Unveiling the Macroeconomic Drivers of Financial Development: Evidence from Malaysia

Masitah Zulham*, Dewi Fariha Abdullah, Abdul Rahim Ridzuan

Faculty of Management,Universiti Teknologi Malaysia, Johor Bahru 81310, Malaysia

***Corresponding author**

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ABSTRACT

Financial development is crucial in a country's growth by promoting economic expansion and alleviating poverty. As the financial sector advances, it increases access to financial services, allowing for better risk diversification. However, the annual growth of domestic credit in Malaysia has decelerated during the past decade. A subsequent decline in annual Gross Domestic Product (GDP) growth in Malaysia, attributed to the economic shock experienced during the specified period, leads to less demand for financial services. Therefore, examining macroeconomic variables that impact financial development in Malaysia is essential. This study focuses on key indicators such as economic growth, real interest rates, and inflation, analysing their effects on financial development. It also considers control variables like Trade Openness (TO) and Human Capital (HC) to prevent biased results. Using ARDL estimation on 42 years of annual data from 1980 to 2022 shows that economic growth (LNGDP), real interest rates (LNRIR), and human capital (LNHC) positively influence financial development (LNFD). Conversely, inflation (LNINF) has a significant negative effect. Policymakers are encouraged to maintain a stable macroeconomic environment that supports growth, such as low inflation, manageable interest rates, and a sound banking system. These conditions will help channel economic expansion into financial sector development.

Type of Paper: Empirical

Keywords: Financial Development, Economic Growth, Interest Rate, Inflation, and ARDL

INTRODUCTION

The growth concerning the financial sector with respect to emerging economies and markets is essential for the expansion of the private sector, aiming to boost economic activity and reduce poverty. It acts as an authorisation system that facilitates transactions by providing liquidity. As the financial sector matures, access to financial services expands, allowing for better risk management. Giving the poor and vulnerable populations more access while lessening inequality and poverty (Demirgüç-kunt & Levine, 2009), including increasing demand for low-skilled workers (Levine, 2021). Similarly, Tchamyou and Asongu (2017) also agreed that financial sector development permits the movement of capital. It boosts consumption and investment, promoting employment, lifting individuals out of poverty, and enhancing economic performance. It is considered a vital element for building a resilient, diverse, and robust economy. Additionally, it supports Small and Medium-sized Enterprises (SMEs) by providing access to credit. Since SMEs are often labour-intensive and create more jobs than larger firms, they significantly support economic growth in emerging economies.

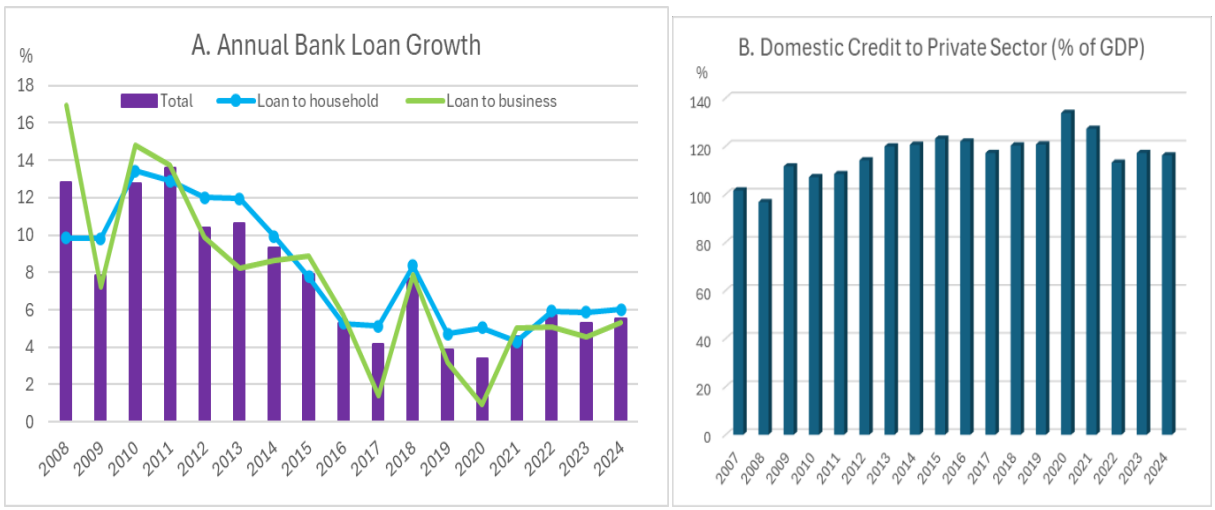
According to the International Monetary Fund (IMF), Malaysia's banking sector is more developed in comparison to several other emerging markets, such as Indonesia, the Philippines, Myanmar, and Cambodia, mainly because more loan was given to households and businesses. Based on Figure 1, households that are referring to regular people were considered the biggest group taking out loans purposely for buying properties and vehicles, with an annual growth of 6.0% in 2024. Since there has been an improvement in the labour market, where people have jobs and earn better incomes, this has helped boost demand for household loans.

Outstanding business loan growth was sustained at 5.32% in 2024. This was supported by higher investment-related loan growth amid more moderate growth in working capital loans.

Non-Performing Loan (NPL) accounts for 9.4% with respect to total loans in 2005, have persisted below 2.0% since late 2013, even through the pandemic, as well as beyond. By the third quarter in the year of 2023, these loans represented only 1.7% of total loans, only slightly higher by 0.1 percentage points compared to the pre-pandemic period of 2015-2019 (OECD, 2024). Malaysia's NPL ratio has consistently stayed lower than that of its regional neighbours, reflecting a stable and resilient financial environment.

Nevertheless, a specific segment of the household loan portfolio necessitates careful monitoring by financial regulators. By the conclusion of 2023, 25% with regard to household borrowers showed a Debt-Service Ratio (DSR) exceeding 60% (Bank Negara Malaysia, 2023). Meaning that one out of four people with a loan was using more than 60% of their income just to pay off their debt. According to Nordin et al. (2018), most of the high debt levels are concentrated among middle-income as well as high-income borrowers, who often possess larger financial reserves to manage loan repayments during financial shocks. Consequently, even with the rise in interest rates since 2022 and the fact that 78.3% concerning outstanding household debt was on floating rates at the end of 2023, the impairment ratio for borrowers with high DSR has stayed low as well as stable at 1.2% (Bank Negara Malaysia, 2023). This suggests that most high-debt borrowers are still managing to pay their loans on time, even with rising interest rates, and fewer people require assistance or special repayment plans.

