

FINANCIAL PERFORMANCE AND REVENUE GROWTH IN MALAYSIAN CREDIT COOPERATIVES: DO TAX OBLIGATIONS MATTER?

DESEMPENHO FINANCEIRO E CRESCIMENTO DA RECEITA NAS COOPERATIVAS DE CRÉDITO DA MALÁSIA: AS OBRIGAÇÕES FISCAIS SÃO RELEVANTES?

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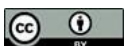
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Abstract

Credit cooperatives constitute a vital component of Malaysia's financial ecosystem by promoting financial inclusion and supporting member-based economic activities. Despite their growing economic contribution, sustained revenue growth remains uneven across credit cooperatives, raising questions about the effectiveness of internal financial management and the role of institutional constraints such as taxation. This study investigates the relationship between financial performance and revenue growth in Malaysian credit cooperatives, with particular attention to the moderating role of the tax ratio. Using balanced panel data for 24 credit cooperatives over the period 2018–2024, the analysis employs pooled ordinary least squares, fixed-effects, and random-effects estimations, supplemented by Driscoll–Kraay robust standard errors to address heteroskedasticity, serial correlation, and cross-sectional dependence. The findings indicate that profitability is the most consistent driver of revenue growth, while liquidity exerts a weaker but positive influence. Leverage does not exhibit a stable effect, reflecting the conservative capital structures of cooperatives. Contrary to theoretical expectations, the tax ratio does not significantly moderate the relationship between financial performance and revenue growth, suggesting that Malaysia's relatively uniform cooperative tax framework dampens fiscal heterogeneity across

Resumo

As cooperativas de crédito constituem um componente vital do ecossistema financeiro da Malásia, promovendo a inclusão financeira e apoiando as atividades econômicas dos seus membros. Apesar de sua crescente contribuição econômica, o crescimento sustentado da receita continua desigual entre as cooperativas de crédito, levantando questões sobre a eficácia da gestão financeira interna e o papel de restrições institucionais, como a tributação. Este estudo investiga a relação entre o desempenho financeiro e o crescimento da receita nas cooperativas de crédito da Malásia, com especial atenção ao papel moderador do índice de tributação. Utilizando dados de painel equilibrados para 24 cooperativas de crédito no período de 2018 a 2024, a análise emprega estimativas de mínimos quadrados ordinários agrupados, efeitos fixos e efeitos aleatórios, complementadas por erros-padrão robustos de Driscoll–Kraay para lidar com a heterocedasticidade, a correlação serial e a dependência transversal. Os resultados indicam que a rentabilidade é o fator mais consistente do crescimento da receita, enquanto a liquidez exerce uma influência mais fraca, mas positiva. A alavancagem não exibe um efeito estável, refletindo as estruturas de capital conservadoras das cooperativas. Contrariamente às expectativas teóricas, a taxa de tributação não modera significativamente a



institutions. These results contribute to cooperative finance literature by highlighting the dominance of internal efficiency over fiscal conditions in shaping revenue outcomes and offer practical implications for cooperative managers and policymakers concerned with long-term financial sustainability.

Keywords: Credit Cooperatives. Revenue Growth. Financial Performance. Profitability. Liquidity. Taxation. Panel Data.

relação entre desempenho financeiro e crescimento da receita, sugerindo que a estrutura tributária relativamente uniforme das cooperativas na Malásia atenua a heterogeneidade fiscal entre as instituições. Esses resultados contribuem para a literatura sobre finanças cooperativas ao destacar o predomínio da eficiência interna sobre as condições fiscais na determinação dos resultados de receita e oferecem implicações práticas para gestores de cooperativas e formuladores de políticas preocupados com a sustentabilidade financeira de longo prazo.

Palavras-chave: Cooperativas de Crédito. Crescimento da Receita. Desempenho Financeiro. Rentabilidade. Liquidez. Tributação. Dados de Painel.

1 INTRODUCTION

Cooperatives play a critical role in modern financial systems by promoting inclusive finance, democratic governance, and community-based economic development. Unlike investor-owned financial institutions, cooperatives operate under a member-oriented model in which economic returns are reinvested to enhance collective welfare rather than maximize shareholder profit. Within this ecosystem, credit cooperatives serve as member-based financial intermediaries that provide savings facilities, consumer financing, and microcredit services that complement the formal banking sector.

In Malaysia, the cooperative movement has expanded significantly over the past decade, emerging as an important contributor to national economic activity. According to the Suruhanjaya Koperasi Malaysia (SKM), the cooperative sector generated more than RM64 billion in turnover and served over seven million members in recent years. Credit cooperatives account for a substantial proportion of cooperative financial activity due to their lending operations, asset accumulation, and role in supporting financial access for civil servants, small entrepreneurs, and local communities.

