International Journal of Computer Information Systems and Industrial Management Applications
ISSN 2150-7988 Volume 18(20s) 2026 pp. 373-393
https://doi.org/10.70917/ijcisim-2026-5187
Article

Competition, Ethical Governance and Sustainable Finance: Evidence from Development Financial Institutions in Malaysia

Mohd Faizal Basri

Faculty of Management and Economics, Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak, Malaysia
https://orcid.org/0000-0002-0651-4446
Corresponding Author: mfaizal.basri@fpe.upsi.edu.my

Abstract: This study examines the competitive environment and market structure of Malaysian Development Financial Institutions (DFIs) and discusses their implications for ethical governance and sustainable finance. Using panel data from ten Malaysian DFIs covering 2009–2020, the study employs structural and non-structural measures of competition. Market concentration is assessed using the three-bank concentration ratio (CR3), five-bank concentration ratio (CR5), and Herfindahl-Hirschman Index (HHI), while competitive behaviour is evaluated using the Panzar-Rosse H-statistic. The findings indicate that Malaysian DFIs operate under monopolistic competition within a moderately to highly concentrated market dominated by several large institutions. Although such concentration may strengthen financial stability and institutional capacity to undertake large-scale development projects, it also raises concerns regarding governance, accountability, and equitable access to development finance. Furthermore, the financing portfolios of several dominant DFIs indicate increasing reliance on consumption-related financing, suggesting potential mission drift from their developmental mandate. The study argues that competition should be evaluated not solely in terms of market efficiency but also according to its contribution to responsible finance, ethical governance, and sustainable development. Strengthening governance mechanisms and mandate-based performance indicators would help ensure that Malaysian DFIs remain aligned with national development priorities while supporting long-term sustainable economic growth.
Keywords: Development Financial Institutions, Ethical Governance, Market Competition, Mission Drift, Sustainable Finance

1. Introduction

Development Financial Institutions (DFIs) occupy a distinctive position within modern financial systems [1, 2]. Unlike commercial banks whose primary objective is to maximise shareholder value, DFIs are established to address financing gaps by supporting sectors that are strategically important for national socioeconomic development but often underserved by conventional financial institutions. Through targeted financing, advisory services, and long-term investment support, these institutions facilitate the growth of small and medium-sized enterprises (SMEs), agriculture, infrastructure, export-oriented industries, technology, and other priority sectors that contribute to inclusive and sustainable economic development [3]. This targeted financing approach is particularly important because financing constraints continue to impede innovation and long-term investment among many enterprises, especially SMEs operating in emerging economies [4].

In recent years, the role of DFIs has expanded considerably as governments and international organisations increasingly recognise the importance of sustainable finance in addressing economic, social, and environmental challenges. Sustainable finance extends beyond traditional financial performance by incorporating environmental, social, and governance (ESG) considerations into financial decision-making [5, 6]. Within this context, DFIs have become important policy instruments for mobilising capital towards achieving the United Nations Sustainable

Development Goals (SDGs), particularly those relating to poverty reduction, decent work, industrial innovation, reduced inequalities, and sustainable economic growth [7, 8]. The developmental outcomes of DFIs depend not only on the quantity of financing provided, but also on whether financing remains aligned with their developmental mandate.

Malaysia has established one of the most comprehensive development finance ecosystems in Southeast Asia through a network of specialised financial institutions operating under distinct developmental mandates. Prescribed DFIs regulated under the Development Financial Institutions Act 2002 (DFIA 2002) operate alongside several non-prescribed institutions that collectively support national economic priorities [9]. Over the past two decades, successive policy initiatives introduced by Bank Negara Malaysia (BNM), including the Financial Sector Masterplan (2001–2010), the Financial Sector Blueprint (2011–2020), and more recent initiatives promoting value-based finance and sustainable finance, have sought to strengthen institutional resilience, improve governance standards, enhance competitiveness, and reinforce the developmental role of DFIs [5, 10].

Despite these policy reforms, an important question remains. Does the current competitive environment continue to support the original developmental mandate of Malaysian DFIs, or has increasing commercial orientation altered their financing priorities?

This question has become increasingly important because competition within financial markets is often associated with greater efficiency, innovation, and improved customer welfare. While these outcomes are generally desirable, their implications for DFIs are considerably more complex. Unlike commercial banks, DFIs are expected to pursue multiple objectives simultaneously, including financial sustainability, economic development, social inclusion, and public accountability. Accordingly, competition should not be viewed solely through the lens of market efficiency, but also in terms of its capacity to support responsible lending and long-term developmental outcomes.

From an industrial organisation perspective, market concentration can generate economies of scale, improve operational efficiency, and strengthen institutional resilience. Large DFIs are often better positioned to finance major infrastructure projects, strategic industries, and long-term investment programmes that require substantial financial resources. Even so, excessive market concentration may also reduce competitive pressure, weaken innovation, limit financing alternatives, and encourage institutions to prioritise commercially attractive activities over their original developmental objectives. Balancing these competing considerations represents one of the central governance challenges facing DFIs worldwide.

Existing research has extensively examined competition within commercial banking and Islamic banking using structural measures such as the concentration ratio (CR) and the Herfindahl-Hirschman Index (HHI), together with non-structural approaches including the Panzar-Rosse (PR) model and the Lerner Index. Collectively, these studies provide valuable evidence regarding market efficiency, pricing behaviour, and banking competition across different institutional settings. Nevertheless, relatively little empirical attention has been devoted to DFIs despite their unique public policy role and increasing importance within sustainable finance.

More importantly, previous studies have largely evaluated competition from the perspective of financial performance and market efficiency, while paying comparatively limited attention to how competitive conditions may influence responsible lending, governance, and the ability of DFIs to fulfil their developmental mandate. As sustainable finance continues to gain prominence within national and international policy agendas, understanding the relationship between competition and developmental outcomes has become increasingly relevant.

To address these gaps, this study examines the competitive environment and market structure of Malaysian DFIs using both structural and behavioural measures of competition. Specifically, market concentration is evaluated using the three-bank concentration ratio (CR*3*), the five-bank concentration ratio (CR*5*), and the Herfindahl-Hirschman Index (HHI), while competitive behaviour is assessed using the Panzar-Rosse *H*-statistic. Unlike previous studies that interpret these measures primarily through the lens of industrial organisation, this research further considers their implications for ethical governance, responsible lending, and sustainable finance.

Accordingly, the study seeks to answer three research questions:

- What is the prevailing competitive environment and market structure of Malaysian DFIs?
- To what extent do existing competitive conditions support or constrain the developmental mandate of Malaysian DFIs?
- What are the implications of the observed market structure for ethical governance and sustainable finance?

The findings contribute to the literature in three important ways. First, the study extends existing competition literature by focusing specifically on DFIs, a segment of the financial industry that remains comparatively underexplored despite its strategic importance. Second, it integrates industrial organisation theory with business ethics and sustainable finance perspectives, thereby providing a broader framework for evaluating DFI performance beyond conventional measures of competition and profitability. Third, the study offers policy recommendations for strengthening governance mechanisms and mandate-based performance indicators that encourage responsible finance while preserving institutional sustainability.

The remainder of this paper is organised as follows. Section II reviews the literature on DFIs, competition theory, ethical governance, and sustainable finance. Section III describes the research methodology. Section IV presents the empirical findings. Section V discusses the implications of the findings from governance and sustainable finance perspectives. The final section concludes the paper by outlining policy recommendations, study limitations, and directions for future research.

2. LITERATURE REVIEW

A. Development Financial Institutions and Sustainable Development

Earlier research generally acknowledges that DFIs address market failures by providing long-term finance unavailable from commercial institutions [1, 2]. Their primary objective extends beyond commercial profitability to include broader socioeconomic outcomes such as employment creation, industrial development, technological innovation, regional development, and financial inclusion [3, 11]. By mobilising capital towards strategically important sectors, DFIs play an important role in supporting national economic transformation while contributing to long-term sustainable development.