In the year 1991, Malaysia's former prime minister, Dr. Mahathir Mohamad, launched Wawasan 2020 to develop the nation into a fully developed country. To achieve this, a robust financial system was essential to navigate global challenges (Mun & Ismail, 2015). Unfortunately, Malaysia failed to meet its aim of becoming a developed nation by 2020. The goal may not be a complete failure after 30 years, but Malaysia is still lagging behind in terms of banking development compared with Singapore, China, and Thailand (OECD, 2024). Over the past decade, annual bank loan growth has slowed (see Figure 1, Panel A). Notably, from 2020 to 2022, the growth of bank loans failed to keep pace with nominal Gross Domestic Product (GDP), although there was a rebound in 2023 as growth decelerated (Figure 1, Panel B), where the increase in outstanding loans was not as rapid as the growth of the overall economy (Hisham et al., 2023).



(Sources: Bank Negara Malaysia, World Development Indicator, and author calculation)

Figure 1: The annual growth of Malaysia's Bank Loan and Domestic Credit to the Private Sector as a Share of GDP

Noting the influence of global economic shocks, economists stated that economic shocks such as the Asian financial crisis (1997-1998), as well as the global financial crisis (2008-2009), possess a substantial impact on Malaysia's efforts to overhaul its economy. Most recently, the pandemic's progression and concern over the impact of COVID-19 policy measures (2019-2020), continued geopolitical tensions, and unpredictable oil prices resulted in a tightening of global financial conditions. Meanwhile, a subsequent decline in annual (GDP)

growth in Malaysia, attributed to the economic shock experienced during the specified period, results in a reduced demand for financial services (Devadas et al., 2020). NPLs will also be increasing due to weakness in the banking sector. Household and firm could withdraw their deposit when they lose trust in a financial institution. Moreover, the real interest rate for private borrowers often rises due to heightened risk aversion, making borrowing more expensive and reducing investment activity. Figure 2 below illustrates Malaysia's annual GDP growth from 1970 to 2020, highlighting the significant impact of various economic shocks throughout the period.

(Source: World Development Indicator)

Figure 2: Malaysia's Annual GDP Growth 1970-2024

Additionally, a significant domestic risk stems from uncertainty about inflation. Sustained inflation above the 2% target, driven by weak reforms in the Malaysian ringgit and subsidies, may reduce private spending, particularly among low-income households that were hit hardest by recent price hikes (Cheok & Bakar, 2024). It might also trigger more monetary policy tightening. The sluggish progress of fiscal consolidation in achieving medium-term objectives makes public finances susceptible to shocks and heightened spending pressures. A faster decline in inflation could hasten the easing of monetary policy, supporting global growth. Conversely, persistent core inflation may lead to further interest rate hikes, with the central bank raising rates to prevent the economy from overheating. This would make borrowing more costly for households.

Given the limited research or evidence connecting macroeconomic elements like economic growth, real interest rates, inflation, and financial development, this study plays a crucial role in addressing that gap. It examines how Malaysia's financial system can be enhanced by managing macroeconomic variables and how this improvement can support economic development. Additionally, this paper conducts an in-depth analysis using the Autoregressive Distributed Lag (ARDL) model to assess how macroeconomic factors can enhance financial development, thereby contributing to sustainable economic growth and facilitating the country's shift towards achieving high-income status. This paper also focuses on a single country, which is Malaysia, as a case study. Most previous research has concentrated on cross-country and panel analyses. Therefore, the connection between finance and growth in a single-country analysis is limited. Demetriades and Hussein (1996) pointed out the dangers of drawing statistical conclusions from cross-sectional country studies, which frequently assume that different economies are alike.

This paper’s structure is as follows: Section 2 offers a concise literature review with respect to the link between different macroeconomic factors as well as military expenditure. Section 3 presents the research methodology employed in this study. Section 4 discusses the results, and Section 5 concludes with key policy recommendations.

LITERATURE REVIEW

Macroeconomic factors are general economic indicators that influence the overall economy and financial markets. These encompass economic growth, inflation, interest rates, unemployment, fiscal policies, and monetary policies, which influence economic stability, investor confidence, and financial development. Variations in financial development levels between countries may be associated with various factors, including macroeconomic variables. Some empirical research has explored what determines financial development, highlighting factors such as income level, capital account openness, as well as financial openness (Baltagi et al., 2009; Chinn & Ito, 2006; Law & Habibullah, 2009; Rajan & Zingales, 2003). However, the exact influence regarding macroeconomic factors like economic growth, inflation rates, as well as real interest rates on the development with regard to the financial system has not been thoroughly explored. It is crucial to understand the relationship between macroeconomic variables as well as financial development, as theoretical evidence indicates that weak macroeconomic performance can hinder the growth concerning the financial sector.

Economic Growth

Several studies with respect to the finance-growth relationship support the demand-following hypothesis. Mtar and Belazreg (2023) used a system of Generalised Method of Moments (GMM) as well as panel Vector Autoregression (VAR) techniques to examine the interconnections among innovation, financial development, Trade Openness (TO), as well as economic growth in 11 European countries from the year of 2001 to 2016. Their findings reveal a unidirectional, positive link from economic growth to financial development, indicating that economic growth strengthens investor confidence. This stimulates investment and influences financial arrangements, thereby fostering financial development.

Demetriades and Hussein (1996) investigated the causal link between financial development as well as economic growth using time series methods. The dataset included data from 16 countries that met the World Bank criteria for not being highly developed in 1960, with a minimum of 27 consecutive annual data points on relevant variables and a population exceeding 1 million in 1990. The study employed two indicators concerning financial development: the ratio of bank deposit liabilities to nominal GDP, as well as the ratio of bank claims on the private sector to nominal GDP. The findings highlighted that finance is pivotal in driving economic growth. Additionally, they identified reverse causality, implying that the relationship between financial development and economic growth is reciprocal. In general, their findings showed a consistent connection between at least one indicator regarding financial development and real GDP per capita in the majority of the countries studied.