Despite this growth, revenue performance among Malaysian credit cooperatives remains uneven. Some institutions demonstrate strong and sustained revenue expansion, while others experience stagnation or volatility. These differences highlight the importance of understanding the financial determinants of cooperative growth. Revenue growth represents a key indicator of institutional sustainability because it reflects the

cooperative's ability to generate income, expand financial services, strengthen reserves, and maintain member benefits over time.

Financial performance indicators such as liquidity, leverage, and profitability are widely used to evaluate the operational health of financial institutions. In credit cooperatives, these indicators are particularly important because they capture the institution's capacity to manage financial resources, sustain lending activities, and balance risk with growth. However, the extent to which financial performance translates into revenue growth may depend on broader institutional constraints that shape cooperative financial behavior.

One important institutional factor is taxation. Malaysian cooperatives operate under a distinctive fiscal framework that combines corporate income tax obligations with mandatory statutory reserve allocations. While these requirements aim to strengthen long-term financial resilience within the cooperative sector, they simultaneously reduce retained earnings available for reinvestment. From a financial perspective, such fiscal obligations may weaken the ability of financially efficient cooperatives to convert internal performance into revenue expansion.

Although the financial performance of cooperatives has been widely examined in prior research, the role of tax obligations in shaping cooperative revenue outcomes remains insufficiently explored. Most empirical studies focus on direct relationships between financial ratios and performance indicators, overlooking how fiscal obligations may alter these relationships. This gap is particularly relevant in the Malaysian cooperative context, where taxation and statutory contributions are embedded within the institutional regulatory framework.

This study addresses this gap by examining how financial performance influences revenue growth among Malaysian credit cooperatives while accounting for the potential moderating role of tax obligations. Using balanced panel data for 24 credit cooperatives over the period 2018–2024, the analysis employs panel regression techniques with robust standard errors to evaluate the relationships between liquidity, leverage, profitability, taxation, and revenue growth.

By integrating financial performance indicators with institutional fiscal factors, this study contributes to the cooperative finance literature in several ways. First, it provides new empirical evidence on the determinants of revenue growth within Malaysian credit cooperatives. Second, it extends existing research by examining taxation

as a moderating factor rather than a purely direct determinant of performance. Third, the study offers policy-relevant insights for cooperative managers and regulators seeking to strengthen financial sustainability within the cooperative sector.

2 LITERATURE REVIEW

2.1 Financial performance in credit cooperatives

Financial performance is a central determinant of sustainability for member-owned financial institutions such as credit cooperatives. Although cooperatives differ from investor-owned firms in governance structure and objectives, they remain subject to similar financial constraints related to liquidity management, capital structure, and efficiency in resource utilization. Consequently, financial ratios are widely used in cooperative finance research to assess institutional strength and revenue-generating capacity.

In cooperative finance literature, liquidity, leverage, and profitability ratios are commonly used to evaluate financial health. Liquidity ratios measure the ability of cooperatives to meet short-term obligations and sustain operational continuity. Studies indicate that insufficient liquidity exposes cooperatives to solvency risks, while excessive liquidity may reduce income-generating opportunities (Safiyuddin et al., 2021). In the Malaysian context, several studies report that credit cooperatives tend to maintain conservative liquidity positions, reflecting risk-averse management practices shaped by regulatory oversight and member protection mandates.

Leverage ratios capture the extent to which cooperatives rely on debt financing relative to equity. Moderate leverage can enhance growth by enabling asset expansion and service diversification; however, excessive leverage increases financial vulnerability, particularly during economic downturns. Empirical evidence from cooperative and banking sectors suggests that balanced leverage supports sustainable growth, whereas overreliance on debt weakens financial resilience (Abor et al., 2017; Syazwani et al., 2021). Malaysian credit cooperatives, in particular, are found to rely more heavily on member equity than external debt, indicating prudent capital structure management but also limiting aggressive growth potential (Safiyuddin et al., 2021).

Profitability ratios, including return on assets (ROA) and net profit margin (NPM), reflect managerial efficiency and the capacity to generate surplus for reinvestment. Prior studies consistently show that profitability is positively associated with revenue growth and institutional sustainability. Profitable cooperatives are better positioned to expand services, absorb economic shocks, and enhance member benefits (Iannotta et al., 2007; McKillop et al., 2020). In Malaysia, profitability has been identified as a key driver of cooperative expansion, particularly among large and well-established credit cooperatives. Collectively, these financial indicators form the core components of financial performance assessment in cooperative studies. However, the extent to which they translate into revenue growth depends on both internal efficiency and external institutional conditions, including taxation.

2.2 Theoretical foundations

Ratio Analysis Theory provides a foundational framework for evaluating financial performance by transforming accounting data into interpretable indicators of liquidity, solvency, and profitability. Financial ratios enable comparative analysis across time and institutions, allowing stakeholders to assess managerial effectiveness and financial stability (Pandey, 2020; Gitman & Zutter, 2021). In cooperative settings, ratio analysis is particularly valuable because it accommodates the non-profit-maximizing orientation of cooperatives while still capturing financial discipline and sustainability.

