result (Ahmed et al., 2021). The financial industry is an intermediary for the flow of funds in the economy. The greater development of financial institutions means higher financial resources or financing available to the private sector (Ang, 2008). The private sector can utilize financial resources for productive and innovative purposes. Therefore, financial development is essential to many countries, especially to emerging countries like Malaysia.

Past studies have demonstrated that financial development can influence economic activity in many ways. First, efficient and affluent financial institutions ease the process of getting personal loans, which may help people to buy goods such as automobiles, houses, refrigerators, air conditioners, washing machines and other domestic equipment (Javid & Sharif, 2016). Second, financial development can provide efficient financial services to foreign banking

markets and attract FDI (Kahouli, 2017). Third, financial development promotes stock market participation through the sale and purchase of quoted shares of companies (Maji et al., 2017). Fourth, financial development may generally boost research and development (R&D) activities and consequently improve economic activities and environmental quality (Shahbaz et al., 2013).

There are several indicators used to represent financial development of the economy, including domestic credit to private investors. Domestic credit to the private sector takes the form of loans and non-equity securities provided by financial institutions. The private sector has the opportunity to develop and grow by using facilities provided by financial institutions, which can impact the Malaysian economy as a whole. Figure 1 shows the domestic credit to private sector growth of 9.4% per year for the 1971-2017 period.

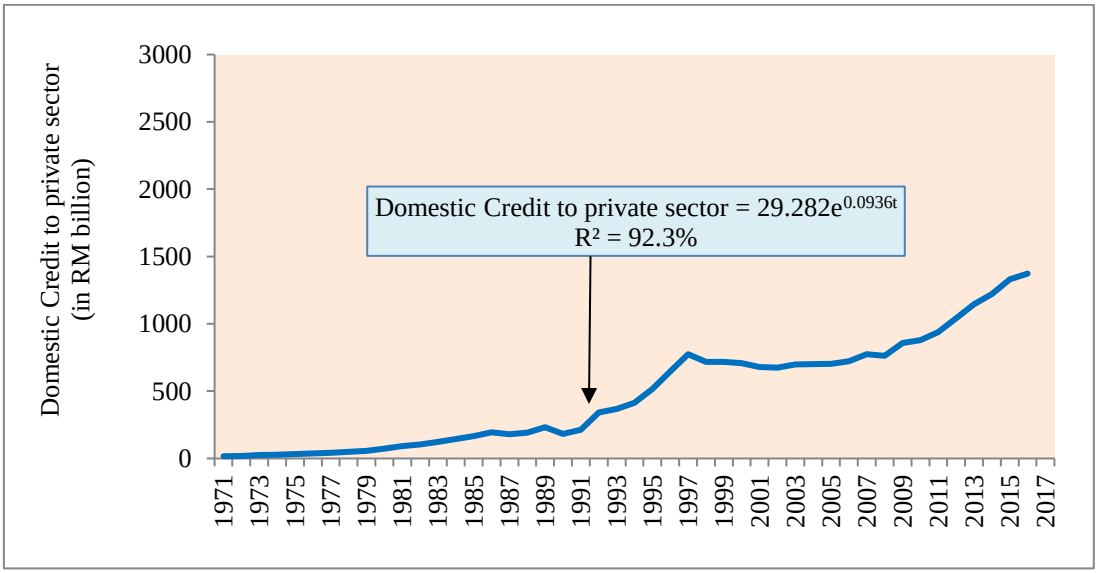

Figure 1: Domestic Credit to the Private sector for the (1971-2016) periods.
Sources: World Development Indicator (2018) / www.worldbank.org

However, the Malaysian financial system is characterized by the limited development of financial markets, where banks are the main source of financing. The majority of the companies are not usually listed, and the market concentration ratio is rather high for Malaysia compared to other advanced financial markets because market capitalization is highly concentrated in the hands of the ten largest firms (Badeed et al., 2016; Ang & Mckibbin, 2007). Thus, the Malaysian financial system can be described as a bank-based system rather than a market-based system.[1] Hence, the use of bank-based financial proxies is more appropriate to study the issue at hand.