Unlike commercial financial institutions, DFIs are expected to balance financial sustainability with public policy objectives. This balance has long been recognised as central to the sustainability of Malaysian DFIs [3]. This dual mandate distinguishes them from conventional banks and requires performance to be assessed using a broader set of criteria than profitability alone. In addition to maintaining sound financial performance, DFIs are increasingly expected to demonstrate measurable developmental outcomes through responsible financing practices, effective governance, and transparent accountability.

Recent developments in sustainable finance have further reinforced the strategic importance of DFIs. International organisations, including the United Nations, the World Bank, the Organisation for Economic Co-operation and Development (OECD), and the Asian Development Bank (ADB), increasingly recognise public development banks as important catalysts for achieving the Sustainable Development Goals (SDGs) by mobilising capital towards socially inclusive, environmentally responsible, and economically sustainable investments [6, 12]. Their effectiveness in achieving these objectives depends not only on the amount of financing provided, but also on whether financing remains directed towards developmental sectors consistent with institutional mandates. Recent evidence further suggests that governance quality and financial reporting transparency influence how institutions allocate equity and debt financing towards long-term sustainable and green investments [13]. Within emerging economies, DFIs have become particularly important in financing infrastructure, supporting micro, small and medium enterprises (MSMEs), promoting innovation, and facilitating green and transition finance.

Malaysia has also strengthened its commitment to sustainable finance through successive financial sector reforms led by Bank Negara Malaysia. Recent initiatives have emphasised responsible financing, climate-related financial risk management, value-based finance, and greater integration of ESG considerations within financial institutions. The growing complexity of green financial markets also places greater emphasis on effective risk assessment and management, particularly as financial institutions expand their involvement in sustainability-oriented financing [14]. These developments have further expanded expectations that Malaysian DFIs should operate not only as providers of development finance but also as institutions that demonstrate high standards of governance, accountability, and long-term societal value creation.

B. Ethical Governance, Responsible Lending and Mission Drift

The growing emphasis on sustainable finance has shifted attention from purely financial performance towards the broader responsibilities of financial institutions in creating long-term economic and social value. Within this context, ethical governance has emerged as a central principle guiding organisational decision-making, emphasising accountability, transparency, fairness, stakeholder engagement, and responsible allocation of financial resources [8, 12]. These governance principles are consistent with earlier evidence showing that non-financial dimensions, particularly corporate social performance, contribute to institutional resilience and financial sustainability [15]. These principles are particularly relevant to DFIs because they manage public resources and are entrusted with advancing national development priorities.

Unlike commercial financial institutions, whose primary accountability is to shareholders, DFIs are accountable to a broader group of stakeholders, including governments, taxpayers, businesses, communities, and future generations. Their financing decisions therefore extend beyond commercial considerations and influence employment creation, entrepreneurship, regional development, financial inclusion, environmental sustainability, and overall economic resilience. Consequently, evaluating DFI performance solely through profitability or market share provides only a partial assessment of their effectiveness.

One of the principal governance challenges faced by development-oriented financial institutions is mission drift [11]. Mission drift refers to the gradual movement of institutions away from their original developmental objectives towards activities that generate stronger commercial returns but contribute less to public policy outcomes [3, 11]. In practice, this may occur when institutions increasingly prioritise low-risk consumer financing, property-related lending, or other commercially attractive market segments while reducing financing directed towards productive sectors such as agriculture, manufacturing, technology, innovation, and small business development.

Mission drift should not necessarily be interpreted as organisational failure. Rather, it reflects the practical tension between financial sustainability and developmental responsibility. As competitive pressures intensify, institutions may seek more profitable financing opportunities to strengthen financial performance, improve capital adequacy, and satisfy prudential requirements. Although these objectives are legitimate from a financial management perspective, they may gradually reduce the developmental additionality that justifies the existence of DFIs.

These competing objectives highlight the need for broader performance measures that capture both financial sustainability and developmental outcomes. Increasingly, international organisations advocate evaluation frameworks that incorporate financial inclusion, developmental impact, ESG performance, responsible lending, and contribution to the Sustainable Development Goals (SDGs) [6, 12]. Within the Malaysian banking industry, recent evidence also demonstrates that value-based principles require stronger institutional disclosure practices if sustainability objectives are to be effectively translated into operational behaviour [16]. Such approaches recognise that the success of DFIs cannot be measured solely by financial returns but also by the long-term value they create for society.

C. Competition Theory and Market Structure

Competition has long been recognised as one of the fundamental determinants of efficiency within financial markets. Traditional industrial organisation theory suggests that competitive markets promote innovation, improve resource allocation, encourage operational efficiency, and enhance consumer welfare [17]. Cross-country studies also suggest that institutional and regulatory factors play an important role in shaping banking competition [18]. Recent evidence from Chinese commercial banks further indicates that changes in competitive conditions can have important implications for institutional performance. Zhu [19] finds that interest rate liberalisation is negatively associated with bank performance, while diversification can moderate this effect, suggesting that financial institutions may respond to competitive pressures by adjusting their business strategies. Similar arguments regarding competition and efficiency have been advanced in emerging market banking studies [20]. More recent studies further suggest that banking efficiency is increasingly influenced by digital transformation, technological innovation, and sustainability-oriented business models, particularly within Industry 4.0 environments [21]. Evidence from other segments of Malaysia's financial sector also points to a relationship between market position and institutional efficiency. Muhamat, et al. [22], examining general takaful operators following the implementation of IFSA 2013, reported substantial differences in technical efficiency across institutions and associated stronger performance with market share and more effective resource utilisation. These findings provide further evidence that market structure and institutional performance are interrelated, although this relationship may differ across financial institutions according to their objectives and regulatory settings. However, the relationship between competition and development finance is considerably more nuanced because DFIs operate under objectives that differ fundamentally from those of profit-maximising commercial banks.

From a structural perspective, market competition is commonly evaluated through measures of market concentration, including the concentration ratio (CR) and the Herfindahl-Hirschman Index (HHI) [17, 23]. These indicators provide information regarding the distribution of market power and the extent to which a small number of institutions dominate market activity. Higher concentration generally indicates lower competitive intensity, although moderate concentration may also generate economies of scale and greater institutional stability. Similar concentration-based approaches have been widely applied in banking market studies across various jurisdictions [24-26].

Behavioural approaches to competition focus instead on how institutions respond to changes in market conditions. Among these approaches, the Panzar-Rosse model remains one of the most widely adopted methods for evaluating banking competition [27, 28]. Rather than relying solely on market shares, the model estimates the responsiveness of total revenue to changes in input prices, allowing researchers to distinguish between monopoly, monopolistic competition, and perfect competition. The integration of structural and behavioural measures therefore provides a more comprehensive understanding of competitive dynamics than either approach alone.

Previous empirical studies generally conclude that commercial banking systems operate under monopolistic competition, although the degree of concentration varies considerably across countries and institutional settings [25, 26, 29, 30]. Similar findings have been reported in emerging banking markets where monopolistic competition remains the predominant market structure [31]. Despite these developments, empirical evidence concerning competition among DFIs remains comparatively limited, particularly within emerging economies where DFIs continue to perform significant public policy functions.

Of greater significance, existing competition studies rarely examine how market concentration influences responsible lending, governance quality, or sustainable development outcomes. Consequently, there remains limited understanding of whether existing competitive conditions strengthen or weaken the developmental outcomes of DFIs. Addressing this gap represents one of the principal motivations of the present study.

Although studies typically evaluate competition in terms of efficiency and profitability, competition may also influence financing allocation behaviour and organisational priorities. For DFIs, market structure therefore has implications not only for efficiency but also for governance quality, mandate fulfilment, and sustainable development outcomes.

D. Research Gap and Conceptual Framework

Although previous studies have made significant contributions to understanding competition within banking markets, three important research gaps remain.