From a broader economic perspective, Production Theory conceptualizes organizational output as a function of input utilization. In credit cooperatives, financial resources liquidity, capital structure, and profitability serve as productive inputs that generate outputs such as revenue growth and service expansion. Inefficient allocation of these inputs results in suboptimal performance and reduced growth potential (Hsiao, 2014; Baltagi, 2021).

Efficiency Theory complements this view by emphasizing how effectively inputs are utilized to achieve maximum output. Farrell's (1957) efficiency framework distinguishes between technical efficiency and allocative efficiency, both of which are relevant in cooperative finance. High ROA and controlled operating costs indicate efficient use of assets, whereas inefficiencies manifest in weak revenue growth despite adequate resources. Empirical studies using Data Envelopment Analysis (DEA) confirm

that efficiency differences explain performance variation among cooperatives and microfinance institutions (Barros et al., 2020; M. S. M. & Vilvanathan, 2021).

The integration of Ratio Analysis, Production Theory, and Efficiency Theory provides a robust conceptual foundation for examining how financial performance influences revenue growth in credit cooperatives. These theories collectively suggest that revenue growth is not merely a function of resource availability, but of how well financial resources are structured, managed, and deployed.

This study contributes to the literature by integrating Ratio Analysis Theory, Production Theory, and Efficiency Theory into a unified analytical framework for cooperative finance. Ratio Analysis Theory provides the financial metrics required to evaluate liquidity, leverage, and profitability performance, while Production Theory conceptualizes financial resources as productive inputs that generate organizational outputs such as revenue growth. Efficiency Theory further explains why institutions with similar resource levels may exhibit different performance outcomes depending on how effectively those resources are utilized. By combining these theoretical perspectives, the study provides a comprehensive explanation of how internal financial management and external fiscal conditions jointly influence revenue growth in credit cooperatives.

2.3 Empirical evidence on financial performance and revenue growth

Empirical studies across financial institutions consistently demonstrate a strong relationship between financial performance and revenue or profit growth. Research in manufacturing and banking sectors finds that liquidity, leverage, and profitability jointly influence growth outcomes, although their individual effects vary by context (Hung & Viriany, 2023; Hendra et al., 2024).

Within cooperative and microfinance settings, Safiyuddin et al. (2021) report that Malaysian credit cooperatives with stronger equity bases and better profitability exhibit more stable revenue patterns. Similarly, Chungyas and Trinidad (2022) show that liquidity and operational efficiency are central to cooperative financial sustainability, particularly in developing economies. Studies using DEA further reveal that inefficiencies often driven by high operating costs or non-performing loans undermine revenue generation despite adequate asset bases (Haq et al., 2009; Barros et al., 2020).

These findings suggest that financial performance indicators are reliable predictors of revenue outcomes. However, most existing studies focus on direct relationships and pay limited attention to the role of external fiscal conditions, particularly taxation, in shaping these dynamics.

2.4 Taxation and cooperative performance

Taxation represents a significant external constraint on organizational finances, as it directly reduces resources available for reinvestment and growth. The tax ratio, defined as tax expenses relative to income, captures the fiscal burden faced by organizations. In conventional firms, high tax ratios are often associated with reduced investment and slower growth (Stiglitz & Rosengard, 2015).

In the cooperative context, taxation has unique implications. While many countries provide tax incentives or exemptions to cooperatives due to their social role, cooperatives may still face indirect fiscal burdens through statutory contributions and compliance costs. In Malaysia, cooperatives are required to allocate a portion of profits to statutory funds in addition to paying corporate income tax, effectively increasing their overall tax burden (SKM, 2023).

