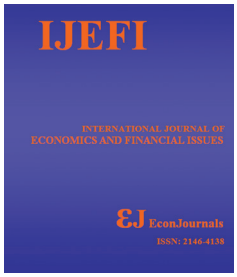

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Does Financial Repression Facilitate Financial Development? Empirical Evidence from Malaysia

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ABSTRACT

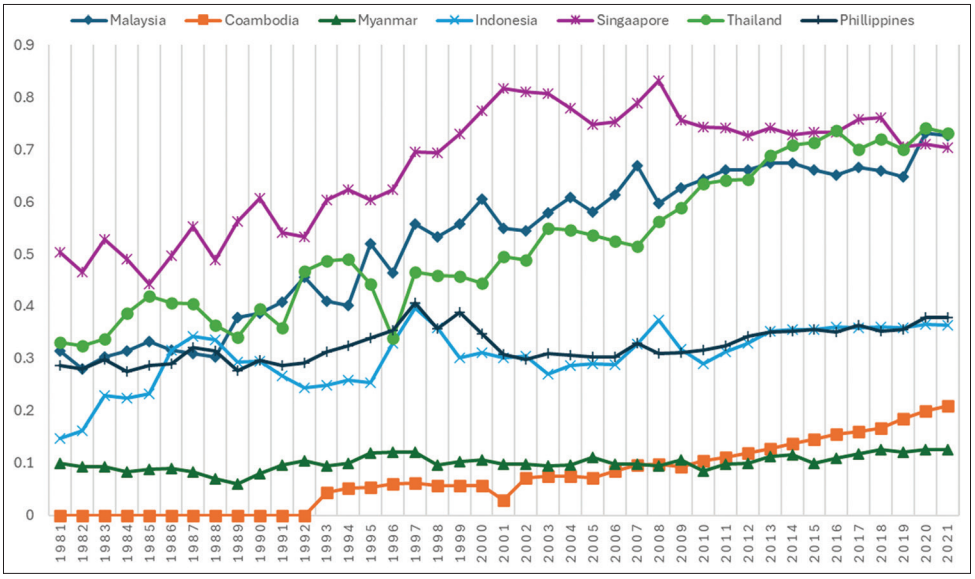
The importance of financial repression to the Malaysian financial development appears to be recognised. Lengthy theoretical and empirical discussions in previous literature have taken place on determinant of financial development which are focusing on macroeconomic factors. However, they ignore the role of financial repression as a determinant for financial development. Thus, the main purpose of this study is to examine the effect of financial repressions and their causality effects on financial development in Malaysia. There are five proxies used to measure financial repression which are public debt, statutory reserve requirement, liquidity requirement, interest rate control, and directed credit program. Other variable such as gross domestic product (GDP), inflation, human capital, and gross fixed capital formation also included as control variable. This study employed 42 years' time series data for the period of 1980-2022. Augmented Dickey Fuller (ADF) unit root test and Phillip Perron unit root tests are applied to test the stationarity properties of the series. This study uses Principal Component Analysis (PCA) to measure financial repression index (FRI). Its address the problem of multicollinearity or high correlation between the various financial repression indicators. This study also employed the Autoregressive Distributed Lag (ARDL) Model to examine the long-run robustness and short-run dynamics of independent variables on Malaysia's financial development. The causal relationship between the variables is further investigated using the Toda Yamamoto Granger non-causality test. Overall, the result shows, there is a negatively significant relationship between financial repression index and financial development. All variables LNFD, LNGDP, LNINF, LNHC and LNGFCF causes LNFRI. However, there is no bi-directional causality (feedback hypothesis) detected in this model. The government could avoid a major policy reversal to reinforce the gains of the reform program. Instead, the government should focus on fine-tuning current policy positions and implementing a stable macro-financial climate based on standard macroeconomic policies with a stable interest rate and lower inflation.

Keywords: Financial Development, Financial Repression, Government Intervention, Banking Sector Control, Principal Components Analysis
JEL Classifications: O16, E44, G28, C32

1. INTRODUCTION

Since gaining independence in 1957, Malaysia has been successful in diversifying its economy and lifting Malaysians out of poverty. Malaysia has proven itself to be a pioneering force in innovative and sustainable finance. The Ministry of Finance (MoF) has spearheaded the alignment and integration of the Sustainable Development Goals (SDGs) with the 12th Malaysian Plan (12MP), and it has called on the public and private sectors to adopt and integrate the SDGs and Environmental, Social and Corporate Governance (ESG) principles into their business decision-making. Malaysia is also well-positioned to take advantage of the digital finance sphere, Industry 4.0, and the Fourth Industrial Revolution.

Figure 1: Financial development index

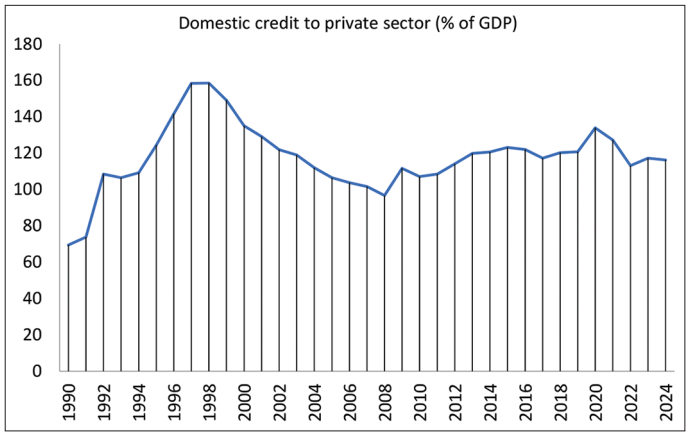


Source: International monetary fund (IMF)

Extensive theoretical and empirical debates on the finance-growth nexus have unfolded over the past six decades in the existing literature. The current trend in the finance-growth literature is focusing on finding the determinants of financial development (Ali and Ali, 2020; Asratie, 2021; Zainudin and Nordin, 2017). Financial development is one of the most interesting topics and major issues discussed by past researchers since building a strong financial system is critical to growing the economy. In literature, Lerohim et al. (2015) explained that financial development is defined as the process of making improvements in the financial intermediary and ensuring its quantity, quality, and efficiency are up to standard. Financial development in developing countries and emerging markets is part of the private sector development plan to enhance economic activity and decrease poverty. It also enhances efficient access to financial services and products. Basically, it is about overcoming the transaction costs associated with collecting saving from different individuals incurred in the financial system. Accordingly, financial development gives better information about possible profitable investments and promotes the optimum allocation of capital (Guru and Yadav, 2019).

As shown in Figure 1, according to the International Monetary Fund (IMF), Malaysia recorded the second-highest ranking for the financial development index in 2021, with a score of 0.73, trailing just behind Thailand, which secured the top position at 0.74 among the ASEAN countries. At the same time, the Singapore index is the third highest, which is 0.70. In the early 1980s, Malaysia's financial development index was relatively low, similar to that of the Philippines. However, within two decades, Malaysia experienced rapid progress, catching up with Thailand and Singapore in financial development. For instance, the financial development index for Cambodia, Myanmar, Indonesia, and the Philippines are 0.19, 0.12, 0.36, and 0.37, respectively, which remain lower in the index as compared to Malaysia. Meanwhile, referring to the situation in Malaysia, economic instability and financial crisis have caused the financial development in Malaysia to be on the weaker side against the other advanced countries.

Figure 2: Malaysia's domestic credit to private sector



Source: World development indicator

The share of Malaysia's domestic credit to the private sector as a percentage of GDP, as shown in Figure 2, was 116% in 2024. This is not far from the global average but still lower than the average of 165% in high-income countries. The share has been increasing since 2009, after a decline following the East Asia Financial Crisis. However, it is still at levels lower than those seen in the 1990s. Malaysia's financial system continues to demonstrate strong capitalisation as well as liquidity. As of September 2024, the banking sector recorded a total capital adequacy ratio of 18.2%, with a common equity Tier 1 ratio of 15.0%, well above regulatory requirements. Liquidity conditions remain solid, with the liquidity coverage ratio at 146.6% in September 2024 (International Monetary Fund, 2025). The resilience of the system is further supported by stress tests executed by the central bank (Bank Negara Malaysia, 2024). Overall, the Malaysian banking sector remains stable and appears to be taking an increasing share of the market.