Song et al. (2021) conducted a study using panel cointegration as well as panel Error Correction Models (ECMs) from the year of 2002 to 2016 to investigate the long-term relationship between corruption, economic growth, and financial development across 142 countries. To offer more detailed insights, the sample was categorised into subsamples concerning developed as well as developing countries. The Vector Error Correction Model (VECM) revealed causal relationships between economic growth and financial development, as well as between corruption and financial growth, in the long run. However, no such causal relationships were discovered for developed countries. Appiah-Otoo and Song (2022) determined new insights in Ghana, where the causality analysis for the period of 1990-2017 has a unidirectional causality where causality flows from economic growth to indicators like domestic credit provided by the financial sector, liquid liabilities as a percentage of GDP, and the life insurance premium volume regarding GDP. The research also highlighted the impact of shocks to domestic credit supplied by the banking sector, credit granted to the private sector, and the assets owned by deposit money banks as a percentage of GDP, which harmed Ghana's economic growth.

Belazreg and Mtar (2020) examined interactions between innovation, TO, financial development, as well as economic growth across 27 Organisation for Economic Cooperation and Development (OECD) countries during the period 2001 to 2016. Utilising a panel VAR model, the author explores a four-way interaction among the variables. The results reveal a neutral relationship between economic growth and innovation, innovation and financial development, as well as innovation and trade. In contrast, the study identifies a one-way (unidirectional) relationship from economic growth leading to financial development as well as from

financial development facilitating trade. Zang and Kim (2007) explored the presence of a causal relationship between financial development indicators and economic growth across 74 countries during the period from 1961 to 1995. Utilising Sims-Geweke causality tests on the comprehensive panel dataset compiled by Levine, Loayza, and Beck, their findings diverged sharply from previous conclusions. They found no evidence supporting a positive unidirectional causality from financial development to economic growth. Instead, the findings strongly indicated that economic growth drives financial development.

Ang and McKibbin (2007) investigated the relationship between financial development and economic growth, or the reverse, within the context of Malaysia's small open economy using individual country time-series data. Financial development in this study was proxied by liquid liabilities (M3) to GDP, the ratio of commercial assets to the sum of commercial and central bank assets, and the share of domestic credit to the private sector relative to nominal GDP. Despite the fact that financial sector reforms have widened the financial system, the author discovered that these policy reforms appear not to have resulted in sustained long-term growth. Rather, Malaysia's financial deepening appears to be driven by the country's overall economic growth. Consequently, the findings align with the demand-following hypothesis, indicating that economic growth drives financial development, but not the other way around.

Real Interest Rate

Another factor that produced ambiguous results is the real interest rate. Luintel and Khan (1999) have examined the finance-growth nexus in 10 sample countries. Using multivariate VAR, they discovered that, in the long run, financial depth is positively and substantially affected by per capita real income as well as the real interest rate. In most cases, the output vectors indicate diminishing returns to physical capital stock as well as a positive effect of the real interest rate on productivity. These outcomes are consistent with the theoretical expectations of the endogenous growth literature. Ang (2008) also received the same result, showing that real interest rates exert a significant positive influence on financial development, indicating that removing interest rate controls could foster financial development by enabling the market to determine its credit allocation.

Using multivariate cointegration methods while appropriately accounting for various macroeconomic shocks, Ang and McKibbin (2007) reported contrasting findings for Malaysia. Their findings demonstrate that both financial repression policies and real interest rates negatively affect financial development. Furthermore, empirical analysis performed on a wide panel of euro area banks revealed a strong negative relationship between bank risk-taking and interest rates. Specifically, lower interest rates are associated with higher bank risk, though this effect on risky assets decreases for banks having greater equity capital (Delis & Kouretas, 2011). The study also revealed that the negative relationship is more pronounced in banks involved in non-traditional banking activities (those with a larger volume of off-balance sheet items), and less pronounced—though still statistically significant—for banks with higher levels of capitalisation.

Aydemir and Ovenc (2016) argued that short-term interest rates have a negative impact on banking profitability in Turkey in the short term. Nonetheless, in the long run, the impact of these variables becomes positive, aligning with expectations. Their findings also highlight that bank profitability in emerging markets is significantly more sensitive to interest rate fluctuations compared to banks in advanced economies like the United Kingdom. Similarly, Assefa et al. (2017) discovered that interest rates have a substantial negative impact on stock returns regarding developed countries, reinforcing the expected cash flow hypothesis. In contrast, stock returns in developing markets are mainly affected by the global market portfolio. The varying effects concerning interest rate changes on stock returns can be partly explained by variations in monetary policy and the more advanced nature of capital markets in developed economies.

As a result, interest rates are vital in influencing investment and saving decisions, as well as the demand regarding financial products, services, intermediaries, and instruments. Higher lending rates increase the cost of capital, which may discourage investors from seeking loans for investment. Other than that, a negative real interest rate, caused by financial repression as well as credit controls, may undermine the motivation to save, ultimately leading to a decline in gross domestic savings (Ang & McKibbin, 2007; Ben Naceur et al., 2008; Luintel & Khan, 1999).

Inflation

Economies with higher inflation are more susceptible to having underperforming banks and less efficient equity markets. In general, past research has demonstrated that inflation is negatively associated with the financial system. Inflation is commonly described as an ongoing rise concerning the general price level of services and goods within an economy, resulting in a decrease in purchasing power at a certain time (Cogoljević et al., 2018; Ereda Melaku, 2020). The overall increase in the cost of services and goods in an economy is often measured by the Consumer Price Index (CPI) and the Producer Price Index (PPI), as the value of the dollar is going to fall when the cost of an item rises. Financial development positively influences economic growth, although high long-term inflation can hinder the efficiency of financial markets.

Bittencourt (2011) determined the effect concerning inflation on financial development utilising data from 1985 to 2004 across ten economically diverse regions in Brazil. His study assessed that inflation negatively and significantly affects financial development. The results indicate that high inflation can reduce the returns on savings, which discourages saving and reduces the number of savers. This, in turn, increases information frictions, limits the number of potential borrowers, and results in a tighter credit supply within the economy.