First, most empirical studies focus on commercial or Islamic banking institutions, while DFIs receive comparatively limited scholarly attention despite their strategic role in supporting national development.

Second, competition has traditionally been evaluated from the perspectives of efficiency, profitability, and market performance. Relatively few studies have integrated business ethics, responsible lending, and sustainable finance into analyses of market competition.

Third, limited empirical evidence exists regarding whether market concentration and competitive behaviour influence the ability of development-oriented financial institutions to remain aligned with their developmental mandate, including the potential for increasing commercial orientation to contribute to mission drift.

Understanding this relationship is particularly important because DFIs must balance commercial sustainability with broader developmental responsibilities. Accordingly, this study proposes that competition should be interpreted as an institutional mechanism that influences financing allocation behaviour, governance quality, and ultimately the ability of DFIs to achieve sustainable development outcomes. Fig. 1 presents the conceptual framework underpinning the study.

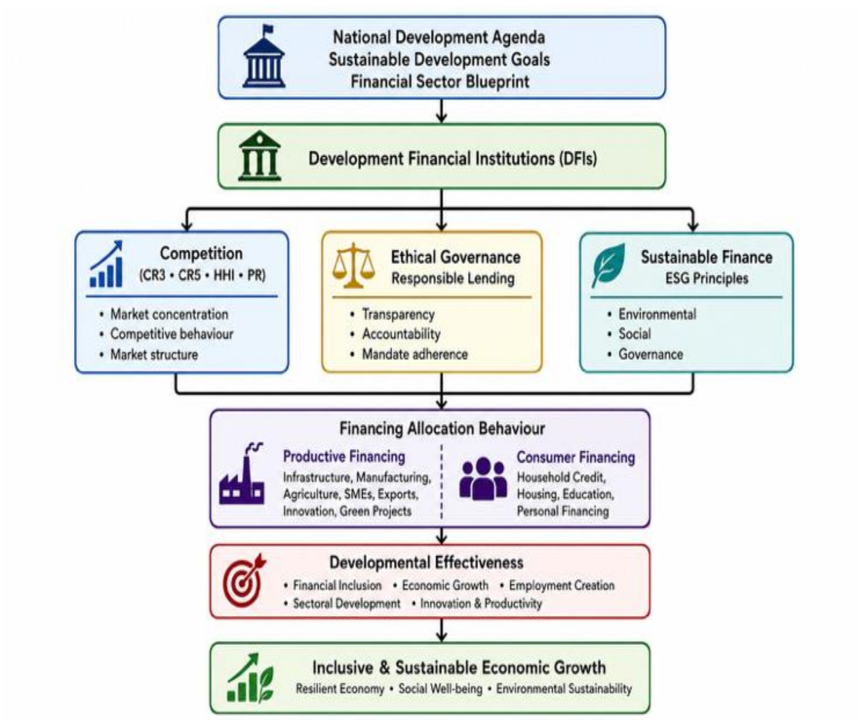

Fig. 1 Conceptual framework linking competition, governance and sustainable development

Source: Developed by the author

3. RESEARCH METHODOLOGY

A. Research Design

This study employs a quantitative panel-data approach to examine the competitive environment and market structure of DFIs in Malaysia and to evaluate the implications of these competitive conditions for ethical governance and sustainable finance. Although competition is traditionally analysed from the perspective of industrial organisation theory, this study extends the discussion by examining whether prevailing market conditions continue to support the developmental objectives for which DFIs were established.

The analysis combines structural and non-structural measures of competition. Structural measures assess the degree of market concentration within the DFI sector, while behavioural measures evaluate how institutions respond to changes in production costs under different competitive environments. Employing both approaches provides a more comprehensive assessment of market dynamics than relying on a single competition indicator.

Unlike previous studies that focus primarily on efficiency and profitability, this study interprets the empirical findings within the broader context of responsible lending, ethical governance, and sustainable finance. Accordingly, market concentration is viewed not merely as an indicator of competition but also as a potential determinant of institutional behaviour and developmental outcomes.

B. Sample Selection and Data Sources

The sample comprises ten DFIs operating in Malaysia over the period from 2009 to 2020. The institutions include both prescribed DFIs regulated under the DFIA 2002 and selected non-prescribed institutions that perform similar development financing functions.

The institutions were selected based on the availability of complete and consistent financial information throughout the twelve-year observation period. Using a balanced panel ensures comparability across institutions and improves the reliability of the empirical estimates.

Financial data were obtained from multiple sources, including annual reports published by the respective institutions, publications issued by Bank Negara Malaysia, Refinitiv Eikon, Fitch Solutions, and Orbis Bank Focus. Using multiple data sources improves data completeness while reducing reliance on a single database.

The final dataset consists of 120 bank-year observations, providing sufficient variation for panel estimation while adequately representing the Malaysian development finance sector. The institutions included in the analysis are:

Prescribed DFIs

- Bank Pembangunan Malaysia Berhad (BPMB)
- Small Medium Enterprise Development Bank Malaysia Berhad (SME Bank)
- Export-Import Bank of Malaysia Berhad (EXIM Bank)
- Bank Kerjasama Rakyat Malaysia Berhad (Bank Rakyat)
- Bank Simpanan Nasional (BSN)
- Agrobank

Non-prescribed DFIs

- Malaysian Industrial Development Finance (MIDF)
- Sabah Development Bank Berhad (SDB)
- Sabah Credit Corporation (SCC)
- Development Bank of Sarawak (DBOS)

The classification and role of these institutions are consistent with industry information published by the Association of Development Finance Institutions of Malaysia [32]. The selected institutions collectively represent the majority of Malaysian development financing activities and therefore provide a representative overview of the sector.

C. Measurement of Market Competition

To obtain a comprehensive assessment of competition, this study employs both structural and behavioural approaches.

The structural approach consists of the three-bank concentration ratio (CR*3*), five-bank concentration ratio (CR*5*), and the Herfindahl-Hirschman Index (HHI). These measures evaluate the distribution of market shares across institutions and provide an indication of market concentration.

The behavioural approach employs the Panzar-Rosse (PR) model, which estimates the elasticity of total revenue with respect to input prices. Unlike concentration measures, the PR model captures competitive conduct rather than market structure, thereby providing complementary evidence regarding the nature of competition within the industry.

The combined use of these measures enables the study to distinguish between market dominance and competitive behaviour, offering a more comprehensive understanding of the Malaysian DFI sector.

D. Concentration Ratio (CR)

The concentration ratio measures the combined market share held by the largest institutions operating within an industry. In banking studies, concentration ratios are widely used because they provide a straightforward indication of market dominance while requiring relatively limited data.

This study computes both the three-bank concentration ratio (CR*3*) and the five-bank concentration ratio (CR*5*) using financing and total assets as proxies for market activity.

The concentration ratio is calculated as:

where:

CR*k* = concentration ratio of the largest *k* institutions;

MS*i* = market share of institution *i*.

Higher CR values indicate greater market concentration and lower competitive intensity. Following widely accepted classifications, concentration ratios below 50 per cent indicate relatively competitive markets, values between 50 and 80 per cent indicate moderate concentration, while values exceeding 80 per cent suggest highly concentrated markets dominated by a small number of institutions.

Although concentration is often associated with reduced competition, moderate concentration may also generate operational efficiencies and improve the capacity of DFIs to finance large-scale development projects. Consequently, concentration should be interpreted alongside broader institutional objectives rather than viewed solely as evidence of reduced market competition.

E. Herfindahl-Hirschman Index (HHI)

While the concentration ratio focuses on the largest institutions, the Herfindahl-Hirschman Index (HHI) provides a more comprehensive measure by incorporating the market shares of all institutions within the industry. Larger institutions receive greater weight because market shares are squared before aggregation, making HHI particularly useful for identifying oligopolistic market structures.