Figure 2 shows the percentage of loans approved by banks to the private sector. It shows large portions of credit approved are dominantly for purchasing transport vehicles and passenger cars, purchasing residential property, and working capital, and it accounted for 55-68% of total credit approved. This means all the credit (loans) approved by banks can directly and indirectly influence transportation, construction, commercial, and manufacturing sectors through the purchasing of vehicles, residential property, and other domestic equipment.

[1] In Malaysia, the financial sector is dominated by the banking institutions. There are 27 registered commercial banks, 16 registered Islamic banks, and 11 registered investment banks with the main purpose of creating profit through loans that they provided (Bank Negara Malaysia, 2018).

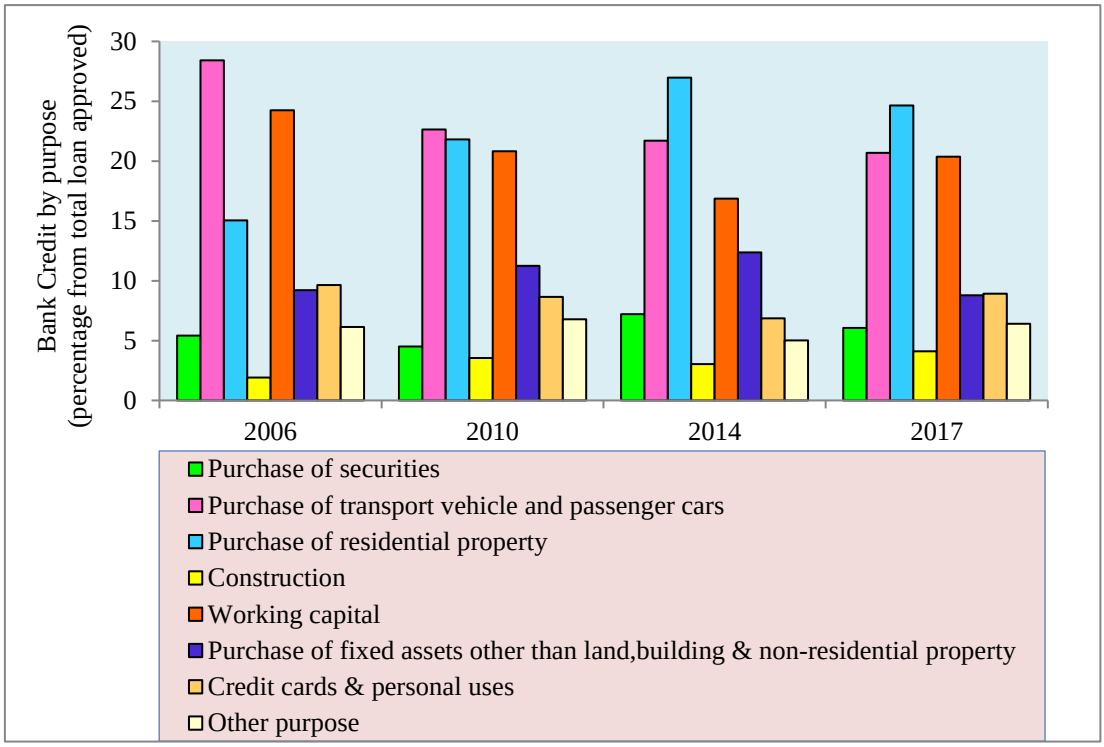

Figure 2: Bank Credit Approved by Purpose of Loan for (2006-2017) periods.
Source: BNM, Quarterly Bulletin 2006 - 2017. (http://bnm.gov.my/index.php)

Notably, the financial development does expand the economic activities; and it was hypothesis that the real sectors have led to increased consumption of energy (Shahbaz et al., 2013; Sadorsky, 2011) and consequently to higher environmental pollution in Malaysia (Maji et al., 2017). The purpose of this study is to review the past literature in term of financial development - environmental pollution nexus, and then come out with the gap in the literature. The significance of this study has two folds. First, this provides more evidence in the literature on the role of financial development in controlling the level of emissions. Second, this study could play a significant step in the process to develop a more sophisticated and robust environmental quality model exactly at the time Malaysia aimed for sustainable development that benefited to current and future generation.