While Bilalli et al. (2024) as well as Demirgüç-Kunt and Detragiache (2005) emphasised the importance of macroeconomic stability, noting that countries with higher inflation rates tend to possess smaller, less active, as well as less efficient banking systems and equity markets, which can lead to financial crises. However, the results were mixed regarding the effect of the inflation rate observed by Zainudin and Nordin (2017) in their study. Their research revealed a positive association with inflation as well as financial development in Thailand and the Philippines, while Malaysia and Singapore exhibited a negative relationship between the two variables.

Using the Principle Component Analysis (PCA) approach, Badeeb and Lean (2017) found that inflation is the most significant factor influencing financial development in Yemen. However, the effect of inflation depends on the specific proxy utilised to represent financial development. Whether inflation has a positive or negative impact is determined by the financial development indicator selected. For instance, while inflation negatively correlates with Private Sector Credit (PSC), it shows a positive relationship with M2 and bank deposits. Consequently, the mixed long-term relationship between inflation and financial development indicators may be influenced by a third factor, such as the interest rate. In Yemen, rising inflation typically prompts the central bank to raise interest rates, which boosts bank deposits but reduces lending to the private sector. The authors propose the possible presence regarding a non-linear relationship between inflation as well as financial development indicators.

Another research by Epstein and Yeldan (2008) used their non-linear regression method to examine the connection between inflation targeting and economic development. Annual statistics for 80 nations are being used for the period 1961-2000. The results of this study indicated an inverse relationship between inflation targeting and financial development. Ehigiamusoe et al. (2020) investigated how inflation influences the relationship between finance as well as economic growth in the West African context, identifying a negative interaction between inflation and financial development. It demonstrated a threshold inflation rate of 5.6%, beyond which the relationship could be adversely affected. The main finding indicates that, rather than simultaneously boosting both financial inflation and development, it is more beneficial to advance financial development while keeping inflation in check. In contrast, Asratie (2021) discovered that inflation had a beneficial and considerable influence in the long run. Hence, this aligns with the quantity theory of money, which argues that there is a positive association between the money supply and inflation, indicating that an inflationary environment can stimulate financial development by maximising the money supply as well as providing more financial resources regarding investment. However, its impact appears to be insignificant in the short term. Table 1 below is a summary of a previous study on the connection between macroeconomic factors and financial development.

Table 1: Summary of previous research on the connection between macroeconomic factors and financial development

• **ECONOMIC GROWTH (EG) AND FINANCIAL DEVELOPMENT (FD)**			
Authors	**Samples and Period**	**Main Variables**	**Impact of EG on FD**
Mtar and Belazreg (2023)	11 European countries (2001-2016)	GDP per capita, gross fixed capital investment, domestic credit to the private sector, trade liberalisation, Foreign Direct Investment (FDI), and inflation.	Positive
Song et al. (2021)	142 countries (2002-2006)	GDP per capita, broad money, and corruption.	Positive
Appiah-Otoo and Song (2022)	Ghana (1990-2017)	Real GDP per capita, total money supply, domestic credit extended by the financial sector, domestic credit to the private sector, bank deposits as a percentage of GDP, liquid liabilities as a percentage of GDP, assets of deposit money banks relative to total deposit money bank assets and central bank assets, assets of deposit money banks as a percentage of GDP, non-life insurance premiums as a percentage of GDP, life insurance premiums as a percentage of GDP, stock market turnover ratio of domestic shares, stock market capitalisation as a percentage of GDP, as well as the listed companies' number.	Negative
Belazreg and Mtar (2020)	27 OECD countries (2001-2016)	GDP per capita, gross fixed capital formation per capita, and the proportion of domestic credit to the private sector in GDP growth, FDI, the CPI, Human Capital (HC), and entrepreneurship.	Positive
Zang and Kim (2007)	76 countries (1961-1995)	Real per capita GDP growth rate, the ratio of commercial bank assets to the sum of central bank as well as commercial bank assets, credit provided by financial intermediaries to the private sector as a percentage of GDP, and liquid liabilities regarding the financial system as a GDP percentage.	Positive
Demetriades and Hussein (1996)	16 countries (start:1960) 27 annual observations	The ratio concerning bank deposit liabilities to nominal GDP, the ratio of bank loans to the private sector to nominal GDP, and real GDP per capita.	Positive (two-way causality)
• **REAL INTEREST RATE (RI) AND FINANCIAL DEVELOPMENT (FD)**			
Authors	**Samples and Period**	**Main Variables**	**Impact of RI on FD**
Luintel and Khan (1999)	10 countries (1951-1994)	Total deposit liabilities of deposit banks, real GDP, and real interest rates.	Positive
Ang and McKibbin (2007)	Malaysia (1960-2001)	Liquid liabilities (M3), the ratio regarding commercial bank assets to the total assets concerning central and commercial banks, domestic credit extended to the private sector, real GDP per capita, the real interest rate, and the financial repression index.	Negative
Delis and Kouretas (2011)	Banks in 16 Euro countries (2001-2008)	Risk, interest rate, a group of bank-specific control variables, along with a set of regulatory, macroeconomic, and structural control variables	Negative
Aydemir and Ovenc (2016)	Turkey (2002-2014)	Return on Equity (ROE), Net Interest Margin (NIM), as well as Return on Assets (ROA), along with the leverage ratio and the growth rate regarding real total assets. To reflect real economic activity, the authors incorporate the quarterly growth rate of real GDP, the 3-month Treasury bill rate, as well as the 10-year government bond yield as part of a robustness analysis.	Negative