However, the economic shock that hit Malaysia had a significant impact on financial development. From Figure 2, it shows a

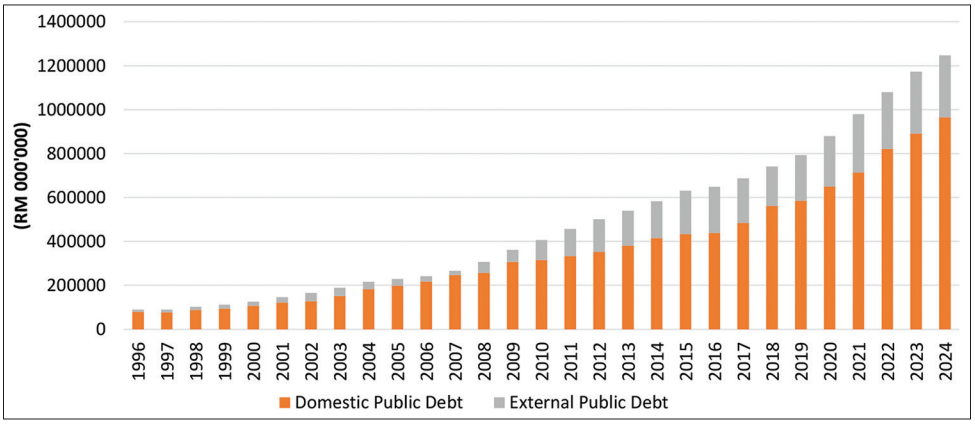
downward trend in Malaysia's domestic credit starting from 1997 until 2009. Malaysia has faced several economic recessions like many other countries. The major impact that Malaysia experiences including the Asian Financial Crisis of 1997-1998, where currency devaluations, capital flight, and weak financial systems triggered it. The Global Financial Crisis of 2008-2009 originated in the United States and had far-reaching effects on Malaysia. The country experienced a decline in exports and reduced foreign direct investment. A sudden disruption has an impact on economic downturns, market volatility, and challenges for businesses and individuals. Recently, the COVID-19 pandemic also caused a global economic recession, including in Malaysia. A pandemic that began as a viral flu outbreak has spread over the world, making the country face several lockdowns and travel restrictions. Industries such as tourism were particularly affected.

The series of economic recessions in Malaysia's history has also made the Malaysian country fail to become a developed nation in 2020. Malaysia's former prime minister, Dr Mahathir Mohamad, launched Wawasan 2020, a plan to transform the country into a fully developed nation, in 1991. In response to the above vision, Malaysia was in dire need of building a robust financial system to have a stronghold against any global challenges (Mun and Ismail, 2015). According to The World Bank (2021), to become a high-income country, Malaysia needs at least the threshold GNI per capita of US$12,535. However, the GNI per capita for Malaysia is only estimated to reach US$11,200 in 2019. It also significantly influences the value of the Malaysian ringgit due to panic selling by investors seeking to avoid trading in the present turbulent market. The goal may not be a complete failure after 30 years, but Malaysia is still lagging behind China and Thailand in financial development (OECD, 2024). Furthermore, addressing corruption is critical if the country truly wants to become a developed nation.

On top of that, the government of Malaysia has incurred large public debt, increasing year by year to meet its high development expenditure and recovery process. According to the Department of statistic Malaysia, the central government debt at the end of 2024 reached RM1.25 trillion or 63% of the gross domestic product (GDP) (International Monetary Fund, 2025; Ministry of Finance, 2024). The general consensus agreed that government spending is crucial in determining how the economy is growing in a country. When a government incurs large spending, devastating effects like budget deficits can occur, especially when the expenditures are higher than tax revenue (Aslam and Jaafar, 2020). From Figure 3 below, we can see a strongly rising trend in the total public debt. As the banking system has a high liquidity situation, the government can move to borrow from this institution and depend on domestic sources an efforts to bridge the gap in the deficit. However, higher domestic debt can disturb financial stability, particularly when banks own a large part in the government debt (Chung-Yee et al., 2020). The government can spend money on various areas such as education, healthcare, infrastructure, defense, and social welfare programs to ensure that the citizens of the country receive the necessary services and facilities that would improve their standard of living. However, when the large proportional assets in banks are in the form of government debt, banks will have less credit to be used for other businesses like private sector investment, causing private investment to be restricted (İlgün, 2016). Bank credit is the most used funding source for the private sector, and thus, policymakers and financial institutions are interested in understanding the effect of financial repression on financial development when the government participates in domestic credit uptake (public debt).

According to Reinhart and Sbrancia (2015) government debt can be reduced or liquidated through financial repression with a tax on bondholders and savers via negative or below-market real interest rates. A prominent example of financial repression is getting into funds from "captive audiences" like retirement funds, banks, and insurance companies, as these bodies are more likely to send their funds to the government and charge minimal interest rates. Financial repression occurs when governments implement regulations that channel funds to themselves in a deregulated market environment, typically at below-market rates. This type of debt is considered a bank policy intervention and is typically issued in the form of government bonds or treasury bills and is used to finance various public projects and initiatives. Chari et al. (2020) defined financial repression as "government regulation put on banks and other financial intermediaries to force them to hold more government bonds than they would otherwise." They argue that financial repression is a set of regulations put by the government on banks and other financial intermediaries to force them to hold more government bonds, and it is considered beneficial if only

Figure 3: Total federal government debt (RM 000'000) from 1996 to 2022



Sources: Bank Negara Malaysia, Ministry of Finance

a government is unable to service its debt. Governments often intervene in a local financial institution during a financial crisis in the form of financial repression to stabilize the economy and restore confidence.

The nuances of this study from other studies in the literature can be seen in several factors. Firstly, the literature often applied several macroeconomic factors like trade openness, real interest rate, real income, and inflation rate as determinants of financial development (Adekunle et al., 2021; Arif and Rawat, 2019; Asratie, 2021; Badeeb and Lean, 2017; Ibrahim and Sare, 2018; Voghouei et al., 2011; Zainudin and Nordin, 2017). However, they ignore the role of financial repression as a determinant of financial development, especially in Malaysian countries. Therefore, this study extends the analysis by proposing the impact of financial repression on financial development by using recent bank policy in Malaysia.

Secondly, this study introduces a new proxy to measure financial repression. There is limited literature or evidence linking public debt as a proxy for financial repression research. Previous studies have found that interest rate control, statutory reserve requirement, liquidity requirement, and directed credit programs are among the factors of financial repression that can impact financial development (Alper et al., 2019; Ang, 2008; Demetriades and Luintel, 2001; Madeira, 2019; Taghipour, 2009). Compared to the past decades, the tools for studying financial repression today have changed. As the current world has higher mobility in cross-border capital, some features like interest rate caps and large-scale capital controls seem to carry less weight, rendering them less effective. In this age, policymakers are more interested in engaging banks, insurance companies, and pension funds to channel funds to the government compared to traditional repression methods (Reinhart and Sbrancia, 2015).

Thirdly, this study tries to solve both empirical and theoretical literature investigating the impact of financial repression on financial development that has a conflicting or inconclusive result. Stiglitz (1993) explained that imperfect financial markets are able to overcome market failures and contribute to higher financial developments in certain government policies that may involve financial repression. Looking from the perspective of a closed economy, any policies around financial repression can affect welfare improvement if the return to scale of available technologies rises (Yülek, 2017a). However, those on the liberalization perspective felt that repressive policies that thrive on setting deposits and offering interest rates below the equilibrium rate, and causing savings would cause investment to drop (Pagano, 1993). This school of thought holds that financial liberalization significantly influences growth, owing to the beneficial impact on financial deepening that can raise credit availability and improve credit allocation (Arestis et al., 2004). This knowledge derives from fundamental economic theory, which ties more excellent growth rates to higher saving rates, which in turn increase when interest rates rise.