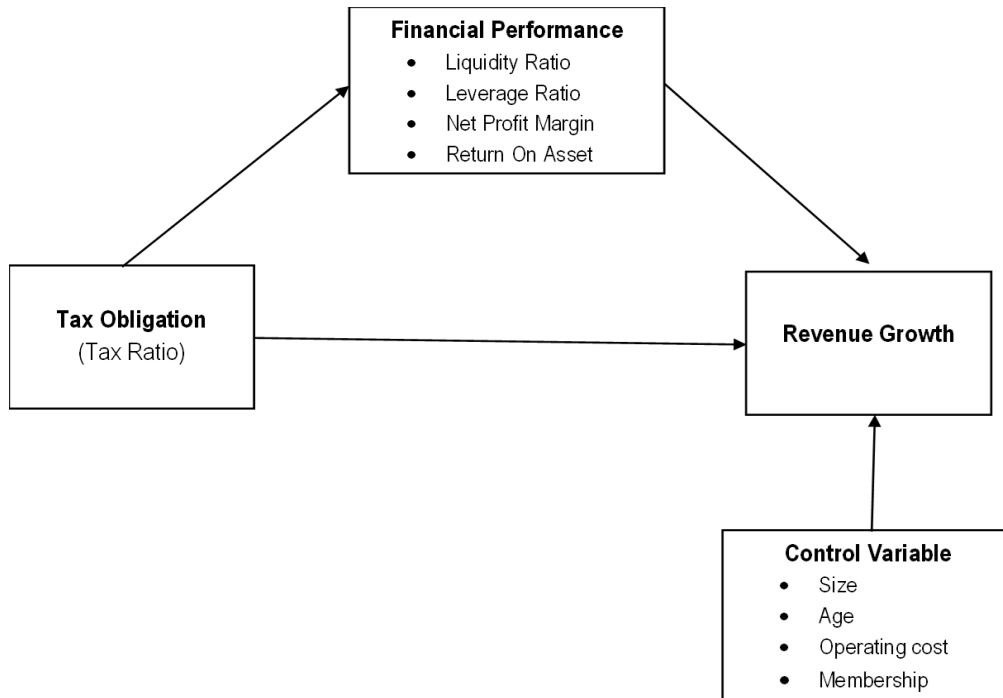
Empirical evidence on the impact of taxation on cooperative performance is mixed. Some studies suggest that high tax burdens constrain profitability and limit revenue expansion, particularly for small and medium-sized enterprises (Judijanto & Syakhrani, 2024). Others argue that moderate and well-designed tax systems can coexist with sustainable growth, especially when tax revenues are reinvested efficiently (Auerbach & Gorodnichenko, 2017).

Cross-country evidence further indicates that the growth effects of taxation depend on institutional quality and economic structure. Abd Hakim et al. (2022) find that direct and indirect taxes are negatively associated with growth in developing economies, whereas developed economies experience weaker or positive effects due to stronger institutions. In cooperative-dominated sectors, preferential tax treatment may reduce the sensitivity of financial performance to tax burdens.

3 CONCEPTUAL FRAMEWORK AND HYPOTHESES

Figure 1

Conceptual framework



This study proposes an analytical framework that explains how financial performance translates into revenue growth within Malaysian credit cooperatives, while accounting for the influence of taxation. Drawing on principles from ratio-based financial analysis and efficiency-oriented production theory, the framework recognizes that cooperative revenue outcomes are shaped by both internal financial management and external fiscal constraints.

Financial performance is represented through four core indicators: liquidity ratio, leverage ratio, net profit margin, and return on assets. Liquidity reflects the adequacy of short-term resources available to support operational continuity, whereas leverage indicates the extent to which cooperative activities are financed through external obligations. Profitability measures capture managerial effectiveness in generating surplus from operating income and asset utilization. Collectively, these indicators reflect the

cooperative's financial capacity to sustain operations, manage risk, and pursue income expansion.

Revenue growth is employed as the dependent variable and serves as a proxy for the cooperative's ability to strengthen its financial base over time. For credit cooperatives, growth in revenue is not solely a commercial objective but also a mechanism for enhancing member benefits, reinforcing statutory reserves, and supporting long-term institutional resilience.

A distinguishing feature of the framework is the treatment of tax obligation, operationalized through the tax ratio. Taxation is expected to exert a direct influence on revenue growth by affecting retained surplus and limiting reinvestment potential. Beyond this direct role, tax obligation is hypothesized to function as a moderating factor that conditions the effectiveness of financial performance in generating revenue growth. Under heavier tax burdens, the positive contribution of liquidity or profitability may be dampened, whereas more favorable tax conditions may allow financial efficiency to translate more strongly into income expansion. To ensure robust estimation, the framework incorporates several control variables cooperative size, age, operating cost, and membership growth. These factors capture structural and operational differences across cooperatives that may independently influence revenue performance. Their inclusion allows the analysis to isolate the net effects of financial performance and taxation. Overall, the framework offers an integrated perspective on how internal financial conditions and tax obligations jointly shape revenue growth in regulated, member-oriented financial institutions.

3.1 Research hypotheses development

Financial performance plays a central role in shaping growth trajectories within financial institutions, as it signals the ability to allocate resources effectively, manage financial risk, and sustain operational income. For credit cooperatives, adequate liquidity is essential to accommodate member withdrawals and maintain lending capacity, while balanced leverage supports financial efficiency without undermining stability. Measures of profitability further reflect managerial competence in transforming assets and activities into operating surpluses. Given the need for cooperatives to reconcile financial viability

with member welfare, stronger financial performance is expected to support more consistent revenue expansion. On this basis, the following hypothesis is proposed: H1: Financial performance is significantly associated with revenue growth.

Fiscal obligations also constitute a critical institutional factor influencing cooperative revenue outcomes, as they determine the proportion of surplus retained for reinvestment and growth. Although Malaysian cooperatives operate within a standardized tax environment, statutory taxes and compulsory fund allocations may limit internal funding capacity. Such constraints can shape pricing structures, lending margins, and strategic growth decisions, ultimately affecting revenue generation. Despite its relevance, the direct effect of tax obligation on cooperative revenue growth remains insufficiently explored in empirical research. Accordingly, the second hypothesis is formulated: H2: Tax obligation significantly affects revenue growth.