Assefa et al. (2017)	21 developed and 19 developing economies (1999-2013)	Short-term interest rates, equity indices, as well as consumer price indices stock return, real effective exchange rate (*REER*), Euro, and the Asian crises (dummy)	Negative
Hye and Islam (2013)	Bangladesh (1975-2009)	GDP, total labour force, gross fixed capital formation, real interest rate, and Financial Development Index (FDI).	Negative
Ben Naceur et al. (2008)	11 MENA countries (1979–2005)	Growth in real GDP per capita, investment rate growth, market capitalisation, trading volume, turnover ratio, stock market index, credit to the private sector, expansion of private credit, income levels, FDI, TO, savings, black market premium, inflation rate, US interest rate, government spending, and financial liberalisation.	Mixed Negative- short run Positive- Long run
• **INFLATION (INF) AND FINANCIAL DEVELOPMENT (FD)**			
Authors	**Samples and Period**	**Main Variables**	**Impact of INF on FD**
Bittencourt (2011)	Brazil (1985 to 2004)	M2 (liquid liabilities), M3 (M2 + other financial assets that are more illiquid), credit to private sector, personal credit, CPI (inflation)	Negative
Zainudin and Nordin (2017)	Malaysia, Singapore, Thailand, and the Philippines (1987-2013)	domestic credit to the private sector, real GDP per capita, real interest rate, CPI, TO	Mixed (Malaysia, Singapore: Negative) (Thailand, Philippines: positive)
Badeeb and Lean (2017)	Yemen (1980-2012)	PSC, M2, deposits. Natural resource rent, GDP per capita, TO, as well as inflation.	Mixed (PSC- Negative) (M2, Deposit- Positive) *possibility of a non-linear link
Epstein and Yeldan (2008)	80 nations (1961-2000)	Growth rate, inflation rate, exchange rate, real interest rate, public assets real interest rate, unemployment rate, trade balance, and central bank foreign reserve.	Negative
Ehigiamusoe et al. (2020)	West African (1980-2014)	Credit to the private sector relative, liquid liability, inflation rate, government debt, real exchange rate, fiscal deficit relative, real interest rate, level of per capita income, government consumption expenditure, as well as TO.	Negative *possibility of a non-linear link, threshold level, which was 5.6 per cent above
Asratie (2021)	Ethiopia (1980-2019)	Total money supply and PSC, external debt, reserve requirements, lending interest rate, real exchange rate, inflation rate, TO, political freedom index, as well as GDP.	Positive

METHODOLOGY

This section offers a concise overview of the model formulation. It outlines the factors that affect financial development in Malaysia, which are thoughtfully chosen based on the country's key macroeconomic indicators.

Model of Financial Development

The general functional form of the model is given below:

$$FD = f(GDP, RIR, INF, TO, HC) \quad (1)$$

where FD is referring to financial development, GDP refers to a proxy concerning economic growth, RIR serves as an indicator of the real interest rate, while INF is a proxy for inflation. The model also incorporates TO and Human Capital (HC) as control variables to enhance estimation accuracy and prevent omitted variable bias. All variables were converted into a log-linear form (LN) to present the outcomes in both short-run as well as long-run elasticities and to smooth out fluctuations in the time series data, thereby producing more accurate and reliable estimates (Shahbaz & Mafizur Rahman, 2010). The logarithmic form of the model, obtained from Equation (1), is presented as follows:

$$\begin{aligned} LNFD_t = {} & \alpha_0 + \beta_1 LNGDP_t + \beta_2 LNRIR_t + \beta_3 LNINF_t + \beta_4 LNTO_t \\ & + \beta_5 LNHC_t \\ & + DUM1 + DUM2 + \mu_t, \end{aligned} \quad (2)$$

where $LNFD_t, LNGDP_t, LNRIR_t, LNINF_t, LNTO_t, and\ LNHC_t$ respectively depict the natural log of financial developmental proxies assessed by local credits to the private sector, the natural log of economic growth examined by GDP per capita, the natural log of inflation proxies evaluated by the CPI, the natural log of TO proxies appraised by the volume of imports and exports to GDP, as well as the natural log of HC assessed through secondary school enrollment. Meanwhile, α is a constant or intercept term, β shows the partial slope coefficients of explanatory variables, and μ_t typifies residual terms comprising a normal distribution with finite variance and zero mean.

A dummy variable is also incorporated into the equation above to account for the impact of the Asian Financial Crisis (1997–1998) as well as the Global Financial Crisis (2008–2009), and is defined as follows:

$$DUM1_{97-98} = \begin{cases} 1 & \text{if } t = 1997-98 \\ 0 & \text{otherwise} \end{cases},$$

$$DUM2_{08-09} = \begin{cases} 1 & \text{if } t = 2008-2009 \\ 0 & \text{otherwise} \end{cases}.$$

The ARDL model, formulated using the Unrestricted Error Correction Model (UECM) framework, is presented as follows:

$$\begin{aligned} \Delta LNFD_t = {} & \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta LNFD_{t-1} + \sum_{i=0}^{q} \alpha_{2i} \Delta LNGDP_{t-1} \\ & + \sum_{i=0}^{r} \alpha_{3i} \Delta LNRIR_{t-1} + \sum_{i=0}^{s} \alpha_{4i} \Delta LNINF_{t-1} + \sum_{i=}^{t} \alpha_{5i} \Delta LNTO_{t-1} \\ & + \sum_{i=0}^{u} \alpha_{6i} \Delta LNHC_{t-1} + DUM1 + DUM2 + \beta_0 LNFD_{t-1} + \beta_1 LNGDP_{t-1} \\ & + \beta_2 LNRIR_{t-1} + \beta_3 LNINF_{t-1} + \beta_4 LNTO_{t-1} + \beta_5 LNHC_{t-1} + DUM1 \\ & + DUM2 + \varepsilon_t, \end{aligned} \quad (3)$$

in which Δ represents the first-difference operator, α_0 is the drift component, and $\varepsilon_t$is the white noise. Note that the above final model may also be observed as an ARDL of order (*p, q, r, s, t, u*). The parameter β_i for i = 1, 2, 3, 4, 5 represents the long-term impact of the respective variables, normalised by β_0, while $\alpha_{1i,}\alpha_{2i,}\alpha_{3i,}\alpha_{4i,}\alpha_{5i,}\alpha_{6i,}$ represent the short-run effect of the ARDL model. After regression of Equation (3), the Wald-test (*F*-statistic) was calculated to distinguish the long-term relationship involving the variable of interest. The Wald test may be performed by applying constraints on the estimated long-run coefficients. The null and alternative hypotheses are as follows: $H_0 = \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ (no long-run relationship). Against the alternative hypothesis: $H_1 \neq \beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$ (a long-run relationship exists). When the computed *F-statistic* exceeds the upper bound critical value, then the H_0 is rejected. Given that the *F*-statistic is below the lower bound critical value, H_0 cannot be renounced. Consequently, when the computed *F-statistic* lies between the lower and upper bound values, the result is vague. Once a long-run relationship is established using the *F*-statistic, the coefficients for both long-run as well as short-run elasticities may be estimated.