The rest of this study is structure as follows. Section 2 presents a review of past studies. Section 3 offers a discussion and section 4 provides concluding remarks.

Review of the past studies

The impact of financial development on environmental conditions has gained increasing attention in recent literature. Financial development is broadly defined as a country's decision to allow and promote financial activities like increased FDI, increased banking activity, and increased stock market activities (Sadorsky, 2011). Financial development is important in this area because it can stimulate the economic efficiency of a country and then affect the energy consumption and level of emissions. Specific reasons for studying the link between financial development and environmental pollution are: (1) it may attract FDI and a higher degree of R&D investment, which can speed up growth and hence affect the dynamic of environmental performance (Shahbaz et al., 2015; Tamazian & Rao, 2010); (2) it provides developing countries with the motive and opportunity to use new technology, help them with clean and environmentally friendly production, and consequently improve the global environment and enhance regional development sustainability (Sadorsky, 2010; Tamazian et al., 2009; and (3)

it may lead to increased industrial activities, which in turn may lead to industrial pollution and environmental degradation (Shahbaz et al., 2013; Jalil & Feridun, 2011; Jensen, 1996). Furthermore, financial development benefits consumers and businesses in many ways. According to Sadorsky (2011), financial development makes possible the process of borrowing money to buy big-ticket (consumer durable) items like automobiles, houses, refrigerators, air conditioners, and washing machines. Also, financial development makes it easier and less costly for businesses to gain access to financial capital that can be used to expand existing businesses by buying and building more plants, hiring more workers, and buying more machinery and equipment. However, all this consumes a lot of energy, which can affect a country's overall demand for energy and thus increase emissions. In this regard, this study anticipates that financial development can and should play an important role in creating opportunities to address environmental challenges. Several articles have been reviewed to reach a good understanding of the financial development-environmental pollution relationship, as summarized in Table 1.

Table 1: Selected Literature on financial development-environmental pollution nexus.

Country	Author	Period of study	Method	Impact on environment pollution
BRIC	Tamazian et al. (2009)	1992-2004	RFM	Ω-shaped
Transition Economies	Tamazian & Rao (2010)	1993-2004	GLS, GMM	[-]
European	Ziaei (2015).	1989-2011	FVAR PVAR modelling	n.a
Indonesia	Shahbaz et al. (2013).	1975Q1-2011Q4	Linear, ARDL, VECM, IAA	[-]
Qatar	Mrabet & Alsamara (2017).	1980-2011	Quadratic, ARDL,	[-]
Kenya	Al-Mulali et al. (2016).	1980-2012	Linear, ARDL	[-]
Pakistan	Javid & Sharif (2016).	1972-2013	Quadratic, ARDL bound test, VECM	[+]
Pakistan	Shahbaz et al. (2016).	1985Q1-2014Q4	PC, NARDL, long run causality	[+]
Pakistan	Shahzad et al.(2017).	1971-2011	Quadratic, ARDL, VECM	[+]
Bangladesh	Shahbaz et al. (2014).	1975-2010	ARDL Bound Test, IAA	[+]
Kuwait	Salahuddin et al. (2018).	1980–2013	ARDL, VECM	n.a
USA		1960-2010		[-]

