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Effect of Loan Portfolio Diversification on Financial Performance: Evidence from Licensed Commercial Banks in Sri Lanka

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Abstract

This study investigates the impact of loan portfolio diversification on the financial performance of licensed commercial banks in Sri Lanka from 2014 to 2023. While portfolio theory emphasizes diversification as a tool to reduce risk, its effect in the Sri Lankan context remains unclear. The study distinguishes between product-wise and sector-wise diversification to address this gap. Secondary data from 13 domestic licensed commercial banks were analyzed using purposive sampling. Loan portfolio diversification was measured through the Herfindahl–Hirschman Index (HHI), with Pearson's correlation and panel data regression applied. Control variables included capital adequacy, non-performing loans, liquidity, and bank size. Results reveal that product-wise diversification negatively affects financial performance, while sector-wise diversification shows a significant positive effect. Capital adequacy ratio and non-performing loan ratio negatively influence performance, whereas liquidity has an insignificant positive impact. Bank size demonstrates a significant negative effect. Findings suggest that banks can improve profitability through product concentration while enhancing stability via sector diversification, offering useful insights for managers and regulators.

Keywords: *Capital Adequacy, Hirschman-Herfindahl Index, Loan Portfolio Concentration; Loan Portfolio Diversification; Non-Performing Loan*

1. Introduction

Commercial banks play a critical role in economic development by mobilizing financial resources and providing both short-term and long-term financing to households, businesses, and industries. A bank's loan portfolio—which includes personal, business, housing, and commercial loans—constitutes its largest asset base and primary source of income (McCarthy *et al.*, 2010). In Sri Lanka, loan portfolio growth remained strong for several years and recorded a 27.1% expansion in 2021. However, this trend reversed in 2022 following severe macroeconomic disruptions,

foreign exchange shortages, and sovereign rating downgrades, which restricted both foreign currency and rupee-denominated borrowings (CBSL, 2022). These developments have placed significant pressure on banks, emphasizing the need for effective loan portfolio management, particularly through loan portfolio diversification (LPD) as a mechanism to reduce exposure to sector-specific risks and enhance financial stability.

Loan portfolio diversification involves distributing loans across borrowers, sectors, products, and regions to minimize default risk. The importance of diversification is well established in traditional banking theory and Modern Portfolio Theory, which argue that risk is reduced when banks do not rely excessively on a single loan segment (Diamond, 1984). However, the long-standing debate between diversification and specialization persists. Scholars such as Singh (1991) and Winton (1999) note that while diversification spreads risk, specialization may improve monitoring efficiency and enhance profitability in sectors where banks possess expertise. Historical financial crises, including the Argentine crisis (2001–2002) and Austrian banking challenges (1997–2003), reveal the dangers associated with lending concentration, highlighting the need for balanced credit distribution strategies.

Despite extensive research globally, empirical findings on LPD remain inconclusive. Some studies report that diversification enhances stability and financial performance (Tah et al., 2016; Shim, 2019; Kashian & Tao, 2014), while others find negative or insignificant effects (Hayden et al., 2005; Adzobu *et al*., 2017). Evidence from developing countries also varies considerably. For instance, Sittichobtham (2019) and Kassa (2018) identify positive effects of diversification in Thailand and Ethiopia, while Huynh and Dang (2021) report reduced returns for Vietnamese banks adopting diversified loan portfolios. These mixed results suggest that the effectiveness of diversification may depend on contextual factors such as market structure, regulatory environment, and the economic cycle.

Research in the Sri Lanka context similarly showed inconsistent and fragmented findings. Lakmali and Disanayake (2021) identified a negative relationship between LPD and performance, whereas Rathnamalala and Perera (2021) found that product-wise diversification reduces profitability, but sector-wise diversification enhances it. These conflicting outcomes highlight the lack of consensus and limited empirical evidence on LPD within Sri Lanka, especially during periods of economic instability.

Existing literature also faces several key gaps. Many studies are based on stable economic environments and may not reflect crisis-driven financial systems such as Sri Lanka's recent downturn. Prior research often focused

on either product-wise or sector-wise diversification but rarely examines them simultaneously. In addition, essential control variables—such as capital adequacy, non-performing loans, liquidity, and bank size—are frequently omitted, limiting the accuracy of findings. Moreover, several international studies rely on short time periods, small samples, or data from developed economies, reducing their applicability to emerging markets. The influence of cultural and institutional factors on lending practices is also underexplored, further restricting the generalizability of previous conclusions.

Addressing these gaps, this study evaluates the impact of loan portfolio diversification on the financial performance of licensed commercial banks in Sri Lanka. It expands the scope of LPD by examining both product-wise and sector-wise diversification and incorporates crucial financial indicators to control for performance variability.