The HHI is calculated as:

where:

HHI = Herfindahl-Hirschman Index;

MS = market share of each institution.

Consistent with international competition guidelines, HHI values below 1,000 indicate unconcentrated markets, values between 1,000 and 1,800 indicate moderate concentration, while values exceeding 1,800 suggest highly concentrated market structures. Within the context of development finance, concentration should not necessarily be interpreted negatively, as larger institutions may possess greater capacity to finance strategic national projects. Nevertheless, persistently high concentration warrants closer examination of governance and financing allocation.

F. Panzar-Rosse Model

Competitive behaviour is evaluated using the Panzar-Rosse (PR) model, one of the most widely applied non-structural approaches in banking competition research. Unlike structural measures, the PR model evaluates how institutions respond to changes in input prices, thereby providing evidence of actual competitive behaviour rather than merely describing market concentration.

Following the standard specification, the reduced-form revenue equation is estimated as:

where:

TREV = total revenue to total assets;

PL = personnel expenses to total assets;

PK = operating expenses to total assets;

PF = funding expenses to total assets;

SIZE = natural logarithm of total assets;

CS = equity to total assets;

INTER = financing to total assets;

RISK = loan loss provisions to total financing.

The *H*-statistic is obtained by summing the estimated coefficients of the three input-price variables (PL, PK and PF).

The interpretation follows the conventional classification:

$H \leq 0$: Monopoly or perfectly collusive market

$0 < H < 1$: Monopolistic competition

$H = 1$: Perfect competition

To ensure the validity of the competition estimates, the long-run equilibrium condition is tested using the Wald test. Consistent with previous banking competition studies, failure to reject the equilibrium hypothesis supports the application of the Panzar-Rosse framework.

G. Summary of Variables

TABLE I

Summary of variables used in the empirical analysis

Variable	Measurement	Description
TREV	Total revenue / Total assets	Dependent variable
PL	Personnel expenses / Total assets	Labour input price

PK	Other operating expenses / Total assets	Capital input price
PF	Funding expenses / Total assets	Price of funds
SIZE	Natural logarithm of total assets	Institution size
CS	Total equity / Total assets	Capital structure
INTER	Total financing / Total assets	Degree of intermediation
RISK	Loan loss provisions / Total financing	Credit risk

The log-linear specification improves estimation efficiency, reduces potential heteroscedasticity, and facilitates interpretation of coefficient estimates as elasticities. Prior to estimation, multicollinearity is assessed using the Variance Inflation Factor (VIF), while overall model adequacy is evaluated using the adjusted coefficient of determination (Adjusted R^2). The fixed-effects estimator was selected because it controls for unobserved institution-specific heterogeneity. The Hausman specification test indicated that the fixed-effects model was preferred over the random-effects specification.

4. EMPIRICAL FINDINGS

A. Market Concentration among Malaysian Development Financial Institutions

Table II presents the concentration ratios and Herfindahl-Hirschman Index for Malaysian DFIs between 2009 and 2020.

TABLE II

Concentration Trends of CR*3*, CR*5* and HHI (2009–2020)

	Concentration trends in financing				**Concentration trends in assets**		
Year	**CR*3***	**CR*5***	**HHI**		**CR*3***	**CR*5***	**HHI**
2009	0.82	0.93	0.29		0.72	0.83	0.21
2010	0.84	0.92	0.31		0.75	0.86	0.24
2011	0.84	0.93	0.31		0.74	0.86	0.25
2012	0.84	0.92	0.32		0.75	0.86	0.26
2013	0.82	0.91	0.29		0.75	0.86	0.25
2014	0.80	0.91	0.28		0.75	0.86	0.25
2015	0.77	0.90	0.27		0.73	0.86	0.25
2016	0.75	0.90	0.27		0.73	0.86	0.26
2017	0.76	0.89	0.28		0.73	0.86	0.27
2018	0.77	0.90	0.28		0.74	0.87	0.27
2019	0.78	0.90	0.30		0.75	0.86	0.28
2020	0.78	0.90	0.30		0.75	0.87	0.27
Mean	**0.80**	**0.91**	**0.29**		**0.74**	**0.86**	**0.26**
Std dev	**0.03**	**0.01**	**0.02**		**0.01**	**0.01**	**0.02**

The concentration ratios indicate that the Malaysian DFI sector remained consistently concentrated throughout the observation period. On average, the three largest institutions accounted for approximately 80 per cent of total financing activities, while the five largest institutions collectively represented more than 90 per cent of the market. Although concentration declined slightly after 2012, the overall market structure remained relatively stable over the twelve-year period.

The HHI results reinforce these observations. Both financing-based and asset-based HHI values consistently exceeded internationally recognised thresholds for highly concentrated markets. These findings suggest that a relatively small number of institutions continue to dominate development financing activities in Malaysia.

From a conventional industrial organisation perspective, such concentration may indicate limited competitive intensity. From a development finance perspective, the implications are more nuanced. Large DFIs may benefit from economies of scale, stronger capital positions, and greater capacity to finance strategic infrastructure and long-term investment projects [33, 34]. In this context, market concentration should be interpreted alongside the developmental objectives of these institutions rather than solely as evidence of reduced competition.

Nevertheless, persistent concentration also raises important governance considerations. Dominance by a limited number of institutions may reduce competitive incentives to innovate, limit financing diversity, and increase the risk that financing priorities gradually shift towards commercially attractive sectors rather than strategically important developmental activities. These issues are discussed in the following section.

B. Competitive Behaviour: Evidence from the Panzar-Rosse Model

To complement the structural measures of competition, this study employs the Panzar-Rosse (PR) model to examine the competitive behaviour of Malaysian DFIs. Whereas concentration measures describe the distribution of market shares, the PR model evaluates how institutions respond to changes in input prices, thereby providing direct evidence regarding the nature of market competition.

TABLE III

Fixed-effects estimation of the Panzar-Rosse model

Variable	**lnTREV**			**ln(1+ROA)**		
	Coefficient	**VIF**	**t-statistic**	**Coefficient**	**VIF**	**t-statistic**
Intercept	-1.4818		-1.9626	0.0475		1.7015
ln PL	-0.2254	2.9188	-2.2793**	-0.0078	2.9188	-1.0391
ln PK	0.1525	1.8825	2.6568***	0.0060	1.8825	3.3527***
ln PF	0.1395	2.3571	2.5413**	0.0018	2.3571	0.4818
ln SIZE	-0.6691	1.2435	-1.7523*	-0.0108	1.2435	-0.7642
ln CS	0.3195	2.8176	2.8409***	0.0093	2.8176	2.2281**
ln INTER	-0.0533	2.6343	-0.8351	-0.0034	1.4699	-1.4323
ln RISK	-0.0052	1.4699	-0.1479	-0.0035		-2.7202***
Adjusted R^2	0.2483			0.1824		
H-statistic	0.0666			0.0000		
Wald test (H=0)	7.1549***			5.2698***		

Test result	Monopolistic competition	Equilibrium
Number of observations	120	120

Note: ***, ** and * indicate significance at 1 per cent, 5 per cent and 10 per cent respectively.

The estimated *H*-statistic of 0.0666 indicates that Malaysian DFIs operated under monopolistic competition throughout the study period. The value lies between zero and one, suggesting that although competition exists within the sector, individual institutions continue to possess a degree of market power arising from their specialised mandates, government support, customer segmentation, and sector-specific financing activities. This finding is broadly comparable with Basri [25], Harkati, et al. [26], Abdul Majid and Sufian [35], all of whom reported monopolistic competition within Malaysian banking markets. The similarity in competitive behaviour suggests that specialised banking institutions, including Islamic banks and DFIs, may exhibit comparable market dynamics despite operating under different institutional mandates [25]. Unlike commercial banks that compete extensively through pricing strategies and product differentiation, Malaysian DFIs operate within clearly defined developmental niches. Consequently, the relatively modest *H*-statistic should not necessarily be interpreted as evidence of weak market performance. Rather, it reflects the institutional design of the Malaysian development finance system, where competition coexists with specialised public policy responsibilities.