Finally, Principal Component Analysis (PCA) was used as a solution to address multicollinearity issues or the high correlation between multiple measures of financial repression. PCA is commonly applied as a data reduction method, usually to reduce a large set of correlated variables to one small set of uncorrelated variables (Gooroochurun et al., 2010). PCA was used to transform a collection of potentially correlated financial repression variables and reduce them to one variable that most represented information that can be derived from the original dataset. This method is powerful in determining the optimal weights of variables compared to other ways, particularly when the variables have equal or subjective weights (Badeeb and Lean, 2017). Therefore, constructing an index for financial repression captures several aspects of financial sector policies, including interest rate controls, directed credit programs, liquidity, and reserve requirements, that are not fully represented by changes in the real interest rate. This study also includes a new proxy for financial repression, public debt, as an index. This application of PCA was justified and needed as different policies were deemed to possess a high degree of multicollinearity among themselves.

Since there is limited literature or evidence linking financial repression and financial development, this study is strongly important. The focus is on how and to what extent Malaysia's financial system can be improved through financial repression and then contribute to the process of economic development. In this way, effective and strict policies need to be structured to promote financial development, improve the quality of governance, and, at the same time, prevent the ease of corruption that could reduce the country's growth. The rest of the paper is organized as follows. Section 1.2 elaborates on banking sector policies in Malaysia. Section 1.3 offers an overview of the financial repression theory. Section 1.4 discusses the literature review of financial repression and financial development. Section 1.5 explains data and model specification. Section 1.6 empirically examines the connections between financial repression and financial development. Finally, the researcher concludes the paper in Section 1.7.

2. LITERATURE REVIEW OF FINANCIAL REPRESSION AND FINANCIAL DEVELOPMENT

According to Ito (2008, p.430), financial repression refers to "the notion that a set of government regulations, laws, and other non-market restrictions prevent the financial intermediaries of an economy from functioning at their full capacity". Usually, financial repression provides inexpensive loans to companies and governments, decreasing their repayment burden by lowering returns to savers below the rate that would otherwise prevail (Jafarov et al., 2019). Financial repression occurs when governments implement regulations that channel funds to themselves that would otherwise go to another borrower in a deregulated market environment (typically at below-market rates). Policies include directed lending to the government via captive domestic audiences (such as pension funds or domestic banks), explicit or implicit interest rate restrictions, cross-border capital movement regulation, and a generally closer relationship between government and bank (Reinhart et al., 2011).

Since the time of McKinnon and Shaw, literature argued on the impact of financial repression on economic growth. One side

favors the inclusion of financial repression, citing its crucial role in fostering economic growth as it raises financial development. However, another side is against financial repression, as this action can be linked to the international financial flows to the economic downturn. As in the late 1980s and 1990s, numerous research has empirically examined the McKinnon-Shaw hypothesis of a relationship between financial repression and financial development. There are various reasons why financial repression can have a significant impact on financial development. According to the McKinnon-Sear–School of Thought, government constraints on the financial system's operation, such as interest rate ceilings, direct credit programs, and high reserve requirements, collectively referred to as financial repression, may impede financial deepening. This, in turn, may affect the quality and quantity of investments, so it impedes the growth of financial systems. Therefore, these would retard economic growth in the country (Mckinnon, 1973; Shaw, 1973).

Some empirical studies found evidence supporting the argument that repressive financial policies promote economic growth through financial development. In countries with imperfect financial markets, certain government policies, like financial repression in the form of directed credit programs, interest rate controls, and high required reserves, can address market failures and lead to higher financial development (Stiglitz, 1993). Interest rate restraints may result in increased financial savings if the financial system is well-governed. Depositors might be more willing to keep their savings in the form of deposits if they perceive restrictions as policies aimed at enhancing the financial system's stability, thereby increasing the financial system's depth. For example, a lack of credit may stimulate the issuance of additional shares to finance business expansion, lowering the cost of capital. Directed lending schemes could direct resources to sectors with a high level of technology spillover. Financial repression in South Korea had a large positive influence on financial development, based on time series evidence carried out by Arestis and Demetriades (1997) and Demetriades and Luintel (2001). This conclusion is attributed to the presence of good governance in Korea.

According to Akinleye and Oluwadare (2022), the cash reserve ratio exerts a negative and significant impact on the return on assets of Deposit Money Banks (DMBs) in Nigeria, amounting to −0.0025 ($P = 0.036 < 0.05$), and also a negative and significant effect on return on equity, recorded at −0.0039 ($P = 0.026 < 0.05$). The study concluded that the effect of cash reserve requirements on bank profitability is statistically significant. In contrast, another study by Agénor and Bayraktar (2023) finds that capital requirements may foster growth by lowering the likelihood of financial crises, potentially through promoting more cautious lending (consistent with the skin in the game perspective). Financial development and openness appear to weaken the growth advantages of such policies, as openness enables domestic financial institutions and nonfinancial entities to borrow externally and shield themselves from policy-driven shifts in local financial market conditions.

Huang and Wang (2011) examined the influence of financial repression on economic growth throughout China's reform phase and concluded that, on average, repressive policies helped economic growth, potentially contributed by the prudent liberalization approach. However, they observed that the impact turned from positive in the 1980s and the 1990s to negative in the 2000s, suggesting rising efficiency losses in recent years. Hye and Islam (2013), found a negative correlation between real interest rates and long-term growth when studying Bangladesh, supporting that financial repression can help growth performance. Ang (2008) found multiple results on the impact of financial repression and economic growth in Malaysia, as repressionist financial policies, such as interest rate controls, high reserve requirements, and directed credit programs, have contributed positively to financial development. However, other direct interventions in the economy, such as resource allocation through the operation of a broad-based employee fund (EPF) scheme and various public investment programs, seem to have impacted negatively on economic growth in Malaysia. Similarly, Xu and Gui (2013) found that a repressed financial system is a two-edged sword. On the one hand, it helps China achieve extraordinary economic growth by subsidizing investment and production; on the other hand, it jeopardizes China's economic health by reducing economic efficiency, slowing job creation, and distorting the country's economic structure.

On the other hand, a number of experts felt the post-2007 global financial crisis could be seen as a financial repression tactic modern era carried out by governments to minimize debt in the modern era. After the global financial crises of 2007-2008, the declining nominal interest rates were seen as an interesting observation, as it led to negative real interest rates. Jafarov et al. (2019) pointed out that financial repression has returned as a result of the increase in public debt during the global financial crisis, and several nations have restored administrative interest rate ceilings. Reinhart and Sbrancia (2015) described financial repression as directed lending to government by captive domestic audiences (such as pension funds), explicit or implicit interest rate limits, restriction of cross-border capital flows, and (usually) a closer relationship between government and banks. They argued that governments are now utilizing financial repression as a deliberate debt-reduction tool. Financial repression can help debt sustainability in addition to promoting financial stability (Garrick, 2016).

Demetriades and Luintel (1997) observed that the direct effects of financial repression in India were negative and quite substantial. They argued that the success of economic policies largely depends on the effectiveness of the institutions that implement them, and this clearly varies from country to country. Meanwhile, in Nepal, Demetriades and Luintel (1996a) suggested that financial sector policies may affect financial deepening through different channels than has so far been recognized by the literature. Their analysis found no evidence to support the widely held view that the real rate of interest is an important determinant of financial development. Taghipour (2009) found that a mild repressive policy in a monopoly banking structure, which is the case in Iran, could have increased financial intermediation. Therefore, monetary authorities used a severe financial repression policy in Iran to enhance financial development. Nevertheless, Feridun and Nejad (2013) found that the composite financial repression index negatively impacts financial development, suggesting that repressive financial policies negatively impact the financial development process.

Hachicha (2005) examined the relationship between banking sector control and financial deepening by using a structural error correction model for Tunisia. The main empirical finding suggests that, in the long run, and short run, financial repression had significant and negative effects on financial development, independently of its well-known influence via the level of the real interest rate. The finding shows a contrast with the prevalence of financial market imperfections, but it is consistent with traditional literature on financial liberalization. Based on the DOLS estimator, the evidence on interest rate restraints points out ambiguous long-run effects on the different indicators for financial development (Gooroochurun et al., 2010). Cash reserve requirement proves to deepen the financial system, while statutory liquidity requirements and directed credit programs show a negative interaction with financial development. Mostly, one-way short-run causality seems to run from the individual controls to financial development, but there is some evidence of reciprocity.