However, the dependent variable may not instantly adjust from short-term fluctuations to its long-run equilibrium state. Hence, to capture the short-run dynamic effects, the restricted Error Correction Model (ECM) is employed through the ARDL as shown in Equation (4) as follows:

$$\Delta LNFD_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i}\Delta LNFD_{t-1} + \sum_{i=0}^{q} \alpha_{2i}\Delta LNGDP_{t-1} + \sum_{i=0}^{r} \alpha_{3i}\Delta LNRIR_{t-1} + \sum_{i=0}^{s} \alpha_{4i}\Delta LNINF_{t-1} + \sum_{i=}^{t} \alpha_{5i}\Delta LNTO_{t-1} + \sum_{i=0}^{u} \alpha_{6i}\Delta LNHC_{t-1} + DUM1 + DUM2 + +\lambda ect_{t-1} + \mu_t. \quad (4)$$

Data Collection

This study utilised annual data spanning from 1980 to 2022, covering a total of 48 years as the sample period. The data summary, along with its sources, is provided in Table 2.

Table 2: Sources of Data

Variable	Description	Unit Measurement	Sources
FD	Domestic credit provided for the private sector.	% of GDP	WDI
GDP	GDP per capita.	constant 2015 US$	WDI
RIR	The lending interest rate is adjusted concerning inflation as measured by the GDP deflator.	Per cent (%)	WDI
INF	Consumer price index.	2010 = 100	WDI
TO	Ratio of total trade (exports plus imports) to its GDP.	% of GDP	WDI
HC	Investment in HC is measured as secondary school enrolment.	% gross	WDI

Note: World Development Indicator (WDI)

RESULTS AND DISCUSSION

This study has applied two unit root tests, including the Augmented Dickey Fuller (ADF) test developed by (Dickey & Fuller, 1981) as well as the Phillips-Perron (PP) test by Phillips and Perron (1988), to examine the stationarity of all the variables. Stationary tests are among the crucial tests to estimate regression with reliable coefficients. Note that stationarity tests are essential for producing reliable regression estimates and for avoiding misleading (spurious) regression results. These tests help evaluate whether the data series possesses a unit root. The null hypothesis for both tests indicates the presence of a unit root. The results, listed in Table 3, present that according to the ADF unit root test, most variables are not stationary at level I(0), except for LNRIR (under intercept as well as trend). Similarly, the PP unit root test produced consistent results. This suggests that the variables exhibit unit roots at the level, as the test statistics do not exceed the critical values, as well as the null hypothesis cannot be rejected. However, at the first difference, the null hypothesis is rejected, indicating that all variables become stationary, or integrated at order I(1). Overall, the unit root tests reveal a mix of stationarity at levels I(0) and first differences I(1), which supports the suitability of conducting a cointegration analysis using the ARDL estimation method.

Table 3: Testing ADF as well as PP Unit Root Test

Level	ADF Unit Root		PP Unit Root	
I(0)	Intercept	Intercept and Trend	Intercept	Intercept and Trend
LNFD	-3.156**	-2.537	-3.140**	-2.558
LNGDP	-0.871	-1.847	-0.858	-2.009
LNINF	-2.832*	-2.580	-2.396	-2.839
LNTO	-2.688*	-1.004	-1.426	-1.122
LNRIR	-4.699***	-6.256***	-4.948***	-6.257***
LNHC	-2.414	-2.874	-2.413	-2.874
First difference	ADF Unit Root		PP Unit Root	
I(1)	Intercept	Intercept and Trend	Intercept	Intercept and Trend
LNFD	-5.706***	-5.254***	-5.685***	-5.899***
LNGDP	-5.435***	-5.380***	-5.389***	-5.325***
LNINF	-5.511***	-5.347***	-5.511***	-5.347***
LNTO	-3.872***	-3.948**	-4.005***	-3.896**
LNRIR	-7.998***	-7.931***	-15.244***	-14.962***
LNHC	-6.080***	-6.066***	-6.087***	-6.087***

Note: 1. ***, ** as well as * are 1%, 5% and 10% significance levels, respectively. 2. The optimal lag length is chosen automatically utilising the Schwarz Info Criterion (SIC) regarding the ADF test, while the bandwidth was
chosen utilising the Newey–West method concerning the PP unit root test.

The ARDL cointegration test, based on the F-statistic, is conducted to verify the existence of long-run relationships. A maximum lag length of 3 was selected, as indicated by the Schwarz Info Criterion (SIC). SIC in Table 4 implies that the optimum orders were (3, 3, 3, 3, 2, 3, 3, 3). The critical values for this model are provided for the number of variables, k=7. According to the results shown in Table 4, the F-statistic for the

bounds test is 12.816, which exceeds the corresponding upper I(1) critical value for k=7 and is statistically significant at the 1% level. This confirms the presence of a long-run relationship in the model. Therefore, the null hypothesis is rejected, while the alternative hypothesis of the bounds test is accepted.

Table 4: Detecting the presence concerning long-run cointegration given the F-stat

Model of Financial Development	Max Lag	Lag order	F statistics
LNFD = f (LNGDP, LNINF, LNTO, LNRIR, LNHC, D1, D2)	(3, 3)	(3, 3, 3, 3, 2, 3, 3, 3)	12.816***
Critical Values for F Stat		Lower Bound, I (0)	Upper Bound, I (1)
10%		2.03	3.13
5%		2.32	3.50
1%		2.96	4.26

Note:

1. # The critical values are obtained automatically under Eviews 9, case III: unrestricted intercept with no trend.
2. k resembles a number of variables, which is equivalent to 7.
3. *, **, as well as *** refer to 10%, 5% and 1% levels of significance, respectively.