The Wald test further indicates that the industry remained in long-run equilibrium during the sample period, supporting the validity of the estimated *H*-statistic. In addition, the Variance Inflation Factor (VIF) values remain well below the commonly accepted threshold of 10, indicating that multicollinearity is unlikely to influence the regression estimates.

Among the explanatory variables, the price of capital and the price of funds exhibit positive and statistically significant relationships with total revenue. These findings suggest that institutions are able to transfer increases in production costs into higher revenues, consistent with monopolistic competition. In contrast, labour costs demonstrate a negative relationship with revenue, implying that increases in personnel expenditure are not fully offset through higher income generation. This may reflect the labour-intensive nature of development finance, where advisory services, relationship management, and developmental support generate long-term value that is not immediately captured through financial returns.

Institution size also exhibits a negative association with revenue, although the effect is comparatively modest. This finding suggests that larger institutions do not necessarily achieve proportionately higher revenue relative to assets, highlighting the possibility of diminishing operational efficiency as organisational complexity increases. Conversely, capital structure demonstrates a positive relationship with revenue, indicating that stronger capitalisation enhances institutional capacity to support financing activities and absorb risk.

The degree of intermediation and institution-specific risk are not statistically significant in explaining revenue generation within the sample. This observation is unsurprising given the developmental mandate of DFIs, where financing decisions are influenced not only by commercial considerations but also by government policies, sectoral priorities, and broader socioeconomic objectives.

Overall, the regression results reinforce the conclusion that Malaysian DFIs operate within a relatively stable competitive environment characterised by limited but meaningful competition. Beyond this, they suggest that market behaviour is shaped as much by institutional mandates as by competitive forces alone.

C. Competition, Market Concentration and Developmental Outcomes

Taken together, the structural and behavioural measures provide a coherent picture of the Malaysian DFI sector. The concentration ratios and HHI demonstrate that market activity remains highly concentrated among a relatively small number of institutions, while the Panzar-Rosse model confirms that these institutions nevertheless compete under monopolistic competition.

At first glance, these findings may appear contradictory. However, they are entirely consistent with the institutional characteristics of development finance. Market concentration does not necessarily imply an absence of competition; rather, it reflects the presence of several dominant institutions operating within specialised market segments. Competition therefore occurs primarily through service quality, financing expertise, institutional reputation, and policy implementation rather than through aggressive price competition.

This distinction is particularly important because excessive competition may not always improve developmental outcomes. Unlike commercial banking, where stronger competition generally enhances consumer welfare, development finance requires an appropriate balance between competition, institutional stability, and policy effectiveness. Excessive rivalry may encourage institutions to pursue short-term commercial opportunities, whereas insufficient competition may reduce innovation and financing accessibility.

Accordingly, the results suggest that the principal policy concern should not be whether Malaysian DFIs become more competitive, but whether the existing competitive environment continues to support their developmental mandate.

D. From Competition to Mission Drift

The findings from the concentration measures and the Panzar-Rosse model suggest that Malaysian DFIs operate within a market structure characterised by both institutional concentration and monopolistic competition. While such a structure may support financial stability and strengthen the capacity of larger institutions to undertake strategic development projects, it may also influence financing allocation behaviour and organisational priorities over time [18, 24]. Similar evidence from banking studies suggests that concentrated markets can coexist with competitive behaviour, particularly where institutions operate within specialised market segments [17, 36].

For DFIs, however, competition must be assessed within the context of their developmental mandate. Unlike commercial banks, DFIs are expected to generate developmental additionality by directing financing towards sectors that experience persistent market failures, including SMEs, agriculture, infrastructure, innovation, and strategic industries [2, 3]. As competitive and financial pressures increase, institutions may face incentives to allocate greater resources towards commercially attractive activities that provide stronger short-term returns and lower risk exposure. Although such behaviour may support financial sustainability, it may also reduce the developmental impact that justifies the existence of DFIs [11].

Accordingly, the key policy question arising from the competition analysis is not whether Malaysian DFIs are sufficiently competitive, but whether existing market conditions continue to support their developmental responsibilities. This issue is particularly important because several institutions account for a substantial proportion of total development financing within the sector. The following section therefore examines financing allocation patterns among major DFIs and considers whether current lending activities remain aligned with responsible finance, ethical governance, and sustainable development objectives.

5. DISCUSSION

A. Financing Patterns and the Risk of Mission Drift

To better understand the practical implications of the observed market structure, this study further examines the financing portfolios of the six largest prescribed DFIs in Malaysia. While the competition analysis provides evidence regarding market concentration and competitive behaviour, financing allocation offers additional insight into whether these institutions continue to fulfil their developmental mandate.

TABLE IV

Sectoral Distribution of Financing among Major Malaysian DFIs (2020)

DFI	Economic sectors	Malaysian Ringgit (MYR)
Bank Rakyat	Consumption credit	72.6 billion (93 per cent)
	Financial, takaful, and business services	3.1 billion (4 per cent)
	Others	1.5 billion (2 per cent)
	Construction	1.0 billion (1 per cent)
BSN	Consumption credit	13.2 billion (45 per cent)
	Purchase of residential property	12.9 billion (44 per cent)
	Purchase of transport vehicles	2.2 billion (7 per cent)
	Others	1.1 billion (4 per cent)
BPMB	Construction	9.8 billion (52 per cent)
	Transport, storage, and communication	2.9 billion (16 per cent)
	Others	1.9 billion (10 per cent)
	Education	1.7 billion (9 per cent)
	Hotel and restaurants	1.3 billion (7 per cent)
	Shipping	1.0 billion (6 per cent)
Agrobank	Crops	4.7 billion (36 per cent)
	Household	3.1 billion (23 per cent)
	Retail and wholesale trade	1.5 billion (12 per cent)
	Manufacturing	1.5 billion (12 per cent)
	Livestock	0.9 billion (7 per cent)
	Others	0.8 billion (6 per cent)
	Fishery	0.6 billion (4 per cent)
SME Bank	Wholesale, retail trade, restaurants, and hotels	2.2 billion (28 per cent)
	Manufacturing	1.3 billion (17 per cent)
	Construction	1.3 billion (17 per cent)
	Financial, insurance/takaful, real estate, and business services	1.2 billion (14 per cent)
	Transportation, storage, and communication	0.9 billion (12 per cent)
	Others	0.9 billion (12 per cent)
EXIM Bank	Manufacturing	1.5 billion (26 per cent)
	Construction	1.3 billion (23 per cent)
	Transportation, storage, and communication	1.1 billion (19 per cent)
	Others	1.1 billion (19 per cent)
	Wholesale, retail trade, restaurants, and hotels	0.7 billion (13 per cent)

The sectoral distribution of financing reveals substantial variation across institutions, reflecting their respective mandates and areas of specialisation. Institutions such as Bank Pembangunan Malaysia Berhad (BPMB), SME Bank, Agrobank and EXIM Bank continue to direct a significant proportion of financing towards productive sectors including infrastructure, manufacturing, agriculture, construction, exports, and business development. These financing activities remain broadly consistent with the developmental objectives established under Malaysia's development finance framework.

However, a different financing pattern is observed for Bank Kerjasama Rakyat Malaysia Berhad (Bank Rakyat) and Bank Simpanan Nasional (BSN). Consumer-related financing accounted for approximately 93 per cent of Bank Rakyat's financing portfolio and 45 per cent of BSN's financing activities during 2020. Together, these two institutions represent a substantial proportion of the overall financing undertaken by Malaysian DFIs. Consequently, their financing decisions exert considerable influence on the developmental orientation of the sector as a whole.

Consumer financing is not inherently inconsistent with the objectives of development finance. Access to household financing contributes to financial inclusion, supports consumption smoothing, improves living standards, and may facilitate human capital investment through education and housing finance. These outcomes remain important components of inclusive economic development.