Additionally, in the case of Kenya, while interest rate caps are often implemented to lower the burden of high interest rates on borrowers, such policies can lead to unintended consequences that negatively impact both the aggregate banking sector and the borrowers themselves (Safavian and Zia, 2018; Alper et al., 2019). They also got the same result for micro-credit and SMEs in Kenya, where they found that the law on interest rate controls has had the opposite effect of what was intended. Specifically, it has led to a collapse of credit to micro, small, and medium enterprises, shrinking of the loan book of the small banks, and reduced financial intermediation (Madeira, 2019). After accounting for both macroeconomic shocks and unobserved household heterogeneity, the results show that being above the interest rate cap reduces the probability of credit access by 8.7% on average. A counterfactual exercise shows that the new legislation excluded 9.7% of the borrowers from banking consumer loans. The law's impact was strongest on the youngest, least educated, and poorest families. Heng and Srinivasan (2015) mentioned that so far, credit to "targeted" sectors is growing as intended by the law but the increase in the average loan size of microfinance institutions and the declining number of borrowers point to potentially adverse effects of the interest rate caps on financial inclusion.

Reinhart (2012) further claimed that regulatory arrangements in the banking sector in the 1930s led to lower real interest rates in the 1940s and 1970s, resulting in a "liquidation" of public debt during the subsequent financial repression. She compared the comeback of financial repression in the aftermath of the 2007-2009 financial crisis, as well as the rise in public debt in industrialized nations, to that period and predicted a long period of financial repression ahead. Financial repression is defined by Chari et al. (2020) as "government regulation put on banks and other financial intermediaries to force them to hold more government bonds than they would otherwise." They created a theoretical model that implies financial repression (forcing banks to hold government debt) is only beneficial if a government is unable to service its debt. As a result, they argued that, under certain circumstances, financial repression may be an effective policy for governments. Aloy et al. (2014) explained that the pressure for fiscal adjustment to reduce the public debt-to-GDP ratio was less in post-World War II France during periods of financial repression since lower interest rates reduced debt servicing costs. They found through a counterfactual analysis that the cost of debt servicing would have been lower in the post-1980 era if the French administrations had pursued the same financial repression measures. Fulcher et al. (2014) argued that the British government used financial repression measures to control public debt servicing throughout time. As the government progressively gets cash from domestic banks to finance the budget, the space for financing private investments has been constrained by the increased demand for public-sector credits. As a result, interest rates for private sector loans from banks may rise (Dreger and Reimers, 2016; Mun and Ismail, 2015) or a tax increase to cover the repayments (Bahal et al., 2018).

Yülek (2017) found a theoretical case in which repressive financial policies could improve welfare rather than presenting an unconditional normative statement advising repressive practices. This study shows that, in the context of a closed economy, financial repression regulations may have welfare-improving effects if growing returns to scale technologies are available, as positive production and externalities were built into such technology and internalized by government policy. However, Jafarov et al. (2019) highlighted that by distorting market incentives and signals, financial repression results in non-quantifiable losses due to inefficiency and rent-seeking. This study aims to quantify some of these losses by evaluating the impact of financial repression on growth over a 45-year period using an updated index of interest rate regulations spanning ninety nations. The findings indicate that financial repression exerts a significant drag on growth, estimated to be between 0.4 and 0.7 percentage points.

Repressive policies are generally more common in relation to banks than to capital markets. The negative impact of financial repression on efficiency and growth is widely accepted and is the theme of a large body of literature. Pagano (1993) showed that financial policies such as interest rate controls and reserve requirements lowered financial resources available for financial intermediation. King and Levine (1993b) developed an endogenous growth model to illustrate that financial sector distortions reduced growth by lowering the rate of innovation. In this case, financial development is less likely to be effective in stimulating economic growth in the presence of a repressed financial system. Financial liberalization is widely considered a necessary component of financial sector development. As such, policies aimed at eliminating interest rate regulations and other restrictions on banking operations could have a significant impact on financial development and, hence, economic growth. However, financial liberalization may exacerbate financial fragility or enlarge the financial system, but its long-term economic advantages are uncertain, both empirically and theoretically.

Empirical evidence reveals that financial liberalization if performed improperly, may destabilize the financial system and cause financial crises. Stiglitz (2000) explained that the rising frequency of financial crises is directly related to financial market liberalization. Liberalization is consistently associated with increased instability, as capital flows are cyclical, worsening economic swings. As Arestis and Demetriades, (1999a; 1999b)

noted, the financial liberalization hypothesis is predicated on a number of implausible assumptions, including perfect competition, perfect knowledge, a good institutional framework, and the stock market's limited influence. The fact that these assumptions are unlikely to be realized in practice may account for the failure of many developing countries' financial liberalization projects, particularly in the 1970s.

3. DATA AND MODEL SPECIFICATION

Based on McKinnon-Shaw-type models, the endogenous growth literature predicts a positive relationship between financial development, economic growth, and the real interest rate (King and Levine, 1993a; King and Levine, 1993b). Based on those theoretical postulates, a financial development association can be specified as follows:

$$FD = f(GDP, R) \quad (1)$$

Where FD is financial development, GDP is the gross domestic product, and R is the real interest rate. In order to examine the role of financial repression on financial development, this study specifies a financial development equation including the measure of financial repression such as public debt, statutory reserve requirement, liquidity requirement, interest rate control, and directed credit program to become an index. Some other macroeconomic factors, such as inflation, human capital, and gross fixed capital formation, are also included as control variables. However, to avoid the econometric problem of multicollinearity in this study, the real interest rate is omitted from the model specification. The following model was adopted as follows:

$$FD = f(FRI, GDP, INF, HC, GFCF, DUM1\ DUM2) \quad (2)$$

Where:
FD: Domestic Credit to Private Sector
FRI: Financial Repression Index
GDP: Gross Domestic Product
INF: Inflation
HC: Human Capital
GFCF: Gross Fixed Capital Formation
DUM 1: Asian Financial Crisis (Dummy)
DUM 2: Global Financial Dummy (Dummy)

To describe short-run and long-run elasticity, Equation (2) was translated into log-linear forms (LN). Log transformation can reduce the problem of heteroscedasticity because it compresses the scale in which the variables are measured, thereby reducing a tenfold difference between two values to a twofold difference (Gujarati and Porter, 2009). The logarithmic form of Equation (2) is as follows:

$$LNFD_t = \alpha_0 + \beta_1 LNFRI_t + \beta_2 LNGDP_t + \beta_3 LNINF_t + \beta_4 LNHC_t + \beta_5 LNGFCF_t + DUM1 + DUM2 + \mu_t \quad (3)$$

There is also a dummy variable included in the above equation to account for the impact of the Asian financial crisis in 1997-1998 and the Global financial crisis in 2008 and 2009, defined as:

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

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

Next, this study transformed Equation (3) above in the auto-regressive-distributed lag (ARDL) form. The ARDL model is based on the unrestricted error correction model (UECM), as invented by Pesaran et al. (2001) is stated below:

$$\Delta LNFD_t = \beta_1 + \theta_0 LNFD_{t-1} + \theta_1 LNFRI_{t-1} + \theta_2 LNGDP_{t-1} + \theta_3 LNINF_{t-1} + \theta_4 LNHC_{t-1} + \theta_5 LNGFC_{t-1} + D1 + D2 + \sum_{i=1}^{a} \beta_i \Delta LNFD_{t-i} + \sum_{i=0}^{b} \gamma_i \Delta LNFRI_{t-i} + \sum_{i=0}^{c} \delta_i \Delta LNGDP_{t-i} + \sum_{i=0}^{d} \lambda_i \Delta LNINF_{t-i} + \sum_{i=0}^{e} \vartheta_i \Delta LNHC_{t-i} + \sum_{i=0}^{f} \psi_i \Delta LNGFC_{t-i} + D1 + D2 + \upsilon_t \quad (4)$$

In this equation, Δ is denoted as the first different operator, and υ_t symbolizes the white noise disturbance term. Several types of diagnostic tests, such as serial correlation and model stability, can be conducted. For the final version of the model, it includes the long-run and short-run estimations from a to f. The level of financial development used (LNFD) was introduced in Equation (3) for both the short-run and long-run, as this equation is influenced and can be explained by its past values that show any cases of disturbance or shocks. For the long-run elasticity, it is the product of the coefficient of the one-lagged explanatory variable (multiplied by a negative sign) that was divided by the coefficient of the one-lagged dependent variable. The coefficients of the first differenced variables describe the short-run effects. The following hypothesis specifies the null of no cointegration in the long-run relationship:
$H_0 = \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = 0$ (there is no long-run relationship)
$H_1 = \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq 0$ (there is a long-run relationship)

In order to prove the existence of the long-run cointegrating relationship, the probability of the F statistic value must be greater than the upper bound value of either 1,5 or 10% significant level. This study uses a comprehensive annual data set ranging from 1980 up to 2022 (42 years) as a sample period. A summary of the data and their sources is shown in Table 1.