Correspondingly, several diagnostic examinations were analysed to verify that the model's results are valid and not spurious. As shown in Table 5, the outcomes indicate no signs of serial correlation or heteroscedasticity in the residuals, and the model is properly formulated, as all test p-values exceed the 10% significance threshold. Furthermore, to assess the model's stability, CUSUM as well as CUSUM of squares (CUSUMSQ) tests were conducted (Brown et al., 1975). Figure 3 verifies the structural stability regarding the model at the 5% significance level, as demonstrated by the blue line remaining within the red dotted boundaries. Based on these diagnostic checks, the model used in this study is considered to generate consistent and strong results, making it useful for policymakers.

Table 5: Diagnostic Tests

Model of Financial Development	(A)	(B)	(C)	(D)
	Serial Correlation (p-value)	Functional Form (p-value)	Normality (p-value)	Heteroscedasticity (p-value)
LNFD = f (LNGDP, LNINF, LNTO, LNRIR, LNHC, DUM1, DUM2)	3.010 (0.120)	0.522 (0.490)	0.012 (0.993)	0.503 (0.923)

Note: 1. *, **, and *** refer to 10%, 5% and 1% levels of significance. 2. The diagnostic test is performed as follows:
A. Lag range multiplier test for residual serial correlation;
B. Ramsey's RESET test utilising the square of the fitted values;
C. Based on a test of skewness and kurtosis of residuals;
D. Based on the regression of squared fitted values 2.

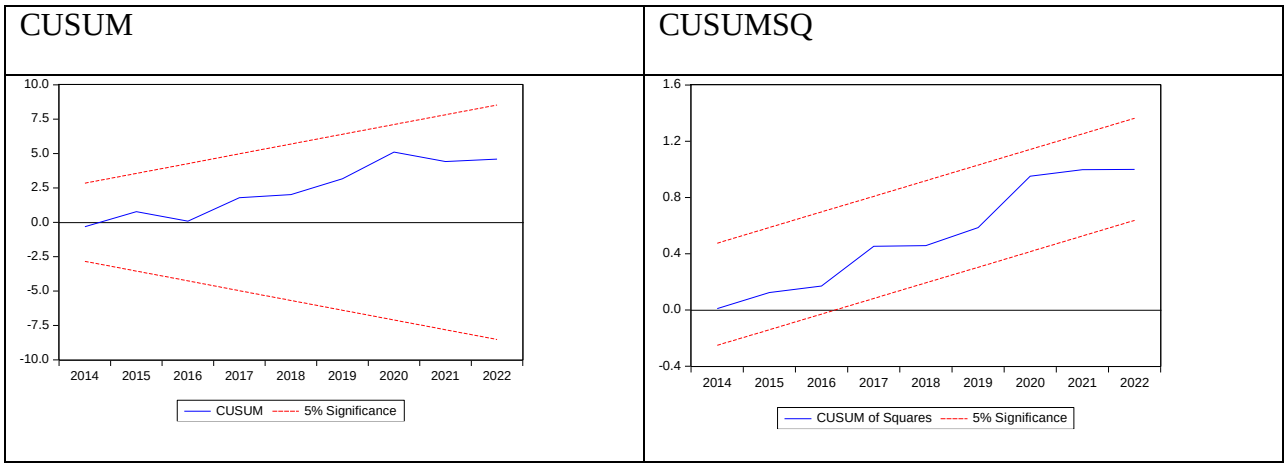


Figure 3: The cumulative sum of recursive residual (CUSUM) as well as the cumulative sum of squares of recursive residuals (CUSUMSQ) tests.

Table 6 below displays the long-run elasticity outcomes for the Financial Development Model, revealing a positive as well as statistically significant association between economic growth and financial development over the long term. These findings suggest that Malaysia's financial development has been fueled by economic growth, resulting in a higher demand for financial services. As Malaysia's economy grows, individuals and businesses experience higher incomes. This leads to more savings, which can be mobilised by financial institutions. Higher demand concerning financial services, for example, deposits, loans, as well as investment products, can be seen when individuals plan to buy a property or companies want to expand their businesses. This finding aligns with theoretical expectations and is supported by empirical evidence from various previous studies, which include Ang (2009), Ang and McKibbin (2007), Arestis et al. (2002), Belazreg and Mtar (2020), Law et al. (2013), Odhiambo (2008), Song et al. (2021) and Zang and Kim (2007).

In addition, the coefficient value for LNINF in this model is negative and substantial at 1% level of significance on the financial development. In this case, 1% increase in LNINF will decrease Malaysia's financial development by around 11.184. Consistent with the hypothesis by Badeeb and Lean (2017), Bilalli et al. (2024), Bittencourt (2011), Mun and Ismail (2015) and Zainudin and Nordin (2017), implying that financial development is adversely influenced by higher inflation. Persistent high inflation can discourage financial development because it erodes financial assets, reduces savings, and increases uncertainty. Therefore, it is reasonable to conclude that the long-run relationship between financial development and inflation may be influenced by a third factor, such as the interest rate. This is due to the fact that elevated inflation levels in Malaysia have prompted the central bank to maximise interest rates. The Central Bank may raise interest rates to combat inflation, which has increased bank deposits, attracted more investors, and expanded financial depth. In line with Ismihan and Ozkan (2012) and Mun and Ismail (2015), the coefficient of interest rate reports a positive and significant finding for this model.

The positive coefficient for the dummy variable (DUM2) in this model, 0.905, suggests a positive relationship between the global financial crisis and financial development. Malaysia was severely impacted by the 2008-2009 global financial crisis. However, in contrast to other nations, it experienced a rapid recovery, with growth rates averaging around 3.5% since 2010 (Tang & Abosedra, 2020). In anticipation of the economic downturn following the period of intense financial turbulence, Bank Negara Malaysia (BNM) enabled the exchange rate to depreciate as capital outflows increased and proactively reduced the policy rate by 150 basis points. Additionally, Malaysia’s financial system has undergone significant changes, strengthening it and enabling it to withstand financial crises (Mun & Ismail, 2015). Therefore, this study indicates a positive correlation between the global financial crisis and financial development during the 2008-2009 period.

TO did not show a statistically significant relationship with financial development in this model. The long-term coefficient for LNTO was estimated at 0.133, but it was not statistically significant at conventional levels. The results suggested that a 1% increase in TO did not lead to a notable trend in strengthening or developing the financial system concerning the long run.