Nevertheless, when consumer financing becomes the dominant activity within institutions originally established to address market failures in productive sectors, important governance questions emerge. DFIs were created primarily to expand financing access for sectors facing structural financing constraints rather than to compete directly with commercial banks in consumer lending markets. An excessive shift towards commercially attractive retail financing may therefore reduce the availability of long-term capital for entrepreneurship, industrial upgrading, innovation, technology adoption, agricultural modernisation, and strategic infrastructure projects.

This phenomenon is commonly described as mission drift, whereby development-oriented institutions gradually reallocate resources towards activities offering stronger commercial returns but lower developmental additionality [3, 11]. Importantly, mission drift should not be interpreted as institutional failure or poor governance. Rather, it reflects the increasingly complex operating environment within which DFIs must simultaneously achieve financial sustainability, maintain regulatory compliance, manage credit risk, and fulfil government development priorities.

Taken together, these findings suggest that the principal governance challenge is not whether DFIs should generate financial returns, but how they can maintain an appropriate balance between commercial sustainability and developmental impact. Achieving this balance is particularly important because the legitimacy of government-supported financial institutions ultimately depends upon the public value they generate rather than their financial performance alone.

While previous research has examined the operational efficiency of Malaysian DFIs [37], the present study extends this literature by demonstrating that competition should also be interpreted from governance and developmental perspectives rather than operational efficiency alone.

B. Competition and Ethical Governance

The relationship between competition and ethical governance is considerably more complex than conventional competition theory suggests. In commercial markets, increased competition generally promotes efficiency, innovation, and consumer welfare. However, DFIs operate within a fundamentally different institutional environment where public policy objectives coexist alongside commercial considerations.

The findings indicate that Malaysian DFIs operate within a competitive environment that is sufficiently stable to preserve institutional sustainability while allowing specialised institutions to focus on their respective mandates. Such an institutional arrangement offers several advantages because excessive competition could encourage short-term commercial behaviour at the expense of long-term developmental objectives. Conversely, insufficient competition may weaken incentives for innovation, service quality improvement, and financing accessibility.

For policymakers, the issue is therefore not to maximise competition, but to ensure that competitive behaviour remains consistent with the ethical responsibilities entrusted to DFIs [6, 8]. Ethical governance therefore requires balancing financial sustainability with responsible lending, transparency, accountability, and measurable developmental outcomes.

The evidence presented here is also consistent with Bank Negara Malaysia's Value-Based Intermediation (VBI) initiative, which encourages financial institutions to balance commercial sustainability with positive social and environmental outcomes [10]. Although originally developed for Islamic financial institutions, the core principles of VBI, namely value creation, responsible financing, and long-term stakeholder welfare, are equally applicable to DFIs. This broader orientation is also consistent with recent developments in Islamic social finance, where sustainable investment and philanthropic capital are increasingly integrated to enhance long-term socioeconomic value creation [38]. The present findings therefore reinforce the importance of ensuring that competitive behaviour remains aligned with broader developmental objectives rather than short-term commercial performance alone.

From this perspective, competition should be viewed as a means of achieving sustainable development rather than an objective in itself. A competitive DFI sector is valuable only insofar as it enhances the ability of institutions to deliver meaningful economic and social benefits to the communities and industries they are intended to serve.

6. POLICY IMPLICATIONS

The empirical findings have several implications for regulators, policymakers, and DFIs. Although the Malaysian DFI sector appears financially stable and operates under monopolistic competition, maintaining financial stability alone should not be regarded as sufficient evidence that these institutions continue to fulfil their developmental mandate. Greater attention should therefore be given to how competition influences financing allocation behaviour, governance practices, and long-term socioeconomic outcomes.

A. Strengthening Mandate-Based Performance Evaluation

The findings suggest that the performance of DFIs should be assessed using a broader framework than conventional financial indicators such as profitability, return on assets, or market share. While these measures remain important for ensuring institutional sustainability, they provide only a partial picture of the value created by development-oriented financial institutions.

Given their public policy role, the assessment of DFI performance should also incorporate indicators that measure developmental impact. Such indicators may include financing directed towards strategic sectors, support for small and medium-sized enterprises (SMEs), employment generation, regional economic development, innovation financing, financial inclusion, and contributions to national sustainability objectives. Measuring these outcomes alongside financial performance would provide a more balanced assessment of institutional effectiveness and reduce incentives for excessive commercialisation.

This recommendation is consistent with the growing international emphasis on developmental additionality, whereby public financial institutions are evaluated according to the unique economic and social value they generate beyond what commercial financial institutions would ordinarily provide [11, 12].

B. Strengthening Responsible Lending Practices

Responsible lending has become an increasingly important component of sustainable finance. Unlike conventional lending practices that primarily emphasise financial returns and credit risk, responsible lending requires institutions to consider the broader economic and social consequences of financing decisions.

For Malaysian DFIs, responsible lending should continue to prioritise sectors where financing constraints remain significant, particularly in SMEs, agriculture, technology-intensive industries, renewable energy, export-oriented businesses, and infrastructure development. These sectors generate long-term productive capacity, stimulate employment, and contribute directly to Malaysia's economic resilience [6, 7].

This recommendation should not be interpreted as discouraging consumer financing. Household financing continues to play an important role in promoting financial inclusion and improving living standards. Nevertheless, regulators should ensure that consumer financing does not gradually displace productive financing activities that constitute the core developmental mandate of DFIs.

C. Governance, Transparency and Public Accountability

The study also highlights the importance of strengthening governance and public accountability within the development finance sector.

Given that many DFIs receive government support or operate under government mandates, stakeholders increasingly expect greater transparency regarding how financial resources are allocated. Annual reports could therefore be enhanced by incorporating developmental performance indicators alongside traditional financial statements. Examples include:

- proportion of financing supporting priority economic sectors;
- financing provided to first-time entrepreneurs and SMEs;
- financing supporting green and sustainable projects;
- regional distribution of financing;
- financing benefiting underserved communities; and
- measurable socioeconomic outcomes achieved through DFI programmes.

Greater disclosure of these indicators would improve accountability while enabling policymakers to evaluate whether institutions remain aligned with national development priorities [8, 10]. Moreover, international developments in financial systems increasingly emphasise integrated disclosure frameworks that combine financial and non-financial information to strengthen transparency, accountability, and stakeholder confidence [39].

This observation is consistent with earlier evidence that institutional efficiency does not necessarily imply greater developmental outcomes [37, 40]. Consequently, evaluating DFIs requires a broader framework that incorporates governance quality and developmental impact in addition to operational performance.

D. Competition Policy and Sustainable Finance

The findings also suggest that competition policy for DFIs should differ from that applied to commercial banking.

Traditional competition policy generally seeks to maximise market rivalry in order to improve efficiency and consumer welfare. However, DFIs perform functions that commercial financial institutions may be unwilling or unable to undertake because of longer investment horizons, higher perceived risks, or lower immediate financial returns.

Consequently, policymakers should seek an appropriate balance between competition, institutional sustainability, and developmental outcomes. Moderate market concentration may therefore be acceptable provided that governance mechanisms ensure continued commitment to responsible lending, financial inclusion, and long-term national development objectives.

This perspective aligns with the broader principles of sustainable finance, which emphasise long-term value creation rather than short-term financial performance alone.

7. THEORY CONTRIBUTIONS

The present study contributes to the literature in several important respects. First, it extends the banking competition literature by focusing specifically on DFIs, an area that has received considerably less empirical attention than commercial and Islamic banking. By applying both structural (CR*3*, CR*5* and HHI) and behavioural (Panzar-Rosse) measures, the study provides one of the few comprehensive assessments of competition within the Malaysian DFI sector.