4. FINDINGS

The analysis started with descriptive statistics for all series. Table 2 reports the summary descriptive statistics for Malaysia. The idea of using descriptive statistics is to check whether a normal distribution exists among the series of financial repression and macroeconomic factors while gauging the degree of association between the level variables considered in the analysis.

The Jarque-Bera test null hypothesis was not rejected in other variables except LNFD, revealing that they are not normally distributed. The most volatile series is LNFRI (1.079), while the least volatile series is LNHC (0.101) in terms of unconditional standard deviation values. In addition, most of the series are

negatively skewed, with the exception of LNFRI and LNGFC. The kurtosis coefficients of LNFRI, LNGDP, and LNINF are <2, but other series, LNFD, LNHC, and LNGFC, are >2, implying the series is abnormally distributed.

Table 3 explains the establishment of a financial repression index based on principal component analysis (PCA) that reduced the eleven dimensions of the financial indicators into a single index. This reduction is critical as none of the eleven indicators were powerful enough to singularly serve as an adequate proxy for financial repression. PCA enables the extraction of information in all the indicators and simultaneously avoids any possible multicollinearity problem where more than one proxy is included in a given equation. The Eigenvalue indicates that the first principal

Table 1: List of variables, definitions, and data sources

Variable	Proxy	Operational definition	Unit measurement	Source
Financial development (FD)	Domestic Credit to Private Sector	Domestic credit provided for private sector.	% of GDP	WDI
Financial repression index (FRI)	Public Debt	The ratio of domestic public debt to GDP.	% of GDP	MOF
	Statutory reserve requirement	Commercial bank statutory reserve requirement ratio (SRR).	Percent	BNM
	Liquidity requirement	Commercial bank liquidity ratio (LR).	Percent	BNM
	Interest rate control	A min. deposit rate, a max. lending rate, a max lending rate to priority sectors, base lending rate (BLR), base rate (BR), 3-month interbank rate, 3-month intervention rate, overnight policy rate (OPR).	1 if a control is present and 0 otherwise	BNM
	Directed credit program	Priority sector lending rate (native Bumiputra community).	Percent	BNM
Macroeconomic Factors (MF)	Economic GROWTH	Gross domestic product (GDP) per capita.	constant 2015 US$	WDI
	Inflation	Consumer price index.	2010=100	WDI
	Human CAPITAL	Investment in human capital is measured as secondary school enrolment.	% gross	WDI
	Gross fixes capital formation	Domestic investment in physical assets for future production.	% of GDP	WDI
Dummy	DUM1	Asian Financial Crisis 1997-1998.	1 if a control is present and 0 otherwise	(Mun and Ismail, 2015)
	DUM2	Global Financial Crisis 2008-2009.		

Sources: Global Financial Development (GFD), Bank Negara Malaysia (BNM), Ministry of Finance (MOF) and World Development Indicator (WDI)

Table 2: Descriptive statistics

Variables	LNFD	LNFRI	LNGDP	LNINF	LNHC	LNGFC
Mean	4.655	−0.061	8.739	4.363	4.313	3.297
Median	4.714	−0.490	8.780	4.402	4.341	3.233
Maximum	5.065	1.626	9.341	4.845	4.450	3.774
Minimum	3.910	−1.520	8.058	3.723	4.053	2.902
Std. Dev.	0.260	1.079	0.397	0.326	0.101	0.238
Skewness	−0.994	0.302	−0.235	−0.213	−0.660	0.562
Kurtosis	3.685	1.552	1.822	1.803	2.678	2.171
Jarque-Bera	7.927**	4.413	2.879	2.893	3.308	3.495
Probability	0.018	0.110	0.236	0.235	0.191	0.174

Table 3: Principal component analysis for financial repression index (FRI)

Principal component	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Comp8	Comp9	Comp10	Comp11
Eigenvalue	5.095	1.818	1.500	1.317	0.776	0.230	0.121	0.070	0.036	0.022	0.015
Difference	3.277	0.318	0.182	0.542	0.546	0.109	0.051	0.034	0.014	0.007	
Variance (%)	46.3	16.5	13.6	12.0	7.1	2.1	1.1	0.6	0.3	0.2	0.1
Cumulative (%)	46.3	62.8	76.5	88.5	95.5	97.6	98.7	99.3	99.7	99.9	100.0
Eigenvector											
Variable	**Comp1**	**Comp2**	**Comp3**	**Comp4**	**Comp5**	**Comp6**	**Comp7**	**Comp8**	**Comp9**	**Comp10**	**Comp11**
PD	0.195	0.116	−0.298	−0.599	0.439	0.198	−0.276	0.164	0.398	0.052	0.069
SRR	−0.279	0.398	0.392	−0.007	−0.080	0.470	0.300	0.493	0.136	−0.016	0.176
LR	0.321	0.438	−0.197	0.150	0.075	0.236	0.126	−0.430	−0.172	−0.379	0.457
DCP	0.353	−0.241	0.231	0.291	0.180	0.230	−0.367	0.334	−0.086	−0.539	−0.225
MDR	0.369	−0.219	0.244	0.011	0.272	−0.252	0.668	−0.038	0.401	−0.103	−0.016
MLR	−0.302	0.054	−0.261	0.202	0.665	−0.249	0.169	0.313	−0.396	−0.007	0.095
BLR	−0.297	−0.393	0.208	−0.160	0.334	0.548	0.117	−0.466	−0.178	0.040	−0.117
BR	0.354	0.341	−0.158	0.239	0.094	0.266	0.151	−0.017	−0.109	0.444	−0.604
IBR	−0.187	0.393	0.475	0.230	0.343	−0.258	−0.375	−0.325	0.305	0.069	−0.070
IVR	−0.184	−0.247	−0.396	0.588	0.006	0.254	−0.050	−0.002	0.536	0.120	0.182
OPR	0.384	−0.206	0.296	0.105	0.095	0.052	−0.173	0.108	−0.210	0.579	0.528

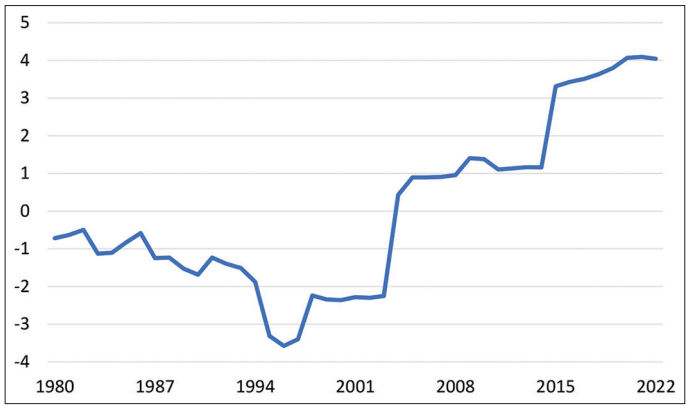
component explains more than 46% of the standard variance. Hence, the first component is a more relevant measure of financial development, as it explains the variations of the dependent variable better than any other linear combination of explanatory variables. Therefore, only information related to the first principal component is considered to form a composite indicator. The full length of the financial repression series can be viewed in Figure 4, where the index coincides greatly with policy changes carried out in Malaysia during the tested period. Any increase in financial repression is represented by a rise in the index, and when the index denotes a low value, it symbolizes a decrease in financial repression.