Accordingly, the main research question is: *To what extent does loan portfolio diversification influence the performance of licensed commercial banks in Sri Lanka?* The sub-questions are: (1) To what extent does product-wise loan diversification impact financial performance? (2) To what extent does sector-wise loan diversification impact financial performance?

The study also offers important practical implications. For bank managers, the findings can support informed credit allocation decisions that balance risk and profitability. For regulators and policymakers, the results may guide the formulation of guidelines that strengthen banking sector resilience and promote sound risk management. For investors and stakeholders, the research provides insights into how diversification strategies shape financial stability and long-term performance. Overall, by addressing conceptual gaps, methodological limitations, and contextual differences in prior literature, this study contributes to a more comprehensive understanding of loan portfolio diversification and its implications for financial performance in emerging economies such as Sri Lanka.

2. Research Method

This quantitative study analyzed the impact of loan portfolio diversification on the financial performance of licensed commercial banks in Sri Lanka. The population included all 24 licensed commercial banks; however, due to data availability, a purposive sample of 13 domestic banks was selected. Secondary data from annual reports spanning 2014 to 2023 were collected, resulting in 130 observations. Loan portfolio diversification was measured using the Herfindahl–Hirschman Index (HHI) for product-wise and sector-

wise diversification. Return on Equity (ROE) was used to assess financial performance. Data were extracted from reports published by banks listed on the Colombo Stock Exchange. Descriptive statistics, correlation, and regression analyses were conducted to evaluate the relationship between diversification and bank performance, controlling for relevant factors.

3. Result and Discussion

Descriptive Statistics

The dataset provides insights into various financial and market characteristics of 130 entities. The average Return on Equity (ROE) is 10.65%, with values ranging from a negative return of -7.64% to a high of 32.71%, showing moderate variability (standard deviation of 0.0707). The Herfindahl-Hirschman Index (HHI) for product market concentration has a mean of 0.3138, indicating moderate concentration, with a range from 0.2168 to 0.7026, reflecting significant variation in competition across entities. Similarly, the HHI for sector market concentration has a mean of 0.3020, also suggesting moderate concentration, with values between 0.1975 and 0.5578. The Capital Adequacy ratio averages 17.35%, with a wide range (from 10.83% to 85.44%), highlighting varied levels of financial stability across the entities. The Non-Performing Loans rate is relatively low, averaging at 4.59%, but with values ranging from 0.89% to 14.42%, indicating some institutions struggle with loan performance. Liquidity is fairly high on average (62.79%), but with significant variability (from 0.88% to 78.80%), suggesting differing levels of financial flexibility. Finally, Bank Size has an average value of 8.59, indicating the presence of both smaller and larger institutions, with a range from 6.83 to 9.64 and a standard deviation of 0.5834, reflecting diversity in the size of the banks. Overall, the data reveals a mix of stability and variability across the financial characteristics of the institutions.

Table 1. Descriptive Statistics

Variables	N	Mean	Minimum	Maximum	Std. Dev
Return on equity	130	0.106456	-0.076425	0.327098	0.070723
HHI product	130	0.313777	0.216782	0.702640	0.093192
HHI sector	130	0.302046	0.197480	0.557848	0.083110
Capital adequacy	130	0.173498	0.108300	0.854400	0.082742
Non-performing loan	130	0.045927	0.008900	0.144200	0.026787
Liquidity	130	0.627890	0.008766	0.788004	0.105351
Bank size	130	8.592477	6.829386	9.644611	0.583435

Source: Author Constructed

Correlation Analysis

The correlation results revealed that HHI Product is negatively correlated with financial performance, suggesting that increased product-wise diversification in a commercial bank's loan portfolio tends to lower financial performance due to higher monitoring costs. The correlation coefficient of -0.4016, significant at the 0.01 level, indicated a moderate negative relationship, aligning with the findings of Rathnamalala and Perera (2021) and Kumanayake *et al.* (2019). In contrast, HHI Sector shows a positive correlation with financial performance (ROE), indicating that greater sector-wise diversification in the loan portfolio enhances financial performance. The correlation coefficient of 0.2772, significant at the 0.01 level, reflects a weak positive association, consistent with the studies by Rathnamalala and Perera (2021) and Kassa (2018). The positive association implies that sector-wise diversification may lead to better financial performance, possibly due to better risk management and optimized resource allocation across sectors.