Second, the study integrates industrial organisation theory with business ethics and sustainable finance. Previous competition studies have primarily interpreted market concentration from the perspectives of efficiency and profitability. In contrast, this study demonstrates that competition also influences governance, financing allocation behaviour, and the ability of institutions to achieve broader developmental objectives.

Third, the concept of mission drift provides a useful theoretical lens for interpreting the behavioural consequences of increasing commercial orientation among DFIs. Rather than viewing competition solely as an economic phenomenon, the study argues that competitive conditions also shape organisational priorities and the allocation of financial resources.

Finally, the study contributes to the emerging literature on sustainable finance by proposing that the effectiveness of DFIs should be evaluated using a multidimensional framework that combines financial sustainability with developmental impact, responsible lending, and ethical governance.

8. LIMITATIONS AND FUTURE RESEARCH

This study provides new evidence on the competitive environment of Malaysian DFIs and its implications for ethical governance and sustainable finance. Nevertheless, several limitations should be acknowledged.

First, the empirical analysis focuses exclusively on Malaysian DFIs. Malaysia provides an informative case because of its well-developed development finance ecosystem and comprehensive regulatory framework. However, institutional arrangements differ considerably across countries. Consequently, caution should be exercised when generalising the findings to other jurisdictions. Comparative studies involving DFIs across ASEAN or other emerging economies would provide valuable insights into how different regulatory environments influence competition, governance, and developmental outcomes.

Second, the study relies primarily on accounting and financial statement information. While these data are appropriate for evaluating market concentration and competitive behaviour, they do not directly measure the developmental outcomes generated by DFI financing. Future research could complement financial indicators with measures of employment creation, enterprise growth, innovation, financial inclusion, environmental impact, or regional economic development. Such indicators would provide a more comprehensive assessment of developmental additionality.

Third, although the Panzar-Rosse model remains one of the most widely accepted approaches for measuring banking competition, future studies could incorporate alternative non-structural measures such as the Lerner Index, Boone Indicator, or stochastic frontier analysis. Comparing different competition measures may provide additional insights into the evolving dynamics of DFIs.

Finally, this study focuses on market structure and financing allocation. Future research may explore how governance quality, board effectiveness, ESG integration, digital transformation, climate-related finance, and institutional ownership influence the ability of DFIs to balance commercial sustainability with developmental objectives. Such studies would further strengthen understanding of the role of DFIs within sustainable financial systems.

9. CONCLUSION

DFIs occupy a unique position within modern financial systems because they are expected to achieve financial sustainability while simultaneously advancing national socioeconomic development. Unlike commercial banks, their success cannot be evaluated solely by profitability or market share. Rather, they must be assessed according to their ability to generate long-term public value through responsible lending, financial inclusion, and sustainable economic development.

This study examined the competitive environment of ten Malaysian DFIs between 2009 and 2020 using structural measures of market concentration (CR*3*, CR*5*, and the Herfindahl-Hirschman Index) together with the non-structural Panzar-Rosse model. Evidence from the empirical analysis indicates that Malaysian DFIs operate under monopolistic competition within a moderately to highly concentrated market dominated by a relatively small number of institutions. Although such concentration may strengthen institutional stability and enhance the capacity to finance strategic national projects, it also raises important questions regarding governance, accountability, and the long-term allocation of development finance.

More broadly, the study extends earlier research on Malaysian banking competition by incorporating ethical governance and sustainable finance into the analysis of DFIs [25, 37, 41].

Further examination of sectoral financing patterns suggests that several dominant institutions allocate substantial resources towards consumer-related financing. While household financing contributes positively to financial inclusion and social welfare, an excessive shift towards commercially attractive activities may gradually reduce financing available for productive sectors that generate broader socioeconomic benefits. This observation highlights the continuing challenge of balancing commercial sustainability with developmental responsibility and reinforces concerns regarding potential mission drift.

The findings therefore suggest that competition should not be evaluated solely according to conventional measures of market efficiency. For DFIs, the more important consideration is whether prevailing competitive conditions enable them to fulfil the developmental mandate for which they were established. Competition should ultimately serve as a mechanism for promoting responsible finance, strengthening institutional governance, and supporting sustainable economic development.

Accordingly, the study recommends that policymakers strengthen mandate-based governance frameworks by incorporating developmental performance indicators alongside conventional financial measures. Greater emphasis should also be placed on responsible lending, financing transparency, ESG integration, and measurable contributions to national development priorities. Such an approach would provide a more balanced evaluation of DFI performance while helping to ensure that public financial resources continue to generate meaningful long-term economic and social value.

In conclusion, the future success of Malaysian DFIs will depend not simply on the degree of competition within the sector, but on their continued ability to balance financial sustainability with ethical governance, responsible finance, and sustainable national development. Maintaining this balance will be essential if DFIs are to remain effective catalysts for inclusive and resilient economic growth in an increasingly complex financial environment.

REFERENCES

1. Asian Development Bank, "Mobilization of Private Finance by Multilateral Development Banks and Development Finance Institutions 2020/2021: Special Edition," 2023. [Online]. Available: https://www.adb.org/sites/default/files/institutional-document/888236/mobilization-private-finance-mdbs-dfis-2020-2021.pdf
2. J. De Luna-Martinez, C. L. Vicente, A. B. Arshad, R. Tatucu, and J. Song, "2017 Survey of National development banks (English)," World Bank Group, Washington, D.C., 2018. [Online]. Available: http://documents.worldbank.org/curated/en/977821525438071799/2017-Survey-of-National-development-banks
3. N. S. M. Yunus, "DFIs of the future - maximising development impact," presented at the Welcome remarks by the Governor of Bank Negara Malaysia at the World Bank and Bank Negara Malaysia Forum on Performance Measurement for DFIs "DFIs of the Future: Maximising Development Impact", Kuala Lumpur, 9 August 2018, 2018.
4. L. Yang, Y. Wang, and R. Rasiah, "Research on the Influence of Tax Incentives and Financing Constraints on NEEQ Enterprises' Innovation," *Sustainability,* vol. 15, no. 3, p. 2608, 2023, doi: https://doi.org/10.3390/su15032608.
5. M. M. Alam, J. Said, F. Ghapar, and H. M. Tahir, "Assessment of Financial Sector Blueprint to Achieve Banking Sector Efficiency in Malaysia," in *European Proceedings of Social and Behavioural Sciences*, D. D. J. Said, N. Erum, N. B. Zakaria, S. Zolkaflil, & N. Yahya, Ed., 2023, vol. 131, pp. 875-895, doi: https://doi.org/10.15405/epsbs.2023.11.72.
6. OECD, "Global Outlook on Financing for Sustainable Development 2025: Towards a More Resilient and Inclusive Architecture," OECD Publishing, Paris, 2025. [Online]. Available: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/02/global-outlook-on-financing-for-sustainable-development-2025_6748f647/753d5368-en.pdf
7. Asian Development Bank, *Asian Development Outlook (ADO) April 2024*. 2024.