The year 1978 denoted a major phase of interest rate liberalization, as commercial banks were permitted to set deposit and lending rates. However, in 1983, the Base Lending Rate (BLR) framework was introduced as the main reference rate to set the retail floating rate loans in Malaysia. As the years pass, BLR determination and implementation have gone through several changes to match the growth of the financial sector. The repeated process of changing the BLR formula was carried out to guarantee a more responsive lending rate would occur when monetary policy changed. The banks and finance companies were instructed to finalize their BLR based on its cost of funds after the cost of a statutory reserve, liquid assets requirements, and overhead were provided (Bank Negara Malaysia, 2024).

However, between October 1985 and January 1987, the market-determined interest rate mechanism was disrupted when BNM exercised controls on interest rates as an effort to counter the consequences brought by the world economic recession. In February 1987, BNM decided to forgo the pegged deposit rate regime and, in September of the same year, moved to utilize the base lending rate (BLR) to manage interest rates. The enforcement of interest rate controls continued until 1991(Lock, 1992; Yusof et al., 1994). In February 1991, the administration no longer controlled the BLR of banking institutions, and the banks and other financial institutions were free to set their deposit and lending rates. This policy allowed deposit and lending rates to be set based on the observation of market forces. This change caused a downward trend from 1991 onwards.

Generally, the index continued to be stable until the event of the Asian financial crisis loomed. Several interventions pertaining the interest rates were carried out to counter the effect of the financial crisis. For example, a new BLR framework was enforced in 1995 to shorten time lag by linking the BLR to the weighted monthly average of the 3-month interbank rate. This framework subjected the lending rates to a maximum of 4% points above the declared BLR. Then, in 1998, the BLR was linked to the 3-month BNM intervention rate rather than the stipulated 3-month interbank rate to reduce the transmission lag. Also, lending rates were subjected to a maximum of 2.5% points above the declared BLR (Bank Negara Malaysia, 2024). This enforcement resulted in a small increase in the index, coinciding with the implementation of the intervention rate and also increasing the percentage of directed credit programs from 20% to 30%. When the crisis ended, the were observations made in the loosening control of liquidity, practiced through a significant reduction in the statutory reserve ratio and liquidity ratio to 4% and 5%, respectively. This practice was then replaced by a new framework called the New Liquidity Framework (NLF) in 1998. The NLF framework offered provides more efficient and ongoing liquidity management as banking institutions must match their liquid assets requirement arising from maturing obligations with maturing assets.

Figure 4: Financial repression index



In 2004, the Central Bank also introduced a new policy called as Overnight policy rate (OPR). The new interest rate framework represents a change in the system of implementing monetary policy and promotes more efficient pricing by banking institutions. It will serve as the primary reference rate in determining other market rates. On top of that, the percentage for directed credit programs kept increasing starting in 2005. During the year, the OPR stated that at least 50% of the total lending made by banks was to be allocated to the Bumiputra community, either individual or Small Medium Enterprise (SME), which focuses on Native Malays, Orang Asli, and Indigenous people of Sabah & Sarawak.

The, a new reference rate for new retail floating rate loans was introduced in January 2015. The new rate is named the Base Rate (BR), and it succeeded the previous Base Lending Rate (BLR). BLR has become less relevant as a reference rate for loan pricing, as lending rates on new retail loans are being offered at substantial discounts to the BLR. The BLR also lacks transparency, which makes it difficult for consumers to make an informed decision (Bank Negara Malaysia, 2024). Meanwhile, the Liquidity Coverage Ratio Framework (LCR) took effect on 1st June 2015 and superseded the guideline on the Liquidity Framework made in July 1998. Under the LCR framework, a banking institution would retain shall maintain a minimum of the following LCR levels in accordance with the timeline given. The percentage average is about 60-100%, which is higher than the previous year where only about 5%. The percentage of government debt over GDP also become higher than previously due to a direct consequence of the COVID-19 pandemic and the government's efforts to support the economy through significant fiscal intervention. Therefore, it indicates that the graph level of the financial repression index keeps increasing over the year.

Two tests were applied, including ADF developed by Dickey and Fuller (1981) and PP by Phillips and Perron (1988) unit root test, to examine the stationarity of all the variables. Stationary tests

are critical to gauge regression with reliable coefficients and to deter spurious regression outcomes. The null hypothesis of both tests reveals a unit root problem in the series, as shown in Table 4. Based on the ADF unit root, none of the variables are significant at level I(0) (at intercept and trend), and a similar result was observed for the PP unit root. Thus, the variables have a unit root in level because the calculated statistics are not bigger than the critical values confirmed by probability values, and the null hypothesis cannot be rejected. The null hypothesis of the unit root problem is rejected at the first difference. This shows that all variables were found to be stationary at the first difference, implying that variables are integrated at I (1). Thus, unit root tests verified the next step, cointegration analysis, using ARDL estimation.

Table 4: Testing ADF and PP unit root test

Level I (0)	ADF unit root		PP unit root	
	Intercept	Intercept and trend	Intercept	Intercept and trend
LNFD	−3.156**	−2.537	−3.140**	−2.558
LNFRI	−0.131	−1.894	−0.215	−1.904
LNGDP	−0.871	−1.847	−0.858	−2.009
LNINF	−2.832*	−2.580	−2.396	−2.839
LNHC	−2.414	−2.874	−2.413	−2.874
LNGFC	−2.026	−2.741	−1.1227	−2.2399
First difference I (1)	**ADF unit root**		**PP unit root**	
	Intercept	Intercept and trend	Intercept	Intercept and trend
LNFD	−5.706***	−5.254***	−5.685***	−5.899***
LNFRI	−5.563***	−5.667***	−5.528***	−5.624***
LNGDP	−5.435***	−5.380***	−5.389***	−5.325***
LNINF	−5.511***	−5.347***	−5.511***	−5.347***
LNHC	−6.080***	−6.066***	−6.087***	−6.087***
LNGFC	−4.775***	−4.706***	−4.736***	−4.664***

(1) ***, **, and * are 1%, 5%, and 10% of significant levels, respectively. (2) The optimal lag length is selected automatically using the Schwarz Info Criteria (SIC) for the ADF test, and the bandwidth is selected by using the Newey–West method for the PP unit root test

Table 5: Detecting the presence of long-run cointegration based on F stat

Model 3	Max Lag	Lag order	F statistics
LNFD=*f* (LNFRI, LNGDP, LNINF, LNHC, LNGFC, D1, D2)	(3, 3)	(2, 0, 2, 3, 1, 3, 2, 2)	10.447***
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

1. # The critical values are obtained automatically under Eviews 9, case III: Unrestricted intercept and no trend
2. k is a number of variables, and it is equivalent to 7
3. *, **, and ***represent the 10%, 5%, and 1% levels of significance, respectively

Next, this paper ran the F-test to confirm the existence of cointegration (Table 5) between variables. The F-test was obtained from the optimum lags, which are based on SIC. SIC-based ARDL suggested that the optimum order was (2, 0, 2, 3, 1, 3, 2, 2). The F-statistics results were greater than the upper bound critical value and significant at the 1% level, thus confirming the existence of cointegration in the model.

Diagnostic tests were carried out to ensure the validity of the long-run and short-run of all the models. Table 6 shows the result of the diagnostic test for this study. The result shows that the probability values for every single test are >10% significant level. Based on the result, the null hypothesis cannot be rejected, and thus, no serial correlation, no heteroscedasticity, and no misspecification of functional form was detected. Therefore, the model is normally distributed. Furthermore, the stability was supported in all the cases because the plots of both CUSUM and CUSUMSQ fell inside the critical bounds of 5% significant. Figure 5 displays the plots of CUSUM and CUSUMSQ tests.