In addition to its direct influence, tax obligation may shape the extent to which financial performance contributes to revenue growth. Mandatory fiscal commitments can either dampen or reinforce the impact of liquidity management, leverage structures, and profitability on income expansion. For example, heavier tax pressure may reduce the reinvestment potential of profitable cooperatives, whereas lower effective tax burdens may enhance the capacity of financially sound institutions to convert performance into growth. By treating tax obligation as a moderating factor, this study acknowledges taxation as a structural constraint influencing financial behavior and outcomes. Thus, the third hypothesis is advanced: H3: Tax obligation moderates the relationship between financial performance and revenue growth.

4 RESEARCH METHODOLOGY

This study adopted a quantitative panel data approach to examine how financial performance influences revenue growth among Malaysian credit cooperatives and whether tax obligations alter this relationship. Panel data analysis was considered appropriate because it allows the examination of both cross-sectional differences across cooperatives and temporal variations over multiple years. By combining these two dimensions, the

method provides stronger empirical inference and improves estimation efficiency compared with purely cross-sectional or time-series approaches.

The analysis covered a seven-year period from 2018 to 2024. The study focused on cooperatives that were consistently ranked in the Top 100 and Top 350 Best Cooperatives Index published by the Malaysian Co-operative Societies Commission (SKM). These cooperatives represent financially active institutions with available financial records, making them suitable for systematic empirical evaluation.

The target population consisted of Malaysian credit cooperatives registered under the Malaysian Co-operative Societies Commission. From this population, a balanced panel sample of 24 credit cooperatives was constructed. The selection was based on the availability of consistent financial information across the study period.

Although the Malaysian cooperative sector includes a large number of entities, many smaller cooperatives do not publicly disclose detailed financial information. Therefore, only cooperatives with accessible audited financial statements and complete records were included in the dataset. This approach ensured data reliability while maintaining consistency across the observation period.

4.1 Data sources

The study relied exclusively on secondary data obtained from authoritative and verifiable sources. These sources included:

1. Publications and statistical reports from the Malaysian Co-operative Societies Commission (SKM)
2. Audited financial statements and annual reports of the selected credit cooperatives
3. Tax-related disclosures and financial records available through cooperative publications and publicly accessible financial databases

Financial indicators were extracted directly from balance sheets and income statements. These data enabled the construction of financial performance ratios, revenue growth measures, and taxation indicators required for the empirical models.

4.2 Variables measurement

The dependent variable in this study was Revenue Growth (RG), which measures the annual change in cooperative revenue. Revenue growth serves as an indicator of financial expansion and operational performance. It reflects the cooperative's ability to increase income from lending activities, service provision, and other operational sources.

Revenue growth was calculated as:

$$RG_{it} = \frac{Revenue_{it} - Revenue_{i,t-1}}{Revenue_{i,t-1}} \quad (1)$$

where

i denotes the cooperative and t represents the year.

The independent variable, financial performance was represented by several financial ratios commonly used in cooperative financial analysis.

- i. *Liquidity Ratio (LR)* This ratio measures the cooperative's capacity to meet short-term obligations using current assets.
- ii. *Leverage Ratio (LVR)* Leverage captures the extent to which cooperative assets are financed through liabilities. Higher leverage may enhance lending capacity but may also increase financial risk.
- iii. *Net Profit Margin (NPM)* Representing operational efficiency and the proportion of profit generated from revenue.
- iv. *Return on Assets (ROA)* Reflecting the ability of the cooperative to generate earnings from its asset base.

The moderating variable was the Tax Ratio (TR). This variable captures the proportion of tax expenses relative to cooperative earnings. The inclusion of the tax ratio allows the study to evaluate whether taxation affects the relationship between financial performance and revenue growth.

To isolate the impact of financial performance, several organisational characteristics were included as control variables:

- i. Cooperative Size – measured using total assets
- ii. Cooperative Age – number of years since establishment
- iii. Operating Cost – operational expenses relative to total activity
- iv. Membership Growth – annual change in cooperative membership

These variables account for structural differences between cooperatives that may influence revenue growth.

4.3 Econometric model specification

The empirical analysis employed a sequence of regression models to evaluate the direct and moderated relationships between financial performance and revenue growth.

i. Baseline Model

The baseline model examined the direct association between financial performance indicators and revenue growth:

$$RG_{it} = \beta_0 + \beta_1 FP_{it} + \varepsilon_{it} \quad (2)$$

where

FP represents financial performance indicators.