	Dogan & Turkekul (2016).		Quadratic, ARDL Bound test, VECM	
Turkey	Shahzad et al. (2017).	1971-2011	Quadratic, ARDL, VECM	[+]
India	Boutabba (2014).	1971-2008	Quadratic, ARDL, VECM	[+]
Malaysia	Bekhet et al. (2017).	1970-2013	Linear, ARDL, VECM	[+]
Malaysia	Bekhet & Othman (2017).	1971-2015	Quadratic, ARDL, VECM	n.a
Malaysia	Shahbaz et al.(2013).	1971-2011	Linear, ARDL, VECM	[-]
Malaysia	Maji et al. (2017).	1980-2014	Linear, ARDL, VECM	[+]

Notes: ∩ = inverted U-shaped; U= U-shaped; [+] = positive relationship with CO_2; [-] = negative relationship with CO_2; VECM = vector error correction model; FE = fixed effect; G-H = Gregory hensen; 2SLS = 2 stage least square; 3SLS = 3 stage least square; ; RFM = Reduced Form Model: PVAR= Partial Vector Autoregressive; Partial PAR; NARDL=Nonlinear Autoregressive Distributed Lags.

Based on Table 1 the relationship between financial development and Environmental pollution is controversial. The positive relationship between financial development and Environmental pollution was found by Javid and Sharif (2016) and Shahbaz et al. (2016) for the case of Pakistan, and Shahbaz et al. (2017) and Shahzad et al. (2014) for the case of Turkey and Bangladesh, respectively. The positive relationship indicates that increased financial development can worsen environmental quality through the scale effect (domestic output expansion), business effect (increase in investment activities) or wealth effect (developed efficient stock market) (Tamazian et al., 2009). In contrast, Tamazian and Rao (2010), Mrabet and Alsmara (2017), Al-Mulali et al. (2016), Shahbaz et al. (2013), and Dogan and Turkekul (2016) revealed a negative relationship between financial development and Environmental pollution for transition economies, Qatar, Kenya, and the USA, respectively. This happened to these particular countries because of the technological effect exceeding the scale effect. Better financial development has successfully induced listed companies to use energy-efficient technology, which consequently helps reduce Environmental pollution (Shahbaz et al., 2016). Conversely, Tamazian et al. (2009) revealed an inverted U-shaped relationship between Environmental pollution and financial development for the case of BRIC (Brazil, Russia, India, and China) countries. This finding suggested that the Environmental pollution–financial development relationship varies and is highly dependent on the stage of financial development.

Discussion

The past studies show the different form of trade-off between financial development and environmental pollution, and it can be summarized as figure 3. 44% of the studies reveal a positive relationship between financial development and environmental pollution, 33% and

17% of the studies show a negative and no relationship between similar indicators respectively. However, a minority of the studies reveal the non-linear via an inverted U-shaped relationship between the abovementioned variable.

The inverted U-shaped relationship can be explaining as follow: At the early stage of financial development, R & D is also in an early stage; thus, the expansion of economic output would increase Environmental pollution. However, after the financial development has sufficiently matured, that particular country can enjoy the outcome of their investment, mainly green investment. The improvement in technology has shifted Environmental pollution from an upward trend to a downward trend. Similar to the global scenario, Malaysia shows inconsistent results as well. Bekhet et al. (2017) and Maji et al. (2017) discovered that financial development worsens environmental quality, while Shahbaz et al. (2013) revealed the potential of financial development to improve environmental quality. All and all, this study suspects that the different framework of the studies is the main reason for dissimilar findings.