Table 7 describes the long run elasticities for the model in this study. Based on the results, there is a negatively significant relationship between the financial repression index and financial development. The coefficient value for LNFRI is −0.095, which means a 1% increase in LNFRI will decrease financial development by 0.095. This study is in line with Ang (2008), Ang and McKibbin (2007), Demetriades and Luintel (1996b), Feridun and Nejad (2013), and Taghipour (2009). Using multivariate cointegration techniques by properly controlling for the various macroeconomic shocks, Ang and McKibbin (2007) found that financial repression policies in Malaysia affect financial deepening negatively. Feridun and Nejad (2013) suggested that repressive financial policies have a negative impact on the financial development process in Iran. Apart from a lending rate ceiling, Demetriades and Luintel (1996b) argued that banking sector controls are found to influence financial deepening negatively in India. However, in the context of imperfections in the financial system, a mild form of administrative control could have improved financial intermediation. The result from Demetriades and Luintel (2001) showed that in South Korea, government intervention in the financial system had positive effects on financial deepening during the estimation period by using two types of measurement. First, the degree of state control over the banking system, and second, mild repression of lending rates.

To strengthen the financial system and recover from the global financial crisis, Malaysia employed a range of strategies, such as an adjustment of monetary policy. Furthermore, in the mid-1990s, monetary policy strategy in Malaysia shifted from monetary targeting to interest rate targeting due to the developments in the

Table 6: Diagnostic tests

Model 3	(A) Serial correlation (P-value)	(B) Functional form (P-value)	(C) Normality (P-value)	(D) Heteroscedasticity (P-value)
LNFD=*f* (LNGDP, LNGDP2, LNINF, LNHC, LNGFC, DUM1, DUM2)	1.032 (0.380)	1.659 (0.223)	0.147 (0.928)	0.815 (0.678)

(1) *, **, and *** represent 10%, 5%, and 1% level of significance. (2) The diagnostic test performed as follows A. Lag range multiplier test for residual serial correlation; B. Ramsey's RESET test using the square of the fitted values; C. Based on a test of skewness kurtosis of residuals; D. Based on the regression of squared fitted values 2

Figure 5: The cumulative sum of recursive residual (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) tests

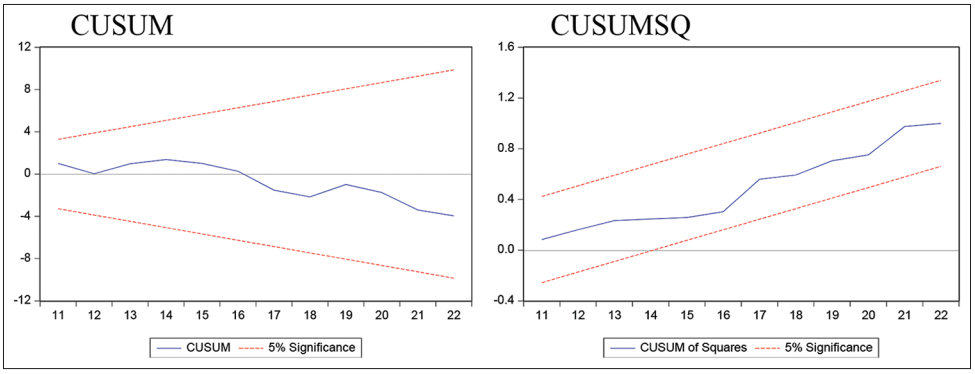


Table 7: Long run elasticities

Model 3	
DV	**LNFD**
Lag order	(2, 0, 2, 3, 1, 3, 2, 2)
IV	**Coefficient**
LNFRI	−0.095***
LNGDP	1.838***
LNINF	−1.843*
LNHC	1.528***
LNGFC	0.414***
DUM1	−0.127
DUM2	0.177**
C	−11.199***

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

Table 8: Short run elasticities and error correction model (based on present lag)

Model 3	
Variable	**Coefficient**
D(LNFD(−1))	0.324**
D(LNFRI)	−0.139***
D(LNGDP)	−0.260
D(LNGDP(−1))	−3.317***
D(LNINF)	−2.597
D(LNINF(−1))	5.421***
D(LNINF(−2))	−2.710***
D(LNHC)	1.238*
D(LNGFC)	0.583**
D(LNGFC(−1))	0.575**
D(LNGFC(−2))	−0.926***
D(DUM1)	0.079
D(DUM1(−1))	0.264*
D(DUM2)	0.170*
D(DUM2(−1))	−0.250**
CointEq(−1)	−1.457***
R-square	0.963
Adj. R-square	0.915

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

economy and financial system (Bank Negara Malaysia, 2024). By lowering interest rates, Bank Negara Malaysia (BNM) has reduced the overnight policy rate to support borrowing and investment. BNM also lowered SRR to inject liquidity into the banking system. Additionally, dedicated funds and financing schemes were launched to support small and medium enterprises, such as the SME Assistance Guarantee Scheme. Therefore, it could suggest the importance of relaxing financial restraints in the banking system so as to deepen the financial system.

Economic growth and financial development in this model are also positively related in the long run and statistically significant. This means a 1% increase in LNGDP will improve LNFD by 1.838 in the long run. In addition, the coefficient value for LNINF in this model is negative and significant at a 10% level of significance on the financial development. In this case, a 1% increase in LNINF will decrease Malaysia's financial development by around 1.843. This model also has a positive sign for the coefficient of the dummy variable (DUM2), which is 0.177, indicating that there is a positive relationship between the global financial crisis and financial development. Moreover, this study notices that the impact of human capital on financial development is positive and significant. This holds irrespective of the model specifications and estimation approach. For instance, a 1% increase in human capital LNHC will increase financial development by 1.528. Thus, the accumulation of the human capital stock spurs financial development in Malaysia.

In Malaysia, banks are central to providing funding for capital formation. As businesses invest in new projects or expand existing operations, the demand for banking services such as loans, mortgages, and other financial products increases. This observation is supported by our findings where Gross Fixed Capital Formation shows a positive and significant relationship with financial development. The long-term coefficient for LNGFC was estimated at 0.414 at a 1% significance level. It means that the 1% increase in LNGFC improves 0.414 financial development. In line with Matadeen et al. (2011) and Mbulawa (2015), their results showed that private investment proxy by the ratio of gross fixed capital formation to GDP does have a positive and significant influence on financial development. This result is also supported by Cherif and Gazdar (2010), and El-Nader and Alraimony (2013). LNGFC refers to the net investment in physical assets, such as infrastructure, machinery, buildings, and equipment, which are used for future production. LNGFC is an important indicator of economic development and plays a crucial role in influencing financial development in Malaysia.

The results of the short run are presented in Table 8, and the outcomes are emphasized in detail as follows. Based on the result, it shows that LNFRI and LNGDP have a negative relationship and significance with LNFD at the current lag and previous lag, respectively. In the short term, when there is a 1%

increase in LNFRI and LNGDP, it will statistically decrease financial development share by 0.139 and 3.317. Next, on the basis of the previous year, LNINF has a positive and statistically significant relationship with LNFD. LNFD was found to increase by 5.421 for every 1% increase in LNINF. However, based on the previous 2 years' lags, LNINF has a significant and negative effect on LNFD. Meanwhile, LNHC and LNGFC have a positively significant relationship with LNFD for the current year at a 10% and 5% significant level, respectively. Additionally, DUM1 and DUM2 have a positively significant relationship with LNFD for the previous year and the current year at a 10% significant level. However, DUM2 has a negatively significant relationship with LNFD in the previous lags, which means a 1% increase in the global financial crisis will hinder financial development by 0.250.