8. United Nations Development Programme. "The SDGs in action." https://www.undp.org/sustainable-development-goals (accessed.
9. Bank Negara Malaysia. "List of development financial institutions." https://www.bnm.gov.my/list-of-development-financial-institutions (accessed 15 April 2022.
10. Bank Negara Malaysia, "Financial Sector Blueprint 2022-2026," Kuala Lumpur, Malaysia, 24 January 2022 2022. [Online]. Available: https://www.bnm.gov.my/fsb3
11. N. Shamsudin, M. O. Mohammed, N. H. Abd. Rahman, and N. K. Mustaffa Kamil, "Mandate Performance Reporting of Malaysian Development Financial Institutions (DFIs): A Review," *Asian Journal of Accounting and Finance,* no. 1, pp. 1-6, 2020-03-31 2020. [Online]. Available: https://myjms.mohe.gov.my/index.php/ajafin/article/view/8755.
12. J. Sachs, *Sustainable development report 2022*. Cambridge University Press, 2022.
13. H. Chen, M. F. Basri, and H. A. Halim, "Equity and Debt Financing Dependence, Green Innovation, and the Moderating Role of Financial Reporting Quality: Evidence from Chinese Firms," *Sustainability,* vol. 17, no. 17, p. 7693, 2025. [Online]. Available: https://www.mdpi.com/2071-1050/17/17/7693.
14. Z. Dong, "Exploration of Intelligent Optimization Algorithm for Risk Management in Green Financial Market Driven by Science and Technology Innovation," *International Journal of Computer Information Systems and Industrial Management Applications,* vol. 18, pp. 16-16, 2026, doi: https://doi.org/10.70917/ijcisim-2026-0219.
15. A. A. Muhamat, M. N. Jaafar, and M. F. Basri, "Corporate Social Performance (CSP) influences on Islamic Bank's financial performance," *Journal of International Business, Economics and Entrepreneurship (JIBE),* vol. 2, no. 1, pp. 11-16, 2017, doi: https://doi.org/10.24191/jibe.v2i1.14456.
16. S. A. Talib, T. M. Iskandar, and R. Muda, "Assessment of value-based principles on Islamic banking practices in Malaysia: An explorative study using bank's disclosure," *Journal of Nusantara Studies (JONUS),* vol. 8, no. 3, pp. 429-452, 2023, doi: https://doi.org/10.24200/jonus.vol8iss3pp429-452.
17. J. A. Bikker and K. Haaf, "Measures of competition and concentration in the banking industry: A review of the literature," *Economic & Financial Modelling,* vol. 9, no. 2, pp. 53-98, 2002.
18. S. Claessens and L. Laeven, "What drives bank competition? Some international evidence," *Journal of Money, Credit and Banking,* vol. 36, no. 3 (Part 2), pp. 563-583, 2004, doi: https://www.jstor.org/stable/3838954.
19. J. Zhu, "An Econometric Model of Interest Rate Marketization and Diversification Driving the Performance Improvement of Listed Commercial Banks in China," *International Journal of Computer Information Systems and Industrial Management Applications,* vol. 18, pp. 13-13, 2026, doi: https://doi.org/10.70917/ijcisim-2026-0174.
20. A. Giustiniani and K. Ross, "Bank competition and efficiency in the FYR Macedonia," *South-Eastern Europe Journal of Economics,* vol. 6, no. 2, 2015.
21. C. Gherțescu, A. G. Manta, R. M. Bădîrcea, and L. F. Manta, "How does the digitalization strategy affect bank efficiency in Industry 4.0? A bibliometric analysis," *Systems,* vol. 12, no. 11, p. 492, 2024, doi: https://doi.org/10.3390/systems12110492.
22. A. A. Muhamat, M. F. Basri, M. N. Jaafar, D. N. A. Mohd Azlan, and N. A. Zamri, "A Study on the Efficiency of General Takaful Operators in Malaysia: Post Implementation of IFSA 2013," *Iranian Economic Review* vol. 27, no. 3, pp. 895-913, 2023, doi: https://doi.org/10.22059/ier.2023.329073.1007250.
23. N. Cetorelli, "Competitive analysis in banking: Appraisal of the methodologies," *Economic Perspectives - Federal Reserve Bank of Chicago,* vol. 23, pp. 2-15, 1999.
24. S. Al-Muharrami, K. Matthews, and Y. Khabari, "Market structure and competitive conditions in the Arab GCC banking system," *Journal of Banking and Finance,* vol. 30, no. 12, pp. 3487-3501, 2006, doi: https://doi.org/10.1016/j.jbankfin.2006.01.006.
25. M. F. Basri, "Competition and market structure of the Malaysian Islamic banking industry," *Journal of Islamic Accounting and Business Research,* vol. 11, no. 3, pp. 721-740, 2020, doi: https://doi.org/10.1108/JIABR-08-2017-0127.
26. R. Harkati, S. M. Alhabshi, and S. Kassim, "Competition between conventional and Islamic banks in Malaysia revisited," *Journal of Islamic Accounting and Business Research,* vol. 11, no. 9, pp. 1771-1789, 2020, doi: https://doi.org/10.1108/JIABR-09-2019-0176.
27. P. Molyneux, D. M. Lloyd-Williams, and J. Thornton, "Competitive conditions in European banking," *Journal of Banking & Finance,* vol. 18, no. 3, pp. 445-459, 1994, doi: https://doi.org/10.1016/0378-4266(94)90003-5.
28. J. C. Panzar and J. N. Rosse, "Testing for "monopoly" equilibrium," *Journal of Industrial Economics,* vol. 35, pp. 443-456, 1987, doi: https://doi.org/10.2307/2098582.
29. S. Al-Muharrami, " The competition and market structure in the Saudi Arabia banking " *Journal of Economic Studies,* vol. 36, no. 5, pp. 446-460, 2009.
30. B. Casu and C. Girardone, "Bank competition, concentration and efficiency in the single European Market," *The Manchester School,* vol. 74, no. 4, pp. 441-468, 2006, doi: https://doi.org/10.1111/j.1467-9957.2006.00503.x.
31. H. Semih Yildirim, & Philippatos, G. C., "Competition and contestability in Central and Eastern European banking market," *Managerial Finance,* vol. 33, no. 3, pp. 195-209, 2007, doi: https://doi.org/10.1108/03074350710718275.
32. Association of Development Finance Institutions of Malaysia. "List of members." https://adfim.com.my/list-of-members/ (accessed 15 April 2022.
33. J. A. Bikker and J. W. B. Bos, "Competition and efficiency in banking: International comparisons," *Economic and Financial Modelling,* vol. 12, pp. 103-148, 2005.

34. J. Y. Lin, J. Xu, Z. Yang, and Y. Zhang, *New Structural Financial Economics: A Framework for Rethinking the Role of Finance in Serving the Real Economy*, Cambridge: Cambridge University Press, 2024. [Online]. Available: https://www.cambridge.org/core/product/1D845A895DF2F4E664F3DB2943AC4567.
35. M. Z. Abdul Majid and F. Sufian, "Market structure and competition in emerging market: Evidence from Malaysian Islamic banking industry," *Journal of Economic Cooperation,* vol. 28, no. 2, pp. 99-121, 2007.
36. B. Casu and C. Girardone, "Competition issues in European banking," *Journal of Financial Regulation and Compliance,* vol. 17, no. 2, pp. 119-133, 2009, doi: doi:10.1108/13581980910952568.
37. N. Hashim, M. F. Basri, and M. Y. M. Hussin, "Technical efficiency of development financial institutions in Malaysia," *Universal Journal of Accounting and Finance,* vol. 9, no. 5, pp. 1125-1133, 2021, doi: https://doi.org/10.13189/ujaf.2021.090522.
38. S. Sulaiman, S. A. Shukor, and M. R. A. Aziz, "Philanthropic impact of investing via waqf-featured unit trust funds: Determinant factors influencing the participation in waqf unit trust funds in Malaysia," *ISRA International Journal of Islamic Finance,* vol. 16, pp. 24-45, 2024.
39. L. Gąsiorkiewicz and J. Monkiewicz, *The digital revolution in banking, insurance and capital markets*. Routledge Abingdon, 2023.
40. M. F. Basri, A. A. Muhamat, and M. N. Jaafar, "The efficiency of Islamic banks in Malaysia: Based on DEA and Malmquist productivity index," *Journal of Emerging Economies & Islamic Research,* vol. 6, no. 3, pp. 1-14, 2018. [Online]. Available: https://journal.uitm.edu.my/ojs/index.php/JEEIR/.
41. M. F. Basri, "The performance of Malaysian Islamic banking industry and the impact of foreign Islamic banks," PhD in Islamic Finance Doctoral thesis, Durham University Business School, Durham University, United Kingdom, 2016. [Online]. Available: http://etheses.dur.ac.uk/11580/