Revenue growth was calculated as:

$$RG_{it} = \frac{Revenue_{it} - Revenue_{i,t-1}}{Revenue_{i,t-1}} \quad (3)$$

ii. Model with Control Variables

The second specification incorporated organisational characteristics:

$$RG_{it} = \beta_0 + \beta_1 FP_{it} + X\beta + \varepsilon_{it} \quad (4)$$

where

X represents the vector of control variables.

iii. Moderation Model

To examine the moderating role of tax obligations, interaction terms were introduced:

$$RG_{it} = \beta_0 + \beta_1 FP_{it} + \beta_2 TR_{it} + \beta_3 (FP \times TR)_{it} + X\beta + \varepsilon_{it} \quad (5)$$

Separate models were estimated using liquidity, leverage, and profitability indicators to avoid multicollinearity and to evaluate their individual effects.

iv. Individual Ratio Models

Additional regressions were estimated to evaluate the interaction between tax ratio and each financial indicator:

$$RG_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 TR_{it} + \beta_3 (LR \times TR)_{it} + X\beta + \varepsilon_{it} \quad (6)$$

$$RG_{it} = \beta_0 + \beta_1 LVR_{it} + \beta_2 TR_{it} + \beta_3 (LVR \times TR)_{it} + X\beta + \varepsilon_{it} \quad (7)$$

$$RG_{it} = \beta_0 + \beta_1 NPM_{it} + \beta_2 TR_{it} + \beta_3 (NPM \times TR)_{it} + X\beta + \varepsilon_{it} \quad (8)$$

These models enabled the identification of whether taxation strengthens or weakens the influence of financial performance on revenue growth.

4.4 Statistical techniques

The empirical analysis was conducted using panel data econometric techniques. First, descriptive statistics were used to summarise the characteristics of the variables. This step provided an overview of the distribution, variability, and central tendency of financial indicators. Second, correlation analysis was performed to assess the relationships between variables and to identify potential multicollinearity issues. Third, panel regression models were estimated using both Fixed Effects (FE) and Random Effects (RE) approaches. The

Hausman test was applied to determine the most appropriate estimator. Several diagnostic tests were also conducted to ensure model robustness:

- i. *Variance Inflation Factor (VIF)* to detect multicollinearity
- ii. *Breusch–Pagan LM test* to evaluate panel structure
- iii. *Heteroskedasticity and autocorrelation tests*
- iv. *Pesaran Cross-Sectional Dependence test*

5 RESULTS AND DISCUSSION

Table 1

Summary of regression result.

Variables / Tests	Model 1(a)	Model 1(b)	Model 2(a)	Model 2(b)	Model 3(a)	Model 3(b)	Model 4	Model 5	Model 6
LR	0.2104**	-	0.3033**	-	0.3024**	-	-0.99998***	-	-
LVR	0.4466***	0.5564***	-0.0931	0.0990	-0.0900	0.1011	-	-1.0001***	-
NPM	-0.7215**	-0.8523***	-0.6465**	-0.8641***	-0.6419**	-0.8596***	-	-	-0.7133**
ROA	-	0.6708***	-	0.8411***	-	0.8388***	-	-	-
TXR	-	-	-	-	-0.1487	-0.1271	0.0004	0.0001	0.0627
Size	-	-	-0.6561**	-0.6706**	-0.6555**	-0.6700**	-0.0000	-0.0001	0.0782
Age	-	-	-0.0030	-0.0024	-0.0029	-0.0023	1.40	-6.49	-0.0008
OC	-	-	0.5078***	0.4888***	0.5057***	0.4871***	0.0001	-0.0000	0.5816***
MG	-	-	-0.2490*	-0.2741**	-0.2521*	-0.2767**	0.0002	0.0002	0.0301
VIF Test	1.65	1.11	2.68	2.21	2.50	2.08	3.11	2.54	1.62
F-Statistic	15.32	16.03	34.33	34.61	29.86	30.10	99999.00	99999.00	38.37
p-value (F)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
BP-LM Test (Panel vs Pooled)	423.04	431.27	430.89	434.13	430.68	433.96	0.00	0.36	433.11
p-value (BP-LM)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	1.00	0.2741	0.0000***
OLS Test (Homoskedasticity)	18447.94	20796.17	7141.60	5888.42	7146.07	5895.27	0.00	0.00	4699.64
p-value (OLS)	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	1.00	1.00	0.0000
Hausman Test (FE vs RE)	53.06	17.61	3.30	2.24	3.00	2.05	2.23	4.24	4.24
p-value (Hausman)	0.0000***	0.0005***	0.8564	0.9456	0.9347	0.9795	0.9458	0.7522	0.7515
Constant	-3.353***	-3.387***	-0.7484*	-0.7759*	-0.7221*	-0.7524*	-0.0003	0.0001	-1.1311***
Observations	168	168	168	168	168	168	168	168	168
R-squared	0.2189	0.2268	0.6003	0.6023	0.6004	0.6023	1.00	1.00	0.6267
Number of Groups	24	24	24	24	24	24	24	24	24

Source: Original calculation of the authors.