HHI Product and HHI Sector are moderately negatively correlated (-0.4269), meaning that as the product market concentration increases, sector market concentration tends to decrease, with a highly significant p-value (0.0000). Capital Adequacy Ratio (CAR) shows a very weak positive correlation with both HHI Product (0.0468) and HHI Sector (-0.0024), implying that market concentration has little to no impact on capital adequacy, and this relationship is statistically insignificant. Non-Performing Loan Ratio (NPLR) shows almost no correlation with the other variables, indicating that loan performance doesn't significantly interact with market concentration, liquidity, or bank size. Liquidity (LIQR) show a very weak negative correlation (-0.0252) with HHI Product**,** suggesting minimal relationships with these variables. Bank Size has a moderately strong negative correlation with CAR (-0.5260), meaning larger banks tend to have lower capital adequacy, which is statistically significant (p-value of 0.0000). Finally, The correlation between ROE and Bank Size (0.5799) is moderately positive, suggesting larger banks tend to be more profitable, though not overwhelmingly strong. Overall, the matrix highlights the complex interrelationships between market concentration, capital adequacy, liquidity, and profitability, with some significant correlations and others that are weak or statistically insignificant.

Table 2 Correlation matrix

Probability	HHI PRODUCT	HHI SECTOR	CAR	NPLR	LIQR	B_SIZE	ROE
HHI PRODUCT	1.0000						
HHI SECTOR	-0.4269	1.0000					
	0.0000	--------					
CAR	0.0468	-0.0024	1.0000				
	0.5968	0.9786	--------				
NPLR	-0.0107	-0.0749	-0.0003	1.0000			
	0.9034	0.3967	0.9972	--------			
LIQR	-0.0252	0.0625	-0.2404	-0.1412	1.0000		
	0.7759	0.4802	0.0059	0.1090	--------		
B_SIZE	-0.1749	0.0624	-0.5260	-0.0185	0.0460	1.0000	
	0.0466	0.4805	0.0000	0.8350	0.6033	--------	
ROE	-0.4016	0.2772	-0.4656	-0.3767	0.1159	0.5799	1.0000

Source: Author Constructed

Hausman Test

The Hausman test resulted in a chi-square value of 18.739852 with a probability of 0.0046, which is greater than the significance level of 0.05. This indicates that the fixed effect model is the preferred model. Following this, F-tests were conducted to determine whether the Pooled OLS or fixed effect model is more appropriate for the study.

F Test

The F-test showed a chi-square probability of 0.0034, which is below the 0.05 threshold, indicating that the fixed effect model is the appropriate choice for the study.

Regression Analysis

The fixed effect model revealed that ROE shows a probability F-statistic of 0.0000, and the Durbin-Watson statistic is 1.2482, indicating no serious autocorrelation issues in the data. The residuals are independent, and there's no serial correlation problem. The adjusted R-squared value of 0.7694 suggests that 76.94% of the variation in ROE can be explained by independent variables such as HHI product, HHI sector, and control

variables like capital adequacy, non-performing loans, liquidity ratio, and bank size. The remaining 23.06% is attributed to other unaccounted factors.

The Herfindahl-Hirschman Index (HHI) for product diversification shows a negative coefficient of -0.1487 with a p-value of 0.0115, indicating a statistically significant negative effect on financial performance (ROE). This suggests that greater product diversification within commercial banks leads to lower financial performance, likely due to increased complexity or inefficiencies in managing a broader product portfolio. In contrast, the HHI for sector diversification has a positive coefficient of 0.1506 with a p-value of 0.0494, showing a statistically significant positive effect on financial performance. This implies that diversifying across sectors enhances financial performance, possibly by reducing risk exposure or providing better opportunities in various sectors, thereby improving overall profitability.

The control variables, such as capital adequacy ratio (CAR) and non-performing loan ratio (NPLR), have negative coefficients (-0.2108 and -0.6143, respectively), indicating that higher CAR and NPLR negatively affect bank performance. However, the liquidity ratio (LIQR) has a positive but insignificant coefficient, suggesting no clear relationship. The bank size variable exhibits a negative coefficient of -0.05318, indicating that smaller banks tend to achieve higher profitability compared to larger ones. This suggests that larger banks may face higher operational costs, managerial inefficiencies, or reduced flexibility in credit allocation, which can adversely affect their financial performance.