Additionally, this study highlights that the effect of HC regarding financial development is both positive and substantial in this model. This holds irrespective of the model specifications and estimation approach. For example, a 1% increase in HC increases financial development by 2.630. Thus, the accumulation of the HC stock spurs financial development in Malaysia. The result is similar to previous findings by Belazreg and Mtar (2020), Ibrahim and Sare, 2018 and Kendall (2012). Indeed, higher HC accumulation may indicate that well-educated individuals possess better access to quality information and are therefore more likely to take less risk-averse approaches (Outreville, 1999). As noted by Ibrahim and Sare (2018), as HC improves via quality education, individuals become more adept at risk analysis, potentially increasing their willingness to take on risk. Furthermore, higher education is often linked to higher savings rates. Both factors necessitate the availability of higher-quality financial services.

Table 6: Long-run elasticities

Model of Financial Development	
DV	LNFD
Lag order	(3, 3, 3, 3, 2, 3, 3, 3)
IV	Coefficient
LNGDP	8.787***
LNINF	-11.184***
LNTO	-0.133
LNRIR	0.082*
LNHC	2.630**
DUM1	-0.177
DUM2	0.905***
C	-33.831***

Note: 1. ***, ** as well as * are 1%, 5% and 10% of significant levels, respectively

Next, this section will discuss the results of the short-run elasticity estimations, as can be viewed in Table 7. This section provides a detailed explanation of the outcomes, with a particular focus on long-run elasticities, as their effects are more relevant for policymakers. The findings display various signs for the variables across different lags. Based on the first model, LNGDP was found to possess a positive and substantial association with LNFD for the current lag. Concerning the short term, a 1% increase with respect to LNGDP statistically increases the financial development share by 2.193. However, the result is contradicted by the findings for LNGDP at the previous lag and the two most recent lags, which show a significant negative relationship with LNFD. Meanwhile, LNINF was found to possess a positive and statistically substantial association with LNFD at the previous lag, but a negative relationship at the 5% significance level at the previous two lags. Based on the previous year, it is concluded that LNTO has a positive effect on LNFD. Meaning, a 1% increase in LNTO accelerated the share regarding financial development by 1.533, according to the statistical analysis. However, there is a negative and substantial association between LNTO and LNFD at 1 % significance level in the previous two years.

As for LNRIR, there is a statistically substantial and positive association with LNFD, both for the current and previous lags. LNFD increased by 0.134 and 0.073 for every 1% rise in LRIR. LNHC showed a negative and statistically substantial association with LNFD in the previous lag, while exhibiting a positive and substantial association in the two preceding lags. The LNFD will decrease by 1.514 and increase by 1.984, respectively. DUM1 shows a negative and significant relationship with LNFD for the current year, indicating that the Asian financial crisis has a notable negative effect regarding financial development in the short term. Conversely, DUM2 for the current year demonstrates a positive and significant correlation with LNFD, indicating that the

global financial crisis possessed a positive and substantial influence concerning financial development in Malaysia.

The long-run elasticity estimates in the model were validated by the negative as well as substantial value of the Error Correction Term (ECT). ECT indicates the adjustment speed for the model, with a negative value suggesting that the variables will converge over time. As a result, this model has the modest speed of adjustment 1 (1.001). This means that approximately 100% disequilibria, respectively, following the previous year's shock to those models, the variables return to long-run equilibrium in the current year. Hence, the R-squared values indicate that nearly 99% of the variables in this model can explain the corresponding dependent variables (LNFD). Therefore, any policy recommended by these studies is both valid and feasible for implementation.

Table 7: Short-run elasticities and error correction model (based on present lag)

Model of Financial Development	
Variable	Coefficient
D(LNFD(-1))	0.227
D(LNFD(-2))	-0.390**
D(LNGDP)	2.193**
D(LNGDP(-1))	-1.925**
D(LNGDP(-2))	-3.396***
D(LNINF)	-1.554
D(LNINF(-1))	4.606**
D(LNINF(-2))	-3.179**
D(LNTO)	0.240
D(LNTO(-1))	1.533***
D(LNTO(-2))	-1.299***
D(LNRIR)	0.134***
D(LNRIR(-1))	0.073***
D(LNHC)	0.831
D(LNHC(-1))	-1.514**
D(LNHC(-2))	1.984***
D(DUM1)	-0.161*
D(DUM1(-1))	0.281
D(DUM1(-2))	-0.370**
D(DUM2)	0.478***
D(DUM2(-1))	-0.422***
D(DUM2(-2))	-0.121
CointEq(-1)	-1.002***
R-square	0.988
Adj. R-square	0.948

Note: 1. ***, ** and * are 1%, 5% and 10% of significant levels, respectively

CONCLUSION AND POLICY RECOMMENDATION

This research's primary goal is to assess the declining trend regarding financial development in Malaysia over the past decade, following several economic recessions. Enhancing financial development is crucial for reaching a high-income status. This study examined several macroeconomic factors, primarily focused on absorptive capacity variables, for example, economic growth, real interest rates, inflation, trade openness (TO), and human capital (HC). The findings of the research are limited to the years 1980 and 2022. The variables that significantly impact financial development, based on their highest elasticity, are inflation, followed by economic growth, HC, and real interest rate. However, TO did not demonstrate any considerable influence on financial development. This is because, in Malaysia, the level of TO is not directly operated through domestic financial deepening. It usually operates through Foreign Direct Investment (FDI) and capital accumulation. The global financial crisis DUM2 shows a positive correlation with financial development. This indicates that, despite the global recession, Malaysia's financial sector proved resilient. BNM took proactive measures, allowing the exchange rate to depreciate as capital outflows rose and preemptively reducing the policy rate by 150 basis points.

BNM is encouraged to maintain a stable macroeconomic environment that supports growth, such as low inflation, manageable interest rates, and a sound banking system. These conditions will help channel economic expansion into financial sector development. In times of high inflation, the government may implement price controls on essential goods and services, including food and fuel, to protect consumers against price spikes. However, this can lead to shortages and other market distortions if not done carefully. BNM are encouraged to maintain clear communication regarding its monetary policy goals and strategies to manage expectations and build credibility.

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