Notes: *, **, *** indicates significant at 10%, 5% and 1% levels. Values in parentheses represent robust standard errors.

Table 1.1 reports the regression estimates examining the relationship between financial performance, tax obligation, and revenue growth across Malaysian credit cooperatives using alternative panel model specifications. Across all models, the overall explanatory power of the regressions is statistically strong, as indicated by the F-statistics, which remain significant at the 1% level ($p < 0.01$). This confirms that the included financial and institutional variables collectively explain variations in cooperative revenue growth.

5.1 Financial performance and revenue growth

The results provide strong empirical support for Hypothesis 1, which proposes that financial performance significantly influences revenue growth among Malaysian credit cooperatives. The relationship is evident across several financial indicators, although the magnitude and direction vary across specifications.

Liquidity ratio (LR) demonstrates a positive and statistically significant relationship with revenue growth in Models 1(a), 2(a), and 3(a). The coefficients are significant at the 5% level, suggesting that improvements in short-term financial capacity are associated with higher revenue expansion. Adequate liquidity enables cooperatives to maintain lending activities, meet operational commitments, and respond more effectively to member financing demand. These results support the argument that liquidity plays an important role in sustaining operational continuity and facilitating revenue generation within member-owned financial institutions.

Leverage ratio (LVR) exhibits a positive and highly significant association with revenue growth in the baseline specifications, particularly in Models 1(a) and 1(b), where the coefficients are significant at the 1% level. However, the statistical significance disappears when additional control variables are introduced in Models 2 and 3. This indicates that the effect of leverage on revenue growth is conditional and influenced by broader institutional factors such as cooperative size, operating costs, and membership dynamics. In practical terms, this suggests that external financing may support cooperative growth only when supported by efficient operational management.

Profitability indicators show the most consistent relationship with revenue growth. Net profit margin (NPM) remains statistically significant across all relevant

specifications, with significance levels ranging between 5% and 1%. Similarly, return on assets (ROA) shows a strong and statistically significant association with revenue growth in Models 1(b), 2(b), and 3(b). These findings highlight profitability as a central driver of revenue performance in Malaysian credit cooperatives. Higher profitability reflects effective management of assets and operational efficiency, enabling cooperatives to expand financial services, strengthen reserves, and sustain long-term institutional growth.

Overall, the results confirm that financial performance indicators particularly liquidity management and profitability efficiency are key determinants of revenue growth within the cooperative sector.

5.2 Tax obligation and revenue growth

Hypothesis 2 proposed that tax obligation significantly affects revenue growth. However, the empirical evidence does not support this hypothesis. The tax ratio (TXR) does not display statistical significance in most model specifications. In Models 3(a), 3(b), and Models 4 through 6, the coefficients remain statistically insignificant at conventional levels.

This result indicates that taxation does not exert a direct influence on revenue growth among Malaysian credit cooperatives. One plausible explanation is the relatively standardized fiscal treatment applied to cooperatives within Malaysia. The cooperative sector operates under a uniform regulatory framework that includes preferential tax arrangements and statutory reserve requirements. Because these fiscal obligations are broadly similar across institutions, variation in effective tax burden remains limited, reducing its explanatory power in determining revenue outcomes.

Consequently, taxation does not emerge as a primary factor shaping cooperative revenue performance within the observed period.

5.3 Moderating role of tax obligation

Hypothesis 3 proposed that tax obligation moderates the relationship between financial performance and revenue growth. The empirical evidence provides only limited

support for this proposition. Interaction models incorporating the tax ratio and financial performance indicators reveal weak and inconsistent effects across specifications.

Although taxation does not exert a strong direct influence on revenue growth, its moderating role appears to be conditional and model dependent. In environments where tax structures remain relatively uniform, the potential moderating influence of taxation becomes inherently constrained. As a result, the impact of financial performance particularly liquidity management and profitability efficiency on revenue growth remains largely unaffected by tax obligations.

This finding suggests that internal financial management practices are more influential than fiscal conditions in determining cooperative revenue outcomes.

5.4 Effects of control variables

Among the control variables, cooperative size demonstrates a statistically significant negative relationship with revenue growth in Models 2(a), 2(b), 3(a), and 3(b). The coefficients are significant at the 5% level, indicating that larger cooperatives may experience slower relative revenue expansion compared with smaller institutions. This may reflect structural rigidities or operational complexities associated with larger cooperative organizations.

Operating costs show a positive and highly significant association with revenue growth across Models 2 and 3. The coefficients remain significant at the 1% level, suggesting that higher operational expenditures are linked to increased revenue generation. This relationship may reflect investments in service delivery, administrative capacity, and member engagement activities that contribute to income expansion.