Table 3. Panel Data Regression for LPD and Financial Performance

Variables	Pooled OLS	Random Effect	Fixed Effect
Constant	-0.1444	0.1562	0.6994
	(0.1120)	(0.2048)	(0.0002)
HHI Product	-0.2138	-0.1785	-0.1487
	(0.0000)	(0.0007)	(0.0115)
HHI Sector	0.0855	0.1422	0.1506
	(0.1248)	(0.0347)	(0.0494)
Capital adequacy ratio	-0.2205	-0.2089	-0.2108
	(0.0002)	(0.0005)	(0.0011)
Non-performing loan ratio	-0.9741	-0.8653	-0.6144
	(0.0000)	(0.0000)	(0.0002)
Liquidity ratio	-0.0199	-0.0087	0.0026
	(0.6120)	(0.7915)	(0.9393)
Bank size	0.0464	0.0071	-0.0532
	(0.0000)	(0.5959)	(0.0077)
R-squared	0.6204	0.3748	0.8016

Adjusted R-squared	0.6019	0.3444	0.7694
F-statistic	33.5043	12.2920	24.9176
Prob(F-Statistic)	0.0000	0.0000	0.0000
Durbin-Wats on stat	0.7805	1.1058	1.2482
Hausman Test – Chi sq 18.7398 (0.0046)			

Source: Author Constructed

Discussion

Consistent with the negative coefficient on the Herfindahl-Hirschman Index (HHI) for product diversification (-0.1487, p = 0.0115), the findings suggest that expanding the variety of loan products adversely impacts financial performance. This negative effect can be attributed to increased operational complexity, administrative costs, and monitoring challenges inherent in managing a broad product portfolio. Such inefficiencies may dilute managerial focus and elevate credit risk exposure, thereby reducing returns. This aligns with empirical studies by Rathnamalala and Perera (2021) and Kumanayake et al. (2019), who documented similar negative associations in the Sri Lankan banking context, reflecting the challenges of product diversification in emerging markets with limited demand and infrastructure. Conversely, sector-wise diversification exhibits a positive and statistically significant effect on ROE (coefficient = 0.1506, p = 0.0494), indicating that spreading loans across multiple economic sectors benefits bank profitability. This finding supports traditional portfolio theory and prior empirical research (Kassa, 2018; Rathnamalala & Perera, 2021), which emphasize the risk-reduction advantages of sectoral diversification by mitigating sector-specific shocks and enhancing overall loan portfolio stability. By avoiding excessive concentration in any one sector, banks may reduce the likelihood of large-scale defaults and better capture growth opportunities, thereby strengthening financial performance.

Regarding control variables, the negative coefficients on capital adequacy ratio (-0.2108) and non-performing loan ratio (-0.6143) corroborate existing literature indicating that higher capital buffers and elevated levels of non-performing loans constrain profitability. While a strong capital base is essential for bank solvency and risk absorption, excessive capital requirements may limit the deployment of funds into profitable lending activities (Nyanyuki et al., 2022). Similarly, high non-performing loans directly erode income and increase provisioning costs, as observed in studies by Ekanayake and Azeez (2015) and Mrindoko *et al.* (2020).

Liquidity ratio (LIQR) demonstrates a positive but statistically insignificant relationship with ROE, suggesting that liquidity management

practices in Sri Lankan banks have yet to translate into consistent profitability gains. This ambiguity aligns with mixed results in the literature, where liquidity's impact on bank performance varies depending on market conditions and bank-specific strategies (Al-Ali, 2020). The negative coefficient for bank size (-0.05318) implies that smaller banks outperform larger counterparts in profitability, which is consistent with Redmond (2013) and Waldron *et al*. (2017) who argued that larger banks may suffer from bureaucratic inefficiencies and operational complexities. In the Sri Lankan context, this may reflect limited economies of scale and challenges in credit risk management within larger institutions, echoing concerns raised by Ruwanthika *et al.* (2022).

Overall, these results highlight the nuanced effects of diversification on bank performance in emerging economies. While sectoral diversification aligns with risk management best practices and improves returns, product diversification may introduce complexity that outweighs benefits in contexts characterized by smaller, less diversified markets and higher credit risks.

4. Conclusions

The correlation analysis showed a negative relationship between product-wise loan diversification (HHI) and financial performance, suggesting that offering more loan products may reduce profitability due to higher costs and credit risks. This aligns with previous Sri Lankan studies (Rathnamalala & Perera, 2021; Kumanayake et al., 2019). In contrast, sector-wise diversification positively and significantly relates to performance, supporting the idea that spreading loans across industries enhances stability and returns.

Regression results confirmed these findings, though they differ from some studies (Menike, 2024; Edirisuriya *et al.*,2019; Stiroh, 2004; Stiroh, 2010; Berger and Bouwman, 2009; Berger et al., 2010) that found diversification improves profitability—likely due to Sri Lanka's smaller, riskier market. Control variables showed that higher capital adequacy and non-performing loans negatively affect profitability, liquidity had no significant effect, and larger banks tended to be less profitable, possibly due to operational inefficiencies.

The study provides useful insights for bank managers, investors, regulators, and policymakers on optimizing loan diversification and risk management. However, it is limited by a small sample of 13 domestic banks and a short timeframe (2014–2023). Future research should expand the sample and consider technological impacts to improve applicability.

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