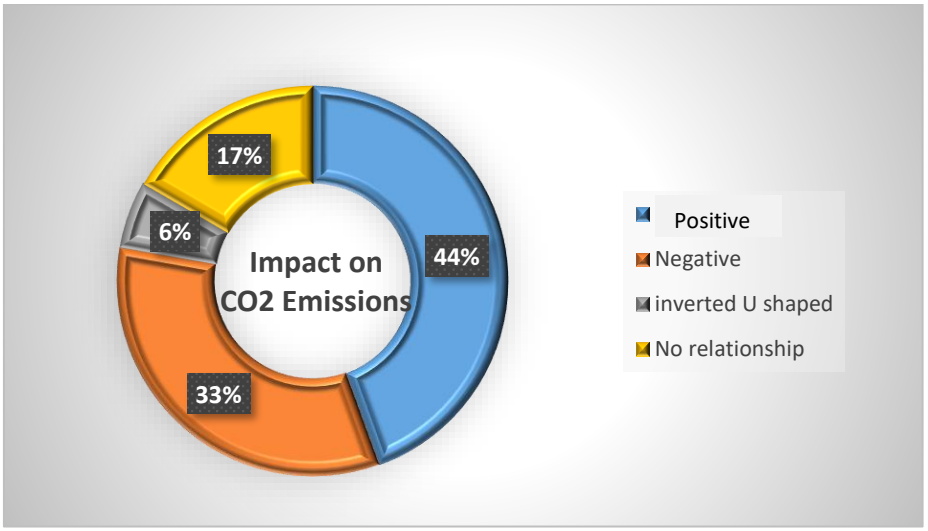

Figure 3: The Finding on Financial Development-Environmental pollution Nexus

The past literature in section 2, clearly shows 56% of the studies utilized the linear model, meanwhile 44% utilizing the non-linear models (see figure 4). The linear model indicates only one type of relationship can be happened in one shot. However, with advance technology and methodology, quadratic model can be utilized. Through quadratic model, the inverted U-shaped relationship between financial development and environmental pollution can be assess in single model only if scale, composition and technological effect applied.

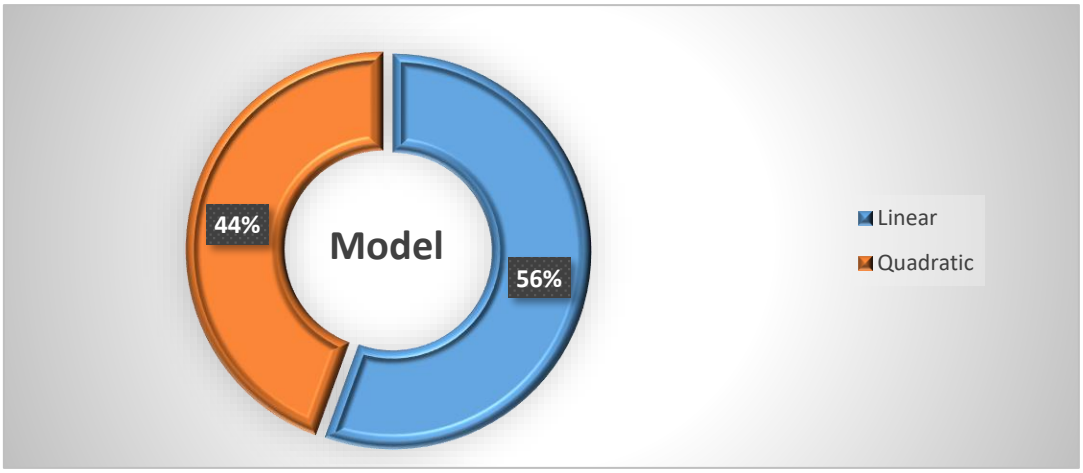

Figure 4: Model to estimate Financial Development-Environmental Pollution Nexus

Conclusion

With the raise in sustainable environment and sustainable development issue in this era, many researchers show their interest to estimate whether economy and financial development could move together with the environmental condition or worsen its condition. This study aims to find more evidence in literature by reviewing the past literature in term of the financial development - environmental pollution nexus; and then come out with the gap in the literature. Through this review, this study significantly provide explanation and understanding on what currently happened and have been done in this area. Later, in the future, another study can be done to complement the existing work by improving either methodology, framework or sampling part. This study reveals the inconsistency in previous finding due to method and framework used by earlier researchers. Instead of that, different kind development stage also contributes to different kind of finding.

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