Membership growth exhibits a negative relationship with revenue growth and reaches statistical significance in several specifications. While membership expansion increases the cooperative's service base, rapid growth may also introduce operational challenges or increased administrative costs that temporarily reduce revenue efficiency.

In contrast, cooperative age does not show statistical significance in any of the models. This indicates that institutional maturity alone does not determine revenue performance among Malaysian credit cooperatives.

5.5 Diagnostic tests and model robustness

Several diagnostic tests were conducted to verify the robustness of the regression models. Variance Inflation Factor (VIF) values range between 1.11 and 3.11, which are well below the commonly accepted threshold of 10. This indicates the absence of multicollinearity among the explanatory variables.

The Breusch–Pagan Lagrange Multiplier (BP-LM) test strongly rejects the pooled OLS specification in Models 1 to 3, confirming the suitability of panel data estimation techniques. Hausman test results indicate that fixed-effects estimation is appropriate for Models 1(a) and 1(b), while random-effects models are preferred for Models 2 and 3, where the null hypothesis cannot be rejected.

Models 4 and 5 report R^2 values approaching unity and coefficients close to one, indicating definitional overlap and accounting identities rather than meaningful behavioural relationships. Consequently, these models are excluded from substantive economic interpretation.

5.6 Summary of findings

Overall, the empirical results demonstrate that financial performance plays a critical role in explaining revenue growth among Malaysian credit cooperatives. Liquidity management and profitability efficiency emerge as the most influential drivers of revenue expansion, while leverage effects appear conditional upon broader institutional factors.

In contrast, tax obligations do not significantly influence revenue growth either directly or as a moderating factor. This suggests that within Malaysia's cooperative fiscal framework, internal financial efficiency remains the dominant determinant of revenue performance.

The empirical results highlight the dominant role of internal financial efficiency in shaping cooperative revenue growth. Among the financial indicators examined, profitability measures particularly return on assets emerge as the most stable predictors of revenue expansion. This finding suggests that efficient asset utilization enables cooperatives to generate sustainable operating income, reinforcing the importance of managerial effectiveness in member-owned financial institutions.

Liquidity also demonstrates a positive relationship with revenue growth, although the effect is less consistent across model specifications. Adequate liquidity allows cooperatives to maintain operational flexibility, meet member withdrawal demands, and support lending activities. However, excessive liquidity may indicate idle financial resources that are not deployed in productive activities, which may weaken revenue expansion. This conditional effect reflects the balance required between financial stability and income generation.

The role of leverage appears more limited. While leverage initially shows a positive association with revenue growth, its significance diminishes once institutional characteristics are controlled for. This outcome suggests that cooperative growth is less dependent on external financing than on internal financial management. The finding aligns with the conservative capital structures commonly observed in credit cooperatives, where reliance on member equity remains dominant.

In contrast, the tax ratio does not demonstrate a statistically significant direct or moderating effect on revenue growth. This result indicates that the fiscal framework governing Malaysian cooperatives does not substantially alter the relationship between financial performance and revenue outcomes. The relatively uniform tax treatment applied across cooperatives may reduce variation in effective tax burdens, thereby limiting the ability of taxation to influence revenue performance.

Overall, the findings suggest that internal financial discipline, particularly asset efficiency and liquidity management, plays a more decisive role than fiscal obligations in determining cooperative revenue growth.

6 CONCLUSION AND RECOMMENDATIONS

This study examined the influence of financial performance and tax obligations on revenue growth among Malaysian credit cooperatives using balanced panel data from 2018 to 2024. The empirical findings demonstrate that internal financial efficiency plays a central role in determining cooperative revenue performance. Liquidity management and asset utilization efficiency emerge as key drivers of revenue growth, while leverage effects appear conditional and dependent on broader institutional characteristics.

Contrary to theoretical expectations, tax obligations do not exert a statistically significant influence on revenue growth. This outcome reflects the relatively standardized fiscal framework governing Malaysian cooperatives, which limits variation in effective tax burdens across institutions. As a result, taxation does not appear to distort the relationship between financial performance and revenue expansion within the cooperative sector.

The findings carry several important implications. For cooperative managers, the results highlight the importance of strengthening asset utilization, improving profitability management, and maintaining optimal liquidity levels in order to sustain revenue growth. For regulators such as the Suruhanjaya Koperasi Malaysia, the findings suggest that policies promoting financial efficiency and governance improvements may yield stronger performance outcomes than adjustments to cooperative tax frameworks alone. For policymakers, the results reinforce the importance of supporting cooperative financial sustainability through capacity-building initiatives and performance monitoring mechanisms.

Future research may extend this analysis by incorporating dynamic panel estimation techniques to address potential endogeneity between financial performance and revenue growth. Additionally, integrating governance variables, digital financial adoption, and member participation indicators may provide a deeper understanding of the institutional drivers of cooperative performance. Comparative cross-country studies may also help determine whether the limited role of taxation observed in Malaysia represents a broader characteristic of cooperative financial systems.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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