Figure 6: AR roots graph for model 3

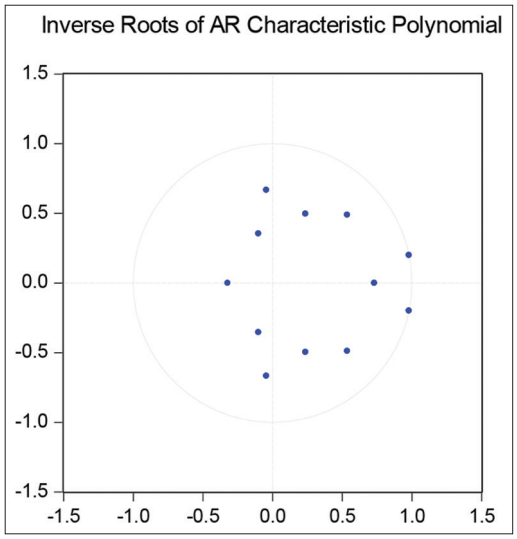
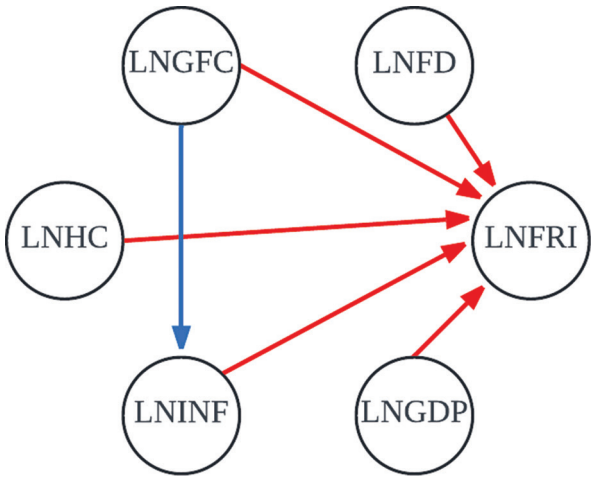


Figure 7: Direction of causality



The negative and significant value of the error correction term (ECT) supported the estimates of long-run elasticity in each model were supported by. ECT works by representing the speed of adjustment for each model. When ECT has a negative value, it means that in the long run, the variables in each model will converge. The analysis also found that the speed of adjustment in this model is −1.457, and from the analysis, approximately 146% of disequilibria, respectively, from the previous year's shock of those models will converge back to the long-run equilibrium in the current year. Next, the R-squared values suggest that almost 96% of the variables in the models can explain the corresponding dependent variables (LNFD). Thus, based on this analysis, any policy suggested by these studies can be deemed valid and implementable.

Another test, the Toda-Yamamoto Granger non-causality test, was carried out to gain information on causality among the variables as proposed. In this model, the optimum lag, *k*, detected is k=2. Thus, to carry out the Granger non-causality test using the Toda and Yamamoto approach, one extra lag (d_{max} = 1) was added to the optimal lag of the VAR model. Next, inverse roots of AR polynomials were performed to ensure that each model is dynamically stable. Figure 6 shows the result, and based on Figure 6, all the inverted roots (dots) for each model were found to lie strictly inside the unit circle, confirming that all models are dynamically stable. For the Toda-Yamamoto Granger non-causality test, the results are displayed in Table 9, and the representation of the result in the figure form can be viewed in Figure 7.

Based on Figure 7, it is found that there are 6 unidirectional (representing blue and red lines) detected in the model. The following unidirectional causality is listed as follows:

1) LNFD granger causes LNFRI
2) LNGDP granger causes LNFRI
3) LNINF granger causes LNFRI
4) LNHC granger causes LNFRI
5) LNGFC granger causes LNFRI
6) LNGFC granger causes LNINF

Overall, the result shows that all variables LNFD, LNGDP, LNINF, LNHC, and LNGFCF cause LNFRI. However, there is no bi-directional causality (feedback hypothesis) detected in this model. A higher degree of financial development (LNFD) can be taken as a requirement for financial repression to be implemented (LNFRI) in Malaysia. Rapid financial development could lead to volatility, financial crises, or speculative bubbles. Policymakers

Table 9: Toda Yamamoto Granger non-causality test

Variable	LNFD	LNFRI	LNGDP	LNINF	LNHC	LNGFC
LNFD	-	8.431** (0.014)	0.129 (0.937)	0.724 (0.696)	0.201 (0.904)	0.032 (0.984)
LNFRI	2.621 (0.269)	-	0.427 (0.807)	3.357 (0.186)	0.288 (0.865)	0.065 (0.968)
LNGDP	0.636 (0.727)	9.812*** (0.007)	-	1.355 (0.507)	2.059 (0.357)	0.950 (0.621)
LNINF	2.056 (0.357)	6.420** (0.040)	0.206 (0.901)	-	0.016 (0.991)	2.160 (0.339)
LNHC	2.070 (0.355)	8.458** (0.014)	0.618 (0.734)	2.114 (0.347)	-	1.688 (0.429)
LNGFC	0.297 (0.861)	8.476** (0.014)	3.078 (0.214)	4.966* (0.083)	2.405 (0.300)	-

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

may implement repressive measures to stabilize the system and protect domestic financial institutions, particularly during periods of economic vulnerability. Policies such as capital controls during the Asian Financial Crisis of 1997 and restrictions on foreign exchange reflect moments of financial repression (Tamirisa, 2001). Next, the level of economic growth could also cause a level of financial repression index. High economic growth often leads to increased demand for credit and financial resources. In Malaysia, the government may use financial repression, such as interest rate controls and directed credit programs to channel resources into sectors critical for maintaining or accelerating economic growth, such as manufacturing and other small-medium enterprises (SME).

The presence of causality from inflation to financial repression has shown very crucial information to the policymakers in the country to treat inflation as one of the important conditions for the country's allocation. Rapid economic growth can lead to inflationary pressures or asset bubbles (Girdzijauskas et al., 2022). Therefore, to prevent overheating of the economy, the government may implement financial repression to regulate liquidity or maintain currency stability. Not like other variables, the LNGFC granger causes two variables, LNFRI and LNINF, simultaneously. Malaysia has pursued ambitious infrastructure and industrialization programs, such as the Economic Transformation Programme (ETP) and earlier state-led initiatives. In this form, financial repression was often used to ensure funding for these projects at manageable costs. Gross fixed capital formation often requires significant borrowing, which can lead to an expansion in the money supply if funded through the banking system. This monetary expansion contributes to inflation.

The causality running from LNHC to LNFRI means that as human capital improves, it often drives structural transformation in the economy, such as industrialization and technological advancements. To guide and maximize the benefits of these transitions, the government might implement financial repression to allocate resources efficiently. For example, directed credit to industries requiring a skilled workforce. Regulation of financial markets to promote sectors aligned with human capital growth, like high-tech manufacturing or knowledge-intensive services. Realizing this, the Malaysian government has allocated a huge budget to programs such as MyBrain 15. This program aims to increase the total enrolment in postgraduate studies in numerous fields as an effort to boost human capital development in the future (Ridzuan et al., 2018).

5. CONCLUSION

The objective is to investigate the impact of financial repression and its causal effect on financial development. Malaysia has faced several financial restructurings since the early 1970s. Since that time, a series of plans have been introduced as part of development strategies to ensure long-term financial stability and recovery from financial crises. These measures aim to mobilize domestic savings and channel them into sectors crucial for economic development, such as infrastructure and industrialization. Interest rate ceilings kept borrowing costs low for targeted industries.

This study combined several factors to measure the financial repression index by using PCA. It included monetary policies such as public debt, reserve requirements, liquidity requirements, interest rate control, and directed credit programs. Based on the ARDL long-run estimation approach, LNFRI displays a negative and significant relationship with financial development in Malaysia. This means that by lowering interest rates, Bank Negara Malaysia (BNM) has reduced the overnight policy rate to support borrowing and investment. BNM also lowered SRR to inject liquidity into the banking system. Additionally, Dedicated funds and financing schemes were launched to support small and medium enterprises, such as the SME Assistance Guarantee Scheme. Toda-Yamamoto Granger non-causality test were added in order to provide information on causality among the variables. Overall, the result shows there is a unidirectional causality relationship where all variables LNFD, LNGDP, LNINF, LNHC, and LNGFCF cause LNFRI. However, there is no bi-directional causality (feedback hypothesis) detected in this model.

Policymakers should consider improving banking regulation and governance to ensure monetary stability while encouraging financial inclusion policies to expand access to credit and banking services. Meanwhile, the government can reduce excessive borrowing through financial institutions to avoid crowding out private sector investment. The government is advised to develop a deep and liquid bond market to provide alternative funding sources. Given the limited research on financial repression, particularly in Malaysia, future studies should explore its impact on financial development by incorporating public debt as a proxy.

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